



INDIANAPOLIS REGIONAL ITS ARCHITECTURE UPDATE

2023 ITS ARCHITECTURE DOCUMENT

Version 1.0

December 19, 2023

Prepared for the Indianapolis Metropolitan Planning Organization



Prepared by Iteris, Inc.

iteris[®]

2023 UPDATE DOCUMENT VERSION CONTROL

Author / Action	Submittal Date	Version No.
Cliff Heise / Draft Report Document	July 10, 2023	1.0
Cliff Heise / Final Report Document	December 19, 2023	1.0

INDIANAPOLIS REGIONAL ITS ARCHITECTURE DOCUMENT HISTORY

Regional ITS Architecture Issue Number / Date	National ITS Architecture Version	Architecture Tool Software Version	Comment
1.0 July 20, 2005	5.0	Turbo Architecture 3.0	Initial Release
1.1 July 20, 2007	5.1	Turbo Architecture 3.1	National Architecture/ Turbo Architecture update
2.0 January 3, 2008	5.1	Turbo Architecture 3.1	First regular architecture update
2.1 February 6, 2008	6.0	Turbo Architecture 4.0	National Architecture/ Turbo Architecture update
3.0 February 1, 2012	6.1	Turbo Architecture 5.0	Second regular architecture update
4.0 October 9, 2014	7.0	Turbo Architecture 7.0	Third regular architecture update; National Architecture / Turbo Architecture update
4.1 2021			ITS Inventory Update Memorandum dated November 24, 2020.
5.0 December 19, 2023	9.2	RAD-IT 9.2	Architecture update; National ITS Architecture Update / RAD-IT update; Architecture Website posted

Table of Contents

1	Introduction	1
2	Architecture Scope	2
3	ITS Stakeholders	3
4	ITS Inventory	7
5	ITS Services	30
6	Roles And Responsibilities	100
7	Functionality	118
8	Interfaces Between Systems	405
9	Communications	418
10	Agreements	430
11	ITS Projects	437
Appendix A.	Functional Requirements	441
Appendix B.	Interface Details	655

List of Tables

Table 1 – ITS Stakeholders.....	3
Table 2 – ITS Inventory.....	7
Table 3 – ITS Services.....	31
Table 4 – Roles And Responsibilities.....	101
Table 5 – Functional Objects Table	118
Table 6: Interconnects	405
Table 7 – Relevant Communications Solutions.....	418
Table 8 – Agreements.....	431
Table 9 – ITS Projects	437
Table 10 – Functional Requirements Table	442

List of Figures

Figure 1: Ambulance Dispatch - Ambulance Vehicles Interface.....	655
Figure 2: Ambulance Dispatch - Avon CSX Rail Yard Interface.....	656
Figure 3: Ambulance Dispatch - Beech Grove Public Safety Interface	657
Figure 4: Ambulance Dispatch - Emergency Operations Center Interface.....	658
Figure 5: Ambulance Dispatch - IMS Command Center Interface	658
Figure 6: Ambulance Dispatch - Indianapolis Airport Management Systems Interface	659
Figure 7: Ambulance Dispatch - Indianapolis Fire Communications Center Interface	660
Figure 8: Ambulance Dispatch - Indianapolis Police Dispatch Interface	661
Figure 9: Ambulance Dispatch - INDOT Indianapolis TMC Interface	662
Figure 10: Ambulance Dispatch - IndyGo Operations Center Interface	663
Figure 11: Ambulance Dispatch - Lawrence Public Safety Interface.....	664
Figure 12: Ambulance Dispatch - Lucas Oil Stadium Command Center Interface.	665
Figure 13: Ambulance Dispatch - Major Employer Management Systems Interface	666
Figure 14: Ambulance Dispatch - Marion County Sheriff Dispatch Interface	667
Figure 15: Ambulance Dispatch - MESA System Interface.....	668
Figure 16: Ambulance Dispatch - Private Fleet Vehicle Dispatch Systems Interface	669
Figure 17: Ambulance Dispatch - School Police Departments Interface.....	669
Figure 18: Ambulance Dispatch - Speedway Public Safety Interface	670
Figure 19: Ambulance Dispatch - Suburban Municipality Emergency Dispatch Interface	671
Figure 20: Ambulance Dispatch - Surrounding County Sheriff Communications Center Interface	672
Figure 21: Ambulance Vehicles - Beech Grove Roadside Equipment Interface	673

Figure 22: Ambulance Vehicles - Indianapolis DPW Roadside Equipment Interface 673

Figure 23: Ambulance Vehicles - INDOT Arterial Traffic Signals and Detection Interface 674

Figure 24: Ambulance Vehicles - Lawrence Roadside Equipment Interface..... 674

Figure 25: Ambulance Vehicles - Speedway Roadside Equipment Interface..... 675

Figure 26: Ambulance Vehicles - Suburban Municipality Street Department Roadside Equipment Interface 675

Figure 27: Ambulance Vehicles - Surrounding County Highway Roadside Equipment Interface 676

Figure 28: Avon CSX Rail Yard - Emergency Operations Center Interface 676

Figure 29: Avon CSX Rail Yard - Indianapolis Fire Communications Center Interface 677

Figure 30: Avon CSX Rail Yard - Indianapolis Police Dispatch Interface 678

Figure 31: Avon CSX Rail Yard - Intelligence Fusion Center Interface 679

Figure 32: Avon CSX Rail Yard - Marion County Sheriff Dispatch Interface 680

Figure 33: Avon CSX Rail Yard - MESA System Interface 681

Figure 34: Avon CSX Rail Yard - Suburban Municipality Emergency Dispatch Interface 682

Figure 35: Avon CSX Rail Yard - Surrounding County Sheriff Communications Center Interface 683

Figure 36: Beech Grove Public Safety - Beech Grove Public Works Operations Interface 684

Figure 37: Beech Grove Public Safety - Beech Grove Vehicles Interface..... 685

Figure 38: Beech Grove Public Safety - Emergency Operations Center Interface. 685

Figure 39: Beech Grove Public Safety - Event Promoters Interface 686

Figure 40: Beech Grove Public Safety - Indianapolis DPW Operations Center Interface 687

Figure 41: Beech Grove Public Safety - Indianapolis Fire Communications Center Interface 688

Figure 42: Beech Grove Public Safety - Indianapolis Police Dispatch Interface 689

Figure 43: Beech Grove Public Safety - INDOT Indianapolis TMC Interface 690

Figure 44: Beech Grove Public Safety - IndyGo Operations Center Interface 691

Figure 45: Beech Grove Public Safety - Intelligence Fusion Center Interface..... 692

Figure 46: Beech Grove Public Safety - Marion County Sheriff Dispatch Interface 693

Figure 47: Beech Grove Public Safety - MESA System Interface 694

Figure 48: Beech Grove Public Safety - Private Towing Companies Interface 695

Figure 49: Beech Grove Public Safety - Utility Emergency Repair/Response Interface 696

Figure 50: Beech Grove Public Safety - Weather Services Interface..... 696

Figure 51: Beech Grove Public Works Operations - Beech Grove Roadside Equipment Interface 697

Figure 52: Beech Grove Public Works Operations - Beech Grove Vehicles Interface 698

Figure 53: Beech Grove Public Works Operations - Emergency Operations Center Interface 699

Figure 54: Beech Grove Public Works Operations - Event Promoters Interface.... 700

Figure 55: Beech Grove Public Works Operations - Indianapolis DPW Operations Center Interface 701

Figure 56: Beech Grove Public Works Operations - Indianapolis MPO Planning Operations Interface..... 702

Figure 57: Beech Grove Public Works Operations - INDOT Arterial TMS Interface 702

Figure 58: Beech Grove Public Works Operations - INDOT Indianapolis TMC Interface 703

Figure 59: Beech Grove Public Works Operations - MESA System Interface..... 704

Figure 60: Beech Grove Public Works Operations - Private Towing Companies Interface 705

Figure 61: Beech Grove Public Works Operations - Utility Emergency Repair/Response Interface..... 706

Figure 62: Beech Grove Public Works Operations - Weather Services Interface .. 706

Figure 63: Beech Grove Roadside Equipment - Beech Grove Vehicles Interface . 707

Figure 64: Beech Grove Roadside Equipment - Indianapolis Fire Department
Emergency Vehicles Interface..... 707

Figure 65: Beech Grove Roadside Equipment - Major Employer Emergency Vehicles
Interface 708

Figure 66: Beech Grove Vehicles - Indianapolis DPW Roadside Equipment Interface
..... 708

Figure 67: Beech Grove Vehicles - INDOT Arterial Traffic Signals and Detection
Interface 709

Figure 68: Carmel CityOS - Carmel ITS Cameras Interface 710

Figure 69: Carmel Engineering Department Operations - Carmel Parking
Management System Interface 711

Figure 70: Carmel Engineering Department Operations - Carmel Roadside
Equipment Interface 712

Figure 71: Carmel Engineering Department Operations - Carmel Vehicle Charging
Stations Interface 713

Figure 72: Carmel Engineering Department Operations - Personal Computing
Devices Interface 713

Figure 73: Carmel Engineering Department Operations - Vehicles Interface 714

Figure 74: Carmel Parking Area Equipment - Carmel Parking Management System
Interface 714

Figure 75: Carmel Parking Management System - Personal Computing Devices
Interface 715

Figure 76: Carmel Vehicle Charging Stations - Electric Utility Interface..... 715

Figure 77: Carmel Vehicle Charging Stations - Vehicles Interface..... 716

Figure 78: CAV Authorizing Center - CAV-ITS Map Update System Interface 716

Figure 79: CAV Authorizing Center - SCMS Interface 717

Figure 80: CAV Authorizing Center - Suburban Municipality Street Department CAV
Roadside Equipment Interface 717

Figure 81: CAV Authorizing Center - Suburban Municipality Street Department
Operations/Dispatch Interface..... 718

Figure 82: CAV-ITS Map Update System - SCMS Interface 718

Figure 83: CAV-ITS Map Update System - Suburban Municipality Street Department CAV Roadside Equipment Interface..... 719

Figure 84: CAV-ITS Map Update System - Suburban Municipality Street Department Operations/Dispatch Interface..... 720

Figure 85: CICS Website - IndyGo Operations Center Interface..... 721

Figure 86: CICS Website - Personal Computing Devices Interface 722

Figure 87: CICS Website - TrafficWise Traveler Information System Interface..... 722

Figure 88: Commercial Vehicles - Emergency Operations Center Interface..... 723

Figure 89: Commercial Vehicles - Indianapolis Police Dispatch Interface 723

Figure 90: Commercial Vehicles - INDOT Indianapolis TMC Interface 724

Figure 91: Commercial Vehicles - ISP Dispatch Interface 724

Figure 92: Commercial Vehicles - Private Fleet Vehicle Dispatch Systems Interface 725

Figure 93: Convention Center Kiosks - Event Promoters Interface..... 725

Figure 94: Downtown Indy Website - Event Promoters Interface..... 726

Figure 95: Downtown Indy Website - Indianapolis DPW Operations Center Interface 726

Figure 96: Downtown Indy Website - Indianapolis MPO Planning Operations Interface 727

Figure 97: Downtown Indy Website - INDOT Indianapolis TMC Interface 728

Figure 98: Downtown Indy Website - IndyGo Operations Center Interface..... 729

Figure 99: Downtown Indy Website - Intelligence Fusion Center Interface..... 730

Figure 100: Downtown Indy Website - MESA System Interface 730

Figure 101: Downtown Indy Website - Personal Computing Devices Interface 731

Figure 102: Downtown Indy Website - Private Parking Management System Interface 731

Figure 103: Downtown Indy Website - TrafficWise Traveler Information System Interface 732

Figure 104: Electric Charging Management Center - Electric Utility Interface..... 732

Figure 105: Electric Charging Management Center - Electric Vehicle Charging Stations Interface 733

Figure 106: Electric Charging Management Center - Payment Administration Center Interface 733

Figure 107: Electric Charging Management Center - Private Traveler Services Interface 734

Figure 108: Electric Charging Management Center - TrafficWise Traveler Information System Interface 734

Figure 109: Electric Utility - Electric Vehicle Charging Stations Interface 735

Figure 110: Electric Utility - Payment Administration Center Interface 735

Figure 111: Electric Vehicle Charging Stations - Payment Administration Center Interface 736

Figure 112: Electric Vehicle Charging Stations - Payment Device Interface 736

Figure 113: Electric Vehicle Charging Stations - Vehicles Interface 737

Figure 114: Emergency Operations Center - Indianapolis Airport Management Systems Interface 738

Figure 115: Emergency Operations Center - Indianapolis DPW Operations Center Interface 739

Figure 116: Emergency Operations Center - Indianapolis Fire Communications Center Interface 740

Figure 117: Emergency Operations Center - Indianapolis Police Dispatch Interface 741

Figure 118: Emergency Operations Center - INDOT Indianapolis TMC Interface.. 742

Figure 119: Emergency Operations Center - INDOT Security Monitoring Field Equipment Interface 743

Figure 120: Emergency Operations Center - IndyGo Operations Center Interface 744

Figure 121: Emergency Operations Center - Intelligence Fusion Center Interface 745

Figure 122: Emergency Operations Center - ISP Dispatch Interface 746

Figure 123: Emergency Operations Center - Lawrence Public Safety Interface 747

Figure 124: Emergency Operations Center - Lawrence Public Works/Street Department Interface..... 748

Figure 125: Emergency Operations Center - Lucas Oil Stadium Command Center Interface 749

Figure 126: Emergency Operations Center - MESA System Interface 750

Figure 127: Emergency Operations Center - Private Fleet Vehicle Dispatch Systems Interface 751

Figure 128: Emergency Operations Center - Private Traveler Services Interface.. 751

Figure 129: Emergency Operations Center - Speedway Public Safety Interface... 752

Figure 130: Emergency Operations Center - Speedway Public Works Interface... 753

Figure 131: Emergency Operations Center - Surrounding County Sheriff Communications Center Interface 754

Figure 132: Emergency Operations Center - Utility Emergency Repair/Response Interface 755

Figure 133: Emergency Operations Center - Weather Services Interface 755

Figure 134: Event Promoters - Indianapolis DPW Operations Center Interface..... 756

Figure 135: Event Promoters - Indianapolis MPO Planning Operations Interface.. 756

Figure 136: Event Promoters - INDOT Indianapolis TMC Interface 757

Figure 137: Event Promoters - IndyGo Kiosks Interface 758

Figure 138: Event Promoters - IndyGo Operations Center Interface 759

Figure 139: Event Promoters - Lawrence Public Safety Interface..... 760

Figure 140: Event Promoters - Lawrence Public Works/Street Department Interface 761

Figure 141: Event Promoters - Personal Computing Devices Interface 762

Figure 142: Event Promoters - Speedway Public Safety Interface..... 762

Figure 143: Event Promoters - Speedway Public Works Interface..... 763

Figure 144: Event Promoters - TrafficWise Traveler Information System Interface 764

Figure 145: Event Promoters - Weather Services Interface 764

Figure 146: IMS Command Center - Indianapolis DPW Operations Center Interface 765

Figure 147: IMS Command Center - INDOT Indianapolis TMC Interface 766

Figure 148: IMS Command Center - MESA System Interface 767

Figure 149: IMS Command Center - Private Towing Companies Interface 768

Figure 150: IMS Command Center - Speedway Public Safety Interface..... 769

Figure 151: IMS Command Center - Surrounding County Highway
Operations/Dispatch Interface..... 770

Figure 152: IMS Command Center - Surrounding County Sheriff Communications
Center Interface 771

Figure 153: IMS Command Center - Utility Emergency Repair/Response Interface
..... 772

Figure 154: IMS Command Center - Weather Services Interface 772

Figure 155: Indianapolis Airport Emergency Vehicles - Indianapolis Airport
Management Systems Interface..... 773

Figure 156: Indianapolis Airport Field Devices - Indianapolis Airport Management
Systems Interface 774

Figure 157: Indianapolis Airport Field Devices - Suburban Municipality Emergency
Vehicles Interface..... 775

Figure 158: Indianapolis Airport Maintenance Vehicles - Indianapolis Airport
Management Systems Interface..... 775

Figure 159: Indianapolis Airport Management Systems - Indianapolis Airport Parking
System Interface 776

Figure 160: Indianapolis Airport Management Systems - Indianapolis DPW
Operations Center Interface 777

Figure 161: Indianapolis Airport Management Systems - Indianapolis Fire
Communications Center Interface 778

Figure 162: Indianapolis Airport Management Systems - Indianapolis Police Dispatch
Interface 779

Figure 163: Indianapolis Airport Management Systems - INDOT Indianapolis TMC
Interface 780

Figure 164: Indianapolis Airport Management Systems - INDOT MCO Management
Interface 781

Figure 165: Indianapolis Airport Management Systems - Intelligence Fusion Center
Interface 782

Figure 166: Indianapolis Airport Management Systems - Marion County Sheriff Dispatch Interface 783

Figure 167: Indianapolis Airport Management Systems - MESA System Interface 784

Figure 168: Indianapolis Airport Management Systems - Private Fleet Vehicle Dispatch Systems Interface..... 785

Figure 169: Indianapolis Airport Management Systems - Suburban Municipality Emergency Dispatch Interface 785

Figure 170: Indianapolis Airport Management Systems - Surrounding County Sheriff Communications Center Interface 786

Figure 171: Indianapolis Airport Management Systems - Taxi Services Interface . 787

Figure 172: Indianapolis Airport Management Systems - Weather Services Interface 787

Figure 173: Indianapolis Airport Parking Area Equipment - Indianapolis Airport Parking System Interface 788

Figure 174: Indianapolis Airport Parking Area Equipment - Personal Computing Devices Interface 789

Figure 175: Indianapolis Airport Parking System - Personal Computing Devices Interface 790

Figure 176: Indianapolis Airport Parking System - TrafficWise Traveler Information System Interface 791

Figure 177: Indianapolis DPW Operations Center - Indianapolis DPW Roadside Equipment Interface 792

Figure 178: Indianapolis DPW Operations Center - Indianapolis DPW Vehicles Interface 793

Figure 179: Indianapolis DPW Operations Center - Indianapolis Fire Communications Center Interface 794

Figure 180: Indianapolis DPW Operations Center - Indianapolis MPO Planning Operations Interface..... 795

Figure 181: Indianapolis DPW Operations Center - Indianapolis Police Dispatch Interface 796

Figure 182: Indianapolis DPW Operations Center - INDOT Arterial TMS Interface 797

Figure 183: Indianapolis DPW Operations Center - INDOT Indianapolis TMC Interface 798

Figure 184: Indianapolis DPW Operations Center - INDOT MCO Management Interface 799

Figure 185: Indianapolis DPW Operations Center - IndyGo Operations Center Interface 800

Figure 186: Indianapolis DPW Operations Center - Intelligence Fusion Center Interface 801

Figure 187: Indianapolis DPW Operations Center - Lawrence Public Safety Interface 802

Figure 188: Indianapolis DPW Operations Center - Lawrence Public Works/Street Department Interface..... 803

Figure 189: Indianapolis DPW Operations Center - Lucas Oil Stadium Command Center Interface 804

Figure 190: Indianapolis DPW Operations Center - Marion County Sheriff Dispatch Interface 805

Figure 191: Indianapolis DPW Operations Center - Media Interface 806

Figure 192: Indianapolis DPW Operations Center - MESA System Interface 807

Figure 193: Indianapolis DPW Operations Center - Private Fleet Vehicle Dispatch Systems Interface 808

Figure 194: Indianapolis DPW Operations Center - Private Parking Management System Interface 808

Figure 195: Indianapolis DPW Operations Center - RWIS Sensors Interface..... 809

Figure 196: Indianapolis DPW Operations Center - Speedway Public Safety Interface 810

Figure 197: Indianapolis DPW Operations Center - Speedway Public Works Interface 811

Figure 198: Indianapolis DPW Operations Center - Suburban Municipality Emergency Dispatch Interface 812

Figure 199: Indianapolis DPW Operations Center - Suburban Municipality Street Department Operations/Dispatch Interface 813

Figure 200: Indianapolis DPW Operations Center - Surrounding County Highway Operations/Dispatch Interface..... 814

Figure 201: Indianapolis DPW Operations Center - Surrounding County Sheriff Communications Center Interface 815

Figure 202: Indianapolis DPW Operations Center - Traffic Data Archive Interface 816

Figure 203: Indianapolis DPW Operations Center - Utility Emergency Repair/Response Interface..... 817

Figure 204: Indianapolis DPW Operations Center - Weather Services Interface ... 818

Figure 205: Indianapolis DPW Roadside Equipment - Indianapolis Fire Department Emergency Vehicles Interface..... 818

Figure 206: Indianapolis DPW Roadside Equipment - IndyGo Transit Vehicles Interface 819

Figure 207: Indianapolis DPW Roadside Equipment - Lawrence Vehicles Interface 819

Figure 208: Indianapolis DPW Roadside Equipment - Major Employer Emergency Vehicles Interface..... 820

Figure 209: Indianapolis DPW Roadside Equipment - Speedway Vehicles Interface 820

Figure 210: Indianapolis DPW Roadside Equipment - Suburban Municipality Emergency Vehicles Interface..... 821

Figure 211: Indianapolis Fire Communications Center - Indianapolis Fire Department Emergency Vehicles Interface..... 821

Figure 212: Indianapolis Fire Communications Center - INDOT Indianapolis TMC Interface 822

Figure 213: Indianapolis Fire Communications Center - Intelligence Fusion Center Interface 823

Figure 214: Indianapolis Fire Communications Center - Lawrence Public Safety Interface 824

Figure 215: Indianapolis Fire Communications Center - Lucas Oil Stadium Command Center Interface 825

Figure 216: Indianapolis Fire Communications Center - Major Employer Management Systems Interface..... 826

Figure 217: Indianapolis Fire Communications Center - MESA System Interface . 827

Figure 218: Indianapolis Fire Communications Center - Personal Computing Devices Interface 828

Figure 219: Indianapolis Fire Communications Center - Private Fleet Vehicle Dispatch Systems Interface..... 828

Figure 220: Indianapolis Fire Communications Center - Private Towing Companies Interface 829

Figure 221: Indianapolis Fire Communications Center - Speedway Public Safety Interface 830

Figure 222: Indianapolis Fire Communications Center - Surrounding County Sheriff Communications Center Interface 831

Figure 223: Indianapolis Fire Communications Center - Utility Emergency Repair/Response Interface..... 832

Figure 224: Indianapolis Fire Communications Center - Weather Services Interface 833

Figure 225: Indianapolis Fire Department Emergency Vehicles - INDOT Arterial Traffic Signals and Detection Interface 833

Figure 226: Indianapolis Fire Department Emergency Vehicles - Lawrence Roadside Equipment Interface 834

Figure 227: Indianapolis Fire Department Emergency Vehicles - MESA System Interface 834

Figure 228: Indianapolis Fire Department Emergency Vehicles - Speedway Roadside Equipment Interface 835

Figure 229: Indianapolis Fire Department Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface 835

Figure 230: Indianapolis MPO Planning Operations - INDOT Indianapolis TMC Interface 836

Figure 231: Indianapolis MPO Planning Operations - IndyGo Operations Center Interface 837

Figure 232: Indianapolis MPO Planning Operations - Lawrence Public Works/Street Department Interface..... 838

Figure 233: Indianapolis MPO Planning Operations - Personal Computing Devices Interface 838

Figure 234: Indianapolis MPO Planning Operations - Speedway Public Works Interface 839

Figure 235: Indianapolis MPO Planning Operations - Suburban Municipality Street Department Operations/Dispatch Interface 840

Figure 236: Indianapolis MPO Planning Operations - Surrounding County Highway Operations/Dispatch Interface..... 841

Figure 237: Indianapolis MPO Planning Operations - Traffic Data Archive Interface 842

Figure 238: Indianapolis Police Department Emergency Vehicles - Indianapolis Police Dispatch Interface..... 843

Figure 239: Indianapolis Police Department Emergency Vehicles - MESA System Interface 844

Figure 240: Indianapolis Police Dispatch - INDOT Indianapolis TMC Interface 845

Figure 241: Indianapolis Police Dispatch - Intelligence Fusion Center Interface.... 846

Figure 242: Indianapolis Police Dispatch - Lawrence Public Safety Interface..... 847

Figure 243: Indianapolis Police Dispatch - Lucas Oil Stadium Command Center Interface 848

Figure 244: Indianapolis Police Dispatch - MESA System Interface 849

Figure 245: Indianapolis Police Dispatch - Private Fleet Vehicle Dispatch Systems Interface 850

Figure 246: Indianapolis Police Dispatch - Private Towing Companies Interface .. 851

Figure 247: Indianapolis Police Dispatch - Speedway Public Safety Interface..... 852

Figure 248: Indianapolis Police Dispatch - Surrounding County Sheriff Communications Center Interface 853

Figure 249: Indianapolis Police Dispatch - Utility Emergency Repair/Response Interface 854

Figure 250: Indianapolis Police Dispatch - Weather Services Interface..... 854

Figure 251: INDOT Arterial Cameras and Controllers - INDOT Arterial TMS Interface 855

Figure 252: INDOT Arterial TMS - INDOT Arterial Traffic Signals and Detection Interface 856

Figure 253: INDOT Arterial TMS - INDOT Indianapolis TMC Interface..... 857

Figure 254: INDOT Arterial TMS - INDOT Ramp Metering System Interface 858

Figure 255: INDOT Arterial TMS - Lawrence Public Works/Street Department Interface 858

Figure 256: INDOT Arterial TMS - MESA System Interface..... 859

Figure 257: INDOT Arterial TMS - Speedway Public Works Interface 859



Figure 258: INDOT Arterial Traffic Signals and Detection - Lawrence Vehicles Interface 860

Figure 259: INDOT Arterial Traffic Signals and Detection - Major Employer Emergency Vehicles Interface..... 860

Figure 260: INDOT Arterial Traffic Signals and Detection - Speedway Vehicles Interface 861

Figure 261: INDOT Arterial Traffic Signals and Detection - Suburban Municipality Emergency Vehicles Interface..... 861

Figure 262: INDOT Gary TMC - INDOT Indianapolis TMC Interface 862

Figure 263: INDOT Hoosier Helper Vehicles - INDOT Indianapolis TMC Interface 863

Figure 264: INDOT Indianapolis TMC - INDOT Indianapolis TMC Roadside Equipment Interface 864

Figure 265: INDOT Indianapolis TMC - INDOT Lane Management Field Equipment Interface 865

Figure 266: INDOT Indianapolis TMC - INDOT MCO Field Devices Interface 866

Figure 267: INDOT Indianapolis TMC - INDOT MCO Management Interface 867

Figure 268: INDOT Indianapolis TMC - INDOT Ramp Metering System Interface 868

Figure 269: INDOT Indianapolis TMC - INDOT Security Monitoring Field Equipment Interface 869

Figure 270: INDOT Indianapolis TMC - INDOT TPIMS Interface..... 869

Figure 271: INDOT Indianapolis TMC - INDOT Variable Speed Limits Field Equipment Interface 870

Figure 272: INDOT Indianapolis TMC - INDOT Work Zone Speed Monitoring Field Equipment Interface 871

Figure 273: INDOT Indianapolis TMC - INDOT Work Zone Speed Warning Field Equipment Interface 872

Figure 274: INDOT Indianapolis TMC - IndyGo Kiosks Interface..... 872

Figure 275: INDOT Indianapolis TMC - IndyGo Operations Center Interface 873

Figure 276: INDOT Indianapolis TMC - Intelligence Fusion Center Interface 874

Figure 277: INDOT Indianapolis TMC - ISP Dispatch Interface 875

Figure 278: INDOT Indianapolis TMC - Lawrence Public Safety Interface 876

Figure 279: INDOT Indianapolis TMC - Lawrence Public Works/Street Department Interface 877

Figure 280: INDOT Indianapolis TMC - Major Employer Management Systems Interface 878

Figure 281: INDOT Indianapolis TMC - Marion County Sheriff Dispatch Interface 879

Figure 282: INDOT Indianapolis TMC - Media Interface 880

Figure 283: INDOT Indianapolis TMC - MESA System Interface..... 881

Figure 284: INDOT Indianapolis TMC - Personal Computing Devices Interface.... 882

Figure 285: INDOT Indianapolis TMC - Private Fleet Vehicle Dispatch Systems Interface 883

Figure 286: INDOT Indianapolis TMC - Private Towing Companies Interface 884

Figure 287: INDOT Indianapolis TMC - Public Health Systems Interface 885

Figure 288: INDOT Indianapolis TMC - RWIS Sensors Interface 885

Figure 289: INDOT Indianapolis TMC - Speedway Public Safety Interface 886

Figure 290: INDOT Indianapolis TMC - Speedway Public Works Interface 887

Figure 291: INDOT Indianapolis TMC - Suburban Municipality Emergency Dispatch Interface 888

Figure 292: INDOT Indianapolis TMC - Suburban Municipality Street Department Operations/Dispatch Interface..... 889

Figure 293: INDOT Indianapolis TMC - Surface Transportation Weather Service Interface 890

Figure 294: INDOT Indianapolis TMC - Surrounding County Highway Operations/Dispatch Interface..... 891

Figure 295: INDOT Indianapolis TMC - Surrounding County Sheriff Communications Center Interface 892

Figure 296: INDOT Indianapolis TMC - Traffic Data Archive Interface 893

Figure 297: INDOT Indianapolis TMC - TrafficWise Traveler Information System Interface 894

Figure 298: INDOT Indianapolis TMC - Utility Emergency Repair/Response Interface 895

Figure 299: INDOT Indianapolis TMC - Weather Services Interface..... 896

Figure 300: INDOT Indianapolis TMC Roadside Equipment - ITS Maintenance Contractor Interface 896

Figure 301: INDOT Indianapolis TMC Roadside Equipment - Vehicles Interface.. 897

Figure 302: INDOT Infrastructure Inventory System - INDOT MCO Management Interface 897

Figure 303: INDOT Infrastructure Inventory System - Traffic Data Archive Interface 898

Figure 304: INDOT MCO Field Devices - INDOT MCO Management Interface..... 899

Figure 305: INDOT MCO Field Devices - INDOT MCO Vehicles Interface 900

Figure 306: INDOT MCO Management - INDOT MCO Vehicles Interface 901

Figure 307: INDOT MCO Management - MESA System Interface 902

Figure 308: INDOT MCO Management - Private Towing Companies Interface..... 903

Figure 309: INDOT MCO Management - RWIS Sensors Interface 904

Figure 310: INDOT MCO Management - Surface Transportation Weather Service Interface 904

Figure 311: INDOT MCO Management - Utility Emergency Repair/Response Interface 905

Figure 312: INDOT MCO Management - Weather Services Interface 906

Figure 313: INDOT Security Monitoring Field Equipment - Intelligence Fusion Center Interface 906

Figure 314: INDOT TPIMS - INDOT TPIMS Equipment Interface..... 907

Figure 315: INDOT Variable Speed Limits Field Equipment - ISP Dispatch Interface 907

Figure 316: INDOT Work Zone Speed Warning Field Equipment - ISP Dispatch Interface 908

Figure 317: IndyGo Kiosks - IndyGo Operations Center Interface 909

Figure 318: IndyGo Kiosks - IndyGo Traveler Card Interface 910

Figure 319: IndyGo Kiosks - Payment Administration Center Interface 910

Figure 320: IndyGo Kiosks - Personal Computing Devices Interface..... 911

Figure 321: IndyGo Kiosks - Private Traveler Services Interface..... 911

Figure 322: IndyGo Operations Center - IndyGo Security Monitoring Field Equipment Interface 912

Figure 323: IndyGo Operations Center - IndyGo Transit Vehicles Interface 913

Figure 324: IndyGo Operations Center - IndyGo Traveler Card Interface..... 914

Figure 325: IndyGo Operations Center - Intelligence Fusion Center Interface..... 915

Figure 326: IndyGo Operations Center - Lawrence Public Safety Interface..... 916

Figure 327: IndyGo Operations Center - Media Interface 917

Figure 328: IndyGo Operations Center - MESA System Interface 918

Figure 329: IndyGo Operations Center - Payment Administration Center Interface 919

Figure 330: IndyGo Operations Center - Personal Computing Devices Interface.. 920

Figure 331: IndyGo Operations Center - Private Traveler Services Interface 921

Figure 332: IndyGo Operations Center - Speedway Public Safety Interface 922

Figure 333: IndyGo Operations Center - Suburban Municipality Street Department Operations/Dispatch Interface..... 923

Figure 334: IndyGo Operations Center - TrafficWise Traveler Information System Interface 924

Figure 335: IndyGo Operations Center - Vehicles Interface..... 924

Figure 336: IndyGo Operations Center - Weather Services Interface..... 925

Figure 337: IndyGo Transit Vehicles - IndyGo Traveler Card Interface 925

Figure 338: IndyGo Transit Vehicles - MESA System Interface..... 926

Figure 339: IndyGo Transit Vehicles - Payment Administration Center Interface .. 926

Figure 340: IndyGo Transit Vehicles - Personal Computing Devices Interface..... 927

Figure 341: IndyGo Traveler Card - Private Parking Area Equipment Interface..... 927

Figure 342: IndyGo Traveler Card - Vehicles Interface 928

Figure 343: Intelligence Fusion Center - Lawrence Public Safety Interface..... 929

Figure 344: Intelligence Fusion Center - Lucas Oil Stadium Command Center Interface 930

Figure 345: Intelligence Fusion Center - Marion County Sheriff Dispatch Interface931

Figure 346: Intelligence Fusion Center - MESA System Interface 932

Figure 347: Intelligence Fusion Center - School Police Departments Interface 933

Figure 348: Intelligence Fusion Center - Speedway Public Safety Interface..... 934

Figure 349: Intelligence Fusion Center - Suburban Municipality Emergency Dispatch Interface 935

Figure 350: Intelligence Fusion Center - Surrounding County Sheriff Communications Center Interface 936

Figure 351: Intelligence Fusion Center - Weather Services Interface 937

Figure 352: ISP Dispatch - ISP Emergency Vehicles Interface..... 937

Figure 353: ISP Dispatch - Private Fleet Vehicle Dispatch Systems Interface..... 938

Figure 354: Lawrence Public Safety - Lawrence Public Works/Street Department Interface 939

Figure 355: Lawrence Public Safety - Lawrence Vehicles Interface 940

Figure 356: Lawrence Public Safety - Marion County Sheriff Dispatch Interface ... 941

Figure 357: Lawrence Public Safety - MESA System Interface 942

Figure 358: Lawrence Public Safety - Private Towing Companies Interface..... 943

Figure 359: Lawrence Public Safety - Utility Emergency Repair/Response Interface 944

Figure 360: Lawrence Public Safety - Weather Services Interface 944

Figure 361: Lawrence Public Works/Street Department - Lawrence Roadside Equipment Interface 945

Figure 362: Lawrence Public Works/Street Department - Lawrence Vehicles Interface 946

Figure 363: Lawrence Public Works/Street Department - MESA System Interface 947

Figure 364: Lawrence Public Works/Street Department - Private Towing Companies Interface 948

Figure 365: Lawrence Public Works/Street Department - Utility Emergency Repair/Response Interface..... 949

Figure 366: Lawrence Public Works/Street Department - Weather Services Interface 950

Figure 367: Lawrence Roadside Equipment - Lawrence Vehicles Interface 950

Figure 368: Lawrence Roadside Equipment - Major Employer Emergency Vehicles Interface 951

Figure 369: Lawrence Roadside Equipment - Suburban Municipality Emergency Vehicles Interface 951

Figure 370: Lucas Oil Stadium Command Center - Marion County Sheriff Dispatch Interface 952

Figure 371: Lucas Oil Stadium Command Center - MESA System Interface 953

Figure 372: Lucas Oil Stadium Command Center - Weather Services Interface ... 954

Figure 373: Major Employer Emergency Vehicles - Major Employer Management Systems Interface 954

Figure 374: Major Employer Emergency Vehicles - Speedway Roadside Equipment Interface 955

Figure 375: Major Employer Management Systems - MESA System Interface 955

Figure 376: Major Employer Management Systems - Private Fleet Vehicle Dispatch Systems Interface 956

Figure 377: Marion County Sheriff Dispatch - Marion County Sheriff Emergency Vehicles Interface 957

Figure 378: Marion County Sheriff Dispatch - MESA System Interface 958

Figure 379: Marion County Sheriff Dispatch - Private Fleet Vehicle Dispatch Systems Interface 959

Figure 380: Marion County Sheriff Dispatch - Private Towing Companies Interface 960

Figure 381: Marion County Sheriff Dispatch - Speedway Public Safety Interface.. 961

Figure 382: Marion County Sheriff Dispatch - Suburban Municipality Emergency Dispatch Interface 962

Figure 383: Marion County Sheriff Dispatch - Surrounding County Highway Operations/Dispatch Interface 963

Figure 384: Marion County Sheriff Dispatch - Surrounding County Sheriff Communications Center Interface 964

Figure 385: Marion County Sheriff Dispatch - Utility Emergency Repair/Response Interface 965

Figure 386: Marion County Sheriff Dispatch - Weather Services Interface 965

Figure 387: Media - TrafficWise Traveler Information System Interface 966

Figure 388: MESA System - Private Towing Companies Interface 967

Figure 389: MESA System - School Buses Interface 968

Figure 390: MESA System - School Police Departments Interface 969

Figure 391: MESA System - Speedway Public Safety Interface 970

Figure 392: MESA System - Speedway Public Works Interface 971

Figure 393: MESA System - Suburban Municipality Emergency Dispatch Interface
..... 972

Figure 394: MESA System - Suburban Municipality Street Department
Operations/Dispatch Interface 973

Figure 395: MESA System - Surrounding County Highway Operations/Dispatch
Interface 974

Figure 396: MESA System - Surrounding County Sheriff Communications Center
Interface 975

Figure 397: MESA System - Taxi Services Interface 976

Figure 398: MESA System - Utility Emergency Repair/Response Interface 977

Figure 399: Micro-Mobility Services - Payment Administration Center Interface.... 978

Figure 400: Micro-Mobility Services - Personal Computing Devices Interface 978

Figure 401: Micro-Mobility Services - Private Traveler Services Interface 979

Figure 402: Other Suburban Municipality Street Department Dispatch - Suburban
Municipality Street Department Operations/Dispatch Interface 979

Figure 403: Payment Administration Center - Personal Computing Devices Interface
..... 980

Figure 404: Payment Administration Center - Private Parking Area Equipment
Interface 980

Figure 405: Payment Administration Center - Private Parking Management System
Interface 981

Figure 406: Payment Administration Center - Private Traveler Services Interface 981

Figure 407: Payment Administration Center - Vehicles Interface 982

Figure 408: Payment Device - Vehicles Interface 982

Figure 409: Pedestrian - Personal Computing Devices Interface..... 983

Figure 410: Pedestrian - Suburban Municipality Street Department Roadside
Equipment Interface 983

Figure 411: Personal Computing Devices - Private Parking Area Equipment Interface
..... 984

Figure 412: Personal Computing Devices - Private Parking Management System
Interface 984

Figure 413: Personal Computing Devices - Private Traveler Services Interface.... 985

Figure 414: Personal Computing Devices - Ride Hailing Services Interface..... 986

Figure 415: Personal Computing Devices - Suburban Municipality Street Department
CAV Roadside Equipment Interface..... 987

Figure 416: Personal Computing Devices - Taxi Services Interface 988

Figure 417: Personal Computing Devices - TrafficWise Traveler Information System
Interface 989

Figure 418: Personal Computing Devices - Vehicles Interface 990

Figure 419: Private Fleet Vehicle Dispatch Systems - Private Towing Companies
Interface 990

Figure 420: Private Fleet Vehicle Dispatch Systems - Suburban Municipality
Emergency Dispatch Interface 991

Figure 421: Private Fleet Vehicle Dispatch Systems - Surrounding County Sheriff
Communications Center Interface..... 991

Figure 422: Private Parking Area Equipment - Private Parking Management System
Interface 992

Figure 423: Private Parking Area Equipment - Vehicles Interface 992

Figure 424: Private Parking Management System - Private Traveler Services
Interface 993

Figure 425: Private Towing Companies - Speedway Public Safety Interface 994

Figure 426: Private Towing Companies - Speedway Public Works Interface 995

Figure 427: Private Towing Companies - Suburban Municipality Emergency Dispatch
Interface 996

Figure 428: Private Towing Companies - Suburban Municipality Street Department Operations/Dispatch Interface..... 997

Figure 429: Private Towing Companies - Surrounding County Highway Operations/Dispatch Interface..... 998

Figure 430: Private Towing Companies - Surrounding County Sheriff Communications Center Interface..... 999

Figure 431: Private Towing Companies - Weather Services Interface..... 1000

Figure 432: Private Traveler Services - Suburban Municipality Street Department Operations/Dispatch Interface..... 1000

Figure 433: Private Traveler Services - Vehicles Interface 1001

Figure 434: School Buses - School Police Departments Interface..... 1002

Figure 435: SCMS - Suburban Municipality Street Department CAV Roadside Equipment Interface 1003

Figure 436: SCMS - Suburban Municipality Street Department Operations/Dispatch Interface 1004

Figure 437: Speedway Public Safety - Speedway Public Works Interface..... 1005

Figure 438: Speedway Public Safety - Speedway Vehicles Interface 1006

Figure 439: Speedway Public Safety - Utility Emergency Repair/Response Interface 1007

Figure 440: Speedway Public Safety - Weather Services Interface 1007

Figure 441: Speedway Public Works - Speedway Roadside Equipment Interface 1008

Figure 442: Speedway Public Works - Speedway Vehicles Interface 1009

Figure 443: Speedway Public Works - Utility Emergency Repair/Response Interface 1010

Figure 444: Speedway Public Works - Weather Services Interface 1011

Figure 445: Speedway Roadside Equipment - Speedway Vehicles Interface..... 1011

Figure 446: Suburban Municipality Emergency Dispatch - Suburban Municipality Emergency Vehicles Interface..... 1012

Figure 447: Suburban Municipality Emergency Dispatch - Suburban Municipality Street Department Operations/Dispatch Interface..... 1013

Figure 448: Suburban Municipality Emergency Dispatch - Surrounding County Highway Operations/Dispatch Interface 1014

Figure 449: Suburban Municipality Emergency Dispatch - Surrounding County Sheriff Communications Center Interface..... 1015

Figure 450: Suburban Municipality Emergency Dispatch - Utility Emergency Repair/Response Interface..... 1016

Figure 451: Suburban Municipality Emergency Dispatch - Weather Services Interface 1017

Figure 452: Suburban Municipality Emergency Vehicles - Suburban Municipality Street Department Roadside Equipment Interface 1017

Figure 453: Suburban Municipality Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface 1018

Figure 454: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Operations/Dispatch Interface 1019

Figure 455: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Roadside Equipment Interface 1020

Figure 456: Suburban Municipality Street Department CAV Roadside Equipment - Vehicles Interface..... 1021

Figure 457: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Roadside Equipment Interface 1022

Figure 458: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Vehicles Interface 1023

Figure 459: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Highway Operations/Dispatch Interface 1024

Figure 460: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Sheriff Communications Center Interface..... 1025

Figure 461: Suburban Municipality Street Department Operations/Dispatch - Utility Emergency Repair/Response Interface..... 1026

Figure 462: Suburban Municipality Street Department Operations/Dispatch - Weather Services Interface 1027

Figure 463: Suburban Municipality Street Department Roadside Equipment - Surrounding County Highway Operations/Dispatch Interface 1027

Figure 464: Suburban Municipality Street Department Roadside Equipment - Vehicles Interface..... 1028

Figure 465: Suburban Municipality Street Department Roadside Equipment - Vulnerable Road User Interface 1028

Figure 466: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Roadside Equipment Interface 1029

Figure 467: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Vehicles Interface 1030

Figure 468: Surrounding County Highway Operations/Dispatch - Surrounding County Sheriff Communications Center Interface..... 1031

Figure 469: Surrounding County Highway Operations/Dispatch - Utility Emergency Repair/Response Interface..... 1032

Figure 470: Surrounding County Highway Operations/Dispatch - Weather Services Interface 1033

Figure 471: Surrounding County Security Monitoring Field Equipment - Surrounding County Sheriff Communications Center Interface 1033

Figure 472: Surrounding County Sheriff Communications Center - Surrounding County Sheriff Emergency Vehicles Interface 1034

Figure 473: Surrounding County Sheriff Communications Center - Utility Emergency Repair/Response Interface..... 1035

Figure 474: Surrounding County Sheriff Communications Center - Weather Services Interface 1036

Figure 475: Taxi Services - Weather Services Interface 1036

Figure 476: TrafficWise Traveler Information System - Vehicles Interface 1037

Figure 477: TrafficWise Traveler Information System - Weather Services Interface 1037

Figure 478: Utility Emergency Repair/Response - Weather Services Interface ... 1038

Figure 479: Vehicles - Vulnerable Road User Interface 1038

Figure 430: Private Towing Companies - Surrounding County Highway Operations/Dispatch Interface..... 1039

Figure 431: Private Towing Companies - Surrounding County Sheriff
Communications Center Interface 1040

Figure 432: Private Towing Companies - Weather Services Interface 1041

Figure 433: Private Traveler Services - Suburban Municipality Street Department
Operations/Dispatch Interface 1041

Figure 434: Private Traveler Services - Vehicles Interface 1042

Figure 435: School Buses - School Police Departments Interface 1043

Figure 436: SCMS - Suburban Municipality Street Department CAV Roadside
Equipment Interface 1044

Figure 437: SCMS - Suburban Municipality Street Department Operations/Dispatch
Interface 1045

Figure 438: Speedway Public Safety - Speedway Public Works Interface 1046

Figure 439: Speedway Public Safety - Speedway Vehicles Interface 1047

Figure 440: Speedway Public Safety - Utility Emergency Repair/Response Interface
..... 1048

Figure 441: Speedway Public Safety - Weather Services Interface 1049

Figure 442: Speedway Public Works - Speedway Roadside Equipment Interface 1049

Figure 443: Speedway Public Works - Speedway Vehicles Interface 1050

Figure 444: Speedway Public Works - Utility Emergency Repair/Response Interface
..... 1051

Figure 445: Speedway Public Works - Weather Services Interface 1052

Figure 446: Speedway Roadside Equipment - Speedway Vehicles Interface 1052

Figure 447: Suburban Municipality Emergency Dispatch - Suburban Municipality
Emergency Vehicles Interface 1053

Figure 448: Suburban Municipality Emergency Dispatch - Suburban Municipality
Street Department Operations/Dispatch Interface 1054

Figure 449: Suburban Municipality Emergency Dispatch - Surrounding County
Highway Operations/Dispatch Interface 1055

Figure 450: Suburban Municipality Emergency Dispatch - Surrounding County Sheriff
Communications Center Interface 1056

Figure 451: Suburban Municipality Emergency Dispatch - Utility Emergency Repair/Response Interface..... 1057

Figure 452: Suburban Municipality Emergency Dispatch - Weather Services Interface 1058

Figure 453: Suburban Municipality Emergency Vehicles - Suburban Municipality Street Department Roadside Equipment Interface 1058

Figure 454: Suburban Municipality Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface 1059

Figure 455: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Operations/Dispatch Interface 1060

Figure 456: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Roadside Equipment Interface 1060

Figure 457: Suburban Municipality Street Department CAV Roadside Equipment - Vehicles Interface..... 1061

Figure 458: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Roadside Equipment Interface 1062

Figure 459: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Vehicles Interface 1063

Figure 460: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Highway Operations/Dispatch Interface 1064

Figure 461: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Sheriff Communications Center Interface..... 1065

Figure 462: Suburban Municipality Street Department Operations/Dispatch - Utility Emergency Repair/Response Interface..... 1066

Figure 463: Suburban Municipality Street Department Operations/Dispatch - Weather Services Interface 1067

Figure 464: Suburban Municipality Street Department Roadside Equipment - Surrounding County Highway Operations/Dispatch Interface 1067

Figure 465: Suburban Municipality Street Department Roadside Equipment - Vehicles Interface..... 1068

Figure 466: Suburban Municipality Street Department Roadside Equipment - Vulnerable Road User Interface 1068

Figure 467: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Roadside Equipment Interface 1069

Figure 468: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Vehicles Interface 1070

Figure 469: Surrounding County Highway Operations/Dispatch - Surrounding County Sheriff Communications Center Interface..... 1071

Figure 470: Surrounding County Highway Operations/Dispatch - Utility Emergency Repair/Response Interface..... 1072

Figure 471: Surrounding County Highway Operations/Dispatch - Weather Services Interface 1073

Figure 472: Surrounding County Security Monitoring Field Equipment - Surrounding County Sheriff Communications Center Interface 1073

Figure 473: Surrounding County Sheriff Communications Center - Surrounding County Sheriff Emergency Vehicles Interface 1074

Figure 474: Surrounding County Sheriff Communications Center - Utility Emergency Repair/Response Interface..... 1075

Figure 475: Surrounding County Sheriff Communications Center - Weather Services Interface 1076

Figure 476: Taxi Services - Weather Services Interface 1076

Figure 477: TrafficWise Traveler Information System - Vehicles Interface 1077

Figure 478: TrafficWise Traveler Information System - Weather Services Interface 1077

Figure 479: Utility Emergency Repair/Response - Weather Services Interface 1078

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1 Introduction

The Indianapolis Regional Intelligent Transportation Systems (ITS) Architecture (RITSA) is a roadmap for transportation systems integration for ITS services over a 10-year time horizon. The architecture represents a shared vision of how each agencies' systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the Indianapolis Region.

The Indianapolis RITSA functionally defines the interactions and information exchanges between the intelligent transportation systems operated and maintained by the various public and private sector organizations in the region. The RITSA includes existing systems as well as planned systems and services that are needed to deliver the transportation services to improve safety, mobility and efficiency across the region.

The Indianapolis RITSA is used by transportation agencies to define and transportation planners to plan ITS projects that address transportation needs. The RITSA provides a functional framework into which an ITS project is integrated. This framework is used as a reference from which a project is defined. Using the Regional Architecture Development for Intelligent Transportation (RAD-IT) software tool, an agency will choose the transportation services, identify the systems to be included, and then select the information exchanges to tailor the project to address the stakeholders' transportation needs.

The Indianapolis RITSA, including the defined ITS projects, is used as a reference in transportation planning activities at all levels to coordinate and integrate ITS across the region. Integration opportunities are considered by stakeholders as their projects are defined using the RITSA content as a guide. The RITSA offers a broader picture that the stakeholders take into consideration when thinking of the project definition. The project definitions take into account other systems and services that may be germane to the project scope and future expansion. The projects are defined within the RITSA domain and it is the projects where the integration opportunities are codified. The project definitions in the RITSA are the first opportunity for integration considerations. Project development in further detail in systems engineering is another opportunity. The RITSA is a primary source for those integration opportunities in both cases.

The Indianapolis RITSA was updated in 2023 by the Indianapolis Metropolitan Planning Organization (IMPO) in partnership with its member organizations. The update project was initiated in February 2023 and completed in August 2023. An architecture assessment, stakeholder workshop, and stakeholder feedback mechanisms were used to gather update information. The architecture update used the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT) Version 9.2 as a reference and complies with the FHWA 23 CFR Rule 940 requirements.

2 Architecture Scope

The Indianapolis RITSA is a roadmap for transportation systems integration. The architecture was developed through a cooperative effort by the region's transportation agencies, covering all modes and all roads in the region. It represents a shared vision of how each agency's systems will work together in the future, sharing information and resources to provide a safer, more efficient, and more effective transportation system for travelers in the region.

The architecture provides an overarching framework that spans all of the region's transportation organizations and individual transportation projects. Using the architecture, each transportation project can be viewed as an element of the overall transportation system, providing visibility into the relationship between individual transportation projects and ways to cost-effectively build an integrated transportation system over time. This chapter establishes the scope of the architecture in terms of its geographic breadth, the scope of services that are covered, and the time horizon that is addressed.

The architecture update covers a 10-year time horizon from 2023-2033.

The geographic scope of the Indianapolis RITSA includes the jurisdictions of public agencies at the Indianapolis DOT, Metropolitan Planning Area, County, City, and Town levels. The primary public sector jurisdictional boundaries making up the Indianapolis RITSA geographic scope include:

- Indiana Department of Transportation (INDOT) Districts including Greenfield, Crawfordsville, and Seymour Districts.
- Metropolitan Planning Areas: Indianapolis MPO
- Counties: Boone County, Hamilton County, Hancock County, Hendricks County, Johnson County, Marion County, Morgan County, Shelby County
- Cities and Towns: Indianapolis, City of Beech Grove, City of Carmel, City of Fishers, City of Franklin, City of Greenfield, City of Greenwood, City of Lawrence, City of Noblesville, City of Southport, City of Westfield, Town of Avon, Town of Bargersville, Town of Brooklyn, Town of Brownsburg, Town of Cicero, Town of Cumberland, Town of Danville, Town of McCordsville, Town of Mooresville, Town of New Palestine, Town of Pittsboro, Town of Plainfield, Town of Speedway, Town of Whiteland, Town of Whitestown, Town of Zionville
- Planning Partners: IndyGo, CIRTA, Indiana DOT, Federal Highway Administration, Federal Transit Administration, Indianapolis Airport, Ports of Indiana

The 2023 architecture was updated by Iteris, Inc. under contract to the Indianapolis Metropolitan Transportation Organization (IMPO).

3 ITS Stakeholders

Identifying stakeholders is an important task in ITS architecture development since effective ITS involves the integration of multiple stakeholders and their transportation systems. Table 1 lists the stakeholders who either participated in the creation of the Indianapolis RITSA or whom the participating stakeholders felt were needed to be included in the architecture. Some stakeholders have been grouped in order to better reflect mutual participation or involvement in transportation services and elements. Every stakeholder in this section is related to one or more of the transportation inventory elements described in the next chapter, either as an individual stakeholder or as a member of a stakeholder group.

Table 1 – ITS Stakeholders

Stakeholder Name	Stakeholder Description
AES Corporation	The AES Corporation is the utility and power generation company that provides power to the electric charging stations in the Indianapolis area.
Ambulance/Emergency Services	Rural/Metro Ambulance and Emergency Services in the Indianapolis region.
Central Indiana Regional Transportation Authority	The Central Indiana Regional Transportation Authority (CIRTA) is a regional governmental organization dedicated to enhancing transportation connectivity across Central Indiana. CIRTA's primary focus is to connect Indianapolis with suburban and rural communities in Marion, Hamilton, Hancock, Shelby, Johnson, Morgan, Hendricks, Boone, Delaware, and Madison counties by improving and expanding mass transit options.
City of Beech Grove	The City of Beech Grove is a city in Marion County IN (excluded from Unigov).
City of Carmel	The City of Carmel is a suburban city in Hamilton County IN north of Indianapolis.
City of Lawrence	The City of Lawrence is a city in Marion County IN (excluded from Unigov).
CTASC	The Indiana Counterterrorism and Security Council (CTASC) was formed in 2001 to provide interagency coordination and coordination with the Department of Justice including the FBI and the Secret Service. CTASC members represent 15 different state agencies and is chaired by the Lieutenant Governor.
DTN	DTN is a provider of highly customized, site-specific weather forecasting and analysis services to people anywhere, anytime, via state-of-the-art Internet, wireless, and cellular technologies.
Electric Vehicle Charging Services	Electric Vehicle Charging Services are private companies that deploy and operate electric charging stations where hybrid and all-electric vehicles can be charged.
Event Promoters/Special Events	Event Promoters/Special Events stakeholders include: Indiana Black Expo, Indiana Sports Corporation, Indianapolis Convention and Visitors Association, Indianapolis 500 Festival, NCAA Headquarters, among others.
Financial Institutions	Financial Institutions represent financial and banking institutions that play a role in electronic payment financial transactions.

Stakeholder Name	Stakeholder Description
Generic CAV Stakeholder	The Generic Stakeholder can be a public agency or private organization that owns systems required for administrative, security, credentialing, or other support services for implementing Connected and Automated Vehicle (CAV) projects.
Indiana Department of Transportation	The Indiana Department of Transportation (INDOT) is the state agency responsible for the statewide road network operations and maintenance including ITS functions.
Indiana Department of Transportation District Level	Indiana Department of Transportation District Level represents portions of INDOT's Greenfield, Crawfordsville, and Seymour Districts, including all of the Indianapolis Subdistrict.
Indiana State Police	The Indiana State Police (ISP) represents ISP Districts 51, 52, 53 providing traffic safety and homeland security in the transportation environment.
Indiana University Health	Indiana University Health provide regional health care services through Methodist Hospital, Indiana University Hospital, and the Riley Hospital for Children.
Indianapolis Airport Authority	The Indianapolis Airport Authority is a municipal corporation established by the Indiana General Assembly in 1962. It is responsible for owning, developing and operating several public airports and one public heliport located in and around Indianapolis.
Indianapolis Capital Improvements Board	The Indianapolis Capital Improvements Board was created by the Indiana General Assembly in 1965. The Capital Improvement Board (CIB) is a public entity of Marion County authorized by Indiana Code 36-10-9. It finances, constructs, operates, and maintains any capital facilities or improvements that serve the commercial, industrial, and cultural interests of Indiana and its citizens and has focused on facilities related to convention, cultural, entertainment, and recreational activities in downtown Indianapolis such as the Indianapolis Colts/Lucas Oil Stadium.
Indianapolis Department of Public Works	Indianapolis Department of Public Works (DPW) maintains public infrastructure (including streets, sewers, bridges, and traffic systems) and manages municipal solid waste collection and disposal. DPW also ensures a healthy, safe, and natural environment (air, land, and water). DPW includes six divisions: Policy and Planning, Engineering, Operations, Solid Waste Management Section, Maintenance Operations Section, and Storm/Wastewater Management Section.
Indianapolis Downtown, Inc.	Indianapolis Downtown, Inc. is a not-for-profit organization formed to develop, manage and market Downtown Indianapolis.
Indianapolis Emergency Management Agency	The Indianapolis Emergency Management Agency is responsible for planning for all hazards that threaten the community, whether natural, or man-made.
Indianapolis Fire Department	The Indianapolis Fire Department provides emergency and fire protection services for the City of Indianapolis and surrounding areas.
Indianapolis Motor Speedway	The Indianapolis Motor Speedway is a motor racing circuit located in Speedway IN, an suburb of Indianapolis. It is the home of major racing events such as the Indianapolis 500 and the Brickyard 400.
Indianapolis MPO	The Indianapolis Metropolitan Planning Organization is the designated MPO for Central Indiana. The Indianapolis MPO plans and programs federal transportation funds for highways, transit, non-motorized transportation, and other means of moving people and goods in the 8-county, Central Indiana region.

Stakeholder Name	Stakeholder Description
Indianapolis Police Department	The Indianapolis Metropolitan Police Department (IMPD) provides police services to Marion County. IMPD includes 1,700 sworn officers and 250 civilian employees.
Indianapolis Public Transportation Corporation/IndyGo	The Indianapolis Public Transportation Corporation, branded as IndyGo, is a public transit agency and municipal corporation of the City of Indianapolis. It operates fixed-route buses, bus rapid transit, microtransit, and paratransit services.
Indianapolis Schools	Indianapolis Schools includes Indianapolis Public Schools (IPS), the state's largest school district, serving more than 39,000 students in 79 schools. Also includes 8 township school districts.
Major Employers	Major Employers includes organizations such as Eli Lilly & Co.
Marion County Sheriffs Office	The Marion County Sheriffs Office provides law enforcement services for the people of Indianapolis and Marion County. This includes managing the Adult Detention Center and its prisoners, securing county governmental facilities, serving criminal warrants, enforcing court orders, maintaining the sex offender registry, and more. It is divided into seven divisions: Administrative Division, Communications, Civil, Executive Division, Investigations Division, Jail and Law Enforcement Divisions.
Media Services	Media Services includes television, radio, and print media.
MESA	The Metropolitan Emergency Services Agency (MESA) is the governing body of the Consolidated City of Indianapolis and Marion County public safety communications systems and computer facilities district.
MESA System Users	MESA System Users represents the government agencies in Marion County and surrounding counties and suburban municipalities that utilize the MESA radio system.
National Weather Service	The National Weather Service is a federal agency responsible for national and local weather forecasting.
Pedestrian	Pedestrian is a person traveling on foot, whether walking or running, on a road, sidewalk, crosswalk, or pavement.
Private Commercial Vehicle and Fleet Operators	Private Commercial Vehicle and Fleet Operators represent owner/operators of private commercial vehicles and fleets.
Private Maintenance Companies	Private Maintenance Companies represent private maintenance contractors who perform maintenance on regional signal systems, HAR, DMS, lighting systems, and pumping stations.
Private Parking Service Providers	Private Parking Service Providers represents private companies that provide parking services in the Indianapolis downtown area.
Private Traveler Services	Private Traveler Services are private sector organizations that provide traveler and transportation information services.
Railroad Agencies	Railroad Agencies provide passenger and freight rail services and operations.
RWIS Users	RWIS Users include the Indiana Department of Transportation and Indianapolis DPW who use information from the INDOT-owned RWIS stations in the Indianapolis region.
Suburban Municipalities	Suburban Municipalities represent municipal, city, and township street departments/public works, police, fire, and emergency communications for the following suburban municipalities: Town of Avon, City of Carmel, City of Greenwood, Town of Plainfield, Town of Cumberland, Town of Brownsburg, Town of Zionville, Town of Westfield, Town of New Whiteland, City of Fishers, Town of Southport, Town of Whiteland, City of Franklin, City of Noblesville.

Stakeholder Name	Stakeholder Description
Surrounding Counties	Surrounding Counties represents highway, sheriffs, fire departments, emergency management, and 911 centers in counties within the metropolitan planning area surrounding Marion County, including Boone, Hamilton, Hancock, Hendricks, Johnson, Morgan, and Shelby Counties.
Taxi Companies	Taxi Companies includes over 45 private taxicab companies serving the Indianapolis region.
Towing Operators	Towing Operators represents private towing companies operating in the Indianapolis region.
Town of Speedway	The Town of Speedway is in Marion County IN (excluded from Unigov).
Traffic Data Archive Users Group	The Traffic Data Archive Users Group includes stakeholders with a need to access the proposed online Traffic Data Archive.
Travelers	Travelers represents travelers as motorist, pedestrians, passengers, etc.
Universities	Universities includes Indiana University/Purdue University at Indianapolis (IUPUI), Purdue University, Butler, University of Indianapolis, Ivy Tech and other major institutions in the region.
Utility Companies	Utility Companies includes local utility providers, including as AES, Citizens Gas and Indianapolis Water Company
Vulnerable Road Users	Vulnerable Road Users include pedestrians, cyclists, wheelchair users, two-wheeled scooter micro-mobility users, as well as powered scooters and motorcycles. They are users not in a motorized vehicle capable of operating at the posted speed for the roadway in question, and any roadway user in a vehicle not designed to encase (and thus protect) its occupants.

4 ITS Inventory

An inventory of existing and planned transportation systems is the basis for the Indianapolis RITSA. The transportation system inventory was developed based on input from stakeholders throughout the region. The inventory includes a list of ITS elements and the associated stakeholder responsible for system operation.

Table 2 lists every surface transportation inventory element for the region. A transportation element can be either a center, support, vehicle, traveler or field equipment. Each transportation element listed below has one or more stakeholders associated with it. In order to reduce the complexity of the architecture, some transportation elements with like functionality have been grouped together. Each transportation inventory element is mapped to at least one ARC-IT physical object.

The Indianapolis Regional ITS Architecture (RITSA) inventory is a list of "Elements" that represent the existing and planned ITS systems in a region, as well as non-ITS systems, such as vehicles and people, that exchange information with the ITS systems. Inventory elements are the building blocks that are used to define ITS services.

Table 2 – ITS Inventory

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Ambulance Dispatch	Ambulance Dispatch monitors and manages emergency vehicle dispatch and provides enroute support and coordination.	Ambulance/Emergency Services	Existing	<ul style="list-style-type: none"> Emergency Management Center
Ambulance Vehicles	Ambulance Vehicles include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Ambulance/Emergency Services	Existing	<ul style="list-style-type: none"> Emergency Vehicle OBE
Avon CSX Rail Yard	The Avon CSX Rail Yard manages and operates rail facilities and intermodal activities supporting rail freight movement.	Railroad Agencies	Existing	<ul style="list-style-type: none"> Rail Operations Center
Beech Grove Public Safety	Beech Grove Public Safety includes Police, Fire, and EMS, providing dispatching services for the City of Beech Grove, including the Beech Grove Communications Center.	City of Beech Grove	Existing	<ul style="list-style-type: none"> Emergency Management Center
Beech Grove Public Works Operations	The Beech Grove Department of Public Works (DPW) Operations maintains and manages all roads and ITS within the city limits.	City of Beech Grove	Existing	<ul style="list-style-type: none"> Maint and Constr Management Center Traffic Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Beech Grove Roadside Equipment	The Beech Grove Roadside Equipment includes arterial traffic management roadside equipment such as any and all equipment distributed on and along the roadway which monitors and controls traffic, including traffic signals and vehicle detection devices, as well as maintenance and construction operations equipment.	City of Beech Grove	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
Beech Grove Vehicles	Beech Grove Vehicles include police, fire, Emergency Management Services (EMS), and Maintenance and Construction Operations (MCO) vehicles.	City of Beech Grove	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE • Maint and Constr Vehicle OBE
Carmel CityOS	The Carmel CityOS represents the operating system that receives video and analytical data on traffic patterns and incidents from Carmel ITS Cameras. Acting as an open data platform, the CityOS supports the City of Carmel's other departments in managing the City's transportation infrastructure. The City of Carmel's Information and Communications Systems department manages the CityOS and its associated camera system. CityOS is in the "Realtime Intel Center" that is staffed by Carmel Police Department. CityOS is a joint project between the City of Carmel and Volkswagen.	City of Carmel	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Parking Management Center • Traffic Management Center
Carmel Engineering Department Operations	The Carmel Engineering Department Operations element represents the City of Carmel Department of Engineering operations system which manages all roads within the City limits.	City of Carmel	Existing	<ul style="list-style-type: none"> • Maint and Constr Management Center • Shared Use Transportation Center • Traffic Management Center • Transportation Information Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Carmel ITS Cameras	The Carmel ITS Cameras represents cameras with real time analytic capability that process video to track vehicles, bikes, and pedestrians and provide their presence and the real time analytic information to Carmel engineering and public safety (Fire, Police and Information and Communications Systems) departments.	City of Carmel	Planned	<ul style="list-style-type: none"> • ITS Roadway Equipment • Parking Area Equipment • Security Monitoring Equipment
Carmel Parking Area Equipment	Carmel Parking Area Equipment represents parking area sensors that monitor City of Carmel parking lot usage and provide that information to the Carmel Parking Management System. This also supports an interface for collecting parking fees electronically.	City of Carmel	Planned	<ul style="list-style-type: none"> • Parking Area Equipment
Carmel Parking Management System	Carmel Parking Management System represents automated system that City of Carmel utilizes to operate and manage its parking lots.	City of Carmel	Planned	<ul style="list-style-type: none"> • Parking Management Center
Carmel Roadside Equipment	The Carmel Roadside Equipment represents City of Carmel arterial traffic management roadside equipment including any and all equipment distributed on and along the roadway which monitors and controls traffic, such as traffic signals and vehicle detection devices, as well as Maintenance and Construction Operations (MCO) equipment.	City of Carmel	Existing	<ul style="list-style-type: none"> • ITS Roadway Equipment
Carmel Vehicle Charging Stations	The Carmel Vehicle Charging Stations are electric charging stations owned and operated by the City of Carmel where hybrid and all-electric vehicles can be charged.	City of Carmel	Planned	<ul style="list-style-type: none"> • Electric Charging Management Center • Electric Charging Station

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
CAV Authorizing Center	The Connected and Automated Vehicle (CAV) Authorizing Center provides the functionality needed to enable data exchange between and among mobile and fixed transportation users. Its primary mission is to enable safety, mobility and environmental communications-based applications for both mobile and non-mobile users. The CAV Authorizing Center has some jurisdiction over limited access resources; typically this includes roadside application access and radio spectrum licensing. It may be implemented as an autonomous center or as a set of supporting services that are co-located within another center.	Generic CAV Stakeholder	Future	<ul style="list-style-type: none"> • Authorizing Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
CAV-ITS Map Update System	The Connected and Automated Vehicle (CAV)–ITS Map Update System represents a provider of map databases used to support ITS services. It supports the provision of the map data that are used directly by vehicles (e.g., roadway and intersection geometry data sets), travelers (e.g., navigable maps used for route guidance and display maps used at traveler information points), system operators (e.g., map data used by Traffic Operators to monitor and manage the road network, and map data used by Fleet Managers to manage a vehicle fleet). It may represent a third–party provider or an internal organization that produces map data for agency use. Products may include simple display maps, map data sets that define detailed road network topology and geometry, or full geographic information system databases that are used to support planning and operations. This element is tagged as CAV related, but that is only to draw attention to its need for CAV purposes, but it is also valuable for traditional ITS services.	Generic CAV Stakeholder	Future	<ul style="list-style-type: none"> • Map Update System
CICS Website	The Central Indiana Commuter Services (CICS) Website is a federally-funded IndyGo service to reduce air pollution and traffic congestion. The CICS Website offers commuting solutions to area employers and employees in Boone, Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, Morgan and Shelby counties. These commuting solutions are alternatives to driving alone, such as carpooling, vanpooling, riding transit, biking or walking.	Central Indiana Regional Transportation Authority	Existing	<ul style="list-style-type: none"> • Shared Use Transportation Center • Transportation Information Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Commercial Vehicles	Commercial Vehicles are privately owned commercial vehicles which have been included in the architecture to cover HAZMAT incident reporting.	Private Commercial Vehicle and Fleet Operators	Existing	<ul style="list-style-type: none"> Commercial Vehicle OBE
Convention Center Kiosks	The Convention Center Kiosks are public information displays supporting various levels of interaction and information access including transportation.	Indianapolis Capital Improvements Board	Existing	<ul style="list-style-type: none"> Traveler Support Equipment
Downtown Indy Website	The Downtown Indy Website provides information on Indianapolis events, activities, and parking to promote tourism and business (www.indydt.com).	Indianapolis Downtown, Inc.	Existing	<ul style="list-style-type: none"> Archived Data System Shared Use Transportation Center Transportation Information Center
Electric Charging Management Center	Electric Charging Management Center manages electric vehicle charging stations with availability, location and payment transactions.	Electric Vehicle Charging Services	Planned	<ul style="list-style-type: none"> Electric Charging Management Center
Electric Utility	Electric Utility represents providers of electricity through an electric power distribution network.	AES Corporation	Existing	<ul style="list-style-type: none"> Electric Utility
Electric Vehicle Charging Stations	Electric Vehicle Charging Stations are battery charging facilities for hybrid and all-electric vehicles.	Electric Vehicle Charging Services	Planned	<ul style="list-style-type: none"> Electric Charging Station
Emergency Operations Center	The Emergency Operations Center is the command center for major emergencies in Indianapolis (located in the MESA building).	Indianapolis Emergency Management Agency	Existing	<ul style="list-style-type: none"> Emergency Management Center
Event Promoters	Event Promoters includes the information sources for information about major events in the region such as Indiana Black Expo, Indiana Sports Corporation, Indianapolis Capital Improvements Board (Colts), Indianapolis Convention and Visitors Association, Indianapolis 500 Festival, Indianapolis Downtown, Indianapolis Motor Speedway, and NCAA Headquarters.	Event Promoters/Special Events	Existing	<ul style="list-style-type: none"> Shared Use Transportation Center Transportation Information Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Fiber Communication Loop	The Fiber Communication Loop represents the fiber optic communication loop over which the central management system would communicate with the field equipment.	City of Carmel	Existing	<ul style="list-style-type: none"> • ITS Communications Equipment
IMS Command Center	The Indianapolis Motor Speedway (IMS) Command Center is operated during race events. During race events, the IMS Command Center hosts various agencies as a Multi-Agency Command Center (MACC). These agencies include local police/fire (on MESA System), IndyGo, INDOT, the Federal Aviation Administration (FAA), the Transportation Safety Administration (TSA), and local hospitals. The agencies and organizations use their own communications systems, but operate in the MACC using face-to-face communications with each other. MESA also provides equipment and one operator in the MACC. The Indiana State Police (250 personnel) are based in the Speedway infield, and receive a MECA radios to communicate with MESA and the MACC.	Indianapolis Motor Speedway	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Parking Area Equipment • Parking Management Center • Traffic Management Center
Indianapolis Airport Emergency Vehicles	The Indianapolis Airport Emergency Vehicles represent 18 squad cars, fire vehicles (aerial truck, mini-pumper, 4 special crash trucks, rescue, others), containment vehicle (for bomb detonations), decontamination unit (for airport and county use, bought by county emergency management), and a mass casualty vehicle.	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Indianapolis Airport Field Devices	The Indianapolis Airport Field Devices are comprised of CCTV cameras, portable DMS, gate operations, weather sensors, backup tornado warning systems, and environmental sensors (for airport runoff).	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> Alerting and Advisory System Connected Vehicle Roadside Equipment ITS Roadway Equipment Security Monitoring Equipment
Indianapolis Airport Maintenance Vehicles	The Indianapolis Airport Maintenance Vehicles include airport roadway maintenance, facility maintenance and supervisory vehicles.	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> Maint and Constr Vehicle OBE
Indianapolis Airport Management Systems	The Indianapolis Airport Management Systems represents the traffic management, emergency management, and maintenance systems within the jurisdiction of the airport.	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> Alternate Mode Transportation Center Emergency Management Center Maint and Constr Management Center Traffic Management Center
Indianapolis Airport Parking Area Equipment	The Indianapolis Airport Parking Area Equipment represents parking area sensors that monitor parking lot usage and provide that information to the Indianapolis Airport Parking Management System. This element also supports an interface for collecting parking fees electronically.	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> Parking Area Equipment
Indianapolis Airport Parking System	The Indianapolis Airport Parking System is an automated system that allows frequent travelers the opportunity to enter and exit parking lots quickly without fumbling for cash, credit cards or coins. The system includes online parking reservation at www.indianapolisairport.com/parking/index.php .	Indianapolis Airport Authority	Existing	<ul style="list-style-type: none"> Parking Management Center Shared Use Transportation Center Transportation Information Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Indianapolis DPW Operations Center	The Indianapolis Department of Public Works (DPW) Operations Center includes traffic signal maintenance and operations, Maintenance and Construction Operations (MCO) dispatching and emergency services. It is located in the MESA Building.	Indianapolis Department of Public Works	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Emissions Management Center • Maint and Constr Management Center • Traffic Management Center
Indianapolis DPW Roadside Equipment	The Indianapolis Department of Public Works (DPW) Roadside Equipment includes arterial traffic management roadside equipment such as equipment distributed on and along the roadway which monitors and controls traffic, for example, traffic signals and vehicle detection devices, as well as Maintenance and Construction Operations (MCO) equipment.	Indianapolis Department of Public Works	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
Indianapolis DPW Vehicles	Indianapolis Department of Public Works (DPW) Vehicles are Maintenance and Construction Operations (MCO) vehicles which include ITS devices that provide sensory, processing, storage, and communications functions necessary to support highway maintenance and construction.	Indianapolis Department of Public Works	Existing	<ul style="list-style-type: none"> • Maint and Constr Vehicle OBE
Indianapolis Fire Communications Center	The Indianapolis Fire Communications Center is responsible for fire and Emergency Management Services (EMS) dispatch services for Marion County (including Wishard Ambulance) with the exception of the town of Speedway and the cities of Beech Grove and Lawrence. The center is located in the MESA Building.	Indianapolis Fire Department	Existing	<ul style="list-style-type: none"> • Emergency Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Indianapolis Fire Department Emergency Vehicles	The Indianapolis Fire Department (IFD) Emergency Vehicles include ITS equipment that provides sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response. The IFD vehicle fleet includes HAZMAT response vehicles.	Indianapolis Fire Department	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Indianapolis MPO Planning Operations	The Indianapolis Metropolitan Planning Organization (MPO) administers the Regional Transportation Planning Program, which results in plans and programs for highways, transit, and other means of moving people and goods in compliance with federal transportation requirements to guide the development of an efficient multi-modal transportation system within the Indianapolis Metropolitan Planning Area.	Indianapolis MPO	Planned	<ul style="list-style-type: none"> • Archived Data User System • Shared Use Transportation Center • Transportation Information Center
Indianapolis Police Department Emergency Vehicles	Indianapolis Police Department Emergency Vehicles include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Indianapolis Police Department	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Indianapolis Police Dispatch	Indianapolis Police Dispatch is a central location for all Indianapolis Metropolitan Police Department (IPD) calls (including 911) and dispatching. Located in the MESA Building.	Indianapolis Police Department	Existing	<ul style="list-style-type: none"> • Emergency Management Center
INDOT Arterial Cameras and Controllers	INDOT Arterial Cameras and Controllers represents CCTV cameras and controllers along the arterials that are used for traffic surveillance and control.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • ITS Roadway Equipment
INDOT Arterial TMS	The INDOT Arterial Traffic Management System (TMS) provides central control of all devices on the state operated arterial roadways within the Metropolitan Planning Area (MPA).	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Traffic Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
INDOT Arterial Traffic Signals and Detection	INDOT Arterial Traffic Signals and Detection includes traffic signals and vehicle detection devices that detect and control traffic at the intersections.	Indiana Department of Transportation District Level	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
INDOT Gary TMC	INDOT Gary Traffic Management Center (TMC) serves as a backup for the INDOT Indianapolis TMC and operates the INDOT Indianapolis TMC systems in situations when INDOT Indianapolis TMC cannot operate its system.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Maint and Constr Management Center • Shared Use Transportation Center • Traffic Management Center • Transportation Information Center
INDOT Hoosier Helper Vehicles	INDOT Hoosier Helper Vehicles is INDOT's Safety Service Patrol (SSP). Hoosier Helper vehicles include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
INDOT Indianapolis TMC	The Indianapolis Traffic Management Center (TMC) is located at 21st Street and Post Road, manages the interstate and highways in the Indianapolis Region, and coordinates with local and county transportation and multimodal agency operations.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Archived Data System • Emergency Management Center • Maint and Constr Management Center • Shared Use Transportation Center • Traffic Management Center • Transportation Information Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
INDOT Indianapolis TMC Roadside Equipment	INDOT Indianapolis Traffic Management Center (TMC) Roadside Equipment includes any and all equipment distributed on and along the roadway which monitors and controls traffic, including DMS, CCTV cameras, and vehicle detection devices.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
INDOT Infrastructure Inventory System	INDOT Infrastructure Inventory System is an electronic inventory of ITS devices on the interstate system (GIS format).	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Asset Management System
INDOT Lane Management Field Equipment	The INDOT Lane Management Field Equipment element represents ITS equipment, overhead signs, cameras and other associated equipment that would be utilized to designate the shoulder of an interstate or a freeway as a travel lane and to manage and control it.	Indiana Department of Transportation	Future	<ul style="list-style-type: none"> • ITS Roadway Equipment
INDOT MCO Field Devices	INDOT Maintenance and Construction Operations (MCO) Field Devices are used for operational purposes of maintenance and construction.	Indiana Department of Transportation District Level	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
INDOT MCO Management	INDOT Maintenance and Construction Operations (MCO) provides management and maintenance dispatch from the INDOT Indianapolis district maintenance facilities in the Greenfield, Crawfordsville, and Seymour districts.	Indiana Department of Transportation District Level	Existing	<ul style="list-style-type: none"> • Maint and Constr Management Center
INDOT MCO Vehicles	INDOT Maintenance and Construction Operations (MCO) Vehicles include ITS devices that provides the sensory, processing, storage, and communications functions necessary to support highway maintenance and construction.	Indiana Department of Transportation District Level	Existing	<ul style="list-style-type: none"> • Maint and Constr Vehicle OBE
INDOT Ramp Metering System	INDOT Ramp Metering System represents ramp metering equipment on I-465 on-ramps.	Indiana Department of Transportation	Planned	<ul style="list-style-type: none"> • ITS Roadway Equipment

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
INDOT Security Monitoring Field Equipment	INDOT Security Monitoring Field Equipment represents security monitoring field equipment including sensors and surveillance devices that monitor transportation infrastructure and public areas.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Security Monitoring Equipment
INDOT TPIMS	The Indiana Department of Transportation (INDOT) Truck Parking Information Management System (TPIMS) is the Truck Parking Management System for the State of Indiana. This system determines parking availability at rest areas and communicates this information upstream to truck operators.	Indiana Department of Transportation	Planned	<ul style="list-style-type: none"> • Parking Management Center • Traffic Management Center
INDOT TPIMS Equipment	The Indiana Department of Transportation (INDOT) Truck Parking Information Management System (TPIMS) Equipment represents the TPIMS Parking Area Equipment for the State of Indiana. It monitors parking lot usage and provides information to TPIMS.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Parking Area Equipment
INDOT Variable Speed Limits Field Equipment	This element represents equipment that would monitor vehicle speed in an area and may also notify an enforcement agency to enforce the designated speed limit in the area.	Indiana Department of Transportation	Planned	<ul style="list-style-type: none"> • ITS Roadway Equipment
INDOT Work Zone Speed Monitoring Field Equipment	INDOT Work Zone Speed Monitoring Field Equipment represents equipment (cameras, detection) that would monitor vehicle speeds in a work zone and sends the speed information to traffic management center and may notify an enforcement agency to enforce the speed limit in the work zone.	Indiana Department of Transportation	Planned	<ul style="list-style-type: none"> • ITS Roadway Equipment
INDOT Work Zone Speed Warning Field Equipment	INDOT Work Zone Speed Warning Field Equipment represents equipment (warning signs, DMS) that would display warning about the speed and may also notify an enforcement agency about the speed.	Indiana Department of Transportation	Planned	<ul style="list-style-type: none"> • ITS Roadway Equipment

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
IndyGo Kiosks	IndyGo Kiosks are public informational displays supporting various levels of interaction and information access.	Indianapolis Public Transportation Corporation/IndyGo	Existing	<ul style="list-style-type: none"> • Security Monitoring Equipment • Traveler Support Equipment
IndyGo Operations Center	IndyGo Operations Center represents dispatching for IndyGo fixed route and paratransit vehicles.	Indianapolis Public Transportation Corporation/IndyGo	Existing	<ul style="list-style-type: none"> • Archived Data System • Emergency Management Center • Parking Area Equipment • Parking Management Center • Shared Use Transportation Center • Transit Management Center • Transportation Information Center
IndyGo Security Monitoring Field Equipment	IndyGo Security Monitoring Field Equipment includes sensors and surveillance devices that monitor transportation infrastructure and public areas.	Indianapolis Public Transportation Corporation/IndyGo	Existing	<ul style="list-style-type: none"> • Security Monitoring Equipment • Traveler Support Equipment
IndyGo Transit Vehicles	IndyGo Transit Vehicles include ITS devices that support the safe and efficient movement of passengers. These systems collect, manage, and disseminate transit-related information to the driver, operations and maintenance personnel, and transit system patrons.	Indianapolis Public Transportation Corporation/IndyGo	Existing	<ul style="list-style-type: none"> • Transit Vehicle OBE
IndyGo Traveler Card	IndyGo Traveler Cards enable the transfer of electronic information from the user of a service (i.e. a traveler) to the provider of the service.	Indianapolis Public Transportation Corporation/IndyGo	Existing	<ul style="list-style-type: none"> • Payment Device • Traveler Card
Intelligence Fusion Center	Intelligence Fusion Center brings together public safety and transportation agencies to collect and distribute information regarding homeland security intelligence.	CTASC	Planned	<ul style="list-style-type: none"> • Emergency Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
ISP Dispatch	Indiana State Police (ISP) Dispatch represents dispatching for ISP vehicles in Districts 51, 52, 53. ISP Post 52 is co-located with the Indianapolis TMC. Includes weather/road conditions hotline (website/telephone line).	Indiana State Police	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Enforcement Center • Other Emergency Management Centers • Shared Use Transportation Center • Traffic Management Center • Transportation Information Center
ISP Emergency Vehicles	Indiana State Police (ISP) Emergency Vehicles represents ISP emergency vehicles that include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Indiana State Police	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
ITS Maintenance Contractor	ITS Maintenance Contractor provides preventative maintenance and emergency repair services to ITS equipment.	Private Maintenance Companies	Existing	<ul style="list-style-type: none"> • Maint and Constr Field Personnel • Maint and Constr Vehicle Operator
Lawrence Public Safety	Lawrence Public Safety represents Police, Fire, and Emergency Management Services (EMS) dispatching for the City of Lawrence, including Public Safety Communications.	City of Lawrence	Existing	<ul style="list-style-type: none"> • Emergency Management Center
Lawrence Public Works/Street Department	The Lawrence Public Works/Street Department represents the City of Lawrence signal system operations and road maintenance in the City of Lawrence.	City of Lawrence	Existing	<ul style="list-style-type: none"> • Maint and Constr Management Center • Traffic Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Lawrence Roadside Equipment	Lawrence Roadside Equipment represents the City of Lawrence arterial traffic management roadside equipment including equipment distributed on and along the roadway which monitors and controls traffic, including traffic signals and vehicle detection devices, including Maintenance and Construction Operations (MCO) equipment.	City of Lawrence	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
Lawrence Vehicles	Lawrence Vehicles represent City of Lawrence police, fire, Emergency Management Services (EMS), and Maintenance and Construction Operations (MCO) vehicles	City of Lawrence	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE • Maint and Constr Vehicle OBE
Lucas Oil Stadium Command Center	The Lucas Oil Stadium Command Center is a command center for events at the Lucas Oil Stadium.	Indianapolis Capital Improvements Board	Existing	<ul style="list-style-type: none"> • Emergency Management Center
Major Employer Emergency Vehicles	Major Employer Emergency Vehicles are ambulance, HAZMAT, and fire vehicles operating on major employment centers in the region.	Major Employers	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Major Employer Management Systems	Major Employer Management Systems are incident and emergency management systems for major employer facilities, including emergency operations center.	Major Employers	Existing	<ul style="list-style-type: none"> • Emergency Management Center • Event Promoter System
Marion County Sheriff Dispatch	Marion County Sheriff Dispatch provides a central location for all MCS calls and dispatching and is located in the MESA Building.	Marion County Sheriffs Office	Existing	<ul style="list-style-type: none"> • Emergency Management Center
Marion County Sheriff Emergency Vehicles	Marion County Sheriff Emergency Vehicles include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Marion County Sheriffs Office	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Media	Media represents the news and information media services providing information such as traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media.	Media Services	Existing	<ul style="list-style-type: none"> • Media

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
MESA System	The Metropolitan Emergency Services Agency (MESA) is an emergency communications system for Marion County (except the towns of Speedway, Beech Grove, and Lawrence).	MESA System Users	Existing	<ul style="list-style-type: none"> Emergency Communications System Emergency Management Center
Micro-Mobility Services	Micro-Mobility Services represents systems that provide information about shared-use transportation services that provide low-cost methods of transportation to enhance mobility and address the last-mile needs of downtown Indianapolis. This mode of transportation generally defined as micro-mobility which includes bicycles, scooters, electric-assist bicycles, electric scooters (e-scooters), and other small, lightweight, wheeled conveyances.	Private Traveler Services	Existing	<ul style="list-style-type: none"> Shared Use Transportation Center
Other Suburban Municipality Street Department Dispatch	Other Suburban Municipality Street Department Dispatch represent municipal agencies responsible for traffic signal maintenance and operation, as well as Maintenance and Construction Operations (MCO) dispatching and emergency services.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> Maint and Constr Management Center Traffic Management Center
Payment Administration Center	Payment Administration Center provides general financial payment administration services and supports electronic fund transfer.	Financial Institutions	Existing	<ul style="list-style-type: none"> Payment Administration Center
Payment Device	Payment Device represents a device that transfers funds electronically from a traveler to a service provider that provides the services to the traveler.	Travelers	Existing	<ul style="list-style-type: none"> Payment Device
Pedestrian	Pedestrians are humans traveling on foot, whether walking or running, on a road, sidewalk, crosswalk, or pavement.		Existing	<ul style="list-style-type: none"> Pedestrian
Personal Computing Devices	Personal Computing Devices refers to mobile equipment an individual carries and can personalize with their choices for information about transportation networks, such as mobile phones, tablets and laptops.	Travelers	Existing	<ul style="list-style-type: none"> Payment Device Personal Information Device

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Private Fleet Vehicle Dispatch Systems	The Private Fleet Vehicle Dispatch Systems represents charter bus fleets, major truck fleet operators, and others that operate in Indiana. Note that the dispatch operations for these organizations may actually be outside the state.	Private Commercial Vehicle and Fleet Operators	Existing	<ul style="list-style-type: none"> Fleet and Freight Management Center
Private Parking Area Equipment	Private Parking Area Equipment represents parking area sensors that monitor parking lot usage and provide that information to the Parking Management System. This also supports an interface or collecting parking fee electronically.	Private Parking Service Providers	Existing	<ul style="list-style-type: none"> Parking Area Equipment
Private Parking Management System	Private Parking Management Systems represent automated systems that parking service providers utilize to operate and manage parking lots.	Private Parking Service Providers	Existing	<ul style="list-style-type: none"> Parking Management Center
Private Towing Companies	Private Towing Companies provide removal of vehicles and debris from roadways.	Towing Operators	Existing	<ul style="list-style-type: none"> Emergency Management Center
Private Traveler Services	Private Traveler Services represents private sector systems that provide traveler information services to travelers such as trip planning, payment, and guidance across all modes of travel (public and private).	Private Traveler Services	Existing	<ul style="list-style-type: none"> Shared Use Transportation Center Transportation Information Center
Public Health Systems	Public Health Systems represents the health system operated by Indiana University Health that manages emergencies related to biological attacks, hazardous materials spills or other threats to public health.	Indiana University Health	Existing	<ul style="list-style-type: none"> Public Health System
RWIS Sensors	Road Weather Information System (RWIS) stations (6) located in the Indianapolis metropolitan area. Includes atmospheric and pavement monitoring sensors.	RWIS Users	Existing	<ul style="list-style-type: none"> Connected Vehicle Roadside Equipment Emissions Management Center ITS Roadway Equipment
School Buses	School Bus services for the Indianapolis Public Schools (IPS), township, and municipal schools in the Indianapolis region.	Indianapolis Schools	Existing	<ul style="list-style-type: none"> Transit Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
School Police Departments	School Police Departments are the Indianapolis Public Schools (IPS) Police includes ninety-one (91) full-time, and a varying number of part-time, sworn police officers, numerous civilian employees. IPS Police Officers are stationed in all of the high, middle and alternative schools of IPS. Also includes township school district police departments.	Indianapolis Schools	Existing	<ul style="list-style-type: none"> Emergency Management Center
SCMS	Security and Credentials Management System (SCMS) support connected and autonomous vehicle operations. The SCMS enables trusted communications between mobile devices and other mobile devices, roadside devices, and centers and protects data they handle from unauthorized access. As the SCMS interacts with mobile devices and other devices in the Connected and Automated Vehicle (CAV) environment, these devices pass through stages as certificates and cryptographic material are furnished that enable the device to have trusted interactions with other devices in the CAV environment.	Generic CAV Stakeholder	Future	<ul style="list-style-type: none"> Cooperative ITS Credentials Management System
Speedway Public Safety	Speedway Public Safety represents Police, Fire, and Emergency Management Services (EMS) dispatching for the Town of Speedway.	Town of Speedway	Existing	<ul style="list-style-type: none"> Emergency Management Center
Speedway Public Works	Speedway Public Works represents Town of Speedway Department of Public Works operations that maintain all roads within the town limits.	Town of Speedway	Existing	<ul style="list-style-type: none"> Maint and Constr Management Center Traffic Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Speedway Roadside Equipment	Speedway Roadside Equipment represent Town of Speedway arterial traffic management roadside equipment includes any and all equipment distributed on and along the roadway which monitors and controls traffic, including traffic signals and vehicle detection devices, including Maintenance and Construction Operations (MCO) equipment.	Town of Speedway	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment
Speedway Vehicles	Speedway Vehicles represent Town of Speedway police, fire, emergency management services (EMS), and maintenance and construction operations (MCO) vehicles.	Town of Speedway	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE • Maint and Constr Vehicle OBE
Suburban Municipality Emergency Dispatch	Suburban Municipality Emergency Dispatch represent police, fire, EMS, and emergency communications for municipalities outside of Unigov.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> • Emergency Management Center
Suburban Municipality Emergency Vehicles	Suburban Municipality Emergency Vehicles represent suburban municipality emergency vehicles that include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Suburban Municipality Street Department CAV Roadside Equipment	Suburban Municipality Street Department CAV Roadside Equipment represents the Connected and Autonomous Vehicle (CAV) field equipment that is installed on and along the roadway to support CAV services.	Suburban Municipalities	Planned	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment
Suburban Municipality Street Department Operations/Dispatch	Suburban Municipality Street Department Operations/Dispatch represents suburban municipality street departments responsible for traffic signal maintenance and operation, as well as maintenance and construction operations dispatching and emergency services.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> • Maint and Constr Management Center • Traffic Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Suburban Municipality Street Department Roadside Equipment	Suburban Municipality Street Department Roadside Equipment represent suburban municipality arterial traffic management roadside equipment that includes any and all equipment distributed on and along the roadway which monitors and controls traffic, including traffic signals and vehicle detection devices, including MCO equipment.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> • ITS Roadway Equipment
Suburban Municipality Street Department Vehicles	Suburban Municipality Street Department Vehicles represent suburban municipality Maintenance and Construction Operations (MCO) vehicles that include ITS devices that provides the sensory, processing, storage, and communications functions necessary to support highway maintenance and construction.	Suburban Municipalities	Existing	<ul style="list-style-type: none"> • Maint and Constr Vehicle OBE
Surface Transportation Weather Service	Surface Transportation Weather Service are providers of value-added sector specific meteorological services. These providers utilize National Weather Service data and predictions, road condition information and local environmental data to provide weather observations and forecasts.	DTN	Existing	<ul style="list-style-type: none"> • Surface Transportation Weather Service
Surrounding County Highway Operations/Dispatch	Surrounding County Highway Dispatch is responsible for traffic signal maintenance and operation, as well as MCO dispatching and emergency services.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Maint and Constr Management Center • Traffic Management Center
Surrounding County Highway Roadside Equipment	Surrounding County Highway Roadside Equipment represents surrounding county arterial traffic management roadside equipment including equipment distributed on and along the roadway which monitors and controls traffic, including traffic signals and vehicle detection devices, including MCO equipment.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Connected Vehicle Roadside Equipment • ITS Roadway Equipment

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Surrounding County Highway Vehicles	Surrounding County Highway Vehicles represent surrounding county Maintenance and Construction Operations (MCO) vehicles that include ITS devices providing the sensory, processing, storage, and communications functions necessary to support highway maintenance and construction.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Maint and Constr Vehicle OBE
Surrounding County Security Monitoring Field Equipment	Surrounding County Security Monitoring Field Equipment includes sensors and surveillance devices that monitor transportation infrastructure and public areas for security purposes.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Security Monitoring Equipment
Surrounding County Sheriff Communications Center	Surrounding County Sheriff Communications Center represents emergency call centers (911)/dispatch centers in adjoining counties providing information about incidents and incident response.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Emergency Management Center
Surrounding County Sheriff Emergency Vehicles	Surrounding County Sheriff Emergency Vehicles include ITS equipment that provides the sensory, processing, storage, and communications functions necessary to support safe and efficient emergency response.	Surrounding Counties	Existing	<ul style="list-style-type: none"> • Emergency Vehicle OBE
Taxi Services	Taxi Services represent private taxi services.	Taxi Companies	Existing	<ul style="list-style-type: none"> • Transit Management Center
Traffic Data Archive	The Traffic Data Archive is an online traffic data archive used to inform planning activities and traffic operations through historical traffic data for prediction analysis.	Traffic Data Archive Users Group	Planned	<ul style="list-style-type: none"> • Archived Data System
TrafficWise Traveler Information System	The TrafficWise Traveler Information System includes the Indiana 511 traveler information system providing telephone and website services.	Indiana Department of Transportation	Existing	<ul style="list-style-type: none"> • Shared Use Transportation Center • Transportation Information Center
Utility Emergency Repair/Response	Utility Emergency Repair/Response represents Utility Company services and vehicles.	Utility Companies	Existing	<ul style="list-style-type: none"> • Emergency Management Center

Element Name	Element Description	Stakeholder	Element Status	Associated Physical Objects
Vehicles	Vehicles represents personal automobiles and fleet vehicles that include ITS safety, navigation and traveler information systems that may be applicable to any highway vehicle.	Travelers	Existing	<ul style="list-style-type: none"> • Basic Vehicle • Light Vehicle OBE • Location and Time Data Source
Vulnerable Road User	Vulnerable Road Users represents any roadway user not in a motorized vehicle capable of operating at the posted speed for the roadway in question, and also any roadway user in a vehicle not designed to encase (and thus protect) its occupants. This includes pedestrians, cyclists, wheelchair users, two-wheeled scooter micro-mobility users, as well as powered scooters and motorcycles.	Vulnerable Road Users	Existing	<ul style="list-style-type: none"> • Vulnerable Road Users
Weather Services	Weather Services include the National Weather Service as well as private disseminators of weather data.	National Weather Service	Existing	<ul style="list-style-type: none"> • Weather Service System

5 ITS Services

ITS services, or service packages, describe what can be done to improve the efficiency, safety, and convenience of the regional transportation system through better information, advanced systems and new technologies. Some services are specific to one primary stakeholder while others require broad stakeholder participation. Table 3 lists the ITS services that meet transportation needs in the region. Services "bundle" multiple ITS elements to address specific transportation management services, such as surface street control or traveler information.

An ITS Service Package is not in and of itself, an ITS project. Instead, Service Packages are the "building blocks" of ITS, and a specific ITS project may include multiple Service Packages that provide multiple interrelated functions. For example, a transit ITS project designed to improve service efficiency may include Service Packages for vehicle tracking, fixed-route schedule management, and automated passenger counting.

Stakeholders can use services to better understand the integration necessary to address transportation needs. The services listed include a description of the service and a list of the elements involved in the service for its delivery. Stakeholders can find the services meeting their needs for future project definition. Additional services can be defined using the Regional Architecture Development for Intelligent Transportation (RAD-IT) and those services can be integrated into the RITSA during a future maintenance update. When defining a project, a stakeholder should use the services in the RITSA or a new service defined with the RAD-IT software to define the services a project will deliver to meet specific needs.

Table 3 – ITS Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
CVO05	Commercial Vehicle Parking (INDOT Truck Parking Information Management System (TPIMS))	This service package provides parking information to commercial vehicle operators both pre-trip and en route. The parking information will be based on information collected from each truck parking area using individual sensors in each space, or in/out sensors for the area. The raw data is processed by state DOT or third party providers and supplied to fleet managers, to mobile devices used by commercial vehicle operators, to DMS on the roadway or directly to in vehicle systems as commercial vehicles approach roadway exits with key facilities such as parking. This service package also provides the ability for the commercial vehicle driver, or fleet manager to request a parking reservation.	Existing	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT TPIMS • INDOT TPIMS Equipment
CVO12	HAZMAT Management (Indianapolis Region)	This service package integrates incident management capabilities with commercial vehicle tracking to assure effective treatment of HAZMAT material transport, including response to incidents. HAZMAT tracking is performed by the Fleet and Freight Management Center. The Emergency Management Center is notified by the Commercial Vehicle and the Fleet and Freight Management Center of the HAZMAT vehicle location and information about the HAZMAT load. If an incident occurs, the Emergency Management Center can use the information to coordinate the response. The response is tailored based on information that is provided as part of the original incident notification or derived from	Existing	<ul style="list-style-type: none"> • Ambulance Dispatch • Commercial Vehicles • Emergency Operations Center • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Indianapolis TMC • ISP Dispatch • Major Employer Management Systems • Marion County Sheriff Dispatch • Private Fleet Vehicle Dispatch Systems

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		supplemental information provided by the Fleet and Freight Management Center. The latter information can be provided prior to the beginning of the trip, during the trip, or gathered following the incident depending on the selected policy and implementation.		<ul style="list-style-type: none"> • Private Towing Companies • Suburban Municipality Emergency Dispatch • Surrounding County Sheriff Communications Center
DM01	ITS Data Warehouse	This service package provides access to transportation data to support transportation planning, condition and performance monitoring, safety analysis, and research. Configurations range from focused repositories that house data collected and owned by a single agency, district, private sector provider, or research institution to broad repositories that contain multimodal, multidimensional data from varied data sources covering a broader region. Both central repositories and physical distributed ITS data repositories are supported. Requests for data that are satisfied by access to a single repository in the ITS Data Warehouse service package may be parsed by the local repository and dynamically translated to requests to other repositories that relay the data necessary to satisfy the request. The repositories could include a data registry capability that allows registration of data identifiers or data definitions for interoperable use throughout a region.	Existing	<ul style="list-style-type: none"> • Beech Grove Public Safety • Beech Grove Public Works Operations • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis MPO Planning Operations • Indianapolis Police Dispatch • INDOT Indianapolis TMC • INDOT Infrastructure Inventory System • INDOT MCO Management • IndyGo Operations Center • ISP Dispatch • Lawrence Public Safety • Lawrence Public Works/Street Department • Marion County Sheriff Dispatch • Speedway Public Safety • Speedway Public Works • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				<ul style="list-style-type: none"> Surrounding County Highway Operations/Dispatch Surrounding County Sheriff Communications Center Traffic Data Archive
DM02	Performance Monitoring (IMPO Mobile Data Products)	The Performance Monitoring service package uses information collected from detectors and sensors, connected vehicles, and operational data feeds from centers to support performance monitoring and other uses of historical data including transportation planning, condition monitoring, safety analyses, and research. The information may be probe data information obtained from vehicles in the network to determine network performance measures such as speed and travel times, or it may be information collected from the vehicles and processed by the infrastructure, e.g. environmental data and infrastructure conditions monitoring data. Additional data are collected including accident data, road condition data, road closures and other operational decisions to provide context for measured transportation performance and additional safety and mobility-related measures. More complex performance measures may be derived from the collected data.	Planned	<ul style="list-style-type: none"> Indianapolis MPO Planning Operations Traffic Data Archive
MC01	Maintenance and Construction Vehicle and Equipment Tracking	This service package tracks the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. Checks can include ensuring the correct roads are being	Existing	<ul style="list-style-type: none"> INDOT MCO Management INDOT MCO Vehicles



Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		plowed and work activity is being performed at the correct locations.		
MC01	Maintenance and Construction Vehicle and Equipment Tracking (Indy DPW)	This market package will track the location of maintenance and construction vehicles and other equipment to ascertain the progress of their activities. These activities can include ensuring the correct roads are being plowed and work activity is being performed at the correct locations.	Future	<ul style="list-style-type: none"> Indianapolis DPW Operations Center Indianapolis DPW Vehicles
MC02	Maintenance and Construction Vehicle Maintenance	This service package performs vehicle maintenance scheduling and manages both routine and corrective maintenance activities on vehicles and other maintenance and construction equipment. It includes on-board sensors capable of automatically performing diagnostics for maintenance and construction vehicles, and the systems that collect this diagnostic information and use it to schedule and manage vehicle and equipment maintenance.	Existing	<ul style="list-style-type: none"> Beech Grove Public Works Operations Beech Grove Vehicles Indianapolis Airport Maintenance Vehicles Indianapolis Airport Management Systems Indianapolis DPW Operations Center Indianapolis DPW Vehicles INDOT MCO Management INDOT MCO Vehicles Lawrence Public Works/Street Department Lawrence Vehicles Speedway Public Works Speedway Vehicles Suburban Municipality Street Department Operations/Dispatch Suburban Municipality Street Department Vehicles Surrounding County Highway Operations/Dispatch Surrounding County Highway Vehicles
MC03	Roadway Automated	This service package automatically treats a roadway	Future	<ul style="list-style-type: none"> INDOT MCO Field Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	Treatment	section based on environmental or atmospheric conditions. Treatments include fog dispersion, anti-icing chemicals, etc. The service package includes the environmental sensors that detect adverse conditions, the automated treatment system itself, and driver information systems (e.g., dynamic message signs) that warn drivers when the treatment system is activated.		<ul style="list-style-type: none"> • INDOT MCO Management
MC04	Winter Maintenance	This service package supports winter road maintenance including snow plow operations, roadway treatments (e.g., salt spraying and other anti-icing material applications), and other snow and ice control activities. This package monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.	Existing	<ul style="list-style-type: none"> • Beech Grove Public Works Operations • Beech Grove Vehicles • Indianapolis Airport Maintenance Vehicles • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis DPW Vehicles • INDOT MCO Management • INDOT MCO Vehicles • Lawrence Public Works/Street Department • Lawrence Vehicles • Speedway Public Works • Speedway Vehicles • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Vehicles • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Vehicles
MC05	Roadway	This service package supports	Existing	<ul style="list-style-type: none"> • Beech Grove Public

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	Maintenance and Construction	<p>numerous services for scheduled and unscheduled maintenance and construction on a roadway system or right-of-way. Maintenance services include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, CCTV, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling maintenance and construction activities.</p>		<ul style="list-style-type: none"> Works Operations • Beech Grove Roadside Equipment • Beech Grove Vehicles • Indianapolis Airport Maintenance Vehicles • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • Indianapolis DPW Vehicles • INDOT Infrastructure Inventory System • INDOT MCO Field Devices • INDOT MCO Management • INDOT MCO Vehicles • ITS Maintenance Contractor • Lawrence Public Works/Street Department • Lawrence Roadside Equipment • Lawrence Vehicles • Speedway Public Works • Speedway Roadside Equipment • Speedway Vehicles • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment • Suburban Municipality Street Department Vehicles • Surrounding County Highway Operations/Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				<ul style="list-style-type: none"> Surrounding County Highway Roadside Equipment Surrounding County Highway Vehicles
MC06	Work Zone Management	<p>This service package manages work zones, controlling traffic in areas of the roadway where maintenance, construction, and utility work activities are underway. Traffic conditions are monitored using CCTV cameras and controlled using dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers. Work zone information is coordinated with other groups (e.g., TIC, traffic management, other maintenance and construction centers). Work zone speeds and delays are provided to the motorist prior to the work zones. This service package provides control of field equipment in all maintenance and construction areas, including fixed, portable, and truck-mounted devices supporting both stationary and mobile work zones.</p>	Existing	<ul style="list-style-type: none"> Beech Grove Public Works Operations Beech Grove Roadside Equipment Beech Grove Vehicles Indianapolis Airport Field Devices Indianapolis Airport Management Systems Indianapolis DPW Operations Center Indianapolis DPW Roadside Equipment Indianapolis DPW Vehicles INDOT Indianapolis TMC Roadside Equipment INDOT MCO Field Devices INDOT MCO Management INDOT MCO Vehicles ITS Maintenance Contractor Lawrence Public Works/Street Department Lawrence Roadside Equipment Lawrence Vehicles Private Towing Companies Speedway Public Works Speedway Roadside Equipment Speedway Vehicles Suburban Municipality Street Department Operations/Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				<ul style="list-style-type: none"> • Suburban Municipality Street Department Roadside Equipment • Suburban Municipality Street Department Vehicles • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment • Surrounding County Highway Vehicles
MC07	Work Zone Safety Monitoring	This service package provides warnings to maintenance personnel within a work zone about potential hazards within the work zone. It enables vehicles or the infrastructure to provide warnings to workers in a work zone when a vehicle is moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).	Existing	<ul style="list-style-type: none"> • INDOT Indianapolis TMC Roadside Equipment • ITS Maintenance Contractor • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment • Surrounding County Highway Vehicles
MC07	Work Zone Safety Monitoring (INDOT Work Zone Speed Enforcement)	This service package provides warnings to maintenance personnel within a work zone about potential hazards within the work zone. It enables vehicles or the infrastructure to provide warnings to workers in a work zone when a vehicle is moving in a manner that appears to create an unsafe condition (e.g., moving at high speed or entering the work zone).	Planned	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Work Zone Speed Monitoring Field Equipment
MC08	Maintenance and Construction Activity Coordination (TrafficWise Traveler Information System)	This market package supports the dissemination of maintenance and construction activity to centers that can utilize it as part of their operations, or to the Information Service Providers who can provide the information to travelers.	Existing	<ul style="list-style-type: none"> • Indianapolis DPW Operations Center • Indianapolis MPO Planning Operations • INDOT Indianapolis TMC • TrafficWise Traveler Information System

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PM01	Parking Space Management (City of Carmel ITS Traffic Cameras)	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares collected parking information with local drivers and information providers for broader distribution.	Existing	<ul style="list-style-type: none"> • Carmel CityOS • Carmel ITS Cameras
PM01	Parking Space Management (City of Carmel Smart Parking)	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares collected parking information with local drivers and information providers for broader distribution.	Planned	<ul style="list-style-type: none"> • Carmel Engineering Department Operations • Carmel Parking Area Equipment • Carmel Parking Management System • Personal Computing Devices
PM01	Parking Space Management (Indianapolis Airport)	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares	Existing	<ul style="list-style-type: none"> • Indianapolis Airport Parking Area Equipment • Indianapolis Airport Parking System

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		collected parking information with local drivers and information providers for broader distribution.		
PM01	Parking Space Management (Private Parking Service Provider)	This service package monitors and manages parking spaces in lots, garages, and other parking areas and facilities. It assists in the management of parking operations by monitoring parking lot ingress and egress, parking space occupancy and availability. Infrastructure-based detectors and/or connected vehicles may be used to monitor parking occupancy. The service package shares collected parking information with local drivers and information providers for broader distribution.	Existing	<ul style="list-style-type: none"> • Downtown Indy Website • Personal Computing Devices • Private Parking Area Equipment • Private Parking Management System
PM03	Parking Electronic Payment (City of Carmel Smart Parking)	This service package supports electronic collection of parking fees. This includes all types of parking fee collection including short term and long term parking and pay-for-use loading zones. It collects parking fees from in-vehicle equipment, contact or proximity cards, or any smart payment device. This service package supports both payment via a local point of sale in the parking area or direct payment via wide area wireless communications. User accounts may be established to facilitate secure payment using only a secure ID and enhance services offered to frequent customers.	Planned	<ul style="list-style-type: none"> • Carmel Parking Area Equipment • Carmel Parking Management System • Personal Computing Devices
PM03	Parking Electronic Payment (Indianapolis Airport)	This service package supports electronic collection of parking fees. This includes all types of parking fee collection including short term and long term parking and pay-for-use loading zones. It collects parking fees from in-vehicle	Existing	<ul style="list-style-type: none"> • Indianapolis Airport Parking Area Equipment • Indianapolis Airport Parking System • Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		equipment, contact or proximity cards, or any smart payment device. This service package supports both payment via a local point of sale in the parking area or direct payment via wide area wireless communications. User accounts may be established to facilitate secure payment using only a secure ID and enhance services offered to frequent customers.		
PM03	Parking Electronic Payment (Private Parking Service Provider)	This service package supports electronic collection of parking fees. This includes all types of parking fee collection including short term and long term parking and pay-for-use loading zones. It collects parking fees from in-vehicle equipment, contact or proximity cards, or any smart payment device. This service package supports both payment via a local point of sale in the parking area or direct payment via wide area wireless communications. User accounts may be established to facilitate secure payment using only a secure ID and enhance services offered to frequent customers.	Existing	<ul style="list-style-type: none"> • Personal Computing Devices • Private Parking Area Equipment • Private Parking Management System
PS01	Emergency Call-Taking and Dispatch	This service package provides basic public safety call-taking and dispatch services. It includes emergency vehicle equipment, equipment used to receive and route emergency calls, and wireless communications that enable safe and rapid deployment of appropriate resources to an emergency. Coordination between Emergency Management Centers supports emergency notification between agencies. Wide area wireless communications between the Emergency	Existing	<ul style="list-style-type: none"> • Ambulance Dispatch • Ambulance Vehicles • Beech Grove Public Safety • Beech Grove Vehicles • Emergency Operations Center • IMS Command Center • Indianapolis Fire Communications Center • Indianapolis Fire Department Emergency Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>Management Center and an Emergency Vehicle supports dispatch and provision of information to responding personnel. This service package also provides information to support dynamic routing of emergency vehicles. Traffic information, road conditions, and weather advisories are provided to enhance emergency vehicle routing. The Emergency Management Center provides routing information based on real-time conditions and has the option to request an ingress/egress route from the Traffic Management Center.</p>		<ul style="list-style-type: none"> • Indianapolis Police Department Emergency Vehicles • Indianapolis Police Dispatch • INDOT Hoosier Helper Vehicles • INDOT Indianapolis TMC • ISP Dispatch • ISP Emergency Vehicles • Lawrence Public Safety • Lawrence Vehicles • Lucas Oil Stadium Command Center • Major Employer Emergency Vehicles • Major Employer Management Systems • Marion County Sheriff Dispatch • Marion County Sheriff Emergency Vehicles • MESA System • Private Towing Companies • School Police Departments • Speedway Public Safety • Speedway Vehicles • Suburban Municipality Emergency Dispatch • Suburban Municipality Emergency Vehicles • Surrounding County Sheriff Communications Center • Surrounding County Sheriff Emergency Vehicles • Utility Emergency Repair/Response

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS02	Emergency Response	This service package supports emergency/ incident response by personnel in the field. It includes emergency vehicle equipment used to provide response status as well as video or images from either the vehicle or from emergency personnel in the field. Wide area wireless communications between the Emergency Management Center, Emergency Personnel and Emergency Vehicles supports a sharing of emergency response information. The service package also includes tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident, including the functions and interfaces commonly supported by a mobile command center.	Existing	<ul style="list-style-type: none"> • Ambulance Dispatch • Ambulance Vehicles • Beech Grove Public Safety • Beech Grove Vehicles • Emergency Operations Center • IMS Command Center • Indianapolis Airport Emergency Vehicles • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Fire Department Emergency Vehicles • Indianapolis Police Department Emergency Vehicles • Indianapolis Police Dispatch • INDOT Hoosier Helper Vehicles • INDOT Indianapolis TMC • IndyGo Operations Center • ISP Dispatch • ISP Emergency Vehicles • Lawrence Public Safety • Lawrence Vehicles • Major Employer Emergency Vehicles • Major Employer Management Systems • Marion County Sheriff Dispatch • Marion County Sheriff Emergency Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				<ul style="list-style-type: none"> • MESA System • Private Towing Companies • School Police Departments • Speedway Public Safety • Speedway Vehicles • Suburban Municipality Emergency Dispatch • Suburban Municipality Emergency Vehicles • Utility Emergency Repair/Response
PS02	Emergency Response (Surrounding County/IFC)	<p>This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this market package to detect and verify incidents and implement an appropriate response. This market package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications</p>	Planned	<ul style="list-style-type: none"> • Intelligence Fusion Center • Surrounding County Sheriff Communications Center • Surrounding County Sheriff Emergency Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>or resource coordination between center subsystems. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination market package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information market packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.</p>		
PS03	Emergency Vehicle Preemption	<p>This service package provides signal preemption for public safety first responder vehicles. Both traditional signal preemption systems and new systems based on connected vehicle technology are covered. In more advanced systems, movement of public safety vehicles through the intersection can be facilitated by clearing queues and holding conflicting phases. In addition, this SP also covers the transition back to normal traffic signal operations after providing emergency vehicle preemption.</p>	Existing	<ul style="list-style-type: none"> • Ambulance Dispatch • Ambulance Vehicles • Beech Grove Public Safety • Beech Grove Vehicles • Indianapolis Fire Communications Center • Indianapolis Fire Department Emergency Vehicles • Indianapolis Police Department Emergency Vehicles • Indianapolis Police Dispatch • ISP Dispatch • ISP Emergency Vehicles • Lawrence Public Safety

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				<ul style="list-style-type: none"> • Lawrence Vehicles • Major Employer Emergency Vehicles • Major Employer Management Systems • Marion County Sheriff Dispatch • Marion County Sheriff Emergency Vehicles • Speedway Public Safety • Speedway Vehicles • Suburban Municipality Emergency Dispatch • Suburban Municipality Emergency Vehicles • Surrounding County Sheriff Communications Center • Surrounding County Sheriff Emergency Vehicles
PS03	Emergency Vehicle Preemption (City of Greenwood Signal Preemption)	This service package provides signal preemption for public safety first responder vehicles. Both traditional signal preemption systems and new systems based on connected vehicle technology are covered. In more advanced systems, movement of public safety vehicles through the intersection can be facilitated by clearing queues and holding conflicting phases. In addition, this SP also covers the transition back to normal traffic signal operations after providing emergency vehicle preemption.	Planned	<ul style="list-style-type: none"> • Suburban Municipality Emergency Vehicles • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment
PS04	Mayday Notification	This service package provides the capability for a vehicle to automatically transmit an emergency message when the vehicle has been involved in a crash or other distress	Existing	<ul style="list-style-type: none"> • Indianapolis Fire Communications Center • Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		situation. An automatic crash notification feature transmits key data on the crash recorded by sensors mounted in the vehicle (e.g. deployment of airbags) without the need for involvement of the driver. The emergency message is sent to emergency response services, which determines and carries out the appropriate response. This service package allows passing vehicles to receive and forward mayday requests in areas where no communications infrastructure exists. Emergency notifications from personal devices are also supported.		
PS08	Roadway Service Patrols	This service package supports roadway service patrol vehicles that monitor roads and aid motorists, offering rapid response to minor incidents (flat tire, accidents, out of gas) to minimize disruption to the traffic stream. If problems are detected, the roadway service patrol vehicles will provide assistance to the motorist (e.g., push a vehicle to the shoulder or median). The service package monitors service patrol vehicle locations and supports vehicle dispatch to identified incident locations. Incident information collected by the service patrol is shared with traffic, maintenance and construction, and traveler information systems.	Existing	<ul style="list-style-type: none"> • INDOT Hoosier Helper Vehicles • INDOT Indianapolis TMC
PS09	Transportation Infrastructure Protection	This service package includes the monitoring of transportation infrastructure (e.g., bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment and barrier and safeguard	Existing	<ul style="list-style-type: none"> • Indianapolis Airport Field Devices • Indianapolis Airport Management Systems • INDOT Indianapolis TMC • INDOT Security

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>systems to control access, preclude an incident, and mitigate the impact of an incident if it occurs. Threats can result from acts of nature (e.g., hurricanes, earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (e.g., stray barge hitting a bridge support). Infrastructure may be monitored with acoustic, environmental threat (such as nuclear, biological, chemical, and explosives), infrastructure condition and integrity, motion and object sensors and video and audio surveillance equipment. Data from such sensors and surveillance equipment may be processed in the field or sent to a center for processing. The data enables operators at the center to detect and verify threats. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated to deter an incident, control access to an area or mitigate the impact of an incident. Barrier systems include gates, barriers and other automated and remotely controlled systems that manage entry to transportation infrastructure. Safeguard systems include blast shields, exhaust systems and other automated and remotely controlled systems that mitigate impact of an incident.</p>		Monitoring Field Equipment
PS09	Transportation Infrastructure Protection (City)	This service package includes the monitoring of transportation infrastructure	Planned	<ul style="list-style-type: none"> • Carmel CityOS • Carmel ITS Cameras

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	of Carmel ITS Traffic Cameras)	<p>(e.g., bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment and barrier and safeguard systems to control access, preclude an incident, and mitigate the impact of an incident if it occurs. Threats can result from acts of nature (e.g., hurricanes, earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (e.g., stray barge hitting a bridge support). Infrastructure may be monitored with acoustic, environmental threat (such as nuclear, biological, chemical, and explosives), infrastructure condition and integrity, motion and object sensors and video and audio surveillance equipment. Data from such sensors and surveillance equipment may be processed in the field or sent to a center for processing. The data enables operators at the center to detect and verify threats. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated to deter an incident, control access to an area or mitigate the impact of an incident. Barrier systems include gates, barriers and other automated and remotely controlled systems that manage entry to transportation infrastructure. Safeguard systems include blast shields, exhaust systems and other automated and remotely controlled systems</p>		

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		that mitigate impact of an incident.		
PS09	Transportation Infrastructure Protection (Surrounding Counties)	This market package includes the monitoring of transportation infrastructure (e.g., bridges, tunnels and management centers) for potential threats using sensors and surveillance equipment and barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. Threats can result from acts of nature (e.g., hurricanes, earthquakes), terrorist attacks or other incidents causing damage to the infrastructure (e.g., stray barge hitting a bridge support). Infrastructure may be monitored with acoustic, environmental threat (such as nuclear, biological, chemical, and explosives), infrastructure condition and integrity, motion and object sensors and video and audio surveillance equipment. Data from such sensors and surveillance equipment may be processed in the field or sent to a center for processing. The data enables operators at the center to detect and verify threats. When a threat is detected, agencies are notified. Detected threats or advisories received from other agencies result in an increased level of system preparedness. In response to threats, barrier and safeguard systems may be activated by Traffic Management Subsystems to deter an incident, control access to an area or mitigate the impact of an incident. Barrier systems include gates, barriers and other automated and remotely	Future	<ul style="list-style-type: none"> Surrounding County Security Monitoring Field Equipment Surrounding County Sheriff Communications Center

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		controlled systems that manage entry to transportation infrastructure. Safeguard systems include blast shields, exhaust systems and other automated and remotely controlled systems that mitigate impact of an incident.		
PS10	Wide-Area Alert	This service package uses ITS driver and traveler information systems to alert the public in emergency situations such as child abductions, severe weather events, civil emergencies, and other situations that pose a threat to life and property. The alert includes information and instructions for transportation system operators and the traveling public, improving public safety and enlisting the public's help in some scenarios. The ITS technologies will supplement and support other emergency and homeland security alert systems such as the Emergency Alert System (EAS). When an emergency situation is reported and verified and the terms and conditions for system activation are satisfied, a designated agency broadcasts emergency information to traffic agencies, transit agencies, information service providers, toll operators, and others that operate ITS systems. The ITS systems, in turn, provide the alert information to transportation system operators and the traveling public using ITS technologies such as dynamic message signs, highway advisory radios, in-vehicle displays, transit displays, 511 traveler information systems, and traveler information	Existing	<ul style="list-style-type: none"> • Emergency Operations Center • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Indianapolis TMC • INDOT Indianapolis TMC Roadside Equipment • IndyGo Kiosks • IndyGo Operations Center • ISP Dispatch • Personal Computing Devices • Private Traveler Services • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment • Surrounding County Highway Operations/Dispatch • Surrounding County

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		websites.		Highway Roadside Equipment <ul style="list-style-type: none"> Surrounding County Sheriff Communications Center TrafficWise Traveler Information System
PS11	Early Warning System	This service package monitors and detects potential, looming, and actual disasters including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and acts of terrorism including nuclear, chemical, biological, and radiological weapons attacks). The service package monitors alerting and advisory systems, ITS sensors and surveillance systems, field reports, and emergency call-taking systems to identify emergencies and notifies all responding agencies of detected emergencies.	Planned	<ul style="list-style-type: none"> Emergency Operations Center Indianapolis Airport Field Devices Indianapolis Airport Management Systems Indianapolis DPW Operations Center Indianapolis Fire Communications Center Indianapolis Police Dispatch INDOT Indianapolis TMC INDOT Security Monitoring Field Equipment IndyGo Operations Center Intelligence Fusion Center ISP Dispatch Major Employer Management Systems Suburban Municipality Street Department Operations/Dispatch Surface Transportation Weather Service Surrounding County Highway Operations/Dispatch Surrounding County Security Monitoring Field Equipment Surrounding County Sheriff

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
				Communications Center • Weather Services
PS12	Disaster Response and Recovery	This service package enhances the ability of the surface transportation system to respond to and recover from disasters. It addresses the most severe incidents that require an extraordinary response from outside the local community. All types of disasters are addressed including natural disasters (hurricanes, earthquakes, floods, winter storms, tsunamis, etc.) and technological and man-made disasters (hazardous materials incidents, nuclear power plant accidents, and national security emergencies such as nuclear, chemical, biological, and radiological weapons attacks). The service package supports coordination of emergency response plans, including general plans developed before a disaster as well as specific tactical plans with short time horizon that are developed as part of a disaster response. The service package provides enhanced access to the scene for response personnel and resources, provides better information about the transportation system in the vicinity of the disaster, and maintains situation awareness regarding the disaster itself. In addition, this service package tracks and coordinates the transportation resources - the transportation professionals, equipment, and materials - that constitute a portion of the disaster response. The service package identifies the key points of integration between	Planned	<ul style="list-style-type: none"> • Ambulance Dispatch • Avon CSX Rail Yard • Beech Grove Public Safety • Emergency Operations Center • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Indianapolis TMC • IndyGo Operations Center • Intelligence Fusion Center • ISP Dispatch • Lawrence Public Safety • Marion County Sheriff Dispatch • MESA System • Public Health Systems • Speedway Public Safety • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch • Surrounding County Highway Operations/Dispatch • Surrounding County Sheriff Communications Center

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>transportation systems and the public safety, emergency management, public health, and other allied organizations that form the overall disaster response. In this service package, the Emergency Management Center represents the federal, regional, state, and local Emergency Operations Centers and the Incident Commands that are established to respond to the disaster. The interface between the Emergency Management Center and the other centers provides situation awareness and resource coordination among transportation and other allied response agencies. In its role, traffic management implements special traffic control strategies and detours and restrictions to effectively manage traffic in and around the disaster. Maintenance and construction provides damage assessment of road network facilities and manages service restoration. Transit management provides a similar assessment of status for transit facilities and modifies transit operations to meet the special demands of the disaster. As immediate public safety concerns are addressed and disaster response transitions into recovery, this service package supports transition back to normal transportation system operation, recovering resources, managing on-going transportation facility repair, supporting data collection and revised plan coordination, and other recovery activities. This service package builds on the</p>		

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>basic traffic incident response service that is provided by TM08, the Traffic Incident Management service package. This service package addresses the additional complexities and coordination requirements that are associated with the most severe incidents that warrant an extraordinary response from outside the local jurisdictions and require special measures such as the activation of one or more emergency operations centers. Many users of ARC-IT will want to consider both TM08 and this service package since every region is concerned with both day-to-day management of traffic-related incidents and occasional management of disasters that require extraordinary response. Disaster Response and Recovery is also supported by PS14, the "Disaster Traveler Information" service package that keeps the public informed during a disaster response. See that service package for more information.</p>		
PS13	Evacuation and Reentry Management	<p>This service package supports evacuation of the general public from a disaster area and manages subsequent reentry to the disaster area. The service package addresses evacuations for all types of disasters, including disasters like hurricanes that are anticipated and occur slowly, allowing a well-planned orderly evacuation, as well as disasters like terrorist acts that occur rapidly, without warning, and allow little or no time for preparation or public warning. This service package</p>	Planned	<ul style="list-style-type: none"> • Avon CSX Rail Yard • Beech Grove Public Safety • CICS Website • Emergency Operations Center • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>supports coordination of evacuation plans among the federal, state, and local transportation, emergency, and law enforcement agencies that may be involved in a large-scale evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. Information is shared with traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes. Reversible lanes, shoulder use, closures, special signal control strategies, and other special strategies may be implemented to maximize capacity along the evacuation routes. Transit resources play an important role in an evacuation, removing many people from an evacuated area while making efficient use of limited capacity. Additional shared transit resources may be added and managed in evacuation scenarios. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. Evacuations are also supported by PS14, the "Disaster Traveler Information" service package, which keeps the public informed during evacuations. See that service package for more information.</p>		<ul style="list-style-type: none"> • INDOT Indianapolis TMC • IndyGo Operations Center • Intelligence Fusion Center • ISP Dispatch • Lawrence Public Safety • Marion County Sheriff Dispatch • MESA System • Private Traveler Services • Speedway Public Safety • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch • Surrounding County Highway Operations/Dispatch • Surrounding County Sheriff Communications Center • TrafficWise Traveler Information System

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PS14	Disaster Traveler Information (511)	This market package uses ITS to provide disaster-related traveler information to the general public, including evacuation and reentry information and other information concerning the operation of the transportation system during a disaster. This market package collects information from multiple sources including traffic, transit, public safety, emergency management, shelter provider, and travel service provider organizations. The collected information is processed and the public is provided with real-time disaster and evacuation information using ITS traveler information systems. A disaster will stress the surface transportation system since it may damage transportation facilities at the same time that it places unique demands on these facilities to support public evacuation and provide access for emergency responders. Similarly, a disaster may interrupt or degrade the operation of many traveler information systems at the same time that safety-critical information must be provided to the traveling public. This market package keeps the public informed in these scenarios, using all available means to provide information about the disaster area including damage to the transportation system, detours and closures in effect, special traffic restrictions and allowances, special transit schedules, and real-time information on traffic conditions and transit system performance in and around the	Planned	<ul style="list-style-type: none"> • Beech Grove Public Safety • CICS Website • Emergency Operations Center • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Indianapolis TMC • IndyGo Kiosks • IndyGo Operations Center • Intelligence Fusion Center • ISP Dispatch • Lawrence Public Safety • Marion County Sheriff Dispatch • Media • MESA System • Personal Computing Devices • Speedway Public Safety • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch • Surrounding County Highway Operations/Dispatch • Surrounding County Sheriff Communications Center • TrafficWise Traveler Information System

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		disaster. This market package also provides emergency information to assist the public with evacuations when necessary. Information on mandatory and voluntary evacuation zones, evacuation times, and instructions are provided. Available evacuation routes and destinations and current and anticipated travel conditions along those routes are provided so evacuees are prepared and know their destination and preferred evacuation route. Information on available transit services and traveler services (shelters, medical services, hotels, restaurants, gas stations, etc.) is also provided. In addition to general evacuation information, this market package provides specific evacuation trip planning information that is tailored for the evacuee based on origin, selected destination, and evacuee-specified evacuation requirements and route parameters. This market package augments the ATIS market packages that provide traveler information on a day-to-day basis for the surface transportation system. This market package provides focus on the special requirements for traveler information dissemination in disaster situations.		
PT01	Transit Vehicle Tracking	This service package monitors current transit vehicle location using an Automated Vehicle Location System. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time.	Planned	<ul style="list-style-type: none"> IndyGo Operations Center IndyGo Transit Vehicles
PT02	Transit Fixed-	This service package performs	Existing	<ul style="list-style-type: none"> IndyGo Operations

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	Route Operations	automated dispatch and system monitoring for fixed-route and flexible-route transit services. This service performs scheduling activities including the creation of schedules, blocks and runs, as well as operator assignment. This service monitors the transit vehicle trip performance against the schedule and provides information displays at the Transit Management Center.		<ul style="list-style-type: none"> Center IndyGo Transit Vehicles School Buses
PT03	Dynamic Transit Operations	The Dynamic Transit Operations service package allows travelers to request trips and obtain itineraries using a personal device such as a smart phone, tablet, or personal computer. The trips and itineraries cover multiple transportation services (public transportation modes, private transportation services, shared-ride, walking and biking). This service package builds on existing technology systems such as computer-aided dispatch/ automated vehicle location (CAD/AVL) systems and automated scheduling software, providing a coordination function within and between transit providers that would dynamically schedule and dispatch or modify the route of an in-service vehicle by matching compatible trips together. TI06 covers other shared use transportation options.	Existing	<ul style="list-style-type: none"> IndyGo Operations Center IndyGo Transit Vehicles Taxi Services
PT04	Transit Fare Collection Management	This service package manages transit fare collection on-board transit vehicles and at transit stops using electronic means. It allows transit users to use a traveler card or other electronic payment device such as a smart phone. Readers located either in the	Existing	<ul style="list-style-type: none"> IndyGo Kiosks IndyGo Operations Center IndyGo Transit Vehicles IndyGo Traveler Card

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>infrastructure or on-board the transit vehicles enable electronic fare payment. Data is processed, stored, and displayed on the transit vehicle and communicated as needed to the Transit Management Center. This service supports ad-hoc payments to the transport provider (typically through the 'payment' and 'fare' flows), payments using a transport provider's account system using account-based tokens or integrated multi-provider account systems (typically through the 'account', 'secureID' and 'authorization' flows).</p>		
PT05	Transit Security	<p>This service package provides for the physical security of transit passengers and transit vehicle operators. On-board equipment performs surveillance and sensor monitoring in order to identify potentially hazardous situations. The surveillance equipment includes video (e.g., CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g., chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g., metal detectors). Transit user or transit vehicle operator activated alarms are provided on-board. Public areas (e.g., transit stops, park and ride lots, stations) are also monitored with similar surveillance and sensor equipment and provided with transit user activated alarms. In addition this service package provides surveillance and sensor monitoring of non-</p>	Existing	<ul style="list-style-type: none"> • IndyGo Operations Center • IndyGo Security Monitoring Field Equipment • IndyGo Transit Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>public areas of transit facilities (e.g., transit yards) and transit infrastructure such as bridges, tunnels, and transit railways or bus rapid transit (BRT) guideways. The surveillance equipment includes video and/or audio systems. The sensor equipment includes threat sensors and object detection sensors as described above as well as, intrusion or motion detection sensors and infrastructure integrity monitoring (e.g., rail track continuity checking or bridge structural integrity monitoring). Most of the surveillance and sensor data that is collected by this service package may be monitored by either the Emergency Management Center or the Transit Management Center, providing two possible approaches to implementing this service package. This service package also supports remote transit vehicle disabling and transit vehicle operator authentication by the Transit Management Center.</p>		
PT06	Transit Fleet Management	<p>This service package supports automatic transit maintenance scheduling and monitoring. On-board condition sensors monitor system status and transmit critical status information to the Transit Management Center. The Transit Management Center processes this data and schedules preventative and corrective maintenance. The service package also supports the day to day management of the transit fleet inventory, including the assignment of specific transit vehicles to blocks and the assignment of transit vehicle operators to</p>	Existing	<ul style="list-style-type: none"> • IndyGo Operations Center • IndyGo Transit Vehicles • School Buses • Taxi Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		runs.		
PT08	Transit Traveler Information	This service package provides transit users at transit stops and on-board transit vehicles with ready access to transit information. The information services include transit stop announcement, imminent arrival signs, and real-time transit schedule displays that are of general interest to transit users. Systems that provide custom transit trip itineraries and other tailored transit information services are also represented by this service package.	Planned	<ul style="list-style-type: none"> • Downtown Indy Website • IndyGo Kiosks • IndyGo Operations Center • IndyGo Transit Vehicles • Personal Computing Devices
PT09	Transit Signal Priority (Indianapolis Transit Signal Priority)	The Transit Signal Priority service package uses transit vehicle to infrastructure communications to allow a transit vehicle to request priority at one or a series of intersections. The service package provides feedback to the transit driver indicating whether the signal priority has been granted or not. This service package can contribute to improved operating performance of the transit vehicles by reducing the time spent stopped at a red light.	Existing	<ul style="list-style-type: none"> • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • IndyGo Operations Center • IndyGo Transit Vehicles
PT09	Transit Signal Priority (IndyGo Bus Rapid Transit System)	The Transit Signal Priority service package uses transit vehicle to infrastructure communications to allow a transit vehicle to request priority at one or a series of intersections. The service package provides feedback to the transit driver indicating whether the signal priority has been granted or not. This service package can contribute to improved operating performance of the transit vehicles by reducing the time spent stopped at a red light.	Planned	<ul style="list-style-type: none"> • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • IndyGo Operations Center • IndyGo Transit Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
PT14	Multi-modal Coordination	This service package establishes two way communications between multiple transit and traffic agencies to improve service coordination. Multimodal coordination between transit agencies can increase traveler convenience at transit transfer points and clusters (a collection of stops, stations, or terminals where transfers can be made conveniently) and also improve operating efficiency.	Existing	<ul style="list-style-type: none"> Indianapolis Airport Management Systems Indianapolis Airport Parking System Indianapolis DPW Operations Center IndyGo Operations Center IndyGo Transit Vehicles Taxi Services
ST01	Emissions Monitoring	This service package monitors individual vehicle emissions and provides general air quality monitoring using distributed sensors to collect the data. The collected information is transmitted to the Emissions Management Center for processing. Both area wide air quality monitoring and point emissions monitoring are supported by this service package. For area wide monitoring, this service package measures air quality, identifies sectors that are non-compliant with air quality standards, and collects, stores and reports supporting statistical data. For point emissions monitoring, this service package collects data from on-board diagnostic systems and measures tail pipe emissions to identify vehicles that exceed emissions standards and/or clean vehicles that could be released from standard emissions tests, depending on policy and regulations. Summary emissions information or warnings can also be displayed to drivers. The gathered information can	Existing	<ul style="list-style-type: none"> Indianapolis DPW Operations Center RWIS Sensors

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		be used to implement environmentally sensitive travel demand management (TDM) programs, policies, and regulations.		
ST05	Electric Charging Stations Management (City of Carmel Electric Vehicle Charging)	The Electric Charging Station Management service package provides an exchange of information between the electric vehicle and charging station to manage the charging operation. The agency or company operating the charging station can use vehicle information such as the capability of the vehicle (e.g. operational status of the electrical system, how many amps can the vehicle handle, and % charge complete) to determine that the charge is being properly applied and determine an estimated time to complete charging.	Planned	<ul style="list-style-type: none"> • Carmel Engineering Department Operations • Carmel Vehicle Charging Stations • Vehicles
ST05	Electric Charging Stations Management (Electric Vehicle Charging Stations)	--Instance of ST05-- The Electric Charging Station Management service package provides an exchange of information between the electric vehicle and charging station to manage the charging operation. The agency or company operating the charging station can use vehicle information such as the capability of the vehicle (e.g. operational status of the electrical system, how many amps can the vehicle handle, and % charge complete) to determine that the charge is being properly applied and determine an estimated time to complete charging.	Planned	<ul style="list-style-type: none"> • Electric Charging Management Center • Electric Utility • Electric Vehicle Charging Stations • Payment Administration Center • Payment Device • Private Traveler Services • TrafficWise Traveler Information System • Vehicles
SU01	Connected Vehicle System Monitoring and Management (Suburban Municipality Intersection)	This service package provides monitoring, management and control services necessary to other applications and/or devices operating within the Connected Vehicle Environment. This service	Future	<ul style="list-style-type: none"> • CAV Authorizing Center • CAV-ITS Map Update System • SCMS • Suburban Municipality Street

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	CAV)	package maintains and monitors the performance and configuration of the connected vehicle system. This includes tracking and management of the infrastructure configuration as well as detection, isolation, and correction of infrastructure service problems. It also includes monitoring of performance of the infrastructure and mobile equipment, which includes RSEs, OBEs, the back office applications, as well as the communication links that connect the system.		<ul style="list-style-type: none"> Department CAV Roadside Equipment Suburban Municipality Street Department Operations/Dispatch
SU04	Map Management (Suburban Municipality Intersection CAV)	This service package defines interfaces that can be used download or update all types of map data used to support intelligent transportation systems. This map data will be accessed by centers, field, and vehicle physical objects. The service package can also be used to harness the Connected Vehicle Environment to provide rich source data that can be used to verify, refine, and enhance geographic map data.	Future	<ul style="list-style-type: none"> CAV Authorizing Center CAV-ITS Map Update System Suburban Municipality Street Department Operations/Dispatch
SU08	Security and Credentials Management (Suburban Municipality CAV)	This service package is used to ensure trusted communications between mobile devices and other mobile devices or roadside devices and protect data they handle from unauthorized access. The service package grants trust credentials to qualified mobile devices and infrastructure devices in the Connected Vehicle Environment so that those devices may be considered trusted by other devices that receive trust credentials from the SCM service package. The service package allows credentials to be requested	Future	<ul style="list-style-type: none"> CAV-ITS Map Update System SCMS Suburban Municipality Street Department CAV Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		and revoked and secures the exchange of trust credentials between parties, so that no other party can intercept and use those credentials illegitimately. The service package provides security to the transmissions between connected devices, ensuring authenticity and integrity of the transmissions. Additional security features include privacy protection, authorization and privilege class definition, as well as non-repudiation of origin.		
TI01	Broadcast Traveler Information (Existing)	This market package collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadly disseminates this information through existing infrastructures and low cost user equipment (e.g., FM subcarrier, cellular data broadcast). The information may be provided directly to travelers or provided to merchants and other traveler service providers so that they can better inform their customers of travel conditions. Different from the market package ATMS6 - Traffic Information Dissemination, which provides localized HAR and DMS information capabilities, ATIS1 provides a wide area digital broadcast service. Successful deployment of this market package relies on availability of real-time traveler information from roadway instrumentation, probe vehicles or other sources.	Existing	<ul style="list-style-type: none"> • Downtown Indy Website • Event Promoters • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • IndyGo Operations Center • Media • Personal Computing Devices • Surface Transportation Weather Service • TrafficWise Traveler Information System • Weather Services
TI01	Broadcast	This service package provides	Existing	<ul style="list-style-type: none"> • INDOT Indianapolis

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	Traveler Information (TMC to TrafficWise)	a digital broadcast service that disseminates traveler information to all equipped travelers within range. It collects traffic conditions, advisories, general public transportation, toll and parking information, incident information, roadway maintenance and construction information, air quality and weather information, and broadcasts the information to travelers using technologies such as FM subcarrier, satellite radio, cellular data broadcasts, and Internet streaming technologies. This service package provides public information that is available to all equipped vehicles in the vicinity of the roadside equipment.		<p>TMC</p> <ul style="list-style-type: none"> • TrafficWise Traveler Information System
TI02	Personalized Traveler Information (City of Carmel Smart Parking)	This service package provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that "push" a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information. Although the Internet is the predominate network used for traveler information dissemination, a range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications with the traveler. A variety of interactive devices may be used by the	Planned	<ul style="list-style-type: none"> • Carmel Engineering Department Operations • Carmel Parking Management System • Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>traveler to access information prior to a trip or en route including phone via a 511-like portal and web pages via smart phone, tablet, personal computer, and a variety of in-vehicle devices.</p>		
TI02	Personalized Traveler Information (Existing)	<p>This market package provides tailored information in response to a traveler request. Both real-time interactive request/response systems and information systems that 'push' a tailored stream of information to the traveler based on a submitted profile are supported. The traveler can obtain current information regarding traffic conditions, roadway maintenance and construction, transit services, ride share/ride match, parking management, detours and pricing information. A range of two-way wide-area wireless and fixed-point to fixed-point communications systems may be used to support the required data communications between the traveler and Information Service Provider. A variety of interactive devices may be used by the traveler to access information prior to a trip or en route including phone via a 511-like portal, kiosk, Personal Digital Assistant, personal computer, and a variety of in-vehicle devices. This market package also allows value-added resellers to collect transportation information that can be aggregated and be available to their personal devices or remote traveler systems to better inform their customers of transportation conditions. Successful deployment of this market package relies on availability</p>	Existing	<ul style="list-style-type: none"> • Convention Center Kiosks • Event Promoters • Indianapolis Airport Parking System • IndyGo Kiosks • Personal Computing Devices • Private Traveler Services

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		of real-time transportation data from roadway instrumentation, transit, probe vehicles or other means. A traveler may also input personal preferences and identification information via a 'traveler card' that can convey information to the system about the traveler as well as receive updates from the system so the card can be updated over time.		
TI03	En-Route Guidance (MAT En-Route Guidance)	This service package offers route planning and turn-by-turn guidance that is responsive to current conditions. The route may be determined by the center or the user equipment and turn-by-turn guidance is provided as the vehicle travels along the route. Real-time guidance updates may be provided during the trip as conditions change. Optionally, the center may monitor trip status and collect additional feedback from users about the route during the trip and after trip completion.	Future	<ul style="list-style-type: none"> • IndyGo Operations Center • Personal Computing Devices • Private Traveler Services • Suburban Municipality Street Department Operations/Dispatch • Vehicles
TI04	Trip Planning and Payment (MAT Planning)	This service package offers the user trip planning and pre-trip guidance services. It generates a trip plan, including a multimodal route and associated service information (e.g., parking information), based on traveler preferences and constraints. Routes may be based on static information or reflect real time network conditions. Unlike TI03, where the user equipment determines the route, the route determination functions are performed by the center in this service package. The trip plan may be confirmed by the traveler and advanced payment and reservations for transit and alternate mode (e.g., airline, rail, and ferry) trip	Planned	<ul style="list-style-type: none"> • Electric Charging Management Center • IndyGo Kiosks • IndyGo Operations Center • Micro-Mobility Services • Personal Computing Devices • Private Parking Management System • Private Traveler Services • Suburban Municipality Street Department Operations/Dispatch • Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		segments, and ancillary services are accepted and processed. The confirmed trip plan may include specific routing information that can be supplied to the traveler as general directions or as turn-by-turn route guidance depending on the level of user equipment.		
TI05	Integrated Multi-Modal Electronic Payment (MAT Payment Integration)	The Integrated Multi-Modal Electronic Payment (IMMEP) service package provides electronic payment capability for transit fares, tolls, road use, parking, and other areas requiring electronic payments. IMMEP enables the provision of payment for transportation services using a single account for multiple public transportation providers. The transportation user establishes an account with a financial service provider (modeled as the Payment Administration Center (PAC)), and the PAC communicates with various public transportation providers to coordinate charges. IMMEP also supports the management of transportation user access rights (i.e., this user can use the subway but not the bus). Payment transactions are centralized; the user provides only a secure, registered token (the 'secureID') to the transportation provider's access control equipment. The transportation provider uses that token and context to initiate transactions with the PAC.	Planned	<ul style="list-style-type: none"> • IndyGo Kiosks • IndyGo Operations Center • IndyGo Transit Vehicles • IndyGo Traveler Card • Micro-Mobility Services • Payment Administration Center • Personal Computing Devices • Private Parking Area Equipment • Private Parking Management System • Private Traveler Services • Vehicles
TI06	Shared Use Mobility and Dynamic Ridesharing (Micro-Mobility Services)	This service package addresses dynamic ridesharing/ride matching services to travelers and other forms of shared use transportation. Dynamic ridesharing allows travelers to	Existing	<ul style="list-style-type: none"> • Micro-Mobility Services • Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>arrange carpool trips through a personal device with a wireless connection to a ride matching system (e.g., a web-based application). It uses inputs from both passengers and drivers pre-trip, during the trip, and post-trip . These inputs are then translated into “optimal” pairings between passengers and drivers to provide both with a convenient route between their two origin and destination locations. After the trip, information is provided back to the service package to improve the user’s experience for future trips. The shared use aspect of the service package addresses three types of shared use that may be arranged using an internet connected personal device. In the first type, a traveler arranges for the temporary use of a vehicle. In the second type of shared use, a traveler arranges for a vehicle to pick them up at a specific location and take them to another location. The second type of shared use may be implemented as a ride matching or ridesharing service, including those provided by Uber and Lyft. The third type of shared use is a bikeshare capability.</p>		
TI06	Shared Use Mobility and Dynamic Ridesharing (Ride Hailing Services)	<p>This service package addresses dynamic ridesharing/ride matching services to travelers and other forms of shared use transportation. Dynamic ridesharing allows travelers to arrange carpool trips through a personal device with a wireless connection to a ride matching system (e.g., a web-based application). It uses inputs from both passengers</p>	Existing	<ul style="list-style-type: none"> Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>and drivers pre-trip, during the trip, and post-trip . These inputs are then translated into “optimal” pairings between passengers and drivers to provide both with a convenient route between their two origin and destination locations. After the trip, information is provided back to the service package to improve the user’s experience for future trips. The shared use aspect of the service package addresses three types of shared use that may be arranged using an internet connected personal device. In the first type, a traveler arranges for the temporary use of a vehicle. In the second type of shared use, a traveler arranges for a vehicle to pick them up at a specific location and take them to another location. The second type of shared use may be implemented as a ride matching or ridesharing service, including those provided by Uber and Lyft. The third type of shared use is a bikeshare capability.</p>		
TI06	Shared Use Mobility and Dynamic Ridesharing (Ridesharing Services)	<p>This service package addresses dynamic ridesharing/ride matching services to travelers and other forms of shared use transportation. Dynamic ridesharing allows travelers to arrange carpool trips through a personal device with a wireless connection to a ride matching system (e.g., a web-based application). It uses inputs from both passengers and drivers pre-trip, during the trip, and post-trip . These inputs are then translated into “optimal” pairings between passengers and drivers to provide both with a convenient</p>	Existing	<ul style="list-style-type: none"> • CICS Website • IndyGo Kiosks • IndyGo Operations Center • Personal Computing Devices

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>route between their two origin and destination locations. After the trip, information is provided back to the service package to improve the user’s experience for future trips. The shared use aspect of the service package addresses three types of shared use that may be arranged using an internet connected personal device. In the first type, a traveler arranges for the temporary use of a vehicle. In the second type of shared use, a traveler arranges for a vehicle to pick them up at a specific location and take them to another location. The second type of shared use may be implemented as a ride matching or ridesharing service, including those provided by Uber and Lyft. The third type of shared use is a bikeshare capability.</p>		
TI07	In-Vehicle Signage	<p>This service package augments regulatory, warning, and informational signs and signals by providing information directly to drivers through in-vehicle devices. The information provided would include static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states including highway intersection and highway-rail intersection status and local conditions warnings identified by local environmental sensors). This service package also includes the capability for maintenance and construction, emergency, and transit vehicles to transmit sign information to vehicles in the vicinity so that in vehicle signing can be used without</p>	Future	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Indianapolis TMC Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		fixed infrastructure in areas such as work zones, around incidents, and at bus stops.		
TM01	Infrastructure-Based Traffic Surveillance	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.	Existing	<ul style="list-style-type: none"> • Beech Grove Public Works Operations • Beech Grove Roadside Equipment • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • INDOT Arterial Cameras and Controllers • INDOT Arterial TMS • INDOT Arterial Traffic Signals and Detection • INDOT Indianapolis TMC • INDOT Indianapolis TMC Roadside Equipment • Lawrence Public Works/Street Department • Lawrence Roadside Equipment • Speedway Public Works • Speedway Roadside Equipment • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment
TM01	Infrastructure-Based Traffic	This service package includes traffic detectors, other	Planned	<ul style="list-style-type: none"> • Carmel CityOS

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	Surveillance (City of Carmel ITS Traffic Cameras)	surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.		<ul style="list-style-type: none"> • Carmel ITS Cameras
TM01	Infrastructure-Based Traffic Surveillance (City of Greenwood Traffic Flow and Queue Mitigation)	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for	Existing	<ul style="list-style-type: none"> • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.		
TM01	Infrastructure-Based Traffic Surveillance (INDOT Marion County Signal and CCTV)	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.	Existing	<ul style="list-style-type: none"> • INDOT Arterial TMS • INDOT Arterial Traffic Signals and Detection
TM01	Infrastructure-Based Traffic Surveillance (Roundabout Traffic Surveillance and Analytics)	This service package includes traffic detectors, other surveillance equipment, the supporting field equipment, and Center to Field communications to transmit the collected data back to the Traffic Management Center. The derived data can be used locally such as when traffic detectors are connected directly to a signal control system or remotely (e.g., when a CCTV system sends data	Planned	<ul style="list-style-type: none"> • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>back to the Traffic Management Center). The data generated by this service package enables traffic managers to monitor traffic and road conditions, identify and verify incidents, detect faults in indicator operations, and collect census data for traffic strategy development and long range planning. The collected data can also be analyzed and made available to users and the Traveler Information Center physical object.</p>		
TM02	<p>Vehicle-Based Traffic Surveillance (Suburban Municipality Intersection CAV)</p>	<p>This service package uses probe data information obtained from vehicles in the network to support traffic operations, including incident detection and the implementation of localized operational strategies. Since traffic data is collected from vehicles, travel times and other related traffic performance measures are available. This service package includes the capability to collect data from Connected Vehicles so that "probe" data can be collected from all equipped vehicles, providing access to a large vehicle population as penetration increases. Incident detection enables transportation agencies to determine the location of potential incidents so the agencies can respond more quickly to the incident and mitigate any negative impacts to the transportation network. Vehicle data that can be used to detect potential incidents include changes in vehicle speeds indicating the disruption of traffic flow, when a vehicle's safety systems</p>	Future	<ul style="list-style-type: none"> • Suburban Municipality Street Department CAV Roadside Equipment • Suburban Municipality Street Department Operations/Dispatch • Vehicles

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		have been activated or deployed, or sudden vehicle turns or deceleration at a specific location (indicating a potential obstacle in the roadway).		
TM03	Traffic Signal Control	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.	Existing	<ul style="list-style-type: none"> • Beech Grove Public Works Operations • Beech Grove Roadside Equipment • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • INDOT Arterial TMS • INDOT Arterial Traffic Signals and Detection • Lawrence Public Works/Street Department • Lawrence Roadside Equipment • Speedway Public Works • Speedway Roadside Equipment • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment
TM03	Traffic Signal Control (City of Carmel Fiber Installation)	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging	Existing	<ul style="list-style-type: none"> • Carmel Engineering Department Operations • Carmel Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.</p>		
TM03	<p>Traffic Signal Control (City of Greenwood Signal and Detection Implementation), Traffic Signal Control (City of Greenwood Traffic Flow and Queue Mitigation)</p>	<p>This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of</p>	Existing	<ul style="list-style-type: none"> • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.		
TM03	Traffic Signal Control (INDOT Marion County Signal and CCTV)	This service package provides the central control and monitoring equipment, communication links, and the signal control equipment that support traffic control at signalized intersections. A range of traffic signal control systems are represented by this service package ranging from fixed-schedule control systems to fully traffic responsive systems that dynamically adjust control plans and strategies based on current traffic conditions and priority requests. This service package is generally an intra-jurisdictional package. Systems that achieve coordination across jurisdictions by using a common time base or other strategies that do not require real time coordination would also be represented by this package. Coordination of traffic signal systems using real-time communications is covered in the TM07-Regional Traffic Management service package. This service package is consistent with typical traffic signal control systems.	Existing	<ul style="list-style-type: none"> • INDOT Arterial TMS • INDOT Arterial Traffic Signals and Detection
TM05	Traffic Metering	This service package provides central monitoring and control, communications, and field equipment that support metering of traffic. It supports the complete range of metering strategies including ramp, interchange, and mainline metering. This package incorporates the	Existing	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Indianapolis TMC Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		instrumentation included in the TM01 service package (traffic sensors are used to measure traffic flow and queues) to support traffic monitoring so responsive and adaptive metering strategies can be implemented. Also included is configurable field equipment to provide information to drivers approaching a meter, such as advance warning of the meter, its operational status (whether it is currently on or not, how many cars per green are allowed, etc.), lane usage at the meter (including a bypass lane for HOVs) and existing queue at the meter.		
TM05	Traffic Metering (INDOT I-465 Ramp Metering)	This service package provides central monitoring and control, communications, and field equipment that support metering of traffic. It supports the complete range of metering strategies including ramp, interchange, and mainline metering. This package incorporates the instrumentation included in the TM01 service package (traffic sensors are used to measure traffic flow and queues) to support traffic monitoring so responsive and adaptive metering strategies can be implemented. Also included is configurable field equipment to provide information to drivers approaching a meter, such as advance warning of the meter, its operational status (whether it is currently on or not, how many cars per green are allowed, etc.), lane usage at the meter (including a bypass lane for HOVs) and existing queue at the meter.	Planned	<ul style="list-style-type: none"> • INDOT Arterial TMS • INDOT Indianapolis TMC • INDOT Ramp Metering System
TM06	Traffic Information Dissemination	This service package provides driver information using roadway equipment such as	Existing	<ul style="list-style-type: none"> • Indianapolis DPW Operations Center • INDOT Indianapolis

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, travel restrictions, incident information, and emergency alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Transportation Information Centers. A link to the Maintenance and Construction Management Center allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated.</p>		<p>TMC</p> <ul style="list-style-type: none"> • INDOT Indianapolis TMC Roadside Equipment • IndyGo Operations Center • Media • TrafficWise Traveler Information System
TM06	Traffic Information Dissemination (City of Carmel Fiber Installation)	<p>This service package provides driver information using roadway equipment such as dynamic message signs or highway advisory radio. A wide range of information can be disseminated including traffic and road conditions, closure and detour information, travel restrictions, incident information, and emergency</p>	Existing	<ul style="list-style-type: none"> • Carmel Engineering Department Operations • Carmel Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>alerts and driver advisories. This package provides information to drivers at specific equipped locations on the road network. Careful placement of the roadway equipment provides the information at points in the network where the drivers have recourse and can tailor their routes to account for the new information. This package also covers the equipment and interfaces that provide traffic information from a traffic management center to the media (for instance via a direct tie-in between a traffic management center and radio or television station computer systems), Transit Management, Emergency Management, and Transportation Information Centers. A link to the Maintenance and Construction Management Center allows real time information on road/bridge closures and restrictions due to maintenance and construction activities to be disseminated.</p>		
TM07	Regional Traffic Control (INDOT-Indianapolis DPW)	<p>This market package provides for the sharing of traffic information and control among traffic management centers to support a regional control strategy. This market package advances the Surface Street Control and Freeway Control Market Packages by adding the communications links and integrated control strategies that enable integrated interjurisdictional traffic control. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on</p>	Existing	<ul style="list-style-type: none"> Indianapolis DPW Operations Center INDOT Arterial TMS

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>roadside instrumentation supported by the Surface Street Control and Freeway Control Market Packages and adds hardware, software, and fixed-point to fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of control between traffic management centers.</p>		
TM07	Regional Traffic Management	<p>This service package provides for the sharing of information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the TM03-Traffic Signal Control and TM05-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point communications capabilities to</p>	Existing	<ul style="list-style-type: none"> • Beech Grove Public Works Operations • Indianapolis DPW Operations Center • INDOT Arterial TMS • INDOT Indianapolis TMC • Lawrence Public Works/Street Department • Speedway Public Works • Suburban Municipality Street Department Operations/Dispatch • Surrounding County Highway Operations/Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of device control between traffic management centers.		
TM07	Regional Traffic Management (City of Greenwood Traffic Flow and Queue Mitigation)	This service package provides for the sharing of information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the TM03-Traffic Signal Control and TM05-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of	Existing	<ul style="list-style-type: none"> • Other Suburban Municipality Street Department Dispatch • Suburban Municipality Street Department Operations/Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		device control between traffic management centers.		
TM07	Regional Traffic Management (INDOT Gary TMC)	This service package provides for the sharing of information and control among traffic management centers to support regional traffic management strategies. Regional traffic management strategies that are supported include inter-jurisdictional, real-time coordinated traffic signal control systems and coordination between freeway operations and traffic signal control within a corridor. This service package advances the TM03-Traffic Signal Control and TM05-Traffic Metering service packages by adding the communications links and integrated control strategies that enable integrated, interjurisdictional traffic management. The nature of optimization and extent of information and control sharing is determined through working arrangements between jurisdictions. This package relies principally on roadside instrumentation supported by the Traffic Signal Control and Traffic Metering service packages and adds hardware, software, and fixed-point communications capabilities to implement traffic management strategies that are coordinated between allied traffic management centers. Several levels of coordination are supported from sharing of information through sharing of device control between traffic management centers.	Existing	<ul style="list-style-type: none"> • INDOT Gary TMC • INDOT Indianapolis TMC
TM08	Traffic Incident Management System	This service package manages both unexpected incidents and planned events so that the impact to the transportation network and	Existing	<ul style="list-style-type: none"> • Ambulance Dispatch • Avon CSX Rail Yard • Beech Grove Public Safety • Beech Grove Public

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>traveler safety is minimized. The service package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this service package to detect and verify incidents and implement an appropriate response. This service package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between centers. Incident response also includes presentation of information to affected travelers using the Traffic Information Dissemination service package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information service packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with</p>		<ul style="list-style-type: none"> Works Operations • Downtown Indy Website • Emergency Operations Center • Event Promoters • IMS Command Center • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Indianapolis TMC • INDOT Indianapolis TMC Roadside Equipment • INDOT MCO Field Devices • INDOT MCO Management • IndyGo Operations Center • ISP Dispatch • Lawrence Public Safety • Lawrence Public Works/Street Department • Major Employer Management Systems • Marion County Sheriff Dispatch • Media • MESA System • Private Towing Companies • RWIS Sensors • School Buses • School Police Departments • Speedway Public

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>emergency personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel. This service package is closely related with the Public Safety service packages, which focus on services that support first responders. In particular, local management of the incident using an incident command system is covered by PS02.</p>		<ul style="list-style-type: none"> • Safety • Speedway Public Works • Suburban Municipality Emergency Dispatch • Suburban Municipality Street Department Operations/Dispatch • Utility Emergency Repair/Response
TM08	Traffic Incident Management System (Surrounding County/IFC)	<p>This market package manages both unexpected incidents and planned events so that the impact to the transportation network and traveler safety is minimized. The market package includes incident detection capabilities through roadside surveillance devices (e.g. CCTV) and through regional coordination with other traffic management, maintenance and construction management and emergency management centers as well as rail operations and event promoters. Information from these diverse sources is collected and correlated by this market package to detect and verify incidents and implement an appropriate response. This market package supports traffic operations personnel in developing an appropriate response in coordination with emergency management, maintenance and construction management, and other incident response personnel to confirmed incidents. The response may include traffic control strategy modifications or resource coordination between center subsystems. Incident response also includes presentation of</p>	Planned	<ul style="list-style-type: none"> • Intelligence Fusion Center • Surrounding County Highway Operations/Dispatch • Surrounding County Sheriff Communications Center

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>information to affected travelers using the Traffic Information Dissemination market package and dissemination of incident information to travelers through the Broadcast Traveler Information or Interactive Traveler Information market packages. The roadside equipment used to detect and verify incidents also allows the operator to monitor incident status as the response unfolds. The coordination with emergency management might be through a CAD system or through other communication with emergency field personnel. The coordination can also extend to tow trucks and other allied response agencies and field service personnel.</p>		
TM09	Integrated Decision Support and Demand Management	<p>This service package recommends courses of action to transportation operators in a corridor, downtown area, or other heavily traveled area. Recommendations are based on an assessment of current and forecast transportation network performance and environmental conditions. Multi-modal transportation operational strategies are created that consider all modes and all roads in the travel area to correct network imbalances and effectively manage available capacity. As part of the operational strategies, this service package may also recommend lane restrictions, transit, parking, and toll strategies to influence traveler route and mode choices to support active demand management programs and policies managing both traffic and the</p>	Planned	<ul style="list-style-type: none"> • Event Promoters • IMS Command Center • Indianapolis DPW Operations Center • Indianapolis Fire Communications Center • Indianapolis Police Dispatch • INDOT Arterial TMS • IndyGo Operations Center • Marion County Sheriff Dispatch • Private Parking Management System • Suburban Municipality Emergency Dispatch • Surrounding County Sheriff Communications Center • TrafficWise Traveler Information System

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>environment. Operational strategies, including demand management recommendations, are coordinated to support operational decisions by each transportation operator that are consistent with the recommended strategy. All recommended operational strategies are based on historical evaluation, real-time assessment, and forecast of the roadway network performance based on predicted travel demand patterns. This service package also collects air quality, parking availability, transit usage, and vehicle occupancy data to support operational strategies that manage and balance capacity and demand.</p>		
TM13	Standard Railroad Grade Crossing	<p>This service package manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate more advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Both passive (e.g., the crossbuck sign) and active warning systems (e.g., flashing lights and gates) are supported. (Note that passive systems exercise only the single interface between the ITS Roadway Equipment and the Driver in the physical view.) These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized</p>	Existing	<ul style="list-style-type: none"> • Beech Grove Public Works Operations • Beech Grove Roadside Equipment • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment • INDOT Arterial TMS • INDOT Arterial Traffic Signals and Detection • Lawrence Public Works/Street Department • Lawrence Roadside Equipment • Speedway Public Works • Speedway Roadside Equipment • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported to both highway and railroad officials through wayside interfaces and interfaces to the Traffic Management Center.		Equipment <ul style="list-style-type: none"> • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment
TM16	Reversible Lane Management	This service package provides for the management of reversible lane facilities. In addition to standard surveillance capabilities, this service package includes sensory functions that detect wrong-way vehicles and other special surveillance capabilities that mitigate safety hazards associated with reversible lanes. The package includes the field equipment, physical lane access controls, and associated control electronics that manage and control these special lanes. This service package also includes the equipment used to electronically reconfigure intersections and manage right-of-way to address dynamic demand changes and special events.	Existing	<ul style="list-style-type: none"> • Indianapolis DPW Operations Center • Indianapolis DPW Roadside Equipment
TM17	Speed Warning and Enforcement	This service package monitors vehicle speeds and supports warning drivers when their speed is excessive. Also the service includes notifications to an enforcement agency to enforce the speed limit of the roadway. Speed monitoring can be made via spot speed or average speed measurements. Roadside equipment can display the speed of passing vehicles and/or suggest a safe driving speed. Environmental	Planned	<ul style="list-style-type: none"> • ISP Dispatch • Surrounding County Highway Operations/Dispatch • Surrounding County Highway Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>conditions and vehicle characteristics may be monitored and factored into the safe speed advisories that are provided to the motorist. For example, warnings can be generated recognizing the limitations of a given vehicle for the geometry of the roadway such as rollover risk for tall vehicles. This service focuses on monitoring of vehicle speeds and enforcement of the speed limit while the variable speed limits service (covered in TM20-Variable Speed Limits service package) focuses on varying the posted speed limits to create more uniform speeds along a roadway, to promote safer driving during adverse conditions (such as fog) and/or to reduce air pollution.</p>		
TM17	Speed Warning and Enforcement (INDOT Variable Speed Limit Enforcement)	<p>This service package monitors vehicle speeds and supports warning drivers when their speed is excessive. Also the service includes notifications to an enforcement agency to enforce the speed limit of the roadway. Speed monitoring can be made via spot speed or average speed measurements. Roadside equipment can display the speed of passing vehicles and/or suggest a safe driving speed. Environmental conditions and vehicle characteristics may be monitored and factored into the safe speed advisories that are provided to the motorist. For example, warnings can be generated recognizing the limitations of a given vehicle for the geometry of the roadway such as rollover risk for tall vehicles. This service focuses on monitoring of</p>	Planned	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Variable Speed Limits Field Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>vehicle speeds and enforcement of the speed limit while the variable speed limits service (covered in TM20-Variable Speed Limits service package) focuses on varying the posted speed limits to create more uniform speeds along a roadway, to promote safer driving during adverse conditions (such as fog) and/or to reduce air pollution.</p>		
TM17	Speed Warning and Enforcement (INDOT Work Zone Speed Enforcement)	<p>This service package monitors vehicle speeds and supports warning drivers when their speed is excessive. Also the service includes notifications to an enforcement agency to enforce the speed limit of the roadway. Speed monitoring can be made via spot speed or average speed measurements. Roadside equipment can display the speed of passing vehicles and/or suggest a safe driving speed. Environmental conditions and vehicle characteristics may be monitored and factored into the safe speed advisories that are provided to the motorist. For example, warnings can be generated recognizing the limitations of a given vehicle for the geometry of the roadway such as rollover risk for tall vehicles. This service focuses on monitoring of vehicle speeds and enforcement of the speed limit while the variable speed limits service (covered in TM20-Variable Speed Limits service package) focuses on varying the posted speed limits to create more uniform speeds along a roadway, to promote safer driving during adverse conditions (such as fog) and/or to reduce air pollution.</p>	Planned	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Work Zone Speed Warning Field Equipment • ISP Dispatch

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
TM20	Variable Speed Limits (INDOT Variable Speed Limit Enforcement)	This service package sets variable speed limits along a roadway to create more uniform speeds, to promote safer driving during adverse conditions (such as fog), and/or to reduce air pollution. Also known as speed harmonization, this service monitors traffic and environmental conditions along the roadway. Based on the measured data, the system calculates and sets suitable speed limits, usually by lane. Equipment over and along the roadway displays the speed limits and additional information such as basic safety rules and current traffic information. The system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service establishes variable speed limits and communicates the speed limits to drivers. Speed warnings and enforcement of speeds limits, including variable speed limits, is covered in the TM17-Speed Warning and Enforcement service package. Variable speed limits are an Active Traffic Management (ATM) strategy and are typically used in conjunction with other ATM strategies (such as TM22-Dynamic Lane Management and Shoulder Use and TM23-Dynamic Roadway Warning).	Planned	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Variable Speed Limits Field Equipment
TM22	Dynamic Lane Management and Shoulder Use (INDOT I-465 Hard Shoulder Running)	This service package provides for active management of travel lanes along a roadway. The package includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the	Future	<ul style="list-style-type: none"> • INDOT Indianapolis TMC • INDOT Lane Management Field Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>shoulders. This equipment can be used to change the lane configuration on the roadway according to traffic demand and lane destination along a typical roadway section or on approach to or access from a border crossing, multimodal crossing or intermodal freight depot. This package can be used to allow temporary or interim use of shoulders as travel lanes. The equipment can be used to electronically reconfigure intersections and interchanges and manage right-of-way dynamically including merges. Also, lanes can be designated for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. Prohibitions or restrictions of types of vehicles from using particular lanes can be implemented. The lane management system can be centrally monitored and controlled by a traffic management center or it can be autonomous. This service also can include automated enforcement equipment that notifies the enforcement agency of violators of the lane controls. Dynamic lane management and shoulder use is an Active Traffic Management (ATM) strategy and is typically used in conjunction with other ATM strategies (such as TM20-Variable Speed Limits and TM12-Dynamic Roadway Warning).</p>		
VS12	Vulnerable Road User Safety (Suburban Municipality Intersection)	This service package supports the sensing and warning systems used to interact with pedestrians, cyclists, and other non-motorized users that	Existing	<ul style="list-style-type: none"> • Pedestrian • Suburban Municipality Street Department CAV Roadside Equipment

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
	CAV)	<p>operate on the main vehicle roadways, or on pathways that intersect the main vehicle roadways. These systems allow automated warning or active protection for this class of users. It integrates traffic, pedestrian, and cyclist information from roadside or intersection detectors and new forms of data from wirelessly connected, non-motorized traveler-carried mobile devices to request right-of-way or to inform non-motorized travelers when to cross and how to remain aligned with the crosswalk or pathway based on real-time Signal Phase and Timing (SPaT) and MAP information. In some cases, priority will be given to non-motorized travelers, such as persons with disabilities who need additional crossing time, or in special conditions (e.g., weather) where non-motorized travelers may warrant priority or additional crossing time. This service package will enable a service call to be routed to the traffic controller from a mobile device of a registered person with disabilities after confirming the direction and orientation of the roadway that the individual is intending to cross. It also provides warnings to the non-motorized user of possible infringement of the crossing or pathway by approaching vehicles.</p>		<ul style="list-style-type: none"> • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside Equipment • Vehicles • Vulnerable Road User
VS12	Vulnerable Road User Safety (VRU Safety)	<p>This service package supports the sensing and warning systems used to interact with pedestrians, cyclists, wheel chair users, scooter riders, and other vulnerable road users that are on pathways that are immediately adjacent to or</p>	Planned	<ul style="list-style-type: none"> • Pedestrian • Personal Computing Devices • Suburban Municipality Street Department CAV Roadside Equipment • Suburban

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>intersect the roadway. These systems allow automated warning or active protection for this class of users. It integrates traffic and vulnerable road user information from roadside or intersection detectors and new forms of data from wirelessly connected, traveler-carried mobile devices to request right-of-way or to inform pedestrians when to cross and how to remain aligned with the crosswalk or pathway based on real-time Signal Phase and Timing (SPaT) and MAP information. In some cases, priority will be given to non-motorized travelers, such as persons with disabilities who need additional crossing time, or in special conditions (e.g., weather) where non-motorized travelers may warrant priority or additional crossing time. This service package will enable a service call to be routed to the traffic controller from a mobile device of a registered person with disabilities after confirming the direction and orientation of the roadway that the individual is intending to cross. It also provides warnings to the vulnerable road users of possible infringement of the crossing or pathway by approaching vehicles.</p>		<p>Municipality Street Department Operations/Dispatch</p> <ul style="list-style-type: none"> • Suburban Municipality Street Department Roadside Equipment • Vehicles • Vulnerable Road User
VS13	Intersection Safety Warning and Collision Avoidance (Suburban Municipality Intersection CAV)	<p>This service package enables a connected vehicle approaching an instrumented signalized intersection to receive information from the infrastructure regarding the signal timing and the geometry of the intersection. The vehicle uses its speed and acceleration profile, along with the signal timing and geometry</p>	Future	<ul style="list-style-type: none"> • Suburban Municipality Street Department CAV Roadside Equipment • Suburban Municipality Street Department Operations/Dispatch • Suburban Municipality Street Department Roadside

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		<p>information to determine if it appears likely that the vehicle will be able to pass safely through the intersection without violating the signal or colliding with other vehicles. If the vehicle determines that proceeding through the intersection is unsafe, a warning is provided to the driver and/or collision avoidance actions are taken, depending on the automation level of the vehicle.</p>		<p>Equipment</p> <ul style="list-style-type: none"> • Vehicles • Vulnerable Road User
WX01	Weather Data Collection	<p>This service package collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. It also collects data from vehicles in the road network that can be used to directly measure or infer current environmental conditions. It leverages vehicle on-board systems that measure temperature, sense current weather conditions (rain and sun sensors) and also can monitor aspects of the vehicle operational status (e.g., use of headlights, wipers, and traction control system) to gather information about local environmental conditions. In addition, environmental sensor systems located on Maintenance and Construction Vehicles are also potential data sources. The collected environmental data is used by the Weather Information Processing and Distribution service package to process the information and make decisions on operations. The collected environmental data may be aggregated, combined with data attributes and sent to meteorological systems for data qualification</p>	Existing	<ul style="list-style-type: none"> • Indianapolis Airport Field Devices • Indianapolis DPW Operations Center • INDOT Indianapolis TMC • INDOT MCO Management • RWIS Sensors

Service Package	Service Package Name	Service Package Description	Service Package Status	Included Elements
		and further data consolidation. The service package may also request and receive qualified data sets from meteorological systems.		
WX02	Weather Information Processing and Distribution	This service package processes and distributes the environmental information collected from the Weather Data Collection service package. This service package uses the environmental data to detect environmental hazards such as icy road conditions, high winds, dense fog, etc. so operational centers and decision support systems can make decision on corrective actions to take. The continuing updates of road condition information and current temperatures can be used to more effectively deploy road maintenance resources, issue general traveler advisories, issue location specific warnings to drivers using the Traffic Information Dissemination service package, and aid operators in scheduling work activity.	Existing	<ul style="list-style-type: none"> • Indianapolis Airport Management Systems • Indianapolis DPW Operations Center • INDOT Indianapolis TMC • INDOT MCO Management • Surface Transportation Weather Service • Weather Services

6 Roles and Responsibilities

An Operational Concept identifies the roles and responsibilities that each participating agency must undertake to provide the ITS services included in the ITS Architecture. Changing needs may arise that will require an agreement to be formed between all affected parties that defines new or additional roles. Defining the roles and responsibilities of the participating stakeholders in the region and the willingness of agencies to accept their roles and responsibilities is an important step in realizing the common goal of an interoperable ITS system throughout the region.

Table 4 lists the roles and responsibilities of stakeholders involved in delivering the existing and planned Services and Projects included in this ITS architecture. Included are stakeholders' roles and responsibilities for planning, implementing, managing and operating transportation systems and the ITS applications selected to address operational needs. Stakeholders and their roles and responsibilities are grouped by specific service areas to which they are related. These roles and responsibilities are presented in high-level terms sufficient to understand current relationships and future integration opportunities.

Table 4 – Roles and Responsibilities

Stakeholder	RR Description	RR Status
Roles and Responsibilities Area: Archived Data Systems for Indianapolis Region		
City of Beech Grove	Analyze traffic data for planning purposes	Existing
City of Beech Grove	Collect and store traffic data	Existing
City of Lawrence	Analyze traffic data for planning purposes	Existing
City of Lawrence	Collect and store traffic data	Existing
Indiana Department of Transportation	Analyze traffic data for planning purposes	Existing
Indiana Department of Transportation	Assist universities with research as needed	Existing
Indiana Department of Transportation	Collect and store traffic data	Existing
Indiana Department of Transportation	Provide traffic data to requesting agencies	Existing
Indiana Department of Transportation District Level	Analyze traffic data for planning purposes	Existing
Indiana Department of Transportation District Level	Collect and store traffic data	Existing
Indiana Department of Transportation District Level	Provide traffic data to 511	Planned
Indiana Department of Transportation District Level	Provide traffic data to requesting agencies	Existing
Indiana Department of Transportation District Level	Provide traffic data to Trafficwise website	Planned
Indiana State Police	Collect and store incident reports	Existing
Indianapolis Department of Public Works	Analyze traffic data for planning purposes	Existing
Indianapolis Department of Public Works	Collect and store traffic data	Existing
Indianapolis Department of Public Works	Provide traffic data to requesting agencies	Existing
Indianapolis Downtown, Inc.	Collect and store parking data	Existing
Indianapolis Fire Department	Collect and store incident reports	Existing
Indianapolis MPO	Support online traffic data archive	Future
Indianapolis MPO	Analyze traffic and parking data for planning purposes	Existing
Indianapolis MPO	Collect and store traffic and parking data	Existing
Indianapolis MPO	Provide traffic data to requesting agencies	Existing
Indianapolis Police Department	Collect and store incident reports	Existing
Indianapolis Public Transportation Corporation/IndyGo	Analyze transit data for planning purposes	Existing
Indianapolis Public Transportation Corporation/IndyGo	Collect and store transit data	Existing
Marion County Sheriffs Office	Collect and store incident reports	Existing
Suburban Municipalities	Analyze traffic data for planning purposes	Existing
Suburban Municipalities	Collect and store traffic data	Existing
Surrounding Counties	Analyze traffic data for planning purposes	Existing
Surrounding Counties	Collect and store traffic data	Existing

Stakeholder	RR Description	RR Status
Town of Speedway	Analyze traffic data for planning purposes	Existing
Town of Speedway	Collect and store traffic data	Existing
Traffic Data Archive Users Group	Access online traffic data	Future
Universities	Analyze traffic data for research purposes	Existing
Universities	Distribute research results	Existing
Roles and Responsibilities Area: City of Carmel Electric Vehicle Charging		
City of Carmel	Deploy and operate electric charging stations.	Planned
Travelers	Enable and use in-vehicle secure payment application or services for payment of electric vehicle charging transactions when available.	Planned
Roles and Responsibilities Area: City of Carmel Fiber Installation		
City of Carmel	Operates traffic signal systems for the City of Carmel.	Planned
City of Carmel	Operates and maintains closed-circuit televisions (CCTVs) and field sensors.	Planned
Roles and Responsibilities Area: City of Carmel ITS Traffic Cameras		
City of Carmel	Operates and maintains ITS Cameras.	Existing
Roles and Responsibilities Area: City of Carmel Smart Parking		
City of Carmel	Manages parking in the City of Carmel, including dissemination of parking information to travelers.	Planned
City of Carmel	Provides parking information to travelers.	Planned
Travelers	Load traveler information application on mobile device.	Planned
Travelers	Pay parking fees electronically.	Planned
Roles and Responsibilities Area: City of Greenwood Signal and Detection Implementation		
Suburban Municipalities	Install and operate traffic signals (local routes)	Planned
Roles and Responsibilities Area: City of Greenwood Signal Preemption		
Suburban Municipalities	Install and maintain signal preemption equipment.	Planned
Suburban Municipalities	Install and operate traffic signals (local routes)	Planned
Roles and Responsibilities Area: City of Greenwood Traffic Flow and Queue Mitigation		
Suburban Municipalities	Install and operate traffic signals (local routes)	Existing
Roles and Responsibilities Area: Emergency Management for Indianapolis Region		
Ambulance/Emergency Services	Respond to emergencies	Existing
Ambulance/Emergency Services	Receive and process emergency calls	Existing
Ambulance/Emergency Services	Provide emergency medical services	Existing
City of Beech Grove	Respond to emergencies	Existing
City of Beech Grove	Receive and process emergency calls	Existing

Stakeholder	RR Description	RR Status
City of Beech Grove	Support evacuation	Existing
City of Beech Grove	Establish emergency command (local routes)	Existing
City of Beech Grove	Provide emergency medical services	Existing
City of Lawrence	Respond to emergencies	Existing
City of Lawrence	Support evacuation	Existing
City of Lawrence	Receive and process emergency calls	Existing
City of Lawrence	Establish emergency command (local routes)	Existing
City of Lawrence	Provide emergency medical services	Existing
CTASC	Coordinate emergency response between agencies	Existing
CTASC	Enact emergency plans	Existing
CTASC	Enact evacuation plan	Existing
DTN	Initiate weather emergency warnings	Existing
Event Promoters/Special Events	Support evacuation	Existing
Event Promoters/Special Events	Coordinate emergency response between agencies	Existing
Event Promoters/Special Events	Enact emergency plans	Existing
Indiana Department of Transportation	Coordinate emergency response between agencies	Existing
Indiana Department of Transportation	Enact evacuation plan	Existing
Indiana Department of Transportation District Level	Receive and process emergency calls	Existing
Indiana Department of Transportation District Level	Support evacuation	Existing
Indiana Department of Transportation District Level	Respond to emergencies	Existing
Indiana State Police	Receive and process emergency calls	Existing
Indiana State Police	Support evacuation	Existing
Indiana State Police	Respond to emergencies	Existing
Indiana State Police	Establish emergency command (state routes)	Existing
Indianapolis Airport Authority	Receive and process emergency calls	Existing
Indianapolis Airport Authority	Respond to emergencies	Existing
Indianapolis Airport Authority	Coordinate emergency response between agencies	Existing
Indianapolis Airport Authority	Enact emergency plans	Existing
Indianapolis Airport Authority	Establish emergency command (on-site)	Existing
Indianapolis Capital Improvements Board	Coordinate emergency response between agencies	Existing
Indianapolis Capital Improvements Board	Enact emergency plans	Existing
Indianapolis Capital Improvements Board	Enact evacuation plan	Existing
Indianapolis Department of Public Works	Support evacuation	Existing
Indianapolis Department of Public Works	Respond to emergencies	Existing

Stakeholder	RR Description	RR Status
Indianapolis Department of Public Works	Receive and process emergency calls	Existing
Indianapolis Emergency Management Agency	Coordinate emergency response between agencies	Existing
Indianapolis Emergency Management Agency	Enact emergency plans	Existing
Indianapolis Emergency Management Agency	Enact evacuation plan	Existing
Indianapolis Fire Department	Receive and process emergency calls	Existing
Indianapolis Fire Department	Respond to emergencies	Existing
Indianapolis Fire Department	Provide emergency medical services	Existing
Indianapolis Motor Speedway	Coordinate emergency response between agencies	Existing
Indianapolis Motor Speedway	Enact emergency plans	Existing
Indianapolis Motor Speedway	Enact evacuation plan	Existing
Indianapolis Police Department	Support evacuation	Existing
Indianapolis Police Department	Respond to emergencies	Existing
Indianapolis Police Department	Receive and process emergency calls	Existing
Indianapolis Police Department	Establish emergency command (local routes)	Existing
Indianapolis Public Transportation Corporation/IndyGo	Respond to emergencies	Existing
Indianapolis Public Transportation Corporation/IndyGo	Support evacuation	Existing
Indianapolis Schools	Receive and process emergency calls	Existing
Indianapolis Schools	Respond to emergencies	Existing
Indianapolis Schools	Enact emergency plans	Existing
Indianapolis Schools	Enact evacuation plan	Existing
Indianapolis Schools	Establish emergency command (on-site)	Existing
Major Employers	Respond to emergencies	Existing
Major Employers	Enact emergency plans	Existing
Major Employers	Enact evacuation plans	Existing
Major Employers	Establish emergency command (on-site)	Existing
Marion County Sheriffs Office	Respond to emergencies	Existing
Marion County Sheriffs Office	Receive and process emergency calls	Existing
Marion County Sheriffs Office	Establish emergency command (local routes)	Existing
Media Services	Initiate general emergency warnings	Existing
MESA System Users	Receive and process emergency calls	Existing
MESA System Users	Respond to emergencies	Existing
National Weather Service	Initiate weather emergency warnings	Existing
Railroad Agencies	Coordinate emergency response between agencies	Existing
Railroad Agencies	Enact emergency plans	Existing

Stakeholder	RR Description	RR Status
Suburban Municipalities	Support evacuation	Existing
Suburban Municipalities	Receive and process emergency calls	Existing
Suburban Municipalities	Respond to emergencies	Existing
Suburban Municipalities	Establish emergency command (local routes)	Existing
Suburban Municipalities	Provide emergency medical services	Existing
Surrounding Counties	Respond to emergencies	Existing
Surrounding Counties	Support evacuation	Existing
Surrounding Counties	Receive and process emergency calls	Existing
Surrounding Counties	Establish emergency command (local routes)	Existing
Surrounding Counties	Provide emergency medical services	Existing
Towing Operators	Respond to emergencies	Existing
Town of Speedway	Receive and process emergency calls	Existing
Town of Speedway	Support evacuation	Existing
Town of Speedway	Respond to emergencies	Existing
Town of Speedway	Establish emergency command (local routes)	Existing
Town of Speedway	Provide emergency medical services	Existing
Utility Companies	Respond to emergencies	Existing
Roles and Responsibilities Area: Emissions Management for the Indianapolis Region		
Indianapolis Department of Public Works	Monitor air quality	Existing
Roles and Responsibilities Area: Freeway Management for Indianapolis Region		
Indiana Department of Transportation	Monitor freeway system	Existing
Indiana Department of Transportation District Level	Detect and verify incidents on freeway	Existing
Indiana Department of Transportation District Level	Determine alternate routes for freeways	Existing
Indiana Department of Transportation District Level	Install and operate ITS freeway devices to collect and disseminate data	Existing
Indiana Department of Transportation District Level	Manage freeway service patrols	Existing
Indiana Department of Transportation District Level	Monitor freeway system	Existing
Indiana State Police	Monitor vehicle speeds (state routes)	Existing
Roles and Responsibilities Area: HAZMAT Response for Indianapolis Region		
Ambulance/Emergency Services	Respond to HAZMAT incidents	Existing
Ambulance/Emergency Services	Provide emergency medical services at HAZMAT incidents	Existing
City of Beech Grove	Respond to HAZMAT incidents (local routes)	Existing
City of Beech Grove	Request HAZMAT incident response aid when necessary	Existing
City of Beech Grove	Coordinate HAZMAT incident site cleanup (local routes)	Existing
City of Beech Grove	Establish HAZMAT incident command (local routes)	Existing

Stakeholder	RR Description	RR Status
City of Beech Grove	Isolate HAZMAT incident site (local routes)	Existing
City of Beech Grove	Provide HAZMAT aid to other responders	Existing
City of Beech Grove	Provide traffic control at HAZMAT incident sites (local routes)	Existing
City of Lawrence	Respond to HAZMAT incidents (local routes)	Existing
City of Lawrence	Request HAZMAT incident response aid when necessary	Existing
City of Lawrence	Coordinate HAZMAT incident site cleanup (local routes)	Existing
City of Lawrence	Establish HAZMAT incident command (local routes)	Existing
City of Lawrence	Isolate HAZMAT incident site (local routes)	Existing
City of Lawrence	Provide HAZMAT aid to other responders	Existing
City of Lawrence	Provide traffic control at HAZMAT incident sites (local routes)	Existing
Indiana Department of Transportation District Level	Respond to HAZMAT incidents	Existing
Indiana Department of Transportation District Level	Coordinate HAZMAT incident response between agencies (state routes)	Existing
Indiana Department of Transportation District Level	Coordinate HAZMAT incident site cleanup (state routes)	Existing
Indiana Department of Transportation District Level	Provide traffic control at HAZMAT incident sites (state routes)	Existing
Indiana State Police	Respond to HAZMAT incidents	Existing
Indiana State Police	Coordinate HAZMAT incident response between agencies (state routes)	Existing
Indiana State Police	Isolate HAZMAT incident site (state routes)	Existing
Indianapolis Airport Authority	Respond to HAZMAT incidents (on-site)	Existing
Indianapolis Airport Authority	Request HAZMAT incident response aid when necessary	Existing
Indianapolis Airport Authority	Coordinate HAZMAT incident site cleanup (on-site)	Existing
Indianapolis Airport Authority	Establish HAZMAT incident command (on-site)	Existing
Indianapolis Airport Authority	Provide HAZMAT aid to other responders	Existing
Indianapolis Department of Public Works	Request HAZMAT incident response aid when necessary	Existing
Indianapolis Department of Public Works	Respond to HAZMAT incidents	Existing
Indianapolis Department of Public Works	Coordinate HAZMAT incident site cleanup (local routes)	Existing
Indianapolis Department of Public Works	Provide HAZMAT aid to other responders	Existing
Indianapolis Department of Public Works	Provide traffic control at HAZMAT incident sites (local routes)	Existing
Indianapolis Emergency Management Agency	Coordinate large-scale HAZMAT incident response between agencies	Existing
Indianapolis Fire Department	Request HAZMAT incident response aid when necessary	Existing
Indianapolis Fire Department	Respond to HAZMAT incidents (local and state routes)	Existing
Indianapolis Fire Department	Coordinate HAZMAT incident response (local and state routes)	Existing
Indianapolis Fire Department	Establish HAZMAT incident command (local and state routes)	Existing
Indianapolis Fire Department	HAZMAT incident site cleanup (local and state routes)	Existing
Indianapolis Fire Department	Provide HAZMAT aid to other responders	Existing

Stakeholder	RR Description	RR Status
Indianapolis Police Department	Respond to HAZMAT incidents	Existing
Indianapolis Police Department	Coordinate HAZMAT incident response between agencies (local routes)	Existing
Indianapolis Police Department	Isolate HAZMAT incident site (local routes)	Existing
Major Employers	Request HAZMAT incident response aid when necessary	Existing
Major Employers	Respond to HAZMAT incidents (on-site)	Existing
Major Employers	Coordinate HAZMAT incident site cleanup (on-site)	Existing
Major Employers	Establish HAZMAT incident command (on-site)	Existing
Marion County Sheriffs Office	Respond to HAZMAT incidents	Existing
Marion County Sheriffs Office	Coordinate HAZMAT incident response (local routes)	Existing
Marion County Sheriffs Office	Isolate HAZMAT incident site (local routes)	Existing
Suburban Municipalities	Respond to HAZMAT incidents (local routes)	Existing
Suburban Municipalities	Request HAZMAT incident response aid when necessary	Existing
Suburban Municipalities	Coordinate HAZMAT incident site cleanup (local routes)	Existing
Suburban Municipalities	Establish HAZMAT incident command (local routes)	Existing
Suburban Municipalities	Isolate HAZMAT incident site (local routes)	Existing
Suburban Municipalities	Provide HAZMAT aid to other responders	Existing
Suburban Municipalities	Provide traffic control at HAZMAT incident sites (local routes)	Existing
Surrounding Counties	Request HAZMAT incident response aid when necessary	Existing
Surrounding Counties	Respond to HAZMAT incidents (local routes)	Existing
Surrounding Counties	Coordinate HAZMAT incident site cleanup (local routes)	Existing
Surrounding Counties	Establish HAZMAT incident command (local routes)	Existing
Surrounding Counties	Isolate HAZMAT incident site (local routes)	Existing
Surrounding Counties	Provide HAZMAT aid to other responders	Existing
Surrounding Counties	Provide traffic control at HAZMAT incident sites (local routes)	Existing
Towing Operators	Respond to HAZMAT incidents (local and state routes)	Existing
Towing Operators	HAZMAT incident site cleanup (local and state routes)	Existing
Town of Speedway	Respond to HAZMAT incidents (local routes)	Existing
Town of Speedway	Request HAZMAT incident response aid when necessary	Existing
Town of Speedway	Coordinate HAZMAT incident site cleanup (local routes)	Existing
Town of Speedway	Establish HAZMAT incident command (local routes)	Existing
Town of Speedway	Isolate HAZMAT incident site (local routes)	Existing
Town of Speedway	Provide HAZMAT aid to other responders	Existing
Town of Speedway	Provide traffic control at HAZMAT incident sites (local routes)	Existing

Stakeholder	RR Description	RR Status
Roles and Responsibilities Area: Incident Management for Indianapolis Region		
Ambulance/Emergency Services	Respond to incidents	Existing
Ambulance/Emergency Services	Provide emergency medical services at incidents	Existing
City of Beech Grove	Respond to incidents	Existing
City of Beech Grove	Coordinate incident site cleanup (local routes)	Existing
City of Beech Grove	Create incident reports	Existing
City of Beech Grove	Establish incident command (local routes)	Existing
City of Beech Grove	Provide traffic control at incident sites (local routes)	Existing
City of Lawrence	Respond to incidents	Existing
City of Lawrence	Coordinate incident site cleanup (local routes)	Existing
City of Lawrence	Create incident reports	Existing
City of Lawrence	Establish incident command (local routes)	Existing
City of Lawrence	Provide traffic control at incident sites (local routes)	Existing
Event Promoters/Special Events	Develop special event traffic plans	Existing
Indiana Department of Transportation District Level	Respond to incidents	Existing
Indiana Department of Transportation District Level	Coordinate incident site cleanup (state routes)	Existing
Indiana Department of Transportation District Level	Create incident reports	Existing
Indiana Department of Transportation District Level	Provide traffic control at incident sites (state routes)	Existing
Indiana State Police	Respond to incidents	Existing
Indiana State Police	Create incident reports	Existing
Indiana State Police	Establish incident command (state routes)	Existing
Indianapolis Department of Public Works	Respond to incidents	Existing
Indianapolis Department of Public Works	Coordinate incident site cleanup (local routes)	Existing
Indianapolis Department of Public Works	Create incident reports	Existing
Indianapolis Department of Public Works	Provide traffic control at incident sites (local routes)	Existing
Indianapolis Downtown, Inc.	Develop special event traffic plans	Existing
Indianapolis Fire Department	Respond to incidents	Existing
Indianapolis Fire Department	Create incident reports	Existing
Indianapolis Motor Speedway	Develop special event traffic plans	Existing
Indianapolis Police Department	Respond to incidents	Existing
Indianapolis Police Department	Create incident reports	Existing
Indianapolis Police Department	Establish incident command (local routes)	Existing
Major Employers	Develop traffic plans	Existing
Marion County Sheriffs Office	Respond to incidents	Existing

Stakeholder	RR Description	RR Status
Marion County Sheriffs Office	Create incident reports	Existing
Marion County Sheriffs Office	Establish incident command (local routes)	Existing
Railroad Agencies	Develop incident response plans	Existing
Suburban Municipalities	Respond to incidents	Existing
Suburban Municipalities	Coordinate incident site cleanup (local routes)	Existing
Suburban Municipalities	Create incident reports	Existing
Suburban Municipalities	Establish incident command (local routes)	Existing
Suburban Municipalities	Provide traffic control at incident sites (local routes)	Existing
Surrounding Counties	Respond to incidents	Existing
Surrounding Counties	Coordinate incident site cleanup (local routes)	Existing
Surrounding Counties	Create incident reports	Existing
Surrounding Counties	Establish incident command (local routes)	Existing
Surrounding Counties	Provide traffic control at incident sites (local routes)	Existing
Towing Operators	Respond to incidents	Existing
Towing Operators	Provide incident site cleanup (local and state routes)	Existing
Town of Speedway	Respond to incidents	Existing
Town of Speedway	Coordinate incident site cleanup (local routes)	Existing
Town of Speedway	Create incident reports	Existing
Town of Speedway	Establish incident command (local routes)	Existing
Town of Speedway	Provide traffic control at incident sites (local routes)	Existing
Roles and Responsibilities Area: Indianapolis Transit Signal Priority		
Indianapolis Department of Public Works	Provide transit signal priority for Indianapolis Public Transportation Corporation/IndyGo.	Existing
Indianapolis Public Transportation Corporation/IndyGo	Provide on-board functionality needed to implement bus tracking and signal priority at local/state route intersections	Planned
Roles and Responsibilities Area: INDOT Automated Work Zone Speed Limit Enforcement		
Indiana Department of Transportation	Provide maintenance and construction information to the traveling public using portable DMS devices.	Planned
Indiana Department of Transportation	Manage work zones for INDOT maintenance and construction activities, and monitor work zone safety with field equipment and vehicles.	Planned
Indiana Department of Transportation	Coordinate construction planning with other maintenance and construction agencies	Planned
Indiana Department of Transportation	Monitor freeway system	Planned
Indiana State Police	Support enforcing designated speed limit in Work Zone area.	Planned

Stakeholder	RR Description	RR Status
Indiana State Police	Receive vehicle speeds from INDOT speed monitoring system.	Planned
Roles and Responsibilities Area: INDOT I-465 Hard Shoulder Running		
Indiana Department of Transportation	Manage freeway lanes dynamically to meet traffic demands.	Planned
Roles and Responsibilities Area: INDOT I-465 Ramp Metering		
Indiana Department of Transportation	Operate and coordinate traffic control devices, traffic sensors, and CCTVs on INDOT freeways, including the ability to control traffic on overflow ramps.	Existing
Indiana Department of Transportation	Monitor traffic images and traffic flow data through CCTVs and field sensors, and maintain operational control of its own field equipment.	Existing
Indiana Department of Transportation	Own, operate, and maintain DMS.	Existing
Indiana Department of Transportation	Monitor freeway system	Existing
Roles and Responsibilities Area: INDOT Marion County Signal and CCTV		
Indiana Department of Transportation District Level	Install and operate ITS surface street devices to collect and disseminate data (state routes)	Existing
Indiana Department of Transportation District Level	Install and operate traffic signals (state routes)	Existing
Roles and Responsibilities Area: INDOT Truck Parking Information Management System (TPIMS)		
Indiana Department of Transportation	Monitor and manage parking availability at rest areas.	Planned
Indiana Department of Transportation	Provide Truck Parking availability information on INDOT DMS.	Planned
Indiana Department of Transportation	Communicate truck parking availability information upstream to commercial vehicle operators.	Planned
Roles and Responsibilities Area: INDOT Variable Speed Limit Enforcement		
Indiana Department of Transportation	Monitor traffic images and traffic flow data through CCTVs and field sensors, and maintain operational control of its own field equipment.	Existing
Indiana Department of Transportation	Monitor freeway system	Existing
Roles and Responsibilities Area: IndyGo Bus Rapid Transit System		
Indianapolis Department of Public Works	Provide transit signal priority for Indianapolis Public Transportation Corporation/IndyGo.	Planned
Indianapolis Public Transportation Corporation/IndyGo	Provide on-board functionality needed to implement bus tracking and signal priority at local/state route intersections	Planned
Roles and Responsibilities Area: Maintenance and Construction for Indianapolis Region		
City of Beech Grove	Coordinate construction activities with other maintenance and construction agencies	Existing
City of Beech Grove	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing

Stakeholder	RR Description	RR Status
City of Lawrence	Coordinate construction activities with other maintenance and construction agencies	Existing
City of Lawrence	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Indiana Department of Transportation	Coordinate construction planning with other maintenance and construction agencies	Existing
Indiana Department of Transportation District Level	Coordinate construction activities with other maintenance and construction agencies	Existing
Indiana Department of Transportation District Level	Install and operate RWIS sensors to collect road weather data	Existing
Indiana Department of Transportation District Level	Maintain state routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Indianapolis Airport Authority	Coordinate construction activities with other maintenance and construction agencies	Existing
Indianapolis Airport Authority	Maintain on-site and local routes including snow and ice control, pavement maintenance, and ITS devices	Existing
Indianapolis Department of Public Works	Coordinate construction activities with other maintenance and construction agencies	Existing
Indianapolis Department of Public Works	Install and operate RWIS sensors to collect road weather data	Existing
Indianapolis Department of Public Works	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Indianapolis MPO	Coordinate construction planning between maintenance and construction agencies	Existing
Private Maintenance Companies	Provide maintenance of ITS devices, including traffic signals, DMS, CCTV, HAR, vehicle detection, and lighting systems	Existing
RWIS Users	Install and operate RWIS sensors to collect road weather data	Existing
Suburban Municipalities	Coordinate construction activities with other maintenance and construction agencies	Existing
Suburban Municipalities	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Surrounding Counties	Coordinate construction activities with other maintenance and construction agencies	Existing
Surrounding Counties	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Town of Speedway	Coordinate construction activities with other maintenance and construction agencies	Existing

Stakeholder	RR Description	RR Status
Town of Speedway	Maintain local routes including snow and ice control, pavement maintenance, and ITS devices (including traffic signals)	Existing
Roles and Responsibilities Area: Parking Management for Indianapolis Region		
Indianapolis Airport Authority	Receive, process, and respond to online parking reservation requests	Existing
Indianapolis Airport Authority	Maintain inventory of airport parking facilities	Existing
Indianapolis Airport Authority	Monitor airport parking	Existing
Indianapolis Downtown, Inc.	Develop special event parking plans	Existing
Indianapolis Downtown, Inc.	Facilitate transit parking programs (i.e. park and ride)	Existing
Indianapolis Downtown, Inc.	Maintain inventory of Downtown parking garages	Existing
Indianapolis Downtown, Inc.	Monitor downtown parking	Existing
Indianapolis Downtown, Inc.	Monitor meter occupancy levels	Existing
Roles and Responsibilities Area: Suburban Municipality CAV Roles and Responsibilities		
Generic CAV Stakeholder	Provide security and credentials management support and certificates for connected vehicle operations.	Future
Pedestrian	Request right-of-way before crossing the roadway.	Existing
Suburban Municipalities	Operate traffic network safely and efficiently with utilization of Connected Vehicle technologies.	Future
Suburban Municipalities	Provide security for CAV communications between vehicles and the roadside.	Future
Suburban Municipalities	Install and operate traffic signals (local routes)	Existing
Travelers	Install and operate in-vehicle CAV equipment.	Future
Roles and Responsibilities Area: Surface Street Management for Indianapolis Region		
City of Beech Grove	Determine alternate routes for surface streets (local routes)	Existing
City of Beech Grove	Install and operate traffic signals (local routes)	Existing
City of Lawrence	Determine alternate routes for surface streets (local routes)	Existing
City of Lawrence	Install and operate traffic signals (local routes)	Existing
Indiana Department of Transportation District Level	Detect and verify incidents on surface street system (state routes)	Planned
Indiana Department of Transportation District Level	Determine alternate routes for surface streets (state routes)	Existing
Indiana Department of Transportation District Level	Install and operate ITS surface street devices to collect and disseminate data (state routes)	Existing
Indiana Department of Transportation District Level	Install and operate traffic signals (state routes)	Existing
Indiana Department of Transportation District Level	Monitor surface street system (state routes)	Existing
Indianapolis Airport Authority	Install and operate ITS surface street devices to collect and disseminate data (on-site)	Planned

Stakeholder	RR Description	RR Status
Indianapolis Airport Authority	Install and operate traffic signals (on-site and local routes)	Existing
Indianapolis Department of Public Works	Detect and verify incidents on surface street system (local routes)	Planned
Indianapolis Department of Public Works	Determine alternate routes for surface streets (local routes)	Existing
Indianapolis Department of Public Works	Install and operate ITS surface street devices to collect and disseminate data (local routes)	Planned
Indianapolis Department of Public Works	Install and operate traffic signals (local routes)	Existing
Indianapolis Department of Public Works	Manage downtown wayfinding sign system	Existing
Indianapolis Department of Public Works	Monitor surface street system (local routes)	Planned
Indianapolis Downtown, Inc.	Manage downtown wayfinding sign system	Existing
Suburban Municipalities	Determine alternate routes for surface streets (local routes)	Existing
Suburban Municipalities	Install and operate traffic signals (local routes)	Existing
Surrounding Counties	Determine alternate routes for surface streets (local routes)	Existing
Surrounding Counties	Install and operate traffic signals (local routes)	Existing
Town of Speedway	Determine alternate routes for surface streets (local routes)	Existing
Town of Speedway	Install and operate traffic signals (local routes)	Existing
Roles and Responsibilities Area: Transit Services for Indianapolis Region		
Central Indiana Regional Transportation Authority	Plan, coordinate, and operate regional transit initiatives	Planned
Indiana University Health	Operate and maintain people mover	Existing
Indianapolis Airport Authority	Provide airport-to-parking facility shuttle services	Existing
Indianapolis Public Transportation Corporation/IndyGo	Manage regional ridesharing program (Central Indiana Commuter Services)	Existing
Indianapolis Public Transportation Corporation/IndyGo	Provide fixed route bus services for the region	Existing
Indianapolis Public Transportation Corporation/IndyGo	Provide on-board functionality needed to implement bus tracking and signal priority at local/state route intersections	Planned
Indianapolis Public Transportation Corporation/IndyGo	Provide paratransit service for the region	Existing
Indianapolis Schools	Provide fixed route school bus services for the region	Existing
Taxi Companies	Provide regional demand-responsive transportation service	Existing
Roles and Responsibilities Area: Transportation Security for the Indianapolis Region		
CTASC	Monitor video surveillance information received from other agencies	Planned
Indiana Department of Transportation	Monitor infrastructure (state routes)	Existing
Indiana Department of Transportation District Level	Monitor infrastructure (state routes)	Existing
Indiana Department of Transportation District Level	Provide video surveillance to authorized security agencies	Planned
Indiana State Police	Monitor video surveillance information received from other agencies	Existing
Indianapolis Airport Authority	Monitor infrastructure (on-site)	Existing

Stakeholder	RR Description	RR Status
Indianapolis Department of Public Works	Monitor infrastructure (local routes)	Future
Indianapolis Public Transportation Corporation/IndyGo	Monitor infrastructure (in-vehicle)	Planned
Railroad Agencies	Monitor infrastructure (rail system)	Existing
Roles and Responsibilities Area: Traveler Information for Indianapolis Region		
DTN	Provide value-added weather information	Existing
DTN	Provide weather alerts	Existing
Event Promoters/Special Events	Maintain special event website	Existing
Indiana Department of Transportation	Disseminate traffic, incident, and maintenance information via 511 system	Planned
Indiana Department of Transportation District Level	Disseminate traffic, incident, and maintenance information to emergency management agencies	Existing
Indiana Department of Transportation District Level	Disseminate traffic, incident, and maintenance information to freeway service patrols	Existing
Indiana Department of Transportation District Level	Disseminate traffic, incident, and maintenance information to travelers and the media	Existing
Indiana Department of Transportation District Level	Disseminate traffic, incident, and maintenance information via 511 system	Planned
Indiana Department of Transportation District Level	Disseminate traffic, incident, and maintenance information via Trafficwise website	Planned
Indianapolis Airport Authority	Maintain airport website (online parking reservations, etc.)	Existing
Indianapolis Capital Improvements Board	Maintain convention center information kiosks	Existing
Indianapolis Downtown, Inc.	Publish parking statistics	Existing
Indianapolis Downtown, Inc.	Maintain website (downtown tourism)	Existing
Indianapolis Public Transportation Corporation/IndyGo	Disseminate real-time arrival data	Planned
Indianapolis Public Transportation Corporation/IndyGo	Maintain Central Indiana Commuter Services website (online ridesharing reservations)	Existing
Indianapolis Public Transportation Corporation/IndyGo	Maintain IndyGo website (schedules, fares, etc.)	Existing
Indianapolis Public Transportation Corporation/IndyGo	Maintain transit information hotline	Existing
Media Services	Disseminate traffic video surveillance data	Existing
Media Services	Disseminate traffic video surveillance data provided by others	Planned
National Weather Service	Provide weather alerts	Existing
National Weather Service	Provide weather information	Existing
Travelers	Report traffic and incident information to emergency services by calling 911.	Existing
Travelers	Report traffic and incident information to travelling public, INDOT Traffic Management Center, emergency services and any other relevant agency using crowdsourcing applications such as WAZE and TrafficWise.	Existing

Stakeholder	RR Description	RR Status
Roles and Responsibilities Area: z Electric Vehicle Charging Stations (example)		
AES Corporation	Provide electric utility in the Indianapolis area.	Existing
Electric Vehicle Charging Services	Deploy and operate electric charging stations.	Planned
Financial Institutions	Provide financial services.	Existing
Indiana Department of Transportation	Provide electric charging station information to travelers.	Planned
Private Traveler Services	Provide travel related information including electric charging stations information to travelers.	Existing
Travelers	Enable and use in-vehicle secure payment application or services for payment of electric vehicle charging transactions when available.	Future
Travelers	Enable and use personal payment device secure payment application or services for payment of electric vehicle charging transactions when available.	Planned
Travelers	Load traveler information application on mobile device.	Planned
Roles and Responsibilities Area: z Multimodal Accessible Travel En-Route Guidance (example project)		
Indianapolis Public Transportation Corporation/IndyGo	Provide transit fares, schedule and schedule adherence information to multimodal transportation service.	Future
Private Traveler Services	Provide pre-trip and en-route trip guidance services for travelers on multimodal trips..	Future
Suburban Municipalities	Provide real-time road network conditions and incident information to inform multimodal trip guidance services.	Future
Travelers	Install and use multimodal trip guidance applications on personal computing devices and in-vehicle systems.	Future
Roles and Responsibilities Area: z Multimodal Accessible Travel Payment Integration (example project)		
Financial Institutions	Provide administration and management of payments associated with multimodal travel, transit, shared use transportation services, parking payments, and other e-payments.	Planned
Indianapolis Public Transportation Corporation/IndyGo	Manage transit fare collection, supporting payment reconciliation with links to financial institutions and enforcement agencies for fare violations.	Planned
Private Parking Service Providers	Manage control of field parking management systems, supporting payment reconciliation with links to financial institutions.	Planned
Private Traveler Services	Support user payments for traveler services that are provided by or procured through the traveler services.	Planned
Travelers	Pay for services through personal computing device, vehicles user interface or public kiosks.	Planned

Stakeholder	RR Description	RR Status
Roles and Responsibilities Area: z Multimodal Accessible Travel Planning (example project)		
Electric Vehicle Charging Services	Support electric charging station reservations and payment for electric charging.	Planned
Electric Vehicle Charging Services	Manage electric charging station operations and back office operations.	Planned
Electric Vehicle Charging Services	Monitor electric charging station occupancy and rates.	Planned
Indianapolis Public Transportation Corporation/IndyGo	Manage coordination of transit transfers between routes and modes.	Planned
Indianapolis Public Transportation Corporation/IndyGo	Provide transit system schedule and fare information to multimodal information services for planned trip coordination.	Planned
Private Parking Service Providers	Provide parking availability, reservation, and fare information to multimodal information services for planned trip coordination.	Planned
Private Traveler Services	Provide pre-trip and en route trip planning services for travelers.	Planned
Private Traveler Services	Collect data from other transportation management centers to inform trip planning services including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, mul	Planned
Private Traveler Services	Provide trip planning for multimodal trips including vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences.	Planned
Suburban Municipalities	Provide road network conditions and incident information to multimodal travel services for trip planning.	Planned
Travelers	Install and use multimodal trip planning applications on personal communication devices.	Planned
Roles and Responsibilities Area: z Roundabout Traffic Surveillance and Analytics (example)		
Suburban Municipalities	Perform data analytic on collected traffic data to identify safety and traffic issues.	Planned
Suburban Municipalities	Analyze traffic data for planning purposes	Planned
Suburban Municipalities	Collect and store traffic data	Planned
Travelers	Turn-on bluetooth services in vehicle.	Planned
Roles and Responsibilities Area: z Vulnerable Road User Safety (example project)		
Suburban Municipalities	Provide security for CAV communications between vehicles and the roadside.	Future
Suburban Municipalities	Operate traffic network safely and efficiently with utilization of Connected Vehicle technologies.	Future
Suburban Municipalities	Install and operate traffic signals (local routes)	Existing
Travelers	Install and operate in-vehicle CAV equipment.	Future

Stakeholder	RR Description	RR Status
Vulnerable Road Users	Load and open VRU safety applications on personal mobile devices to receive safety alerts.	Planned
Vulnerable Road Users	Observe VRU safety signage and alerts when traveling along and across roadways.	Planned

7 Functionality

Each ITS system operated by the stakeholders must perform certain functions to effectively deliver the envisioned project capabilities. The primary functions that each system needs to perform are broadly defined in the Indianapolis RITSA as a set of Functional Objects that make up the physical elements of the architecture. The functional objects associated with each inventory element are listed in Table 5. As projects get implemented, requirements will need to be written to determine what each element must do in order to achieve its given set of functions.

Table 5 – Functional Objects Table

Element Name	Physical Object	Functional Object	Functional Object Description
Ambulance Dispatch	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Ambulance Dispatch	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.

Element Name	Physical Object	Functional Object	Functional Object Description
Ambulance Dispatch	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Ambulance Dispatch	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Ambulance Dispatch	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Ambulance Dispatch	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Ambulance Dispatch	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Ambulance Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Ambulance Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Beech Grove Public Safety	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Beech Grove Public Safety	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Beech Grove Public Safety	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Beech Grove Public Safety	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Safety	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Beech Grove Public Works Operations	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Beech Grove Public Works Operations	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Beech Grove Public Works Operations	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Beech Grove Public Works Operations	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Beech Grove Public Works Operations	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.
Beech Grove Public Works Operations	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Public Works Operations	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Beech Grove Public Works Operations	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.
Beech Grove Public Works Operations	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	<p>'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.</p>
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Beech Grove Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Beech Grove Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
Beech Grove Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.

Element Name	Physical Object	Functional Object	Functional Object Description
Beech Grove Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Beech Grove Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.
Beech Grove Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Beech Grove Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel CityOS	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.
Carmel CityOS	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel CityOS	Parking Management Center	Parking Management	'Parking Management' monitors parking area operations for one or more parking areas, monitoring current operational status including current parking occupancy and rates supporting back office operations.
Carmel CityOS	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Carmel Engineering Department Operations	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Carmel Engineering Department Operations	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel Engineering Department Operations	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Carmel Engineering Department Operations	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.
Carmel Engineering Department Operations	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel Engineering Department Operations	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
Carmel Engineering Department Operations	Transportation Information Center	TIC Travel Services Information and Reservation	'TIC Travel Services Information' disseminates information about traveler services such as lodging, restaurants, electric vehicle charging, and service stations. Tailored traveler service information is provided on request that meets the constraints and preferences specified by the traveler. This application also supports reservations and advanced payment for traveler services including parking and loading zone use.
Carmel ITS Cameras	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Carmel ITS Cameras	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel ITS Cameras	Security Monitoring Equipment	Field Secure Area Sensor Monitoring	'Field Secure Area Sensor Monitoring' includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. Bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). A range of acoustic, environmental threat (e.g. Chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.
Carmel ITS Cameras	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.
Carmel Parking Area Equipment	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel Parking Management System	Parking Management Center	Parking Account and Fee Management	'Parking Account and Fee Management' manages parking fare collection at the Parking Management Center. It provides the back office functions that support control of field parking management systems, supporting payment reconciliation with links to financial institutions. It loads fee data into field systems when those systems are initialized or whenever such information is modified.
Carmel Parking Management System	Parking Management Center	Parking Coordination	'Parking Coordination' supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic management systems. Coordination with traffic management supports local traffic control coordination in and around the parking facility and broader regional coordination. It also shares information with transit management systems and information providers to support multimodal travel planning, including parking reservations capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.
Carmel Parking Management System	Parking Management Center	Parking Management	'Parking Management' monitors parking area operations for one or more parking areas, monitoring current operational status including current parking occupancy and rates supporting back office operations.
Carmel Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Carmel Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.

Element Name	Physical Object	Functional Object	Functional Object Description
Carmel Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.
Carmel Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Carmel Vehicle Charging Stations	Electric Charging Station	Electric Charging Station Management	'Electric Charging Station Management' manages vehicle charging. It verifies that a vehicle is authorized to charge, enabled power delivery, communicates with the vehicle during charging and provides charge status information to the driver. A connection with Connected Vehicle Roadside Equipment provides the capability to integrate charging station coordination and communication into the broader Connected Vehicle Environment.

Element Name	Physical Object	Functional Object	Functional Object Description
CAV Authorizing Center	Center	Center Connected Vehicle Infrastructure Management	'Center Connected Vehicle Infrastructure Management' is the back office application that supports monitoring and maintenance of the Connected Vehicle infrastructure (RSEs, support systems, and associated communications links). It monitors the performance and configuration of the infrastructure portion of the Connected Vehicle Environment. This includes tracking and management of the infrastructure configuration as well as detection, isolation, and correction of infrastructure service problems. The application also includes monitoring of performance of the infrastructure equipment, including RSEs and communications links.
CAV-ITS Map Update System	Map Update System	Map Management	'Map Management' provides the GIS functionality necessary to support map data creation and management. It provides an operator interface that supports management of the map data and rendering of the maps under operator control and interfaces to external data sources, including the connected vehicle environment.
CICS Website	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
CICS Website	Transportation Information Center	TIC Dynamic Ridesharing	'TIC Dynamic Ridesharing' provides dynamic rideshare matches for eligible travelers, connecting riders and drivers for specific trips based on preferences. This ridesharing/ride matching capability also arranges connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing. Reservations and advanced payment are also supported so that each segment of the trip may be confirmed.
CICS Website	Transportation Information Center	TIC Trip Planning	'TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.

Element Name	Physical Object	Functional Object	Functional Object Description
Convention Center Kiosks	Traveler Support Equipment	Traveler Interactive Information	'Traveler Interactive Information' provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. It also supports interactive services that support enrollment, account management, and payments for transportation services. The interactive traveler information capability is provided by a public traveler interface, such as a kiosk.
Downtown Indy Website	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
Downtown Indy Website	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
Downtown Indy Website	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
Downtown Indy Website	Transportation Information Center	TIC Traveler Information Broadcast	'TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.
Electric Charging Management Center	Electric Charging Management Center	Electric Charging Management	'Electric Charging Management' monitors electric charging operations for one or more charging stations, monitoring current operational status including current occupancy and rates supporting back office operations. This function also includes support for reservations and payment of electric charging.
Electric Vehicle Charging Stations	Electric Charging Station	Electric Charging Station Management	'Electric Charging Station Management' manages vehicle charging. It verifies that a vehicle is authorized to charge, enabled power delivery, communicates with the vehicle during charging and provides charge status information to the driver. A connection with Connected Vehicle Roadside Equipment provides the capability to integrate charging station coordination and communication into the broader Connected Vehicle Environment.

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Emergency Operations Center	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Emergency Operations Center	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Emergency Operations Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Incident Command	<p>'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Emergency Operations Center	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.

Element Name	Physical Object	Functional Object	Functional Object Description
Emergency Operations Center	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.
Event Promoters	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
Event Promoters	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
Event Promoters	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
Event Promoters	Transportation Information Center	TIC Traveler Information Broadcast	'TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.
Event Promoters	Transportation Information Center	TIC Traveler Telephone Information	'TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.
IMS Command Center	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.

Element Name	Physical Object	Functional Object	Functional Object Description
IMS Command Center	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
IMS Command Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
IMS Command Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
IMS Command Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
IMS Command Center	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
IMS Command Center	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
IMS Command Center	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
Indianapolis Airport Field Devices	Connected Vehicle Roadside Equipment	RSE Environmental Monitoring	'RSE Environmental Monitoring' collects environmental situation (probe) data from passing vehicles that are equipped with short range communications capability. The collected data includes current environmental conditions as measured by on-board sensors (e.g., ambient temperature and precipitation measures), current status of vehicle systems that can be used to infer environmental conditions (e.g., status of lights, wipers, ABS, and traction control systems), and emissions measures reported by the vehicle. The functional object collects the provided data, aggregates and filters the data based on provided configuration parameters, and sends the collected information back to a center for processing and distribution. This functional object may also process the collected data locally and issue short-term road weather advisories for the road segment using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Field Devices	Connected Vehicle Roadside Equipment	RSE Road Closure Management	'RSE Road Closure Management' communicates with qualified Connected Vehicles and barrier control systems to support local road closure management. It validates and requests implementation of road closure requests. During a closure, it can also support selective access to the closed area, only granting entry permission to allowed vehicles.
Indianapolis Airport Field Devices	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Indianapolis Airport Field Devices	ITS Roadway Equipment	Roadway Barrier System Control	'Roadway Barrier System Control' includes the field equipment that controls barrier systems used to control access to transportation facilities and infrastructure. Barrier systems include automatic or remotely controlled gates, barriers and other access control systems.
Indianapolis Airport Field Devices	ITS Roadway Equipment	Roadway Environmental Monitoring	'Roadway Environmental Monitoring' measures environmental conditions and communicates the collected information back to a center where it can be monitored and analyzed or to other field devices to support communications to vehicles. A broad array of weather and road surface information may be collected. Weather conditions that may be measured include temperature, wind, humidity, precipitation, and visibility. Surface and sub-surface sensors can measure road surface temperature, moisture, icing, salinity, and other metrics.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Field Devices	ITS Roadway Equipment	Roadway Safeguard System Control	'Roadway Safeguard System Control' includes field equipment that controls safeguard systems for transportation facilities and infrastructure. Safeguard systems include blast shields, exhaust systems and other automatic or remotely controlled systems intended to mitigate the impact of an incident.
Indianapolis Airport Field Devices	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Indianapolis Airport Field Devices	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.
Indianapolis Airport Field Devices	Security Monitoring Equipment	Field Secure Area Sensor Monitoring	'Field Secure Area Sensor Monitoring' includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. Bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). A range of acoustic, environmental threat (e.g. Chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Field Devices	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.
Indianapolis Airport Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
Indianapolis Airport Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.
Indianapolis Airport Maintenance Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Evacuation Support	'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.
Indianapolis Airport Management Systems	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Environmental Information Processing	'MCM Environmental Information Processing' processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. The processed environmental information products are presented to center personnel and disseminated to other centers.
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying) and other material applications, and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.
Indianapolis Airport Management Systems	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Barrier System Management	'TMC Barrier System Management' remotely monitors and controls barrier systems for transportation facilities and infrastructure under control of center personnel. Barrier systems include automatic or remotely controlled gates, barriers and other access control systems. It also provides an interface to other centers to allow monitoring and control of the barriers from other centers (e.g., public safety or emergency operations centers).

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Environmental Monitoring	'TMC Environmental Monitoring' assimilates current and forecast road conditions and surface weather information using a combination of weather service provider information, information collected by other centers such as the Maintenance and Construction Management Center, data collected from environmental sensors deployed on and about the roadway, and information collected from connected vehicles. The collected environmental information is monitored and presented to the operator. This information can be used to issue general traveler advisories and support location specific warnings to drivers.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Evacuation Support	'TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Indianapolis Airport Management Systems	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Indianapolis Airport Management Systems	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Traffic Management Center	TMC Multi-Modal Coordination	'TMC Multi-Modal Coordination' supports center-to-center coordination between the Traffic Management and Transit Management Centers. It monitors transit operations and provides traffic signal priority for transit vehicles on request from the Transit Management Center.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).
Indianapolis Airport Management Systems	Traffic Management Center	TMC Safeguard System Management	'TMC Safeguard System Management' remotely monitors and controls safeguard systems for transportation facilities and infrastructure. Safeguard systems include blast shielding, exhaust systems and other automatic or remotely controlled systems intended to mitigate the impact of an incident. When access to a transportation facility is impacted by the activation of a safeguard system, impacted systems and travelers are notified.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Management Systems	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.
Indianapolis Airport Management Systems	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.
Indianapolis Airport Parking Area Equipment	Parking Area Equipment	Parking Area Electronic Payment	'Parking Area Electronic Payment' supports electronic payment of parking fees using in-vehicle equipment (e.g., tags) or contact or proximity cards. It includes the field elements that provide the interface to the in-vehicle or card payment device and the back-office functionality that performs the transaction.
Indianapolis Airport Parking Area Equipment	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Parking System	Parking Management Center	Parking Account and Fee Management	'Parking Account and Fee Management' manages parking fare collection at the Parking Management Center. It provides the back office functions that support control of field parking management systems, supporting payment reconciliation with links to financial institutions. It loads fee data into field systems when those systems are initialized or whenever such information is modified.
Indianapolis Airport Parking System	Parking Management Center	Parking Coordination	'Parking Coordination' supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic management systems. Coordination with traffic management supports local traffic control coordination in and around the parking facility and broader regional coordination. It also shares information with transit management systems and information providers to support multimodal travel planning, including parking reservations capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.
Indianapolis Airport Parking System	Parking Management Center	Parking Management	'Parking Management' monitors parking area operations for one or more parking areas, monitoring current operational status including current parking occupancy and rates supporting back office operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Airport Parking System	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.
Indianapolis Airport Parking System	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
Indianapolis Airport Parking System	Transportation Information Center	TIC Traveler Telephone Information	'TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>
Indianapolis DPW Operations Center	Emissions Management Center	Emissions Connected Vehicle Monitoring	<p>'Emissions Connected Vehicle Monitoring' collects emissions data reported by passing vehicles and uses this data to support air quality management and planning. Coordination with traffic management supports air quality-responsive management of traffic.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Emissions Management Center	Emissions Data Collection	'Emissions Data Collection' collects and stores air quality and emissions management information that is collected in the course of Emissions Management Center operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis DPW Operations Center	Emissions Management Center	Emissions Data Management	'Emissions Data Management' collects and stores air quality and vehicle emissions information by remotely monitoring and controlling area wide and point sensors. General air quality measures are distributed as general traveler information and also may be used in demand management programs. Collected roadside emissions are analyzed and used to detect, identify, and notify concerned parties regarding vehicles that exceed emissions standards.
Indianapolis DPW Operations Center	Emissions Management Center	Emissions Zone Management	'Emissions Zone Management' identifies existing and potential emissions hot spots and coordinates with transportation agencies and their systems to establish low emissions zones to manage air quality in these areas. Through this coordination, the geographic boundary, restrictions, and pricing for the low emissions zone are established and adjusted.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Environmental Information Processing	'MCM Environmental Information Processing' processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. The processed environmental information products are presented to center personnel and disseminated to other centers.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Vehicle Tracking	'MCM Vehicle Tracking' tracks the location of maintenance and construction vehicles and other equipment. Vehicle/equipment location and associated information is presented to the operator.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying) and other material applications, and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Work Activity Coordination	'MCM Work Activity Coordination' disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated with operating agencies, factoring in the needs and activities of other agencies and adjacent jurisdictions. Work schedules are also distributed to Transportation Information Centers for dissemination to the traveling public.
Indianapolis DPW Operations Center	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Demand Management Coordination	'TMC Demand Management Coordination' provides the capability to gather information on regional toll, parking, and transit usage and request changes to pricing and other mechanisms to manage overall transportation demand.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Environmental Monitoring	'TMC Environmental Monitoring' assimilates current and forecast road conditions and surface weather information using a combination of weather service provider information, information collected by other centers such as the Maintenance and Construction Management Center, data collected from environmental sensors deployed on and about the roadway, and information collected from connected vehicles. The collected environmental information is monitored and presented to the operator. This information can be used to issue general traveler advisories and support location specific warnings to drivers.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Evacuation Support	'TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Indianapolis DPW Operations Center	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Multi-Modal Coordination	'TMC Multi-Modal Coordination' supports center-to-center coordination between the Traffic Management and Transit Management Centers. It monitors transit operations and provides traffic signal priority for transit vehicles on request from the Transit Management Center.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Reversible Lane Management	'TMC Reversible Lane Management' remotely monitors and controls reversible lanes. It provides an interface to reversible lane field equipment (traffic sensors, surveillance equipment, lane control signals, physical lane access controls, etc.) and to traffic operations personnel to support central monitoring and control of these facilities.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).
Indianapolis DPW Operations Center	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Traffic Management Decision Support	<p>'TMC Traffic Management Decision Support' recommends courses of action to the traffic operator based on current and forecast road and traffic conditions. Traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand are monitored. Historical data and models are used to compare the impact of potential courses of action and make recommendations to the operator. Decisions are supported through presentation of filtered and fused network-wide road and traffic conditions that identify network imbalances and recommended courses of action. The recommended actions may include predefined incident response plans, signal timing plan changes, DMS/HAR messages, truck restrictions, lane control strategies, metering strategies, and adjustment of variable speed limits. Multimodal strategies may also be recommended that include suggested transit strategies and suggested route and mode choices for travelers. Once a course of action is selected, traffic operations personnel implement these actions within the Traffic Management Center and coordinate the response with other centers in the region.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Operations Center	Traffic Management Center	TMC Traffic Network Performance Evaluation	'TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.
Indianapolis DPW Operations Center	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.
Indianapolis DPW Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Intersection Management	'RSE Intersection Management' uses short range communications to support connected vehicle applications that manage signalized intersections. It communicates with approaching vehicles and ITS infrastructure (e.g., the traffic signal controller) to enhance traffic signal operations. Coordination with the ITS infrastructure also supports conflict monitoring to ensure the RSE output and traffic signal control output are consistent and degrade in a fail safe manner.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Reversible Lanes	'Roadway Reversible Lanes' includes field elements that monitor and control reversible lane facilities. It includes the traffic sensors, surveillance equipment, lane control signals, physical lane access controls, and other field elements that manage traffic on these facilities. It provides current reversible lane facility status information and accepts requests and control commands from the controlling center.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Indianapolis DPW Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Location Tracking	'MCV Vehicle Location Tracking' monitors vehicle location and reports the position and timestamp information to the dispatch center.
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Indianapolis DPW Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Evacuation Support	'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Notification Support	'Emergency Notification Support' receives emergency notification messages from vehicles or personal handheld devices, determines an appropriate response, and either uses internal resources or contacts a local agency to provide that response. The nature of the emergency is determined based on the information in the received message as well as other inputs. This object effectively serves as an interface between automated collision notification systems and the local public safety answering point for messages that require a public safety response. This capability depends on an up-to-date registry of public safety answering points/response agencies by coverage area, the type of emergency, and hours of service.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Fire Communications Center	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Indianapolis Fire Department Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Indianapolis Fire Department Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis MPO Planning Operations	Transportation Information Center	TIC Operations Data Collection	'TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis Police Department Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Indianapolis Police Department Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Indianapolis Police Dispatch	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Indianapolis Police Dispatch	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Indianapolis Police Dispatch	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Indianapolis Police Dispatch	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Indianapolis Police Dispatch	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
INDOT Arterial Cameras and Controllers	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
INDOT Arterial Cameras and Controllers	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Arterial TMS	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
INDOT Arterial TMS	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
INDOT Arterial TMS	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Arterial TMS	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).
INDOT Arterial TMS	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
INDOT Arterial TMS	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Arterial TMS	Traffic Management Center	TMC Traffic Metering	'TMC Traffic Metering' provides center monitoring and control of traffic metering systems including on ramps, through interchanges, and on the mainline roadway. All types of metering are covered including pre-timed/fixed time, time-based, dynamic and adaptive metering strategies and special bypasses. Metering rates can be calculated based upon historical data or current conditions including traffic, air quality, etc.
INDOT Arterial Traffic Signals and Detection	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
INDOT Arterial Traffic Signals and Detection	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.
INDOT Arterial Traffic Signals and Detection	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Arterial Traffic Signals and Detection	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Arterial Traffic Signals and Detection	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
INDOT Hoosier Helper Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Hoosier Helper Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
INDOT Hoosier Helper Vehicles	Emergency Vehicle OBE	EV Service Patrol Vehicle Operations	'EV Service Patrol Vehicle Operations' provides on-board processing and communications to service patrol vehicles that reduce response times and improve safety of responding personnel. It supports service patrol vehicle dispatch and provides incident information back to the dispatching center.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Archived Data System	Archive Data Repository	'Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.
INDOT Indianapolis TMC	Archived Data System	Archive Situation Data Archival	'Archive Situation Data Archival' collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. It controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes, rather than for traffic management. It also collects situation data from connected vehicles. The data collected, quality checks performed, and aggregation strategies are defined to support transportation system performance monitoring and management.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
INDOT Indianapolis TMC	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
INDOT Indianapolis TMC	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
INDOT Indianapolis TMC	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
INDOT Indianapolis TMC	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Incident Command	<p>'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
INDOT Indianapolis TMC	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Environmental Information Processing	'MCM Environmental Information Processing' processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. The processed environmental information products are presented to center personnel and disseminated to other centers.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	'MCM Reduced Speed Zone Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Work Activity Coordination	'MCM Work Activity Coordination' disseminates work activity schedules and current asset restrictions to other agencies. Work schedules are coordinated with operating agencies, factoring in the needs and activities of other agencies and adjacent jurisdictions. Work schedules are also distributed to Transportation Information Centers for dissemination to the traveling public.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
INDOT Indianapolis TMC	Maint and Constr Management Center	MCM Work Zone Safety Management	'MCM Work Zone Safety Management' remotely monitors work zone safety systems that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Barrier System Management	'TMC Barrier System Management' remotely monitors and controls barrier systems for transportation facilities and infrastructure under control of center personnel. Barrier systems include automatic or remotely controlled gates, barriers and other access control systems. It also provides an interface to other centers to allow monitoring and control of the barriers from other centers (e.g., public safety or emergency operations centers).
INDOT Indianapolis TMC	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
INDOT Indianapolis TMC	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
INDOT Indianapolis TMC	Traffic Management Center	TMC Demand Management Coordination	'TMC Demand Management Coordination' provides the capability to gather information on regional toll, parking, and transit usage and request changes to pricing and other mechanisms to manage overall transportation demand.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Dynamic Lane Management and Shoulder Use	'TMC Dynamic Lane Management and Shoulder Use' remotely monitors and controls the system that is used to dynamically manage travel lanes, including temporary use of shoulders as travel lanes. It monitors traffic conditions and demand measured in the field and determines when the lane configuration of the roadway should be changed, when intersections and/or interchanges should be reconfigured, when the shoulders should be used for travel (as a lane), when lanes should be designated for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. and/or when types of vehicles should be prohibited or restricted from using particular lanes. It controls the field equipment used to manage and control specific lanes and the shoulders. It also can automatically notify the enforcement agency of lane control violations.
INDOT Indianapolis TMC	Traffic Management Center	TMC Environmental Monitoring	'TMC Environmental Monitoring' assimilates current and forecast road conditions and surface weather information using a combination of weather service provider information, information collected by other centers such as the Maintenance and Construction Management Center, data collected from environmental sensors deployed on and about the roadway, and information collected from connected vehicles. The collected environmental information is monitored and presented to the operator. This information can be used to issue general traveler advisories and support location specific warnings to drivers.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Evacuation Support	'TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.
INDOT Indianapolis TMC	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
INDOT Indianapolis TMC	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.
INDOT Indianapolis TMC	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
INDOT Indianapolis TMC	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.
INDOT Indianapolis TMC	Traffic Management Center	TMC Restricted Lanes CV Application	'TMC Restricted Lanes CV Application' manages dynamic lanes for connected vehicles. The application provides the back office functions and supports the TMC operator in establishing and managing dynamic lanes using communications to manage lane use for connected vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).
INDOT Indianapolis TMC	Traffic Management Center	TMC Safeguard System Management	'TMC Safeguard System Management' remotely monitors and controls safeguard systems for transportation facilities and infrastructure. Safeguard systems include blast shielding, exhaust systems and other automatic or remotely controlled systems intended to mitigate the impact of an incident. When access to a transportation facility is impacted by the activation of a safeguard system, impacted systems and travelers are notified.
INDOT Indianapolis TMC	Traffic Management Center	TMC Service Patrol Management	'TMC Service Patrol Management' supports dispatch and communication with service patrol vehicles that monitor roads to aid motorists, offering rapid response to minor incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Speed Warning	'TMC Speed Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.
INDOT Indianapolis TMC	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Traffic Management Decision Support	'TMC Traffic Management Decision Support' recommends courses of action to the traffic operator based on current and forecast road and traffic conditions. Traffic incidents, special events, maintenance activities and other events or conditions that impact capacity or demand are monitored. Historical data and models are used to compare the impact of potential courses of action and make recommendations to the operator. Decisions are supported through presentation of filtered and fused network-wide road and traffic conditions that identify network imbalances and recommended courses of action. The recommended actions may include predefined incident response plans, signal timing plan changes, DMS/HAR messages, truck restrictions, lane control strategies, metering strategies, and adjustment of variable speed limits. Multimodal strategies may also be recommended that include suggested transit strategies and suggested route and mode choices for travelers. Once a course of action is selected, traffic operations personnel implement these actions within the Traffic Management Center and coordinate the response with other centers in the region.
INDOT Indianapolis TMC	Traffic Management Center	TMC Traffic Metering	'TMC Traffic Metering' provides center monitoring and control of traffic metering systems including on ramps, through interchanges, and on the mainline roadway. All types of metering are covered including pre-timed/fixed time, time-based, dynamic and adaptive metering strategies and special bypasses. Metering rates can be calculated based upon historical data or current conditions including traffic, air quality, etc.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Traffic Management Center	TMC Traffic Network Performance Evaluation	'TMC Traffic Network Performance Evaluation' measures traffic network performance and predicts travel demand patterns to support traffic flow optimization, demand management, and incident management. It collects traffic data from sensors and surveillance equipment as well as input from other Traffic Management Centers, emissions management, transit operations, and event promoters and uses this information to measure traffic network performance. It collects route planning information from transportation information centers and integrates and uses this information to predict future traffic conditions. The planned control strategies can be passed back to the transportation information center so that the intended strategies can be reflected in future route planning.
INDOT Indianapolis TMC	Traffic Management Center	TMC Variable Speed Limits	'TMC Variable Speed Limits' provides center monitoring and control of variable speed limits systems. It monitors data on traffic and environmental conditions collected from sensors along the roadway. Based on the measured data, it calculates and sets suitable speed limits usually by lane. It controls equipment that posts the current speed limits and displays additional information such as basic safety rules and current traffic information to drivers.
INDOT Indianapolis TMC	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
INDOT Indianapolis TMC	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Transportation Information Center	TIC Emergency Traveler Information	'TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.
INDOT Indianapolis TMC	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
INDOT Indianapolis TMC	Transportation Information Center	TIC Operations Data Collection	'TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Transportation Information Center	TIC Traffic Control Dissemination	'TIC Traffic Control Dissemination' disseminates intersection status, lane control information, and other traffic control related information that is real-time or near real-time in nature and relevant to vehicles in a relatively local area on the road network. It collects traffic control information from Traffic Management Center(s) and disseminates the relevant information to vehicles and other mobile devices.
INDOT Indianapolis TMC	Transportation Information Center	TIC Traveler Information Broadcast	'TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.
INDOT Indianapolis TMC	Transportation Information Center	TIC Traveler Telephone Information	'TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Indianapolis TMC	Transportation Information Center	TIC Trip Planning	'TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.
INDOT Lane Management Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Lane Management Field Equipment	ITS Roadway Equipment	Roadway Dynamic Lane Management and Shoulder Use	'Roadway Dynamic Lane Management and Shoulder Use' includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control specific lanes and/or the shoulders. This equipment can be centrally controlled by a Traffic Management Center or it can be autonomous and monitor traffic conditions and demand along the roadway and determine how to change the lane controls to respond to current conditions. Lane controls can be used to change the lane configuration of the roadway, reconfigure intersections and/or interchanges, allow use of shoulders as temporary travel lanes, designate lanes for use by special vehicles only, such as buses, high occupancy vehicles (HOVs), vehicles attending a special event, etc. and/or prohibit or restrict types of vehicles from using particular lanes. Guidance and information for drivers can be posted on dynamic message signs.
INDOT Lane Management Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
INDOT MCO Field Devices	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Automated Treatment	'Roadway Automated Treatment' automatically treats a roadway section based on environmental or atmospheric conditions or under center control. Treatments include fog dispersion, anti-icing chemicals, etc. It communicates with the center and environmental sensors to support system activation and optionally with sign(s) that warn the driver in adverse conditions when the system is activated.
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Environmental Monitoring	'Roadway Environmental Monitoring' measures environmental conditions and communicates the collected information back to a center where it can be monitored and analyzed or to other field devices to support communications to vehicles. A broad array of weather and road surface information may be collected. Weather conditions that may be measured include temperature, wind, humidity, precipitation, and visibility. Surface and sub-surface sensors can measure road surface temperature, moisture, icing, salinity, and other metrics.
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Incident Detection	'Roadway Incident Detection' provides incident detection using traffic detectors and surveillance equipment. It monitors for unusual traffic conditions that may indicate an incident or processes surveillance images, watching for potential incidents. It provides potential incident information as well as traffic flow and images to the center for processing and presentation to traffic operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
INDOT MCO Field Devices	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.
INDOT MCO Management	Maint and Constr Management Center	MCM Automated Treatment System Control	'MCM Automated Treatment System Control' remotely monitors and controls automated road treatment systems that disperse anti-icing chemicals or otherwise treat a road segment. The automated treatment system may be remotely activated by this object or it may include environmental sensors that activate the system automatically based on sensed environmental conditions. This object monitors treatment system operation, sets operating parameters, and directly controls system activation if necessary.
INDOT MCO Management	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Management	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.
INDOT MCO Management	Maint and Constr Management Center	MCM Environmental Information Processing	'MCM Environmental Information Processing' processes current and forecast weather data, road condition information, local environmental data, and uses internal models to develop specialized detailed forecasts of local weather and surface conditions. The processed environmental information products are presented to center personnel and disseminated to other centers.
INDOT MCO Management	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
INDOT MCO Management	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Management	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.
INDOT MCO Management	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
INDOT MCO Management	Maint and Constr Management Center	MCM Traffic Information Dissemination	'MCM Traffic Information Dissemination' uses dynamic message signs to disseminate traffic and road conditions, closure and detour information, incident information, driver advisories, and other maintenance-related data. It monitors and controls driver information system field equipment including dynamic message signs, managing dissemination of driver information through these systems.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Management	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
INDOT MCO Management	Maint and Constr Management Center	MCM Vehicle Tracking	'MCM Vehicle Tracking' tracks the location of maintenance and construction vehicles and other equipment. Vehicle/equipment location and associated information is presented to the operator.
INDOT MCO Management	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.
INDOT MCO Management	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Location Tracking	'MCV Vehicle Location Tracking' monitors vehicle location and reports the position and timestamp information to the dispatch center.
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
INDOT MCO Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.
INDOT Ramp Metering System	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
INDOT Ramp Metering System	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
INDOT Ramp Metering System	ITS Roadway Equipment	Roadway Traffic Metering	'Roadway Traffic Metering' includes the field equipment used to meter traffic on ramps, through interchanges, and on the mainline roadway. The equipment includes dynamic messages signs to provide guidance and information to drivers at and approaching a meter, including information for any special bypass lanes.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Sensor Monitoring	'Field Secure Area Sensor Monitoring' includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. Bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). A range of acoustic, environmental threat (e.g. Chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.
INDOT Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT TPIMS	Parking Management Center	Parking Coordination	'Parking Coordination' supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic management systems. Coordination with traffic management supports local traffic control coordination in and around the parking facility and broader regional coordination. It also shares information with transit management systems and information providers to support multimodal travel planning, including parking reservations capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.
INDOT TPIMS	Parking Management Center	Parking Data Collection	'Parking Data Collection' collects and stores parking information that is collected in the course of parking system operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
INDOT TPIMS	Parking Management Center	Parking Management	'Parking Management' monitors parking area operations for one or more parking areas, monitoring current operational status including current parking occupancy and rates supporting back office operations.
INDOT TPIMS	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT TPIMS Equipment	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.
INDOT Variable Speed Limits Field Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
INDOT Variable Speed Limits Field Equipment	ITS Roadway Equipment	Roadway Environmental Monitoring	'Roadway Environmental Monitoring' measures environmental conditions and communicates the collected information back to a center where it can be monitored and analyzed or to other field devices to support communications to vehicles. A broad array of weather and road surface information may be collected. Weather conditions that may be measured include temperature, wind, humidity, precipitation, and visibility. Surface and sub-surface sensors can measure road surface temperature, moisture, icing, salinity, and other metrics.
INDOT Variable Speed Limits Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	'Roadway Speed Monitoring and Warning' includes the field elements that monitor vehicle speeds. If the speed is determined to be excessive, an advisory or warning is displayed. Current environmental conditions and other factors that may reduce safe operating speeds may also be taken into account. The operational status (state of the device, configuration, and fault data) is provided to the center. This application can also provide an enforcement function, reporting speed violations to an enforcement agency.
INDOT Variable Speed Limits Field Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.

Element Name	Physical Object	Functional Object	Functional Object Description
INDOT Variable Speed Limits Field Equipment	ITS Roadway Equipment	Roadway Variable Speed Limits	'Roadway Variable Speed Limits' includes the field equipment, physical overhead lane signs and associated control electronics that are used to manage and control variable speed limits systems. This equipment monitors traffic and environmental conditions along the roadway. The system can be centrally monitored and controlled by a Traffic Management Center or it can be autonomous, calculating and setting suitable speed limits, usually by lane. This application displays the speed limits and additional information such as basic safety rules and current traffic information to drivers.
INDOT Work Zone Speed Monitoring Field Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	'Roadway Work Zone Safety' includes field elements that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.
INDOT Work Zone Speed Warning Field Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	'Roadway Speed Monitoring and Warning' includes the field elements that monitor vehicle speeds. If the speed is determined to be excessive, an advisory or warning is displayed. Current environmental conditions and other factors that may reduce safe operating speeds may also be taken into account. The operational status (state of the device, configuration, and fault data) is provided to the center. This application can also provide an enforcement function, reporting speed violations to an enforcement agency.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Kiosks	Traveler Support Equipment	Transit Stop Information Services	'Transit Stop Information Services' furnishes transit users with real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas. It provides transit users with information on transit routes, schedules, transfer options, available services, fares, and real-time schedule adherence. In addition to tailored information for individual transit users, it supports general annunciation and/or display of imminent arrival information and other information of general interest to transit users.
IndyGo Kiosks	Traveler Support Equipment	Traveler Fare Management	'Traveler Fare Management' provides the capability for the traveler to access and use a common fare medium for transit fares, tolls, shared use, and/or parking lot charges using a public device at or near the point of service. It accepts a service request and means of payment or smart card, verifies eligibility, calculates the amount due, collects payment (or deducts balance if smart card), manages allow/block lists, performs token validation, and identifies payment problems. It may be implemented using a card reader/dispenser in a point of sale device that includes a communications interface to the financial infrastructure to support payment collection and reconciliation.
IndyGo Kiosks	Traveler Support Equipment	Traveler Interactive Information	'Traveler Interactive Information' provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. It also supports interactive services that support enrollment, account management, and payments for transportation services. The interactive traveler information capability is provided by a public traveler interface, such as a kiosk.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Kiosks	Traveler Support Equipment	Traveler Trip Planning	'Traveler Trip Planning' provides a personalized trip plan to the traveler. The trip plan is calculated based on preferences and constraints supplied by the traveler and provided to the traveler for confirmation. It represents kiosks and other fixed public interactive displays that may be used by travelers in public areas.
IndyGo Operations Center	Archived Data System	Archive Data Repository	'Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Archived Data System	Archive Situation Data Archival	'Archive Situation Data Archival' collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. It controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes, rather than for traffic management. It also collects situation data from connected vehicles. The data collected, quality checks performed, and aggregation strategies are defined to support transportation system performance monitoring and management.
IndyGo Operations Center	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Emergency Management Center	Emergency Response Management	'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.
IndyGo Operations Center	Emergency Management Center	Emergency Secure Area Alarm Support	'Emergency Secure Area Alarm Support' receives traveler or transit vehicle operator alarm messages, notifies the system operator, and provides acknowledgement of alarm receipt back to the originator of the alarm. The alarms received can be generated by silent or audible alarm systems and may originate from public areas (e.g. transit stops, park and ride lots, transit stations, rest areas) or transit vehicles. The nature of the emergency may be determined based on the information in the alarm message as well as other inputs.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.
IndyGo Operations Center	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Parking Area Equipment	Parking Area Electronic Payment	'Parking Area Electronic Payment' supports electronic payment of parking fees using in-vehicle equipment (e.g., tags) or contact or proximity cards. It includes the field elements that provide the interface to the in-vehicle or card payment device and the back-office functionality that performs the transaction.
IndyGo Operations Center	Parking Management Center	Parking Account and Fee Management	'Parking Account and Fee Management' manages parking fare collection at the Parking Management Center. It provides the back office functions that support control of field parking management systems, supporting payment reconciliation with links to financial institutions. It loads fee data into field systems when those systems are initialized or whenever such information is modified.
IndyGo Operations Center	Parking Management Center	Parking Data Collection	'Parking Data Collection' collects and stores parking information that is collected in the course of parking system operations. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
IndyGo Operations Center	Shared Use Transportation Center	Shared Use Account and Fee Management	'Shared Use Account and Fee Management' manages user accounts and payments at the Shared Use Transportation Center. It provides the back office functions that support payment reconciliation with links to financial institutions.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transit Management Center	Transit Center Connection Protection	'Transit Center Connection Protection' manages the coordination of transit transfers between routes within a single transit agency, between routes of different transit agencies, or between different modes (e.g. a bus transit route and a ferry route). This functional object also supports the capability for an individual traveler to obtain connection protection throughout a specific transit trip. This application may be implemented through peer-to-peer sharing between agencies control systems or as a central transit transfer request brokerage that facilitates the management and coordination of transfers across multiple agencies and control systems.
IndyGo Operations Center	Transit Management Center	Transit Center Data Collection	'Transit Center Data Collection' collects and stores transit information that is collected in the course of transit operations performed by the Transit Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
IndyGo Operations Center	Transit Management Center	Transit Center Fare Management	'Transit Center Fare Management' manages fare collection and passenger load management at the transit center. It provides the back office functions that support transit fare collection, supporting payment reconciliation with links to financial institutions and enforcement agencies for fare violations. It collects data required to determine accurate ridership levels, establish fares, and distribute fare information. It loads fare data into the vehicle prior to the beginning of normal operations and unloads fare collection data from the vehicle at the close out of normal operations. It manages allow/block lists and performs token validation.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transit Management Center	Transit Center Fixed-Route Operations	'Transit Center Fixed-Route Operations' manages fixed route transit operations. It supports creation of schedules, blocks and runs for fixed and flexible route transit services. It allows fixed-route and flexible-route transit services to disseminate schedules and automatically updates customer service operator systems with the most current schedule information. It also supports automated dispatch of transit vehicles. Current vehicle schedule adherence and optimum scenarios for schedule adjustment are also provided. It also receives and processes transit vehicle loading data.
IndyGo Operations Center	Transit Management Center	Transit Center Information Services	'Transit Center Information Services' collects the latest available information for a transit service and makes it available to transit customers and to Transportation Information Centers for further distribution. Customers are provided information at transit stops and other public transportation areas before they embark and on-board the transit vehicle once they are en route. Information provided can include the latest available information on transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, yellow pages, and special events. In addition to general service information, tailored information (e.g., itineraries) are provided to individual transit users.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transit Management Center	Transit Center Multi-Modal Coordination	'Transit Center Multi-Modal Coordination' supports transit service coordination between transit properties and coordinates with other surface and air transportation modes. As part of service coordination, it shares schedule and trip information, as well as transit transfer cluster (a collection of stop points, stations, or terminals where transfers can be made conveniently) and transfer point information between Multimodal Transportation Service Providers, Transit Agencies, and ISPs. An interface to Traffic Management also supports demand management strategies.
IndyGo Operations Center	Transit Management Center	Transit Center Operator Assignment	'Transit Center Operator Assignment' automates and supports the assignment of transit vehicle operators to runs. It assigns operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. It also provides an exception handling process for the operator assignment function to generate supplemental operator assignments when required by changes during the operating day.
IndyGo Operations Center	Transit Management Center	Transit Center Paratransit Operations	'Transit Center Paratransit Operations' manages demand responsive transit services, including paratransit services. It supports planning and scheduling of these services, allowing paratransit and other demand response transit services to plan efficient routes and better estimate arrival times. It also supports automated dispatch of paratransit vehicles and tracks passenger pick-ups and drop-offs. Customer service operator systems are updated with the most current schedule information.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transit Management Center	Transit Center Priority Management	'Transit Center Priority Management' monitors transit schedule performance and generates requests for transit priority on routes and at certain intersections. It may coordinate with the Traffic Management Center to provide transit priority along the selected route, including allocation of dynamic lanes and granting signal priority. It also coordinates with the Transit Vehicle OBE to monitor and manage local transit signal priority requests at individual intersections.
IndyGo Operations Center	Transit Management Center	Transit Center Security	'Transit Center Security' monitors transit vehicle operator or traveler activated alarms received from on-board a transit vehicle. It supports transit vehicle operator authentication and provides the capability to remotely disable a transit vehicle. It also includes the capability to alert operators and police to potential incidents identified by these security features.
IndyGo Operations Center	Transit Management Center	Transit Center Vehicle Assignment	'Transit Center Vehicle Assignment' assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle. It also provides an exception handling process for the vehicle assignment function to generate new, supplemental vehicle assignments when required by changes during the operating day. It provides an inventory management function for the transit facility which stores functional attributes about each of the vehicles owned by the transit operator. These attributes permit the planning and assignment functions to match vehicles with routes based on suitability for the types of service required by the particular routes.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transit Management Center	Transit Center Vehicle Tracking	'Transit Center Vehicle Tracking' monitors transit vehicle location. The location information is collected via a data communication link between the transit vehicles and the transit center. The location information is presented to the transit operator on a digitized map of the transit service area. The location data may be used to determine real time schedule adherence and update the transit system's schedule in real-time. The real-time schedule information is disseminated to other information providers, which furnish the information to travelers.
IndyGo Operations Center	Transit Management Center	Transit Evacuation Support	'Transit Evacuation Support' manages transit resources to support evacuation and subsequent reentry of a population in the vicinity of a disaster or other emergency. It supports coordination of regional evacuation plans, identifying the transit role in a regional evacuation and identifying transit resources that would be used. During an evacuation, it coordinates the use of transit and school bus fleets, supporting evacuation of those with special needs and the general population. Transit service and fare schedules are adjusted and updated service and fare information is made available through traveler information systems.
IndyGo Operations Center	Transit Management Center	Transit Garage Maintenance	'Transit Garage Maintenance' provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data. In addition, it provides information to service personnel to support maintenance activities and records and verifies that maintenance work was performed.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
IndyGo Operations Center	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.
IndyGo Operations Center	Transportation Information Center	TIC Dynamic Ridesharing	'TIC Dynamic Ridesharing' provides dynamic rideshare matches for eligible travelers, connecting riders and drivers for specific trips based on preferences. This ridesharing/ride matching capability also arranges connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing. Reservations and advanced payment are also supported so that each segment of the trip may be confirmed.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
IndyGo Operations Center	Transportation Information Center	TIC Operations Data Collection	'TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
IndyGo Operations Center	Transportation Information Center	TIC Payment Support	'TIC Payment Support' supports user payments for traveler services that are provided by or procured through the Transportation Information Center (TIC).
IndyGo Operations Center	Transportation Information Center	TIC Traffic Control Dissemination	'TIC Traffic Control Dissemination' disseminates intersection status, lane control information, and other traffic control related information that is real-time or near real-time in nature and relevant to vehicles in a relatively local area on the road network. It collects traffic control information from Traffic Management Center(s) and disseminates the relevant information to vehicles and other mobile devices.
IndyGo Operations Center	Transportation Information Center	TIC Traveler Information Broadcast	'TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Operations Center	Transportation Information Center	TIC Trip Planning	'TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.
IndyGo Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Sensor Monitoring	'Field Secure Area Sensor Monitoring' includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. Bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). A range of acoustic, environmental threat (e.g. Chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.
IndyGo Security Monitoring Field Equipment	Traveler Support Equipment	Traveler Security	'Traveler Security' provides the capability to report an emergency or summon assistance from secure areas such as transit stops, transit stations, modal transfer facilities, rest stops and picnic areas, park-and-ride areas, tourism and travel information areas, and emergency pull off areas. This object includes interfaces that support initiation of an alarm and presentation of the returned alarm acknowledgement as well as a broadcast message to advise or warn the traveler.
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Fare Management	'Transit Vehicle On-board Fare Management' supports fare collection using a standard fare card or other non-monetary fare medium and detects payment violations, manages allow/block lists and performs token validation. Collected fare data are made available to the center.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Information Services	'Transit Vehicle On-board Information Services' furnishes en route transit users with real-time travel-related information on-board a transit vehicle. Current information that can be provided to transit users includes transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, non-motorized transportation services, and special events are provided. In addition to tailored information for individual transit users, it also supports general annunciation and/or display of general schedule information, imminent arrival information, and other information of general interest to transit users.
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Maintenance	'Transit Vehicle On-Board Maintenance' collects and processes transit vehicle maintenance data on-board the vehicle, including mileage and vehicle operating conditions. This maintenance information is provided to the management center and used to schedule future vehicle maintenance and repair.
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Paratransit Operations	'Transit Vehicle On-board Paratransit Operations' forwards paratransit and flexible-route dispatch requests to the operator and forwards acknowledgements to the center. It coordinates with, and assists the operator in managing multi-stop runs associated with demand responsive transit services including paratransit. It collects transit vehicle passenger data and makes it available to the center.
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle On-Board Trip Monitoring	'Transit Vehicle On-Board Trip Monitoring' tracks vehicle location, monitors fuel usage, collects operational status (doors opened/closed, running times, etc.) and sends the collected, time stamped data to the Transit Management Center.

Element Name	Physical Object	Functional Object	Functional Object Description
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Schedule Management	'Transit Vehicle Schedule Management' monitors schedule performance and identifies corrective actions when a deviation is detected. It provides two-way communication between the transit vehicle and center, enabling the center to communicate with the vehicle operator and monitor on-board systems.
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Security	'Transit Vehicle Security' provides security and safety functions on-board the transit vehicle. It includes surveillance and sensor systems that monitor the on-board environment, silent alarms that can be activated by transit user or vehicle operator, operator authentication, and a remote vehicle disable function. The surveillance equipment includes video (e.g. CCTV cameras), audio systems and/or event recorder systems. The sensor equipment includes threat sensors (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors) and object detection sensors (e.g. metal detectors).
IndyGo Transit Vehicles	Transit Vehicle OBE	Transit Vehicle Signal Priority	'Transit Vehicle Signal Priority' provides the capability for transit vehicles to determine eligibility for priority and request signal priority at signalized intersections, ramps, and interchanges through short range communication with traffic control equipment at the roadside.
Intelligence Fusion Center	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.

Element Name	Physical Object	Functional Object	Functional Object Description
Intelligence Fusion Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Intelligence Fusion Center	Emergency Management Center	Emergency Evacuation Support	'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.

Element Name	Physical Object	Functional Object	Functional Object Description
Intelligence Fusion Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Intelligence Fusion Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Intelligence Fusion Center	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.
Intelligence Fusion Center	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
ISP Dispatch	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
ISP Dispatch	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
ISP Dispatch	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
ISP Dispatch	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Incident Command	<p>'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
ISP Dispatch	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
ISP Dispatch	Traffic Management Center	TMC Evacuation Support	'TMC Evacuation Support' supports development, coordination, and execution of special traffic management strategies during evacuation and subsequent reentry of a population in the vicinity of a disaster or major emergency. A traffic management strategy is developed based on anticipated demand, the capacity of the road network including access to and from the evacuation routes, and existing and forecast conditions. The strategy supports efficient evacuation and also protects and optimizes movement of response vehicles and other resources that are responding to the emergency.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
ISP Dispatch	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
ISP Dispatch	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Traffic Management Center	TMC Speed Warning	'TMC Speed Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.
ISP Dispatch	Traffic Management Center	TMC Traffic Information Dissemination	'TMC Traffic Information Dissemination' disseminates traffic and road conditions, closure and detour information, incident information, driver advisories, and other traffic-related data to other centers, the media, and driver information systems. It monitors and controls driver information system field equipment including dynamic message signs and highway advisory radio, managing dissemination of driver information through these systems.
ISP Dispatch	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Transportation Information Center	TIC Emergency Traveler Information	'TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.
ISP Dispatch	Transportation Information Center	TIC Operations Data Collection	'TIC Operations Data Collection' collects and stores information that is collected about the transportation information service including data on the number of clients serviced and the services that were provided. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
ISP Dispatch	Transportation Information Center	TIC Traffic Control Dissemination	'TIC Traffic Control Dissemination' disseminates intersection status, lane control information, and other traffic control related information that is real-time or near real-time in nature and relevant to vehicles in a relatively local area on the road network. It collects traffic control information from Traffic Management Center(s) and disseminates the relevant information to vehicles and other mobile devices.

Element Name	Physical Object	Functional Object	Functional Object Description
ISP Dispatch	Transportation Information Center	TIC Traveler Telephone Information	'TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.
ISP Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
ISP Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Lawrence Public Safety	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Lawrence Public Safety	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Lawrence Public Safety	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Lawrence Public Safety	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Safety	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Lawrence Public Works/Street Department	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Lawrence Public Works/Street Department	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Public Works/Street Department	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.
Lawrence Public Works/Street Department	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	<p>'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.</p>
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Lawrence Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Lawrence Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
Lawrence Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.

Element Name	Physical Object	Functional Object	Functional Object Description
Lawrence Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Lawrence Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.
Lawrence Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Lawrence Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.

Element Name	Physical Object	Functional Object	Functional Object Description
Lucas Oil Stadium Command Center	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Lucas Oil Stadium Command Center	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Lucas Oil Stadium Command Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Lucas Oil Stadium Command Center	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.

Element Name	Physical Object	Functional Object	Functional Object Description
Major Employer Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Major Employer Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
Major Employer Management Systems	Emergency Management Center	Emergency Call- Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.

Element Name	Physical Object	Functional Object	Functional Object Description
Major Employer Management Systems	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Major Employer Management Systems	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Major Employer Management Systems	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Major Employer Management Systems	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Major Employer Management Systems	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Major Employer Management Systems	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.

Element Name	Physical Object	Functional Object	Functional Object Description
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Marion County Sheriff Dispatch	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Marion County Sheriff Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Marion County Sheriff Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
MESA System	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
MESA System	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
MESA System	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
MESA System	Emergency Management Center	Emergency Incident Command	<p>'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
MESA System	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
MESA System	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Micro-Mobility Services	Shared Use Transportation Center	Shared Use Account and Fee Management	'Shared Use Account and Fee Management' manages user accounts and payments at the Shared Use Transportation Center. It provides the back office functions that support payment reconciliation with links to financial institutions.
Micro-Mobility Services	Shared Use Transportation Center	Shared Use Operations	'Shared Use Operations' provides shared use services for eligible travelers, connecting with travelers for specific trips or vehicle usage based on preferences. It also provides the traveler with information about the shared use vehicle (including location information) and provides access codes to either the traveler or directly to the vehicle. Reservations and advanced payment are also supported so that each segment of the shared use/ trip may be confirmed.
Other Suburban Municipality Street Department Dispatch	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.

Element Name	Physical Object	Functional Object	Functional Object Description
Payment Administration Center	Payment Administration Center	PAC Payment Administration	'PAC Payment Administration' provides administration and management of payments associated with electronic toll collection, parking payments, and other e-payments. It provides the back office functions that support enrollment, pricing, reduced fare eligibility, payment reconciliation with financial institutions, and violation notification to enforcement agencies. It also supports dynamic pricing to support demand management, allow/block-list management and token validation.
Personal Computing Devices	Personal Information Device	Personal Interactive Traveler Information	'Personal Interactive Traveler Information' provides traffic information, road conditions, transit information, yellow pages (traveler services) information, special event information, and other traveler information that is specifically tailored based on the traveler's request and/or previously submitted traveler profile information. It also supports interactive services that support enrollment, account management, and payments for transportation services. The interactive traveler information capability is provided by personal devices including personal computers and personal portable devices such as smart phones.
Personal Computing Devices	Personal Information Device	Personal Pedestrian Safety	'Personal Pedestrian Safety' improves pedestrian, cyclist, and other vulnerable road user safety by providing personal location information to the infrastructure that can be used to avoid collisions involving vulnerable road users. It may also alert the vulnerable road user of unsafe conditions, augmenting or extending information provided by signals and signs. The information provided and the user interface delivery mechanism (visual, audible, or haptic) can also be tailored to the needs of the user that is carrying or wearing the device that hosts the application.

Element Name	Physical Object	Functional Object	Functional Object Description
Personal Computing Devices	Personal Information Device	Personal Traveler Information Reception	'Personal Traveler Information Reception' receives formatted traffic advisories, road conditions, traffic regulations, transit information, broadcast alerts, and other general traveler information broadcasts and presents the information to the traveler. The traveler information broadcasts are received by personal devices including personal computers and personal portable devices such as smart phones.
Personal Computing Devices	Personal Information Device	Personal Trip Planning and Route Guidance	'Personal Trip Planning and Route Guidance' provides a personalized trip plan to the traveler. The trip plan is calculated based on preferences and constraints supplied by the traveler and provided to the traveler for confirmation. Coordination may continue during the trip so that the route plan can be modified to account for new information. Many equipment configurations are possible including systems that provide a basic trip plan to the traveler as well as more sophisticated systems that can provide transition by transition guidance to the traveler along a multi-modal route with transfers. Devices represented by this functional object include desktop computers at home, work, or at major trip generation sites, plus personal devices such as tablets and smart phones.
Private Parking Area Equipment	Parking Area Equipment	Parking Area Electronic Payment	'Parking Area Electronic Payment' supports electronic payment of parking fees using in-vehicle equipment (e.g., tags) or contact or proximity cards. It includes the field elements that provide the interface to the in-vehicle or card payment device and the back-office functionality that performs the transaction.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Parking Area Equipment	Parking Area Equipment	Parking Area Management	'Parking Area Management' detects and classifies vehicles at parking facility entrances, exits, and other designated locations within the facility. Current parking availability is monitored and used to inform drivers through dynamic message signs/displays so that vehicles are efficiently routed to available spaces. Parking facility information, including current parking rates and directions to entrances and available exits, is also provided to drivers.
Private Parking Management System	Parking Management Center	Parking Account and Fee Management	'Parking Account and Fee Management' manages parking fare collection at the Parking Management Center. It provides the back office functions that support control of field parking management systems, supporting payment reconciliation with links to financial institutions. It loads fee data into field systems when those systems are initialized or whenever such information is modified.
Private Parking Management System	Parking Management Center	Parking Coordination	'Parking Coordination' supports communication and coordination between equipped parking facilities and also supports regional coordination between parking facilities and traffic management systems. Coordination with traffic management supports local traffic control coordination in and around the parking facility and broader regional coordination. It also shares information with transit management systems and information providers to support multimodal travel planning, including parking reservations capabilities. Information including current parking availability, system status, and operating strategies are shared to enable local parking facility management that supports regional transportation strategies.
Private Parking Management System	Parking Management Center	Parking Management	'Parking Management' monitors parking area operations for one or more parking areas, monitoring current operational status including current parking occupancy and rates supporting back office operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Towing Companies	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Private Towing Companies	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Private Towing Companies	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Private Towing Companies	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Towing Companies	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Towing Companies	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Private Towing Companies	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Private Traveler Services	Shared Use Transportation Center	Shared Use Account and Fee Management	'Shared Use Account and Fee Management' manages user accounts and payments at the Shared Use Transportation Center. It provides the back office functions that support payment reconciliation with links to financial institutions.
Private Traveler Services	Shared Use Transportation Center	Shared Use Operations	'Shared Use Operations' provides shared use services for eligible travelers, connecting with travelers for specific trips or vehicle usage based on preferences. It also provides the traveler with information about the shared use vehicle (including location information) and provides access codes to either the traveler or directly to the vehicle. Reservations and advanced payment are also supported so that each segment of the shared use/ trip may be confirmed.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Traveler Services	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.
Private Traveler Services	Transportation Information Center	TIC Dynamic Ridesharing	'TIC Dynamic Ridesharing' provides dynamic rideshare matches for eligible travelers, connecting riders and drivers for specific trips based on preferences. This ridesharing/ride matching capability also arranges connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing. Reservations and advanced payment are also supported so that each segment of the trip may be confirmed.
Private Traveler Services	Transportation Information Center	TIC Payment Support	'TIC Payment Support' supports user payments for traveler services that are provided by or procured through the Transportation Information Center (TIC).
Private Traveler Services	Transportation Information Center	TIC Travel Services Information and Reservation	'TIC Travel Services Information' disseminates information about traveler services such as lodging, restaurants, electric vehicle charging, and service stations. Tailored traveler service information is provided on request that meets the constraints and preferences specified by the traveler. This application also supports reservations and advanced payment for traveler services including parking and loading zone use.

Element Name	Physical Object	Functional Object	Functional Object Description
Private Traveler Services	Transportation Information Center	TIC Trip Planning	'TIC Trip Planning' provides pre-trip and en route trip planning services for travelers. It receives origin, destination, constraints, and preferences and returns trip plan(s) that meet the supplied criteria. Trip plans may be based on current traffic and road conditions, transit schedule information, and other real-time traveler information. Candidate trip plans are multimodal and may include vehicle, transit, and alternate mode segments (e.g., rail, ferry, bicycle routes, and walkways) based on traveler preferences. It also confirms the trip plan for the traveler and supports reservations and advanced payment for portions of the trip. The trip plan includes specific routing information and instructions for each segment of the trip and may also include information and reservations for additional services (e.g., parking) along the route.
RWIS Sensors	Connected Vehicle Roadside Equipment	RSE Emissions Monitoring	'RSE Emissions Monitoring' collects emissions data from passing vehicles that are equipped with short range communications capability and have the capability to collect and report emissions data. The collected data includes current emissions as measured or calculated by on-board equipment. The functional object collects the provided data, aggregates and filters the data based on provided configuration parameters, and sends the collected information back to a center for processing and distribution.

Element Name	Physical Object	Functional Object	Functional Object Description
RWIS Sensors	Connected Vehicle Roadside Equipment	RSE Environmental Monitoring	'RSE Environmental Monitoring' collects environmental situation (probe) data from passing vehicles that are equipped with short range communications capability. The collected data includes current environmental conditions as measured by on-board sensors (e.g., ambient temperature and precipitation measures), current status of vehicle systems that can be used to infer environmental conditions (e.g., status of lights, wipers, ABS, and traction control systems), and emissions measures reported by the vehicle. The functional object collects the provided data, aggregates and filters the data based on provided configuration parameters, and sends the collected information back to a center for processing and distribution. This functional object may also process the collected data locally and issue short-term road weather advisories for the road segment using short range communications.
RWIS Sensors	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
RWIS Sensors	Emissions Management Center	Emissions Connected Vehicle Monitoring	'Emissions Connected Vehicle Monitoring' collects emissions data reported by passing vehicles and uses this data to support air quality management and planning. Coordination with traffic management supports air quality-responsive management of traffic.

Element Name	Physical Object	Functional Object	Functional Object Description
RWIS Sensors	Emissions Management Center	Emissions Data Management	'Emissions Data Management' collects and stores air quality and vehicle emissions information by remotely monitoring and controlling area wide and point sensors. General air quality measures are distributed as general traveler information and also may be used in demand management programs. Collected roadside emissions are analyzed and used to detect, identify, and notify concerned parties regarding vehicles that exceed emissions standards.
RWIS Sensors	ITS Roadway Equipment	Roadway Emissions Monitoring	'Roadway Emissions Monitoring' monitors emissions and general air quality and communicates the collected information back to the Emissions Management Center where it can be monitored, analyzed, and used. This functional object supports point monitoring of individual vehicle emissions as well as general monitoring of standard air quality measures.
RWIS Sensors	ITS Roadway Equipment	Roadway Environmental Monitoring	'Roadway Environmental Monitoring' measures environmental conditions and communicates the collected information back to a center where it can be monitored and analyzed or to other field devices to support communications to vehicles. A broad array of weather and road surface information may be collected. Weather conditions that may be measured include temperature, wind, humidity, precipitation, and visibility. Surface and sub-surface sensors can measure road surface temperature, moisture, icing, salinity, and other metrics.
RWIS Sensors	ITS Roadway Equipment	Roadway Incident Detection	'Roadway Incident Detection' provides incident detection using traffic detectors and surveillance equipment. It monitors for unusual traffic conditions that may indicate an incident or processes surveillance images, watching for potential incidents. It provides potential incident information as well as traffic flow and images to the center for processing and presentation to traffic operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
RWIS Sensors	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
School Buses	Transit Management Center	Transit Center Fixed-Route Operations	'Transit Center Fixed-Route Operations' manages fixed route transit operations. It supports creation of schedules, blocks and runs for fixed and flexible route transit services. It allows fixed-route and flexible-route transit services to disseminate schedules and automatically updates customer service operator systems with the most current schedule information. It also supports automated dispatch of transit vehicles. Current vehicle schedule adherence and optimum scenarios for schedule adjustment are also provided. It also receives and processes transit vehicle loading data.
School Buses	Transit Management Center	Transit Center Operator Assignment	'Transit Center Operator Assignment' automates and supports the assignment of transit vehicle operators to runs. It assigns operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. It also provides an exception handling process for the operator assignment function to generate supplemental operator assignments when required by changes during the operating day.

Element Name	Physical Object	Functional Object	Functional Object Description
School Buses	Transit Management Center	Transit Center Vehicle Assignment	'Transit Center Vehicle Assignment' assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle. It also provides an exception handling process for the vehicle assignment function to generate new, supplemental vehicle assignments when required by changes during the operating day. It provides an inventory management function for the transit facility which stores functional attributes about each of the vehicles owned by the transit operator. These attributes permit the planning and assignment functions to match vehicles with routes based on suitability for the types of service required by the particular routes.
School Buses	Transit Management Center	Transit Garage Maintenance	'Transit Garage Maintenance' provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data. In addition, it provides information to service personnel to support maintenance activities and records and verifies that maintenance work was performed.
School Police Departments	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.

Element Name	Physical Object	Functional Object	Functional Object Description
School Police Departments	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
School Police Departments	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
School Police Departments	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
School Police Departments	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
School Police Departments	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
SCMS	Cooperative ITS Credentials Management System	CCMS Authorization	'CCMS Authorization' components provide authorization credentials (e.g., pseudonym certificates) to end entities. The end entity applies for and obtains authorization credentials, enabling the end entity to enter the "Operational" state. This function requires an interactive dialog, including at minimum a Certificate Request from the end entity desiring certificates. This request will be checked for validity, with the embedded enrollment certificate checked against an internal blacklist. If all checks are passed, this function will distribute a bundle of linked pseudonym certificates suitable for use by the requesting end entity, with the characteristics and usage rules of those certificates dependent on the operational policies of the CCMS. It also provides the secure provisioning of a given object's Decryption Key in response to an authorized request from that object. The retrieved Decryption Key will be used by the receiving object to decrypt the "next valid" batch within the set of previously retrieved Security Credential batches.

Element Name	Physical Object	Functional Object	Functional Object Description
SCMS	Cooperative ITS Credentials Management System	CCMS Misbehavior Reporting and Action	'CCMS Misbehavior Reporting and Action' components process misbehavior reports from end entities. Misbehavior reports are analyzed and investigated if warranted. Investigated misbehavior reports are correlated with end entities and systemic issues are identified. If revocation is warranted, this component provides information to Authorization or Revocation components to initiate revocation and/or blacklisting, as appropriate.
SCMS	Cooperative ITS Credentials Management System	CCMS Provisioning	'CCMS Provisioning' components provide the end entity with material that allows it to enter the 'Unenrolled' state. This consists of root certificates and the crypto material that allows it to communicate securely with the Enrollment components. This function ensures the requesting entity meets requirements for provisioning and provides the certificates and relevant policy information to entities that meet the requirements.
SCMS	Cooperative ITS Credentials Management System	CCMS Revocation	'CCMS Revocation' components generate the internal blacklist and Certificate Revocation List (CRL) and distribute them to other CCMS components and end entities. Once placed on the CRL, an end entity is in the Unauthorized state. Once placed on the blacklist, an end entity is in the Unenrolled state.
SCMS	ITS Object	ITS Security Support	'ITS Security Support' provides communications and system security functions to the ITS Object, including privacy protection functions. It may include firewall, intrusion management, authentication, authorization, profile management, identity management, cryptographic key management. It may include a hardware security module and security management information base.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Speedway Public Safety	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Speedway Public Safety	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Speedway Public Safety	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Speedway Public Safety	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Safety	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Speedway Public Works	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Speedway Public Works	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Speedway Public Works	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Speedway Public Works	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Speedway Public Works	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Speedway Public Works	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Speedway Public Works	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Speedway Public Works	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Speedway Public Works	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Speedway Public Works	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Speedway Public Works	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.
Speedway Public Works	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Public Works	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Speedway Public Works	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.
Speedway Public Works	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	<p>'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.</p>
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Speedway Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Speedway Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.
Speedway Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.

Element Name	Physical Object	Functional Object	Functional Object Description
Speedway Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Speedway Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.
Speedway Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Speedway Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Call- Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Response Management	'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Emergency Dispatch	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Suburban Municipality Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Suburban Municipality Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department CAV Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Device Management	'RSE Device Management' provides executive control and monitoring of the RSE hardware and installed software applications. It monitors the operational status of the hardware and other attached field devices and detects and reports fault conditions. A back office interface supports application installation, upgrade, and configuration as well as remote control of the operating mode and hardware configuration settings and initiation of remote diagnostics. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, repair, and replacement.
Suburban Municipality Street Department CAV Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Intersection Management	'RSE Intersection Management' uses short range communications to support connected vehicle applications that manage signalized intersections. It communicates with approaching vehicles and ITS infrastructure (e.g., the traffic signal controller) to enhance traffic signal operations. Coordination with the ITS infrastructure also supports conflict monitoring to ensure the RSE output and traffic signal control output are consistent and degrade in a fail safe manner.
Suburban Municipality Street Department CAV Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Intersection Safety	'RSE Intersection Safety' uses short range communications to support connected vehicle applications that improve intersection safety. It communicates with approaching vehicles and ITS infrastructure to alert and warn drivers of potential stop sign, red light, and non-motorized user crossing conflicts or violations.
Suburban Municipality Street Department CAV Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Map Management	'RSE Map Management' provides the map functionality necessary to support map data updates to passing vehicles. It collects current map and geometry data and provides current map and geometry data to connected vehicles.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department CAV Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traffic Monitoring	'RSE Traffic Monitoring' monitors the basic safety messages that are shared between connected vehicles and distills this data into traffic flow measures that can be used to manage the network in combination with or in lieu of traffic data collected by infrastructure-based sensors. As connected vehicle penetration rates increase, the measures provided by this application can expand beyond vehicle speeds that are directly reported by vehicles to include estimated volume, occupancy, and other measures. This object also supports incident detection by monitoring for changes in speed and vehicle control events that indicate a potential incident.
Suburban Municipality Street Department CAV Roadside Equipment	ITS Object	ITS Management Support	'ITS Management Support' provides management of the ITS Object. This includes management of regulatory information and policies, management of application processes, management of communication system configuration and update management, communications interfaces, protocol-specific techniques to ensure interoperability such as service advertisements, communications congestion management and interference management, local device states and communications information, billing management, fault management, service level and performance monitoring.
Suburban Municipality Street Department CAV Roadside Equipment	ITS Object	ITS Security Support	'ITS Security Support' provides communications and system security functions to the ITS Object, including privacy protection functions. It may include firewall, intrusion management, authentication, authorization, profile management, identity management, cryptographic key management. It may include a hardware security module and security management information base.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Center	Center Connected Vehicle Infrastructure Management	'Center Connected Vehicle Infrastructure Management' is the back office application that supports monitoring and maintenance of the Connected Vehicle infrastructure (RSEs, support systems, and associated communications links). It monitors the performance and configuration of the infrastructure portion of the Connected Vehicle Environment. This includes tracking and management of the infrastructure configuration as well as detection, isolation, and correction of infrastructure service problems. The application also includes monitoring of performance of the infrastructure equipment, including RSEs and communications links.
Suburban Municipality Street Department Operations/Dispatch	Center	Center Map Management	'Center Map Management' provides the map functionality necessary to support map updates and use within an operational center. It manages map data for the center and provides map data to center applications that use a map.
Suburban Municipality Street Department Operations/Dispatch	ITS Object	ITS Management Support	'ITS Management Support' provides management of the ITS Object. This includes management of regulatory information and policies, management of application processes, management of communication system configuration and update management, communications interfaces, protocol-specific techniques to ensure interoperability such as service advertisements, communications congestion management and interference management, local device states and communications information, billing management, fault management, service level and performance monitoring.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	ITS Object	ITS Security Support	'ITS Security Support' provides communications and system security functions to the ITS Object, including privacy protection functions. It may include firewall, intrusion management, authentication, authorization, profile management, identity management, cryptographic key management. It may include a hardware security module and security management information base.
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Intersection Safety	'TMC Intersection Safety' controls and monitors RSEs that support stop sign, red light, and mixed use crossing violations. It configures the RSEs for the current intersection geometry and traffic signal control equipment at the intersection. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Operations/Dispatch	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.
Suburban Municipality Street Department Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Intersection Management	'RSE Intersection Management' uses short range communications to support connected vehicle applications that manage signalized intersections. It communicates with approaching vehicles and ITS infrastructure (e.g., the traffic signal controller) to enhance traffic signal operations. Coordination with the ITS infrastructure also supports conflict monitoring to ensure the RSE output and traffic signal control output are consistent and degrade in a fail safe manner.
Suburban Municipality Street Department Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Mixed Use Crossing Safety	'Roadway Mixed Use Crossing Safety' is an advanced infrastructure application that detects pedestrians, cyclists, and other non-motorized users and provides active safety warnings to drivers when cross walks or other intersecting mixed use paths are occupied.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Signal Preemption	'Roadway Signal Preemption' includes the field elements that receive signal preemption requests from emergency vehicles approaching a signalized intersection and overrides the current operation of the traffic signals to stop conflicting traffic and grant right-of-way to the approaching vehicle.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Suburban Municipality Street Department Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
Suburban Municipality Street Department Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Suburban Municipality Street Department Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.
Suburban Municipality Street Department Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.

Element Name	Physical Object	Functional Object	Functional Object Description
Suburban Municipality Street Department Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Data Collection	'MCM Data Collection' collects and stores maintenance and construction information that is collected in the course of operations by the Maintenance and Construction Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Environmental Information Collection	'MCM Environmental Information Collection' collects current road and weather conditions using data collected from environmental sensors deployed on and about the roadway. In addition to fixed sensor stations at the roadside, this functional object also collects environmental information from sensor systems located on Maintenance and Construction Vehicles. It also collects current and forecast environmental conditions information that is made available by other systems. The functional object aggregates the sensor system data and provides it, along with data attributes to other applications.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Field Equipment Maintenance	'MCM Field Equipment Maintenance' provides overall management and support for maintenance of field equipment on a roadway system, right-of-way, parking area, transit stop, or other areas where field equipment exists. Services include repair and maintenance of ITS field equipment in these areas (e.g., detectors and other sensors, cameras, dynamic message signs, electronic toll collection equipment, electronic clearance equipment, weigh-in-motion sensors, etc.).
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Incident Management	'MCM Incident Management' supports maintenance and construction participation in coordinated incident response. Incident notifications are shared, incident response resources are managed, and the overall incident situation and incident response status is coordinated among allied response organizations.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Maintenance Decision Support	'MCM Maintenance Decision Support' recommends maintenance courses of action based on current and forecast environmental and road conditions and additional application specific information. Decisions are supported through understandable presentation of filtered and fused environmental and road condition information for specific time horizons as well as specific maintenance recommendations that are generated by the system based on this integrated information. The recommended courses of action are supported by information on the anticipated consequences of action or inaction, when available.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Reduced Speed Zone Warning	'MCM Reduced Speed Zone Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides posted speed limits and associated schedules and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Roadway Maintenance	'MCM Roadway Maintenance' provides overall management and support for routine maintenance on a roadway system or right-of-way. Services managed include landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of non-ITS equipment on the roadway (e.g., signs, gantries, cabinets, guard rails, etc.). Environmental conditions information is also received from various weather sources to aid in scheduling routine maintenance activities. See also MCM Field Equipment Maintenance for maintenance of ITS field equipment.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Vehicle Maintenance Management	'MCM Vehicle Maintenance Management' monitors vehicle and equipment condition, tracks maintenance history, and schedules routine and corrective maintenance based on vehicle/equipment utilization and availability schedules.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Winter Maintenance Management	'MCM Winter Maintenance Management' manages winter road maintenance, tracking and controlling snow plow operations, roadway treatment (e.g., salt spraying and other material applications), and other snow and ice control operations. It monitors environmental conditions and weather forecasts and uses the information to schedule winter maintenance activities, determine the appropriate snow and ice control response, and track and manage response operations.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Work Zone Management	'MCM Work Zone Management' remotely monitors and supports work zone activities, controlling traffic through dynamic message signs (DMS), Highway Advisory Radio (HAR), gates and barriers, and informing other groups of activity (e.g., traveler information, traffic management, other maintenance and construction centers) for better coordination management. Work zone speeds, and delays, and closures are provided to the motorist prior to the work zones. This application provides control of field equipment in all maintenance areas, including fixed and portable field equipment supporting both stationary and mobile work zones.
Surrounding County Highway Operations/Dispatch	Maint and Constr Management Center	MCM Work Zone Safety Management	'MCM Work Zone Safety Management' remotely monitors work zone safety systems that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Basic Surveillance	'TMC Basic Surveillance' remotely monitors and controls traffic sensor systems and surveillance (e.g., CCTV) equipment, and collects, processes and stores the collected traffic data. Current traffic information and other real-time transportation information is also collected from other centers. The collected information is provided to traffic operations personnel and made available to other centers.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Data Collection	'TMC Data Collection' collects and stores information that is created in the course of traffic operations performed by the Traffic Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Incident Detection	'TMC Incident Detection' identifies and reports incidents to Traffic Operations Personnel. It remotely monitors and controls traffic sensor and surveillance systems that support incident detection and verification. It analyzes and reduces the collected sensor and surveillance data, external alerting and advisory and incident reporting systems, anticipated demand information from intermodal freight depots, border crossings, special event information, and identifies and reports incidents and hazardous conditions
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Incident Dispatch Coordination	'TMC Incident Dispatch Coordination' formulates and manages an incident response that takes into account the incident potential, incident impacts, and resources required for incident management. It provides information to support dispatch and routing of emergency response and service vehicles as well as coordination with other cooperating agencies. It provides access to traffic management resources that provide surveillance of the incident, traffic control in the surrounding area, and support for the incident response. It monitors the incident response and collects performance measures such as incident response and clearance times.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC In-Vehicle Signing Management	'TMC In-Vehicle Signing Management' controls and monitors RSEs that support in-vehicle signing. Sign information that may include static regulatory, service, and directional sign information as well as variable information such as traffic and road conditions can be provided to the RSE, which uses short range communications to send the information to in-vehicle equipment. Information that is currently being communicated to passing vehicles and the operational status of the field equipment is monitored by this application. The operational status of the field equipment is reported to operations personnel.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Passive Surveillance	'TMC Passive Surveillance' collects time stamped vehicle identities from different detection zones, correlates the identities, and calculates link travel times and derives other traffic measures.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Regional Traffic Management	'TMC Regional Traffic Management' supports coordination between Traffic Management Centers in order to share traffic information between centers as well as control of traffic management field equipment. This coordination supports wide area optimization and regional coordination that spans jurisdictional boundaries; for example, coordinated signal control in a metropolitan area or coordination between freeway operations and arterial signal control within a corridor.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Roadway Equipment Monitoring	'TMC Roadway Equipment Monitoring' monitors the operational status of field equipment and detects failures. It presents field equipment status to Traffic Operations Personnel and reports failures to the Maintenance and Construction Management Center. It tracks the repair or replacement of the failed equipment. The entire range of ITS field equipment may be monitored including sensors (traffic, infrastructure, environmental, security, speed, etc.) and devices (highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, beacons, security surveillance equipment, etc.).

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Signal Control	'TMC Signal Control' provides the capability for traffic managers to monitor and manage the traffic flow at signalized intersections. This capability includes analyzing and reducing the collected data from traffic surveillance equipment and developing and implementing control plans for signalized intersections. Control plans may be developed and implemented that coordinate signals at many intersections under the domain of a single Traffic Management Center and are responsive to traffic conditions and adapt to support incidents, preemption and priority requests, pedestrian crossing calls, etc.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Speed Warning	'TMC Speed Warning' supports remote control and monitoring of reduced speed zone warning roadside equipment. It provides the location and extent of the reduced speed zone, the posted speed limit(s) with information about the applicability of the speed limit(s) (e.g., time of day, day of week, seasonality, relevant vehicle types) and information about associated road configuration changes including lane merges and shifts. It monitors field equipment operation and reports current status to the operator.
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Standard Rail Crossing Management	'TMC Standard Rail Crossing Management' monitors and controls rail crossing traffic control equipment. This version provides basic support for standard active warning systems at grade crossings. It remotely monitors and reports the status of the rail crossing equipment and sends control plan updates to the equipment.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Operations/Dispatch	Traffic Management Center	TMC Work Zone Traffic Management	'TMC Work Zone Traffic Management' coordinates work plans with maintenance systems so that work zones are established that have minimum traffic impact. Traffic control strategies are implemented to further mitigate traffic impacts associated with work zones that are established, providing work zone information to driver information systems such as dynamic message signs.
Surrounding County Highway Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Traveler Information Communications	'RSE Traveler Information Communications' includes field elements that distribute information to vehicles for in-vehicle display. The information may be provided by a center (e.g., variable information on traffic and road conditions in the vicinity of the field equipment) or it may be determined and output locally (e.g., static sign information and signal phase and timing information). This includes the interface to the center or field equipment that controls the information distribution and the short range communications equipment that provides information to passing vehicles.
Surrounding County Highway Roadside Equipment	Connected Vehicle Roadside Equipment	RSE Work Zone Safety	'RSE Work Zone Safety' communicates with Connected Vehicles and Personal Information Devices carried or worn by the work crew to detect vehicle intrusions in work zones and warn crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Basic Surveillance	'Roadway Basic Surveillance' monitors traffic conditions using fixed equipment such as loop detectors and CCTV cameras.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Field Device Support	'Roadway Field Device Support' monitors the operational status of field devices and detects and reports fault conditions. Consolidated operational status (device status, configuration, and fault information) are reported for resolution and repair. A local interface is provided to field personnel for local monitoring and diagnostics, supporting field maintenance, upgrade, repair, and replacement of field devices.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Field Management Station Operation	'Roadway Field Management Station Operation' supports direct communications between field management stations and the local field equipment under their control.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Passive Monitoring	'Roadway Passive Monitoring' monitors passing vehicles for a signature that can be used to recognize the same vehicle at different points in the network and measure travel times. Depending on the implementation and the penetration rate of the technology that is monitored, other point traffic measures may also be inferred by monitoring the number of vehicles within range over time. Today this approach is implemented most commonly using a Bluetooth receiver that passively monitors Bluetooth devices on-board passing vehicles and license plate readers that record the vehicle license plate number, but any widely deployed vehicle communications technology or feature that can be passively monitored to uniquely identify a vehicle could be used.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Signal Control	<p>'Roadway Signal Control' includes the field elements that monitor and control signalized intersections. It includes the traffic signal controllers, detectors, conflict monitors, signal heads, and other ancillary equipment that supports traffic signal control. It also includes field masters, and equipment that supports communications with a central monitoring and/or control system, as applicable. The communications link supports upload and download of signal timings and other parameters and reporting of current intersection status. It represents the field equipment used in all levels of traffic signal control from basic actuated systems that operate on fixed timing plans through adaptive systems. It also supports all signalized intersection configurations, including those that accommodate pedestrians. In advanced, future implementations, environmental data may be monitored and used to support dilemma zone processing and other aspects of signal control that are sensitive to local environmental conditions.</p>
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Speed Monitoring and Warning	<p>'Roadway Speed Monitoring and Warning' includes the field elements that monitor vehicle speeds. If the speed is determined to be excessive, an advisory or warning is displayed. Current environmental conditions and other factors that may reduce safe operating speeds may also be taken into account. The operational status (state of the device, configuration, and fault data) is provided to the center. This application can also provide an enforcement function, reporting speed violations to an enforcement agency.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Standard Rail Crossing	'Roadway Standard Rail Crossing' manages highway traffic at highway-rail intersections (HRIs) where operational requirements do not dictate advanced features (e.g., where rail operational speeds are less than 80 miles per hour). Either passive (e.g., the crossbuck sign) or active warning systems (e.g., flashing lights and gates) are supported depending on the specific requirements for each intersection. These traditional HRI warning systems may also be augmented with other standard traffic management devices. The warning systems are activated on notification of an approaching train by interfaced wayside equipment. The equipment at the HRI may also be interconnected with adjacent signalized intersections so that local control can be adapted to highway-rail intersection activities. Health monitoring of the HRI equipment and interfaces is performed; detected abnormalities are reported through interfaces to the wayside interface equipment and the Traffic Management Center.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Traffic Information Dissemination	'Roadway Traffic Information Dissemination' includes field elements that provide information to drivers, including dynamic message signs and highway advisory radios.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Safety	'Roadway Work Zone Safety' includes field elements that detect vehicle intrusions in work zones and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone.
Surrounding County Highway Roadside Equipment	ITS Roadway Equipment	Roadway Work Zone Traffic Control	'Roadway Work Zone Traffic Control' controls traffic in areas of the roadway where maintenance and construction activities are underway, monitoring and controlling traffic using field equipment such as CCTV cameras, dynamic messages signs, and gates/barriers. Work zone speeds and delays are provided to the motorist prior to the work zones.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Environmental Monitoring	'MCV Environmental Monitoring' collects current road and surface weather conditions from sensors on-board the maintenance and construction vehicle or by querying fixed sensors on or near the roadway. Environmental information including road surface temperature, air temperature, and wind speed is measured and spatially located and time stamped, and reported back to a center.
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Roadway Maintenance and Construction	'MCV Roadway Maintenance and Construction' includes the on-board systems that support routine non-winter maintenance on a roadway system or right-of-way. Routine maintenance includes landscape maintenance, hazard removal (roadway debris, dead animals), routine maintenance activities (roadway cleaning, grass cutting), and repair and maintenance of both ITS and non-ITS equipment on the roadway (e.g., signs, traffic controllers, traffic detectors, dynamic message signs, traffic signals, etc.).
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle Safety Monitoring	'MCV Vehicle Safety Monitoring' detects vehicle intrusions in the vicinity of the vehicle and warns crew workers and drivers of imminent encroachment. Crew movements are also monitored so that the crew can be warned of movement beyond the designated safe zone. It can be used for stationary work zones or in mobile applications where a safe zone is maintained around the moving vehicle.
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Vehicle System Monitoring and Diagnostics	'MCV Vehicle System Monitoring and Diagnostics' includes on-board sensors capable of monitoring the condition of each of the vehicle systems and diagnostics that can be used to support vehicle maintenance. The status of the vehicle and ancillary equipment and diagnostic information is provided to the vehicle operator, repair facility, and dispatch center.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Winter Maintenance	'MCV Winter Maintenance' supports snow plow operations and other roadway treatments (e.g., salt spraying and other material applications). It supports communications with the center to receive information and instructions that are provided to the vehicle operator and also supports remote control of on-board systems. It tracks operational status of snow and ice control operations and provides this information back to the center.
Surrounding County Highway Vehicles	Maint and Constr Vehicle OBE	MCV Work Zone Support	'MCV Work Zone Support' provides communications and support for local management of a work zone. It supports communications between field personnel and the managing center to keep the center apprised of current work zone status. It controls vehicle-mounted driver information systems (e.g., dynamic message signs) and uses short range communications to monitor and control other fixed or portable driver information systems in the work zone.
Surrounding County Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Sensor Monitoring	'Field Secure Area Sensor Monitoring' includes sensors that monitor conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. Bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). A range of acoustic, environmental threat (e.g. Chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity and motion and object sensors are included.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Security Monitoring Field Equipment	Security Monitoring Equipment	Field Secure Area Surveillance	'Field Secure Area Surveillance' includes video and audio surveillance equipment that monitors conditions of secure areas including facilities (e.g. transit yards), transportation infrastructure (e.g. as bridges, tunnels, interchanges, and transit railways or guideways), and public areas (e.g., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities). It provides the surveillance information to the Emergency Management Center for possible threat detection. It also provides local processing of the video or audio information, providing processed or analyzed results to the Emergency Management Center.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Commercial Vehicle Response	'Emergency Commercial Vehicle Response' identifies and initiates a response to commercial vehicle and freight equipment related emergencies. These emergencies may include incidents involving hazardous materials as well as the detection of non-permitted transport of security sensitive hazmat. It identifies the location of the vehicle, the nature of the incident, the route information, and information concerning the freight itself. The information supports the determination of the response and identifies the responding agencies to notify.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Data Collection	'Emergency Data Collection' collects and stores emergency information that is collected in the course of operations by the Emergency Management Center. This data can be used directly by operations personnel or it can be made available to other data users and archives in the region.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Early Warning System	'Emergency Early Warning System' monitors alerting and advisory systems, information collected by ITS surveillance and sensors, and reports from other agencies and uses this information to identify potential, imminent, or in-progress major incidents or disasters. Notification is provided to initiate the emergency response, including public notification using ITS traveler information systems, where appropriate.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Evacuation Support	<p>'Emergency Evacuation Support' coordinates evacuation plans among allied agencies and manages evacuation and reentry of a population in the vicinity of a disaster or other emergency that poses a risk to public safety. Where appropriate, the affected population is evacuated in shifts, using more than one evacuation route, and including several evacuation destinations to spread demand and thereby expedite the evacuation. All affected jurisdictions (e.g., states and counties) at the evacuation origin, evacuation destination, and along the evacuation route are informed of the plan. The public is provided with real-time evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary. Resource requirements are forecast based on the evacuation plans, and the necessary resources are located, shared between agencies if necessary, and deployed at the right locations at the appropriate times. The evacuation and reentry status are monitored and used to refine the plan and resource allocations during the evacuation and subsequent reentry. It communicates with public health systems to develop evacuation plans and recommended strategies for disasters and evacuation scenarios involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Secure Area Sensor Management	'Emergency Secure Area Sensor Management' manages sensors that monitor secure areas in the transportation system, processes the collected data, performs threat analysis in which data is correlated with other sensor, surveillance, and advisory inputs, and then disseminates resultant threat information to emergency personnel and other agencies. In response to identified threats, the operator may request activation of barrier and safeguard systems to preclude an incident, control access during and after an incident or mitigate impact of an incident. The sensors may be in secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. The types of sensors include acoustic, threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, motion and object sensors.

Element Name	Physical Object	Functional Object	Functional Object Description
Surrounding County Sheriff Communications Center	Emergency Management Center	Emergency Secure Area Surveillance	'Emergency Secure Area Surveillance' monitors surveillance inputs from secure areas in the transportation system. The surveillance may be of secure areas frequented by travelers (i.e., transit stops, transit stations, rest areas, park and ride lots, modal interchange facilities, on-board a transit vehicle, etc.) or around transportation infrastructure such as bridges, tunnels and transit railways or guideways. It provides both video and audio surveillance information to emergency personnel and automatically alerts emergency personnel of potential incidents.
Surrounding County Sheriff Emergency Vehicles	Emergency Vehicle OBE	EV On-Board En Route Support	'EV On-Board En Route Support' provides communications functions to responding emergency vehicles that reduce response times and improve safety of responding public safety personnel and the general public. It supports traffic signal preemption via short range communication directly with signal control equipment and sends alert messages to surrounding vehicles.
Surrounding County Sheriff Emergency Vehicles	Emergency Vehicle OBE	EV On-Board Incident Management Communication	'EV On-board Incident Management Communication' provides communications support to first responders. Information about the incident, information on dispatched resources, and ancillary information such as road and weather conditions are provided to emergency personnel. Emergency personnel transmit information about the incident such as identification of vehicles and people involved, the extent of injuries, hazardous material, resources on site, site management strategies in effect, and current clearance status. Emergency personnel may also send in-vehicle signing messages to approaching traffic using short range communications.

Element Name	Physical Object	Functional Object	Functional Object Description
Taxi Services	Transit Management Center	Transit Center Multi-Modal Coordination	'Transit Center Multi-Modal Coordination' supports transit service coordination between transit properties and coordinates with other surface and air transportation modes. As part of service coordination, it shares schedule and trip information, as well as transit transfer cluster (a collection of stop points, stations, or terminals where transfers can be made conveniently) and transfer point information between Multimodal Transportation Service Providers, Transit Agencies, and ISPs. An interface to Traffic Management also supports demand management strategies.
Taxi Services	Transit Management Center	Transit Center Operator Assignment	'Transit Center Operator Assignment' automates and supports the assignment of transit vehicle operators to runs. It assigns operators to runs in a fair manner while minimizing labor and overtime services, considering operator preferences and qualifications, and automatically tracking and validating the number of work hours performed by each individual operator. It also provides an exception handling process for the operator assignment function to generate supplemental operator assignments when required by changes during the operating day.
Taxi Services	Transit Management Center	Transit Center Paratransit Operations	'Transit Center Paratransit Operations' manages demand responsive transit services, including paratransit services. It supports planning and scheduling of these services, allowing paratransit and other demand response transit services to plan efficient routes and better estimate arrival times. It also supports automated dispatch of paratransit vehicles and tracks passenger pick-ups and drop-offs. Customer service operator systems are updated with the most current schedule information.

Element Name	Physical Object	Functional Object	Functional Object Description
Taxi Services	Transit Management Center	Transit Center Vehicle Assignment	'Transit Center Vehicle Assignment' assigns individual transit vehicles to vehicle blocks and downloads this information to the transit vehicle. It also provides an exception handling process for the vehicle assignment function to generate new, supplemental vehicle assignments when required by changes during the operating day. It provides an inventory management function for the transit facility which stores functional attributes about each of the vehicles owned by the transit operator. These attributes permit the planning and assignment functions to match vehicles with routes based on suitability for the types of service required by the particular routes.
Taxi Services	Transit Management Center	Transit Garage Maintenance	'Transit Garage Maintenance' provides advanced maintenance functions for the transit property. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and monitors operators and vehicles. It collects vehicle mileage data and uses it to automatically generate preventative maintenance schedules for each vehicle by utilizing vehicle tracking data. In addition, it provides information to service personnel to support maintenance activities and records and verifies that maintenance work was performed.

Element Name	Physical Object	Functional Object	Functional Object Description
Traffic Data Archive	Archived Data System	Archive Data Repository	'Archive Data Repository' collects data and data catalogs from one or more data sources and stores the data in a focused repository that is suited to a particular set of ITS data users. It includes capabilities for performing quality checks on the incoming data, error notification, and archive to archive coordination. It includes the capability to define a data registry that allows registration of data identifiers or data definitions for interoperable use throughout a region. It supports a broad range of implementations, ranging from simple data marts that collect a focused set of data and serve a particular user community to large-scale data warehouses that collect, integrate, and summarize transportation data from multiple sources and serve a broad array of users within a region. Repositories may be established to support operations planning, performance monitoring and management, and policy and investment decisions.
Traffic Data Archive	Archived Data System	Archive Government Reporting	'Archive Government Reporting' selects and formats data residing in an ITS archive to facilitate local, state, and federal government data reporting requirements. It provides transportation system statistics and performance measures in required formats to support investment and policy decisions.
Traffic Data Archive	Archived Data System	Archive On-Line Analysis and Mining	'Archive On-Line Analysis and Mining' provides advanced data analysis, summarization, and mining features that facilitate discovery of information, patterns, and correlations in large data sets. Multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services may be offered. Complex performance measures that are derived from multiple data sources may also be produced.

Element Name	Physical Object	Functional Object	Functional Object Description
Traffic Data Archive	Archived Data System	Archive Situation Data Archival	'Archive Situation Data Archival' collects and archives traffic, roadway, and environmental information for use in off-line planning, research, and analysis. It controls and collects information directly from equipment at the roadside, reflecting the deployment of traffic detectors that are used primarily for traffic monitoring and planning purposes, rather than for traffic management. It also collects situation data from connected vehicles. The data collected, quality checks performed, and aggregation strategies are defined to support transportation system performance monitoring and management.
TrafficWise Traveler Information System	Transportation Information Center	TIC Connected Vehicle Traveler Info Distribution	In support of connected vehicle applications, 'TIC Connected Vehicle Traveler Info Distribution' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. Location-specific or situation-relevant traveler information is sent to short range communications transceivers at the roadside.
TrafficWise Traveler Information System	Transportation Information Center	TIC Data Collection	'TIC Data Collection' collects transportation-related data from other centers, performs data quality checks on the collected data and then consolidates, verifies, and refines the data and makes it available in a consistent format to applications that support operational data sharing between centers and deliver traveler information to end-users. A broad range of data is collected including traffic and road conditions, transit data, emergency information and advisories, weather data, special event information, traveler services, parking, multimodal data, and toll/pricing data. It also shares data with other transportation information centers.

Element Name	Physical Object	Functional Object	Functional Object Description
TrafficWise Traveler Information System	Transportation Information Center	TIC Emergency Traveler Information	'TIC Emergency Traveler Information' provides emergency information to the public, including wide-area alerts and evacuation information. It provides emergency alerts, information on evacuation zones and evacuation requirements, evacuation destinations and shelter information, available transportation modes, and traffic and road conditions at the origin, destination, and along the evacuation routes. In addition to general evacuation information, personalized information including tailored evacuation routes, service information, and estimated travel times is also provided based on traveler specified origin, destination, and route parameters. Updated information is provided throughout the evacuation and subsequent reentry as status changes and plans are adapted.
TrafficWise Traveler Information System	Transportation Information Center	TIC Interactive Traveler Information	'TIC Interactive Traveler Information' disseminates personalized traveler information including traffic and road conditions, transit information, parking information, maintenance and construction information, multimodal information, event information, and weather information. Tailored information is provided based on the traveler's request in this interactive service.
TrafficWise Traveler Information System	Transportation Information Center	TIC Travel Services Information and Reservation	'TIC Travel Services Information' disseminates information about traveler services such as lodging, restaurants, electric vehicle charging, and service stations. Tailored traveler service information is provided on request that meets the constraints and preferences specified by the traveler. This application also supports reservations and advanced payment for traveler services including parking and loading zone use.

Element Name	Physical Object	Functional Object	Functional Object Description
TrafficWise Traveler Information System	Transportation Information Center	TIC Traveler Information Broadcast	'TIC Traveler Information Broadcast' disseminates traveler information including traffic and road conditions, incident information, maintenance and construction information, event information, transit information, parking information, and weather information. The same information is broadcast to all equipped traveler interface systems and vehicles.
TrafficWise Traveler Information System	Transportation Information Center	TIC Traveler Telephone Information	'TIC Traveler Telephone Information' services voice-based traveler requests for information that supports traveler telephone information systems like 511. It takes requests for traveler information, which could be voice-formatted traveler requests, dual-tone multi-frequency (DTMF)-based requests, or a simple traveler information request, and returns the requested traveler information in the proper format. In addition to servicing requests for traveler information, it also collects and forwards alerts and advisories to traveler telephone information systems.
Utility Emergency Repair/Response	Emergency Management Center	Emergency Call-Taking	'Emergency Call-Taking' supports the emergency call-taker, collecting available information about the caller and the reported emergency, and forwarding this information to other objects that formulate and manage the emergency response. It receives 9-1-1, 7-digit local access, and motorist call-box calls and interfaces to other agencies to assist in the verification and assessment of the emergency and to forward the emergency information to the appropriate response agency.

Element Name	Physical Object	Functional Object	Functional Object Description
Utility Emergency Repair/Response	Emergency Management Center	Emergency Dispatch	'Emergency Dispatch' tracks the location and status of emergency vehicles and dispatches these vehicles to incidents. Pertinent incident information is gathered from the public and other public safety agencies and relayed to the responding units. Incident status and the status of the responding units is tracked so that additional units can be dispatched and/or unit status can be returned to available when the incident is cleared and closed.
Utility Emergency Repair/Response	Emergency Management Center	Emergency Environmental Monitoring	'Emergency Environmental Monitoring' collects current and forecast road conditions and surface weather information from a variety of sources. The collected environmental information is monitored and presented to the operator and used to more effectively manage incidents.
Utility Emergency Repair/Response	Emergency Management Center	Emergency Incident Command	'Emergency Incident Command' provides tactical decision support, resource coordination, and communications integration for Incident Commands that are established by first responders at or near the incident scene to support local management of an incident. It supports communications with public safety, emergency management, transportation, and other allied response agency centers, tracks and maintains resource information, action plans, and the incident command organization itself. Information is shared with agency centers including resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response. It supports the functions and interfaces commonly supported by a mobile command center.

Element Name	Physical Object	Functional Object	Functional Object Description
Utility Emergency Repair/Response	Emergency Management Center	Emergency Response Management	<p>'Emergency Response Management' provides the strategic emergency response capabilities and broad inter-agency interfaces that are implemented for extraordinary incidents and disasters that require response from outside the local community. It provides the functional capabilities and interfaces commonly associated with Emergency Operations Centers. It develops and stores emergency response plans and manages overall coordinated response to emergencies. It monitors real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, special event and incident information. It tracks the availability of resources and assists in the appropriate allocation of these resources for a particular emergency response. It also provides coordination between multiple allied agencies before and during emergencies to implement emergency response plans and track progress through the incident. It also coordinates with the public through the Emergency Telecommunication Systems (e.g., Reverse 911). It coordinates with public health systems to provide the most appropriate response for emergencies involving biological or other medical hazards.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Utility Emergency Repair/Response	Emergency Management Center	Emergency Routing	'Emergency Routing' supports routing of emergency vehicles and enlists support from the Traffic Management Center to facilitate travel along these routes. Routes may be determined based on real-time traffic information and road conditions or routes may be provided by the Traffic Management Center on request. Vehicles are tracked and routes are based on current vehicle location. It may coordinate with the Traffic Management Center to provide preemption or otherwise adapt the traffic control strategy along the selected route.
Vehicles	Light Vehicle OBE	Light Vehicle Electric Charging Assist	'Light Vehicle Electric Charging Assist' uses short range communications to coordinate with electric charging stations, providing information about the operational state of the electrical system, the maximum charge rate, and the percentage-complete of the charge. This application also receives current information about electric charging systems in the region and makes this information available to the driver on request.
Vehicles	Light Vehicle OBE	Light Vehicle Payment Service	'Light Vehicle Payment Service' supports vehicle payments including VMT- and zone-based payments and payments for other services including fuel/charging services, tolls, and parking. To support VMT-based payment, this application tracks the location of the vehicle at specific times and reports this VMT data along with vehicle identification. A variety of pricing strategies are supported, including strategies that include credits or incentives that reward desired driving patterns and behavior. The onboard equipment supports secure short range communications with connected vehicle roadside equipment to support secure payments.

Element Name	Physical Object	Functional Object	Functional Object Description
Vehicles	Light Vehicle OBE	Light Vehicle Trip Planning and Route Guidance	'Light Vehicle Trip Planning and Route Guidance' includes the in-vehicle system that coordinates with a traveler information center to provide a personalized trip plan to the driver. The trip plan is calculated by the Transportation Information Center (TIC) based on preferences and constraints supplied by the driver and provided to the driver for confirmation. Reservations and advanced payment may also be processed to confirm the trip plan. Coordination with the TIC may continue during the trip so that the route plan can be modified to account for new information. Many equipment configurations are possible including in-vehicle systems that provide a basic trip plan to the driver as well as more sophisticated systems that can provide turn by turn guidance to the driver along the route.

Element Name	Physical Object	Functional Object	Functional Object Description
Vehicles	Vehicle	Vehicle Basic Safety Communication	<p>'Vehicle Basic Safety Communication' exchanges current vehicle location and motion information with other vehicles in the vicinity, uses that information to calculate vehicle paths, and warns the driver when the potential for an impending collision is detected. If available, map data is used to filter and interpret the relative location and motion of vehicles in the vicinity. Information from on-board sensors (e.g., radars and image processing) are also used, if available, in combination with the V2V communications to detect non-equipped vehicles and corroborate connected vehicle data. Vehicle location and motion broadcasts are also received by the infrastructure and used by the infrastructure to support a wide range of roadside safety and mobility applications. This object represents a broad range of implementations ranging from basic Vehicle Awareness Devices that only broadcast vehicle location and motion and provide no driver warnings to advanced integrated safety systems that may, in addition to warning the driver, provide collision warning information to support automated control functions that can support control intervention.</p>

Element Name	Physical Object	Functional Object	Functional Object Description
Vehicles	Vehicle	Vehicle Control Automation	'Vehicle Control Automation' provides lateral and/or longitudinal control of a vehicle to allow 'hands off' and/or 'feet off' driving, automating the steering, accelerator, and brake control functions. It builds on the sensors included in 'Vehicle Safety Monitoring' and 'Vehicle Control Warning' and uses the information about the area surrounding the vehicle to safely control the vehicle. It covers the range of incremental control capabilities from driver assistance systems that take over steering or acceleration/deceleration in limited scenarios with direct monitoring by the driver to full automation where all aspects of driving are automated under all roadway and environmental conditions.
Vehicles	Vehicle	Vehicle Intersection Warning	'Vehicle Intersection Warning' uses V2V and V2I communications to monitor other connected vehicles at intersections and support the safe movement of the vehicle through the intersection. Driver warnings are provided and the application may also optionally take control of the vehicle to avoid collisions. The application will also notify the infrastructure and other vehicles if it detects an unsafe infringement on the intersection.
Vehicles	Vehicle	Vehicle Map Management	'Vehicle Map Management' supports map updates and makes current map and geometry data available to other applications. It manages map data on-board and provides map data to end-user applications that provide location-based services.

Element Name	Physical Object	Functional Object	Functional Object Description
Vehicles	Vehicle	Vehicle Situation Data Monitoring	'Vehicle Situation Data Monitoring' is the highest-level representation of the functionality required to collect traffic and environmental situation data by monitoring and storing the experience of the vehicle as it travels through the road network. Collected data is aggregated into snapshots that are reported when communications is available and with flow control based on parameters provided by the infrastructure. Note that this functional object supports collection of data for areas remote from RSEs or other communications infrastructure.
Vehicles	Vehicle	Vehicle Traveler Information Reception	'Vehicle Traveler Information Reception' receives advisories, vehicle signage data, and other driver information of use to all types of vehicles and drivers and presents this information to the driver using in-vehicle equipment. Information presented may include fixed sign information, traffic control device status (e.g., signal phase and timing data), advisory and detour information, warnings of adverse road and weather conditions, travel times, and other driver information.

8 Interfaces Between Systems

The interfaces of the transportation systems in Indianapolis RITSA are based on ARC-IT and tailored to reflect the plan for the region. Architecture diagrams display the transportation systems in the Indianapolis RITSA, and more importantly, how these systems are and will be connected with one another so information can be exchanged and transportation services can be coordinated. Stakeholders may use these diagrams to identify integration opportunities.

Table 6 lists the interconnect relationships between inventory elements included in the Indianapolis RITSA. These interconnects show a particular system and all other systems with which it shares information. Interconnects indicate information sharing without specifying the type of information being shared or the direction of the information movement.

Appendix B provides the interface details between each interconnect defined in Table 6 through a series of interface diagrams showing the information (i.e., information flows) exchanges between the various systems.

Further information about the interfaces of the systems in the region is contained in the RAD-IT database. RAD-IT can be used to create tailored interconnect and information flow diagrams for any system in the database.

Table 6: Interconnects

Element 1	Element 2	Status
Ambulance Dispatch	Ambulance Vehicles	Existing
Ambulance Dispatch	Avon CSX Rail Yard	Existing
Ambulance Dispatch	Beech Grove Public Safety	Existing
Ambulance Dispatch	Emergency Operations Center	Existing
Ambulance Dispatch	IMS Command Center	Existing
Ambulance Dispatch	Indianapolis Airport Management Systems	Existing
Ambulance Dispatch	Indianapolis Fire Communications Center	Existing
Ambulance Dispatch	Indianapolis Police Dispatch	Existing
Ambulance Dispatch	INDOT Indianapolis TMC	Existing
Ambulance Dispatch	IndyGo Operations Center	Existing
Ambulance Dispatch	Lawrence Public Safety	Existing
Ambulance Dispatch	Lucas Oil Stadium Command Center	Existing
Ambulance Dispatch	Major Employer Management Systems	Existing
Ambulance Dispatch	Marion County Sheriff Dispatch	Existing
Ambulance Dispatch	MESA System	Existing
Ambulance Dispatch	Private Fleet Vehicle Dispatch Systems	Existing
Ambulance Dispatch	School Police Departments	Existing
Ambulance Dispatch	Speedway Public Safety	Existing
Ambulance Dispatch	Suburban Municipality Emergency Dispatch	Existing
Ambulance Dispatch	Surrounding County Sheriff Communications Center	Existing
Ambulance Vehicles	Beech Grove Roadside Equipment	Existing
Ambulance Vehicles	Indianapolis DPW Roadside Equipment	Existing
Ambulance Vehicles	INDOT Arterial Traffic Signals and Detection	Existing

Element 1	Element 2	Status
Ambulance Vehicles	Lawrence Roadside Equipment	Existing
Ambulance Vehicles	Speedway Roadside Equipment	Existing
Ambulance Vehicles	Suburban Municipality Street Department Roadside Equipment	Existing
Ambulance Vehicles	Surrounding County Highway Roadside Equipment	Existing
Avon CSX Rail Yard	Emergency Operations Center	Existing
Avon CSX Rail Yard	Indianapolis Fire Communications Center	Existing
Avon CSX Rail Yard	Indianapolis Police Dispatch	Existing
Avon CSX Rail Yard	Intelligence Fusion Center	Planned
Avon CSX Rail Yard	Marion County Sheriff Dispatch	Existing
Avon CSX Rail Yard	MESA System	Existing
Avon CSX Rail Yard	Suburban Municipality Emergency Dispatch	Existing
Avon CSX Rail Yard	Surrounding County Sheriff Communications Center	Existing
Beech Grove Public Safety	Beech Grove Public Works Operations	Existing
Beech Grove Public Safety	Beech Grove Vehicles	Existing
Beech Grove Public Safety	Emergency Operations Center	Existing
Beech Grove Public Safety	Event Promoters	Existing
Beech Grove Public Safety	Indianapolis DPW Operations Center	Existing
Beech Grove Public Safety	Indianapolis Fire Communications Center	Existing
Beech Grove Public Safety	Indianapolis Police Dispatch	Existing
Beech Grove Public Safety	INDOT Indianapolis TMC	Existing
Beech Grove Public Safety	IndyGo Operations Center	Existing
Beech Grove Public Safety	Intelligence Fusion Center	Planned
Beech Grove Public Safety	Marion County Sheriff Dispatch	Existing
Beech Grove Public Safety	MESA System	Existing
Beech Grove Public Safety	Private Towing Companies	Existing
Beech Grove Public Safety	Utility Emergency Repair/Response	Existing
Beech Grove Public Safety	Weather Services	Existing
Beech Grove Public Works Operations	Beech Grove Roadside Equipment	Existing
Beech Grove Public Works Operations	Beech Grove Vehicles	Existing
Beech Grove Public Works Operations	Emergency Operations Center	Existing
Beech Grove Public Works Operations	Event Promoters	Existing
Beech Grove Public Works Operations	Indianapolis DPW Operations Center	Existing
Beech Grove Public Works Operations	Indianapolis MPO Planning Operations	Existing
Beech Grove Public Works Operations	INDOT Arterial TMS	Future
Beech Grove Public Works Operations	INDOT Indianapolis TMC	Existing
Beech Grove Public Works Operations	MESA System	Existing
Beech Grove Public Works Operations	Private Towing Companies	Existing
Beech Grove Public Works Operations	Utility Emergency Repair/Response	Existing
Beech Grove Public Works Operations	Weather Services	Existing
Beech Grove Roadside Equipment	Beech Grove Vehicles	Existing
Beech Grove Roadside Equipment	Indianapolis Fire Department Emergency Vehicles	Existing
Beech Grove Roadside Equipment	Major Employer Emergency Vehicles	Existing
Beech Grove Vehicles	Indianapolis DPW Roadside Equipment	Existing
Beech Grove Vehicles	INDOT Arterial Traffic Signals and Detection	Existing
Carmel CityOS	Carmel ITS Cameras	Planned

Element 1	Element 2	Status
Carmel Engineering Department Operations	Carmel Parking Management System	Planned
Carmel Engineering Department Operations	Carmel Roadside Equipment	Existing
Carmel Engineering Department Operations	Carmel Vehicle Charging Stations	Planned
Carmel Engineering Department Operations	Personal Computing Devices	Planned
Carmel Engineering Department Operations	Vehicles	Planned
Carmel Parking Area Equipment	Carmel Parking Management System	Planned
Carmel Parking Management System	Personal Computing Devices	Planned
Carmel Vehicle Charging Stations	Electric Utility	Planned
Carmel Vehicle Charging Stations	Vehicles	Planned
CAV Authorizing Center	CAV-ITS Map Update System	Future
CAV Authorizing Center	SCMS	Future
CAV Authorizing Center	Suburban Municipality Street Department CAV Roadside Equipment	Future
CAV Authorizing Center	Suburban Municipality Street Department Operations/Dispatch	Future
CAV-ITS Map Update System	SCMS	Future
CAV-ITS Map Update System	Suburban Municipality Street Department CAV Roadside Equipment	Future
CAV-ITS Map Update System	Suburban Municipality Street Department Operations/Dispatch	Future
CICS Website	IndyGo Operations Center	Existing
CICS Website	Personal Computing Devices	Existing
CICS Website	TrafficWise Traveler Information System	Future
Commercial Vehicles	Emergency Operations Center	Existing
Commercial Vehicles	Indianapolis Police Dispatch	Existing
Commercial Vehicles	INDOT Indianapolis TMC	Existing
Commercial Vehicles	ISP Dispatch	Existing
Commercial Vehicles	Private Fleet Vehicle Dispatch Systems	Existing
Convention Center Kiosks	Event Promoters	Existing
Downtown Indy Website	Event Promoters	Existing
Downtown Indy Website	Indianapolis DPW Operations Center	Existing
Downtown Indy Website	Indianapolis MPO Planning Operations	Existing
Downtown Indy Website	INDOT Indianapolis TMC	Existing
Downtown Indy Website	IndyGo Operations Center	Existing
Downtown Indy Website	Intelligence Fusion Center	Planned
Downtown Indy Website	MESA System	Existing
Downtown Indy Website	Personal Computing Devices	Existing
Downtown Indy Website	Private Parking Management System	Existing
Downtown Indy Website	TrafficWise Traveler Information System	Future
Electric Charging Management Center	Electric Utility	Planned
Electric Charging Management Center	Electric Vehicle Charging Stations	Planned
Electric Charging Management Center	Payment Administration Center	Planned
Electric Charging Management Center	Private Traveler Services	Future
Electric Charging Management Center	TrafficWise Traveler Information System	Planned
Electric Utility	Electric Vehicle Charging Stations	Planned

Element 1	Element 2	Status
Electric Utility	Payment Administration Center	Planned
Electric Vehicle Charging Stations	Payment Administration Center	Planned
Electric Vehicle Charging Stations	Payment Device	Planned
Electric Vehicle Charging Stations	Vehicles	Planned
Emergency Operations Center	Indianapolis Airport Management Systems	Existing
Emergency Operations Center	Indianapolis DPW Operations Center	Existing
Emergency Operations Center	Indianapolis Fire Communications Center	Existing
Emergency Operations Center	Indianapolis Police Dispatch	Existing
Emergency Operations Center	INDOT Indianapolis TMC	Existing
Emergency Operations Center	INDOT Security Monitoring Field Equipment	Existing
Emergency Operations Center	IndyGo Operations Center	Existing
Emergency Operations Center	Intelligence Fusion Center	Planned
Emergency Operations Center	ISP Dispatch	Existing
Emergency Operations Center	Lawrence Public Safety	Existing
Emergency Operations Center	Lawrence Public Works/Street Department	Existing
Emergency Operations Center	Lucas Oil Stadium Command Center	Existing
Emergency Operations Center	MESA System	Existing
Emergency Operations Center	Private Fleet Vehicle Dispatch Systems	Existing
Emergency Operations Center	Private Traveler Services	Existing
Emergency Operations Center	Speedway Public Safety	Existing
Emergency Operations Center	Speedway Public Works	Existing
Emergency Operations Center	Surrounding County Sheriff Communications Center	Existing
Emergency Operations Center	Utility Emergency Repair/Response	Existing
Emergency Operations Center	Weather Services	Existing
Event Promoters	Indianapolis DPW Operations Center	Existing
Event Promoters	Indianapolis MPO Planning Operations	Existing
Event Promoters	INDOT Indianapolis TMC	Existing
Event Promoters	IndyGo Kiosks	Existing
Event Promoters	IndyGo Operations Center	Existing
Event Promoters	Lawrence Public Safety	Existing
Event Promoters	Lawrence Public Works/Street Department	Existing
Event Promoters	Personal Computing Devices	Existing
Event Promoters	Speedway Public Safety	Existing
Event Promoters	Speedway Public Works	Existing
Event Promoters	TrafficWise Traveler Information System	Future
Event Promoters	Weather Services	Existing
IMS Command Center	Indianapolis DPW Operations Center	Existing
IMS Command Center	INDOT Indianapolis TMC	Existing
IMS Command Center	MESA System	Existing
IMS Command Center	Private Towing Companies	Existing
IMS Command Center	Speedway Public Safety	Existing
IMS Command Center	Surrounding County Highway Operations/Dispatch	Existing
IMS Command Center	Surrounding County Sheriff Communications Center	Existing
IMS Command Center	Utility Emergency Repair/Response	Existing
IMS Command Center	Weather Services	Existing
Indianapolis Airport Emergency Vehicles	Indianapolis Airport Management Systems	Existing
Indianapolis Airport Field Devices	Indianapolis Airport Management Systems	Existing

Element 1	Element 2	Status
Indianapolis Airport Field Devices	Suburban Municipality Emergency Vehicles	Existing
Indianapolis Airport Maintenance Vehicles	Indianapolis Airport Management Systems	Existing
Indianapolis Airport Management Systems	Indianapolis Airport Parking System	Existing
Indianapolis Airport Management Systems	Indianapolis DPW Operations Center	Existing
Indianapolis Airport Management Systems	Indianapolis Fire Communications Center	Existing
Indianapolis Airport Management Systems	Indianapolis Police Dispatch	Existing
Indianapolis Airport Management Systems	INDOT Indianapolis TMC	Planned
Indianapolis Airport Management Systems	INDOT MCO Management	Existing
Indianapolis Airport Management Systems	Intelligence Fusion Center	Planned
Indianapolis Airport Management Systems	Marion County Sheriff Dispatch	Existing
Indianapolis Airport Management Systems	MESA System	Existing
Indianapolis Airport Management Systems	Private Fleet Vehicle Dispatch Systems	Existing
Indianapolis Airport Management Systems	Suburban Municipality Emergency Dispatch	Existing
Indianapolis Airport Management Systems	Surrounding County Sheriff Communications Center	Existing
Indianapolis Airport Management Systems	Taxi Services	Existing
Indianapolis Airport Management Systems	Weather Services	Planned
Indianapolis Airport Parking Area Equipment	Indianapolis Airport Parking System	Existing
Indianapolis Airport Parking Area Equipment	Personal Computing Devices	Existing
Indianapolis Airport Parking System	Personal Computing Devices	Existing
Indianapolis Airport Parking System	TrafficWise Traveler Information System	Future
Indianapolis DPW Operations Center	Indianapolis DPW Roadside Equipment	Existing
Indianapolis DPW Operations Center	Indianapolis DPW Vehicles	Existing
Indianapolis DPW Operations Center	Indianapolis Fire Communications Center	Existing
Indianapolis DPW Operations Center	Indianapolis MPO Planning Operations	Existing
Indianapolis DPW Operations Center	Indianapolis Police Dispatch	Existing
Indianapolis DPW Operations Center	INDOT Arterial TMS	Existing
Indianapolis DPW Operations Center	INDOT Indianapolis TMC	Existing
Indianapolis DPW Operations Center	INDOT MCO Management	Existing
Indianapolis DPW Operations Center	IndyGo Operations Center	Existing
Indianapolis DPW Operations Center	Intelligence Fusion Center	Planned
Indianapolis DPW Operations Center	Lawrence Public Safety	Existing
Indianapolis DPW Operations Center	Lawrence Public Works/Street Department	Existing
Indianapolis DPW Operations Center	Lucas Oil Stadium Command Center	Existing
Indianapolis DPW Operations Center	Marion County Sheriff Dispatch	Existing
Indianapolis DPW Operations Center	Media	Existing
Indianapolis DPW Operations Center	MESA System	Existing
Indianapolis DPW Operations Center	Private Fleet Vehicle Dispatch Systems	Existing
Indianapolis DPW Operations Center	Private Parking Management System	Existing
Indianapolis DPW Operations Center	RWIS Sensors	Existing
Indianapolis DPW Operations Center	Speedway Public Safety	Existing
Indianapolis DPW Operations Center	Speedway Public Works	Existing
Indianapolis DPW Operations Center	Suburban Municipality Emergency Dispatch	Existing
Indianapolis DPW Operations Center	Suburban Municipality Street Department Operations/Dispatch	Existing
Indianapolis DPW Operations Center	Surrounding County Highway Operations/Dispatch	Existing

Element 1	Element 2	Status
Indianapolis DPW Operations Center	Surrounding County Sheriff Communications Center	Existing
Indianapolis DPW Operations Center	Traffic Data Archive	Planned
Indianapolis DPW Operations Center	Utility Emergency Repair/Response	Existing
Indianapolis DPW Operations Center	Weather Services	Existing
Indianapolis DPW Roadside Equipment	Indianapolis Fire Department Emergency Vehicles	Existing
Indianapolis DPW Roadside Equipment	IndyGo Transit Vehicles	Existing
Indianapolis DPW Roadside Equipment	Lawrence Vehicles	Existing
Indianapolis DPW Roadside Equipment	Major Employer Emergency Vehicles	Existing
Indianapolis DPW Roadside Equipment	Speedway Vehicles	Existing
Indianapolis DPW Roadside Equipment	Suburban Municipality Emergency Vehicles	Existing
Indianapolis Fire Communications Center	Indianapolis Fire Department Emergency Vehicles	Existing
Indianapolis Fire Communications Center	INDOT Indianapolis TMC	Existing
Indianapolis Fire Communications Center	Intelligence Fusion Center	Planned
Indianapolis Fire Communications Center	Lawrence Public Safety	Existing
Indianapolis Fire Communications Center	Lucas Oil Stadium Command Center	Existing
Indianapolis Fire Communications Center	Major Employer Management Systems	Existing
Indianapolis Fire Communications Center	MESA System	Existing
Indianapolis Fire Communications Center	Personal Computing Devices	Existing
Indianapolis Fire Communications Center	Private Fleet Vehicle Dispatch Systems	Existing
Indianapolis Fire Communications Center	Private Towing Companies	Existing
Indianapolis Fire Communications Center	Speedway Public Safety	Existing
Indianapolis Fire Communications Center	Surrounding County Sheriff Communications Center	Existing
Indianapolis Fire Communications Center	Utility Emergency Repair/Response	Existing
Indianapolis Fire Communications Center	Weather Services	Existing
Indianapolis Fire Department Emergency Vehicles	INDOT Arterial Traffic Signals and Detection	Existing
Indianapolis Fire Department Emergency Vehicles	Lawrence Roadside Equipment	Existing
Indianapolis Fire Department Emergency Vehicles	MESA System	Existing
Indianapolis Fire Department Emergency Vehicles	Speedway Roadside Equipment	Existing
Indianapolis Fire Department Emergency Vehicles	Surrounding County Highway Roadside Equipment	Existing
Indianapolis MPO Planning Operations	INDOT Indianapolis TMC	Existing
Indianapolis MPO Planning Operations	IndyGo Operations Center	Existing
Indianapolis MPO Planning Operations	Lawrence Public Works/Street Department	Existing
Indianapolis MPO Planning Operations	Personal Computing Devices	Existing
Indianapolis MPO Planning Operations	Speedway Public Works	Existing
Indianapolis MPO Planning Operations	Suburban Municipality Street Department Operations/Dispatch	Existing
Indianapolis MPO Planning Operations	Surrounding County Highway Operations/Dispatch	Existing
Indianapolis MPO Planning Operations	Traffic Data Archive	Planned
Indianapolis Police Department Emergency Vehicles	Indianapolis Police Dispatch	Existing

Element 1	Element 2	Status
Indianapolis Police Department Emergency Vehicles	MESA System	Existing
Indianapolis Police Dispatch	INDOT Indianapolis TMC	Existing
Indianapolis Police Dispatch	Intelligence Fusion Center	Planned
Indianapolis Police Dispatch	Lawrence Public Safety	Existing
Indianapolis Police Dispatch	Lucas Oil Stadium Command Center	Existing
Indianapolis Police Dispatch	MESA System	Existing
Indianapolis Police Dispatch	Private Fleet Vehicle Dispatch Systems	Existing
Indianapolis Police Dispatch	Private Towing Companies	Existing
Indianapolis Police Dispatch	Speedway Public Safety	Existing
Indianapolis Police Dispatch	Surrounding County Sheriff Communications Center	Existing
Indianapolis Police Dispatch	Utility Emergency Repair/Response	Existing
Indianapolis Police Dispatch	Weather Services	Existing
INDOT Arterial Cameras and Controllers	INDOT Arterial TMS	Existing
INDOT Arterial TMS	INDOT Arterial Traffic Signals and Detection	Existing
INDOT Arterial TMS	INDOT Indianapolis TMC	Existing
INDOT Arterial TMS	INDOT Ramp Metering System	Existing
INDOT Arterial TMS	Lawrence Public Works/Street Department	Future
INDOT Arterial TMS	MESA System	Existing
INDOT Arterial TMS	Speedway Public Works	Future
INDOT Arterial Traffic Signals and Detection	Lawrence Vehicles	Existing
INDOT Arterial Traffic Signals and Detection	Major Employer Emergency Vehicles	Existing
INDOT Arterial Traffic Signals and Detection	Speedway Vehicles	Existing
INDOT Arterial Traffic Signals and Detection	Suburban Municipality Emergency Vehicles	Existing
INDOT Gary TMC	INDOT Indianapolis TMC	Existing
INDOT Hoosier Helper Vehicles	INDOT Indianapolis TMC	Existing
INDOT Indianapolis TMC	INDOT Indianapolis TMC Roadside Equipment	Existing
INDOT Indianapolis TMC	INDOT Lane Management Field Equipment	Existing
INDOT Indianapolis TMC	INDOT MCO Field Devices	Existing
INDOT Indianapolis TMC	INDOT MCO Management	Existing
INDOT Indianapolis TMC	INDOT Ramp Metering System	Existing
INDOT Indianapolis TMC	INDOT Security Monitoring Field Equipment	Existing
INDOT Indianapolis TMC	INDOT TPIMS	Planned
INDOT Indianapolis TMC	INDOT Variable Speed Limits Field Equipment	Existing
INDOT Indianapolis TMC	INDOT Work Zone Speed Monitoring Field Equipment	Existing
INDOT Indianapolis TMC	INDOT Work Zone Speed Warning Field Equipment	Planned
INDOT Indianapolis TMC	IndyGo Kiosks	Planned
INDOT Indianapolis TMC	IndyGo Operations Center	Existing
INDOT Indianapolis TMC	Intelligence Fusion Center	Planned
INDOT Indianapolis TMC	ISP Dispatch	Existing
INDOT Indianapolis TMC	Lawrence Public Safety	Existing
INDOT Indianapolis TMC	Lawrence Public Works/Street Department	Existing

Element 1	Element 2	Status
INDOT Indianapolis TMC	Major Employer Management Systems	Existing
INDOT Indianapolis TMC	Marion County Sheriff Dispatch	Existing
INDOT Indianapolis TMC	Media	Existing
INDOT Indianapolis TMC	MESA System	Existing
INDOT Indianapolis TMC	Personal Computing Devices	Existing
INDOT Indianapolis TMC	Private Fleet Vehicle Dispatch Systems	Existing
INDOT Indianapolis TMC	Private Towing Companies	Existing
INDOT Indianapolis TMC	Public Health Systems	Existing
INDOT Indianapolis TMC	RWIS Sensors	Existing
INDOT Indianapolis TMC	Speedway Public Safety	Existing
INDOT Indianapolis TMC	Speedway Public Works	Existing
INDOT Indianapolis TMC	Suburban Municipality Emergency Dispatch	Existing
INDOT Indianapolis TMC	Suburban Municipality Street Department Operations/Dispatch	Planned
INDOT Indianapolis TMC	Surface Transportation Weather Service	Existing
INDOT Indianapolis TMC	Surrounding County Highway Operations/Dispatch	Existing
INDOT Indianapolis TMC	Surrounding County Sheriff Communications Center	Existing
INDOT Indianapolis TMC	Traffic Data Archive	Planned
INDOT Indianapolis TMC	TrafficWise Traveler Information System	Existing
INDOT Indianapolis TMC	Utility Emergency Repair/Response	Existing
INDOT Indianapolis TMC	Weather Services	Existing
INDOT Indianapolis TMC Roadside Equipment	ITS Maintenance Contractor	Planned
INDOT Indianapolis TMC Roadside Equipment	Vehicles	Future
INDOT Infrastructure Inventory System	INDOT MCO Management	Existing
INDOT Infrastructure Inventory System	Traffic Data Archive	Existing
INDOT MCO Field Devices	INDOT MCO Management	Existing
INDOT MCO Field Devices	INDOT MCO Vehicles	Existing
INDOT MCO Management	INDOT MCO Vehicles	Existing
INDOT MCO Management	MESA System	Existing
INDOT MCO Management	Private Towing Companies	Existing
INDOT MCO Management	RWIS Sensors	Existing
INDOT MCO Management	Surface Transportation Weather Service	Existing
INDOT MCO Management	Utility Emergency Repair/Response	Existing
INDOT MCO Management	Weather Services	Existing
INDOT Security Monitoring Field Equipment	Intelligence Fusion Center	Planned
INDOT TPIMS	INDOT TPIMS Equipment	Planned
INDOT Variable Speed Limits Field Equipment	ISP Dispatch	Planned
INDOT Work Zone Speed Warning Field Equipment	ISP Dispatch	Planned
IndyGo Kiosks	IndyGo Operations Center	Planned
IndyGo Kiosks	IndyGo Traveler Card	Planned
IndyGo Kiosks	Payment Administration Center	Planned
IndyGo Kiosks	Personal Computing Devices	Planned
IndyGo Kiosks	Private Traveler Services	Existing

Element 1	Element 2	Status
IndyGo Operations Center	IndyGo Security Monitoring Field Equipment	Existing
IndyGo Operations Center	IndyGo Transit Vehicles	Existing
IndyGo Operations Center	IndyGo Traveler Card	Planned
IndyGo Operations Center	Intelligence Fusion Center	Planned
IndyGo Operations Center	Lawrence Public Safety	Existing
IndyGo Operations Center	Media	Existing
IndyGo Operations Center	MESA System	Existing
IndyGo Operations Center	Payment Administration Center	Planned
IndyGo Operations Center	Personal Computing Devices	Existing
IndyGo Operations Center	Private Traveler Services	Planned
IndyGo Operations Center	Speedway Public Safety	Existing
IndyGo Operations Center	Suburban Municipality Street Department Operations/Dispatch	Existing
IndyGo Operations Center	TrafficWise Traveler Information System	Existing
IndyGo Operations Center	Vehicles	Planned
IndyGo Operations Center	Weather Services	Existing
IndyGo Transit Vehicles	IndyGo Traveler Card	Existing
IndyGo Transit Vehicles	MESA System	Existing
IndyGo Transit Vehicles	Payment Administration Center	Planned
IndyGo Transit Vehicles	Personal Computing Devices	Planned
IndyGo Traveler Card	Private Parking Area Equipment	Planned
IndyGo Traveler Card	Vehicles	Planned
Intelligence Fusion Center	Lawrence Public Safety	Planned
Intelligence Fusion Center	Lucas Oil Stadium Command Center	Planned
Intelligence Fusion Center	Marion County Sheriff Dispatch	Planned
Intelligence Fusion Center	MESA System	Planned
Intelligence Fusion Center	School Police Departments	Planned
Intelligence Fusion Center	Speedway Public Safety	Planned
Intelligence Fusion Center	Suburban Municipality Emergency Dispatch	Planned
Intelligence Fusion Center	Surrounding County Sheriff Communications Center	Planned
Intelligence Fusion Center	Weather Services	Planned
ISP Dispatch	ISP Emergency Vehicles	Existing
ISP Dispatch	Private Fleet Vehicle Dispatch Systems	Existing
Lawrence Public Safety	Lawrence Public Works/Street Department	Existing
Lawrence Public Safety	Lawrence Vehicles	Existing
Lawrence Public Safety	Marion County Sheriff Dispatch	Existing
Lawrence Public Safety	MESA System	Existing
Lawrence Public Safety	Private Towing Companies	Existing
Lawrence Public Safety	Utility Emergency Repair/Response	Existing
Lawrence Public Safety	Weather Services	Existing
Lawrence Public Works/Street Department	Lawrence Roadside Equipment	Existing
Lawrence Public Works/Street Department	Lawrence Vehicles	Existing
Lawrence Public Works/Street Department	MESA System	Existing
Lawrence Public Works/Street Department	Private Towing Companies	Existing

Element 1	Element 2	Status
Lawrence Public Works/Street Department	Utility Emergency Repair/Response	Existing
Lawrence Public Works/Street Department	Weather Services	Existing
Lawrence Roadside Equipment	Lawrence Vehicles	Existing
Lawrence Roadside Equipment	Major Employer Emergency Vehicles	Existing
Lawrence Roadside Equipment	Suburban Municipality Emergency Vehicles	Existing
Lucas Oil Stadium Command Center	Marion County Sheriff Dispatch	Existing
Lucas Oil Stadium Command Center	MESA System	Existing
Lucas Oil Stadium Command Center	Weather Services	Existing
Major Employer Emergency Vehicles	Major Employer Management Systems	Existing
Major Employer Emergency Vehicles	Speedway Roadside Equipment	Existing
Major Employer Management Systems	MESA System	Existing
Major Employer Management Systems	Private Fleet Vehicle Dispatch Systems	Existing
Marion County Sheriff Dispatch	Marion County Sheriff Emergency Vehicles	Existing
Marion County Sheriff Dispatch	MESA System	Existing
Marion County Sheriff Dispatch	Private Fleet Vehicle Dispatch Systems	Existing
Marion County Sheriff Dispatch	Private Towing Companies	Existing
Marion County Sheriff Dispatch	Speedway Public Safety	Existing
Marion County Sheriff Dispatch	Suburban Municipality Emergency Dispatch	Existing
Marion County Sheriff Dispatch	Surrounding County Highway Operations/Dispatch	Existing
Marion County Sheriff Dispatch	Surrounding County Sheriff Communications Center	Existing
Marion County Sheriff Dispatch	Utility Emergency Repair/Response	Existing
Marion County Sheriff Dispatch	Weather Services	Existing
Media	TrafficWise Traveler Information System	Existing
MESA System	Private Towing Companies	Existing
MESA System	School Buses	Existing
MESA System	School Police Departments	Existing
MESA System	Speedway Public Safety	Existing
MESA System	Speedway Public Works	Existing
MESA System	Suburban Municipality Emergency Dispatch	Existing
MESA System	Suburban Municipality Street Department Operations/Dispatch	Existing
MESA System	Surrounding County Highway Operations/Dispatch	Existing
MESA System	Surrounding County Sheriff Communications Center	Existing
MESA System	Taxi Services	Existing
MESA System	Utility Emergency Repair/Response	Existing
Micro-Mobility Services	Payment Administration Center	Planned
Micro-Mobility Services	Personal Computing Devices	Existing
Micro-Mobility Services	Private Traveler Services	Future
Other Suburban Municipality Street Department Dispatch	Suburban Municipality Street Department Operations/Dispatch	Existing
Payment Administration Center	Personal Computing Devices	Planned
Payment Administration Center	Private Parking Area Equipment	Planned
Payment Administration Center	Private Parking Management System	Planned
Payment Administration Center	Private Traveler Services	Planned

Element 1	Element 2	Status
Payment Administration Center	Vehicles	Planned
Payment Device	Vehicles	Planned
Pedestrian	Personal Computing Devices	Planned
Pedestrian	Suburban Municipality Street Department Roadside Equipment	Planned
Personal Computing Devices	Private Parking Area Equipment	Existing
Personal Computing Devices	Private Parking Management System	Existing
Personal Computing Devices	Private Traveler Services	Future
Personal Computing Devices	Suburban Municipality Street Department CAV Roadside Equipment	Existing
Personal Computing Devices	Taxi Services	Planned
Personal Computing Devices	TrafficWise Traveler Information System	Existing
Personal Computing Devices	Vehicles	Planned
Private Fleet Vehicle Dispatch Systems	Private Towing Companies	Existing
Private Fleet Vehicle Dispatch Systems	Suburban Municipality Emergency Dispatch	Existing
Private Fleet Vehicle Dispatch Systems	Surrounding County Sheriff Communications Center	Existing
Private Parking Area Equipment	Private Parking Management System	Existing
Private Parking Area Equipment	Vehicles	Planned
Private Parking Management System	Private Traveler Services	Future
Private Towing Companies	Speedway Public Safety	Existing
Private Towing Companies	Speedway Public Works	Existing
Private Towing Companies	Suburban Municipality Emergency Dispatch	Existing
Private Towing Companies	Suburban Municipality Street Department Operations/Dispatch	Existing
Private Towing Companies	Surrounding County Highway Operations/Dispatch	Existing
Private Towing Companies	Surrounding County Sheriff Communications Center	Existing
Private Towing Companies	Weather Services	Existing
Private Traveler Services	Suburban Municipality Street Department Operations/Dispatch	Future
Private Traveler Services	Vehicles	Planned
School Buses	School Police Departments	Existing
SCMS	Suburban Municipality Street Department CAV Roadside Equipment	Future
SCMS	Suburban Municipality Street Department Operations/Dispatch	Future
Speedway Public Safety	Speedway Public Works	Existing
Speedway Public Safety	Speedway Vehicles	Existing
Speedway Public Safety	Utility Emergency Repair/Response	Existing
Speedway Public Safety	Weather Services	Existing
Speedway Public Works	Speedway Roadside Equipment	Existing
Speedway Public Works	Speedway Vehicles	Existing
Speedway Public Works	Utility Emergency Repair/Response	Existing
Speedway Public Works	Weather Services	Existing
Speedway Roadside Equipment	Speedway Vehicles	Existing
Suburban Municipality Emergency Dispatch	Suburban Municipality Emergency Vehicles	Existing

Element 1	Element 2	Status
Suburban Municipality Emergency Dispatch	Suburban Municipality Street Department Operations/Dispatch	Existing
Suburban Municipality Emergency Dispatch	Surrounding County Highway Operations/Dispatch	Existing
Suburban Municipality Emergency Dispatch	Surrounding County Sheriff Communications Center	Existing
Suburban Municipality Emergency Dispatch	Utility Emergency Repair/Response	Existing
Suburban Municipality Emergency Dispatch	Weather Services	Existing
Suburban Municipality Emergency Vehicles	Suburban Municipality Street Department Roadside Equipment	Planned
Suburban Municipality Emergency Vehicles	Surrounding County Highway Roadside Equipment	Existing
Suburban Municipality Street Department CAV Roadside Equipment	Suburban Municipality Street Department Operations/Dispatch	Planned
Suburban Municipality Street Department CAV Roadside Equipment	Suburban Municipality Street Department Roadside Equipment	Planned
Suburban Municipality Street Department CAV Roadside Equipment	Vehicles	Planned
Suburban Municipality Street Department Operations/Dispatch	Suburban Municipality Street Department Roadside Equipment	Existing
Suburban Municipality Street Department Operations/Dispatch	Suburban Municipality Street Department Vehicles	Existing
Suburban Municipality Street Department Operations/Dispatch	Surrounding County Highway Operations/Dispatch	Existing
Suburban Municipality Street Department Operations/Dispatch	Surrounding County Sheriff Communications Center	Existing
Suburban Municipality Street Department Operations/Dispatch	Utility Emergency Repair/Response	Existing
Suburban Municipality Street Department Operations/Dispatch	Weather Services	Existing
Suburban Municipality Street Department Roadside Equipment	Surrounding County Highway Operations/Dispatch	Planned
Suburban Municipality Street Department Roadside Equipment	Vehicles	Existing
Suburban Municipality Street Department Roadside Equipment	Vulnerable Road User	Existing
Surrounding County Highway Operations/Dispatch	Surrounding County Highway Roadside Equipment	Existing
Surrounding County Highway Operations/Dispatch	Surrounding County Highway Vehicles	Existing
Surrounding County Highway Operations/Dispatch	Surrounding County Sheriff Communications Center	Existing
Surrounding County Highway Operations/Dispatch	Utility Emergency Repair/Response	Existing
Surrounding County Highway Operations/Dispatch	Weather Services	Existing
Surrounding County Security Monitoring Field Equipment	Surrounding County Sheriff Communications Center	Existing

Element 1	Element 2	Status
Surrounding County Sheriff Communications Center	Surrounding County Sheriff Emergency Vehicles	Existing
Surrounding County Sheriff Communications Center	Utility Emergency Repair/Response	Existing
Surrounding County Sheriff Communications Center	Weather Services	Existing
Taxi Services	Weather Services	Existing
TrafficWise Traveler Information System	Vehicles	Planned
TrafficWise Traveler Information System	Weather Services	Existing
Utility Emergency Repair/Response	Weather Services	Existing
Vehicles	Vulnerable Road User	Planned

9 Communications

Communications standards are essential to cost-effective integration of ITS throughout the region. ITS standards are fundamental to the establishment of an open ITS environment that achieves the goal of interoperability for ITS. Standards facilitate deployment of interoperable systems at local, regional, national and international levels without impeding innovation as technology advances and new approaches evolve.

Establishing communications standards for exchanging information among ITS systems is important not only from an interoperability point of view; it also provides interchangeability and expandability thereby reducing risk and cost. Since an agency using standardized interfaces can select among multiple vendors for products and applications, competition is maintained and prices are lower in the long term.

In ARC-IT and in this regional architecture, the relevant communications standards for a particular interface are grouped together into ‘Communication Solutions’ that define the set of standards that are required for the interface. The first table identifies all of the communications solutions that have been selected for this region.

Frequently, more than one communications solution will be available for a given interface. Many standards overlap in applicability and offer varying features and levels of performance and security. This provides flexibility in the design of ITS systems allowing agencies to choose the most applicable communications solution for their needs. Before systems are designed, all stakeholders involved in the applicable ITS service(s) should agree on the communications solution and any required/desired tailoring. Once a decision is made, all future systems supporting that interface should use the agreed upon communications solution. Table 7 lists the relevant communications solutions applicable to the Indianapolis RITSA.

Table 7 – Relevant Communications Solutions

Name	Description
(Data Not Needed) - Bluetooth	This solution is used within Australia, Canada, the E.U. and the U.S.. It combines standards associated with (Data Not Needed) with those for Bluetooth. The (Data Not Needed) standards include an empty set of upper-layer standards. The Bluetooth standards include lower-layer standards that support wireless communications over a personal area network of up to roughly 100 meters.
(None-Data) - Guaranteed Secure Internet (ITS)	This solution is used within Australia, the E.U. and the U.S.. It combines standards associated with (None-Data) with those for I-I: Guaranteed Secure Internet (ITS). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Name	Description
(None-Data) - Guaranteed Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-M: Guaranteed Secure Wireless Internet (ITS). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Guaranteed Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
(None-Data) - Local Unicast Wireless (1609.2)	This solution is used within the U.S.. It combines standards associated with (None-Data) with those for V-X: Local Unicast Wireless (1609.2). The (None-Data) standards include an unspecified set of standards at the upper layers. The V-X: Local Unicast Wireless (1609.2) standards include lower-layer standards that support local-area unicast wireless solutions applicable to North America, such as WAVE DSRC, LTE-V2X, LTE, Wi-Fi, etc.
(None-Data) - LTE-V2X WSMP	This solution is used within the U.S.. It combines standards associated with (None-Data) with those for V-X: LTE-V2X WSMP. The (None-Data) standards include an unspecified set of standards at the upper layers. The V-X: LTE-V2X WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications using the WAVE Short Messaging Protocol (WSMP) over 3GPP C-V2X in the 5.9GHz spectrum.
(None-Data) - Secure Internet (ITS)	This solution is used within Australia, the E.U. and the U.S.. It combines standards associated with (None-Data) with those for I-I: Secure Internet (ITS). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
(None-Data) - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with (None-Data) with those for I-M: Secure Wireless Internet (ITS). The (None-Data) standards include an unspecified set of standards at the upper layers. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
(None-Data) - Wide Area Broadcast	This solution is used within Australia, the E.U. and the U.S.. It combines standards associated with (None-Data) with those for C-X: Wide Area Broadcast. The (None-Data) standards include an unspecified set of standards at the upper layers. The C-X: Wide Area Broadcast standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.

Name	Description
Data for Distribution (TBD) - OMG DDS over Wireless	This solution is used within the U.S.. It combines standards associated with Data for Distribution (TBD) with those for OMG DDS over Wireless. The Data for Distribution (TBD) standards include a placeholder for upper-layer standards necessary to define the data (elements and structures) necessary to complete a solution for the information flow based on data distribution technologies. The data standard will need to include a specific customization for the desired data distribution technology used (e.g., Kafka, DDS, etc.). The OMG DDS over Wireless standards include lower-layer standards that support secure data sharing and command operations between remote devices over wireless links.
Parking - Secure Internet (ITS)	This solution is used within Australia, Canada, the E.U. and the U.S.. It combines standards associated with Parking with those for I-I: Secure Internet (ITS). The Parking standards include upper-layer standards required to exchange parking information. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
TPEG2 - Secure Internet (ITS)	This solution is used within Australia, the E.U. and the U.S.. It combines standards associated with TPEG2 with those for I-I: Secure Internet (ITS). The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
TPEG2 - Wide Area Broadcast	This solution is used within Australia, the E.U. and the U.S.. It combines standards associated with TPEG2 with those for C-X: Wide Area Broadcast. The TPEG2 standards include upper-layer standards required to support multi-modal information services.. The C-X: Wide Area Broadcast standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.
US: ADMS - Guaranteed Secure Internet (ITS)	This solution is used within Canada and the U.S.. It combines standards associated with US: ADMS with those for I-I: Guaranteed Secure Internet (ITS). The US: ADMS standards include upper-layer standards required to implement interfaces with an archived data management system. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: ADMS - Secure Internet (ITS)	This solution is used within Canada and the U.S.. It combines standards associated with US: ADMS with those for I-I: Secure Internet (ITS). The US: ADMS standards include upper-layer standards required to implement interfaces with an archived data management system. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: ATIS - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: ATIS with those for I-I: Secure Internet (ITS). The US: ATIS standards include upper-layer standards required to implement traveler information communications. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Name	Description
US: ATIS - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: ATIS with those for I-M: Secure Wireless Internet (ITS). The US: ATIS standards include upper-layer standards required to implement traveler information communications. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: ATIS - Wide Area Broadcast	This solution is used within the U.S.. It combines standards associated with US: ATIS with those for C-X: Wide Area Broadcast. The US: ATIS standards include upper-layer standards required to implement traveler information communications. The C-X: Wide Area Broadcast standards include lower-layer standards that support one entity broadcasting information to all wireless devices over an area that covers at least a metropolitan area without any expectation of acknowledgement or response; security is provided by the upper-layers.
US: CDS - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: CDS with those for I-I: Secure Internet (ITS). The US: CDS standards include upper-layer standards required to manage the curb-space using CDS standards. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: GTFS - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS with those for I-I: Secure Internet (ITS). The US: GTFS standards include upper-layer standards required to implement public, transit-related communications. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: GTFS - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS with those for I-M: Secure Wireless Internet (ITS). The US: GTFS standards include upper-layer standards required to implement public, transit-related communications. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: GTFS real-time - Guaranteed Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS real-time with those for I-I: Guaranteed Secure Internet (ITS). The US: GTFS real-time standards include upper-layer standards required to implement real-time, public, transit-related communications. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Name	Description
US: GTFS real-time - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS real-time with those for I-I: Secure Internet (ITS). The US: GTFS real-time standards include upper-layer standards required to implement real-time, public, transit-related communications. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: GTFS real-time - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS real-time with those for I-M: Secure Wireless Internet (ITS). The US: GTFS real-time standards include upper-layer standards required to implement real-time, public, transit-related communications. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: GTFS static - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS static with those for I-I: Secure Internet (ITS). The US: GTFS static standards include upper-layer standards required to implement static, public, transit-related communications. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: GTFS static - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: GTFS static with those for I-M: Secure Wireless Internet (ITS). The US: GTFS static standards include upper-layer standards required to implement static, public, transit-related communications. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: MDS - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: MDS with those for I-I: Secure Internet (ITS). The US: MDS standards include The Mobility Data Specification is a digital tool that helps cities to better manage transportation in the public right of way. MDS standardizes communication and data-sharing between cities and private mobility providers, such as e-scooter and bike share companies. This allows cities to share and validate policy digitally, enabling vehicle management and better outcomes for residents. Plus, it provides mobility service providers with a framework they can re-use in new markets, allowing for seamless collaboration that saves time and money.. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

Name	Description
US: Misbehavior reporting - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: Misbehavior reporting with those for I-I: Secure Internet (ITS). The US: Misbehavior reporting standards include upper-layer standards required to support misbehavior reporting services. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: NTCIP Data Collection - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Data Collection with those for I-F: SNMPv3/TLS. The US: NTCIP Data Collection standards include upper-layer standards required to implement center-to-field communications for data collection and monitoring of traffic characteristics (e.g., non-real-time data). The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Environmental Sensors - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-F: SNMPv3/TLS. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement center-to-field weather and environmental sensor communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Environmental Sensors - Wireless SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Environmental Sensors with those for I-M: Wireless SNMPv3/TLS. The US: NTCIP Environmental Sensors standards include upper-layer standards required to implement center-to-field weather and environmental sensor communications. The I-M: Wireless SNMPv3/TLS standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).
US: NTCIP Generic Device - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Generic Device with those for I-F: SNMPv3/TLS. The US: NTCIP Generic Device standards include upper-layer standards required to implement center-to-field communications for any device functionality. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Message Sign - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-F: SNMPv3/TLS. The US: NTCIP Message Sign standards include upper-layer standards required to implement center-to-field message sign communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.

Name	Description
US: NTCIP Message Sign - Wireless SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Message Sign with those for I-M: Wireless SNMPv3/TLS. The US: NTCIP Message Sign standards include upper-layer standards required to implement center-to-field message sign communications. The I-M: Wireless SNMPv3/TLS standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).
US: NTCIP Ramp Meters - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Ramp Meters with those for I-F: SNMPv3/TLS. The US: NTCIP Ramp Meters standards include upper-layer standards required to implement center-to-field ramp meter communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Signal Priority - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal Priority with those for I-F: SNMPv3/TLS. The US: NTCIP Signal Priority standards include upper-layer standards required to implement center-to-field traffic signal control priority communications (e.g., for busses and emergency vehicles). The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Signal System Masters - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Signal System Masters with those for I-F: SNMPv3/TLS. The US: NTCIP Signal System Masters standards include upper-layer standards required to implement center-to-field signal-system master communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Traffic Signal - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Traffic Signal with those for I-F: SNMPv3/TLS. The US: NTCIP Traffic Signal standards include upper-layer standards required to implement center-to-field traffic signal communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Transportation Sensors - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Transportation Sensors with those for I-F: SNMPv3/TLS. The US: NTCIP Transportation Sensors standards include upper-layer standards required to implement center-to-field transportation sensors (e.g., vehicle detectors) communications (e.g., real-time). The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.

Name	Description
US: NTCIP Video Switches - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Video Switches with those for I-F: SNMPv3/TLS. The US: NTCIP Video Switches standards include upper-layer standards required to implement center-to-field video switch communications. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Warning Device - SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-F: SNMPv3/TLS. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-F: SNMPv3/TLS standards include lower-layer standards that support secure center-to-field and field-to-field communications using simple network management protocol (SNMPv3); implementations are strongly encouraged to use the TLS for SNMP security option for this solution to ensure adequate security.
US: NTCIP Warning Device - Wireless SNMPv3/TLS	This solution is used within the U.S.. It combines standards associated with US: NTCIP Warning Device with those for I-M: Wireless SNMPv3/TLS. The US: NTCIP Warning Device standards include a composite of upper-layer standards that support monitoring for unsafe traffic activities and displaying warning to drivers. The I-M: Wireless SNMPv3/TLS standards include lower-layer standards that support secure infrastructure-to-mobile communications using simple network management protocol (SNMPv3).
US: SAE J3067 (J2735 SE) - Guaranteed Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-I: Guaranteed Secure Internet (ITS). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance characteristics. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: SAE J3067 (J2735 SE) - Guaranteed Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-M: Guaranteed Secure Wireless Internet (ITS). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance characteristics. The I-M: Guaranteed Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.

Name	Description
US: SAE J3067 (J2735 SE) - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE J3067 (J2735 SE) with those for I-M: Secure Wireless Internet (ITS). The US: SAE J3067 (J2735 SE) standards include a proposed solution for the upper-layers to implement V2X information flows that do not yet have fully standardized messages, functionality or performance characteristics. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: SAE Lane-Level Mapping - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE Lane-Level Mapping with those for I-I: Secure Internet (ITS). The US: SAE Lane-Level Mapping standards include upper-layer standards required to implement lane-level and road furniture mapping information flows. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: SAE LTE-V2X BSM - LTE-V2X WSMP	This solution is used within the U.S.. It combines standards associated with US: SAE LTE-V2X BSM with those for V-X: LTE-V2X WSMP. The US: SAE LTE-V2X BSM standards include upper-layer standards required to implement V2V safety information flows over C-V2X. The V-X: LTE-V2X WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications using the WAVE Short Messaging Protocol (WSMP) over 3GPP C-V2X in the 5.9GHz spectrum.
US: SAE Other J2735 - Local Unicast Wireless (1609.2)	This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: Local Unicast Wireless (1609.2). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance characteristics. The V-X: Local Unicast Wireless (1609.2) standards include lower-layer standards that support local-area unicast wireless solutions applicable to North America, such as WAVE DSRC, LTE-V2X, LTE, Wi-Fi, etc.
US: SAE Other J2735 - LTE-V2X IPv6	This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: LTE-V2X IPv6. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance characteristics. The V-X: LTE-V2X IPv6 standards include lower-layer standards that support connectionless vehicle-to-any communications using Internet Protocol version 6 (IPv6) over C-V2X in the 5.9GHz spectrum.
US: SAE Other J2735 - LTE-V2X WSMP	This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for V-X: LTE-V2X WSMP. The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance characteristics. The V-X: LTE-V2X WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications using the WAVE Short Messaging Protocol (WSMP) over 3GPP C-V2X in the 5.9GHz spectrum.

Name	Description
US: SAE Other J2735 - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-I: Secure Internet (ITS). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance characteristics. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: SAE Other J2735 - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: SAE Other J2735 with those for I-M: Secure Wireless Internet (ITS). The US: SAE Other J2735 standards include upper-layer standards required to implement V2X information flows that do not yet have fully specified functionality and performance characteristics. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: SAE Signal Control Messages - Local Unicast Wireless (1609.2)	This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: Local Unicast Wireless (1609.2). The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: Local Unicast Wireless (1609.2) standards include lower-layer standards that support local-area unicast wireless solutions applicable to North America, such as WAVE DSRC, LTE-V2X, LTE, Wi-Fi, etc.
US: SAE Signal Control Messages - LTE-V2X WSMP	This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: LTE-V2X WSMP. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: LTE-V2X WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications using the WAVE Short Messaging Protocol (WSMP) over 3GPP C-V2X in the 5.9GHz spectrum.
US: SAE Signal Control Messages - WAVE WSMP	This solution is used within the U.S.. It combines standards associated with US: SAE Signal Control Messages with those for V-X: WAVE WSMP. The US: SAE Signal Control Messages standards include upper-layer standards required to implement signal control information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over IEEE WAVE in the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTF.
US: SAE Signal Preemption - LTE-V2X TCP	This solution is used within the U.S.. It combines standards associated with US: SAE Signal Preemption with those for V-X: LTE-V2X TCP. The US: SAE Signal Preemption standards include upper-layer standards required to implement signal preemption and priority information flows. The V-X: LTE-V2X TCP standards include lower-layer standards that support connection-oriented vehicle-to-any communications using the Transmission Control Protocol (TCP) over Internet Protocol version 6 (IPv6) over C-V2X in the 5.9GHz spectrum.

Name	Description
US: SAE VRU Messages - WAVE WSMP	This solution is used within the U.S.. It combines standards associated with US: SAE VRU Messages with those for V-X: WAVE WSMP. The US: SAE VRU Messages standards include upper-layer standards required to implement vulnerable road user information flows. The V-X: WAVE WSMP standards include lower-layer standards that support connectionless, near constant, ultra-low latency vehicle-to-any communications within ~300m using the WAVE Short Messaging Protocol (WSMP) over IEEE WAVE in the 5.9GHz spectrum. The broadcast mode is interoperable with M5 FNTF.
US: TCIP - Guaranteed Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: TCIP with those for I-I: Guaranteed Secure Internet (ITS). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: TCIP - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: TCIP with those for I-I: Secure Internet (ITS). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: TCIP - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: TCIP with those for I-M: Secure Wireless Internet (ITS). The US: TCIP standards include upper-layer standards required to implement transit-related communications. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.
US: TMDD - NTCIP Messaging	This solution is used within the U.S.. It combines standards associated with US: TMDD with those for C-C: NTCIP Messaging. The US: TMDD standards include upper-layer standards required to implement center-to-center communications with traffic management systems. The C-C: NTCIP Messaging standards include lower-layer standards that support partially secure communications between two centers as commonly used in the US.
US: TOMP - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: TOMP with those for I-I: Secure Internet (ITS). The US: TOMP standards include upper-layer standards required to share information among transport operators. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: TOMP - Secure Wireless Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: TOMP with those for I-M: Secure Wireless Internet (ITS). The US: TOMP standards include upper-layer standards required to share information among transport operators. The I-M: Secure Wireless Internet (ITS) standards include lower-layer standards that support secure communications between two entities, either or both of which may be mobile devices, but they must be stationary or only moving within wireless range of a single wireless access point (e.g., a parked car). Security is based on X.509 or IEEE 1609.2 certificates. A non-mobile (if any) endpoint may connect to the service provider using any Internet connection method.

Name	Description
US: WAVE Tolling - LTE-V2X TCP	This solution is used within the U.S.. It combines standards associated with US: WAVE Tolling with those for V-X: LTE-V2X TCP. The US: WAVE Tolling standards include upper-layer standards required to implement V2I tolling flows. The V-X: LTE-V2X TCP standards include lower-layer standards that support connection-oriented vehicle-to-any communications using the Transmission Control Protocol (TCP) over Internet Protocol version 6 (IPv6) over C-V2X in the 5.9GHz spectrum.
US: WZDx - Guaranteed Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: WZDx with those for I-I: Guaranteed Secure Internet (ITS). The US: WZDx standards include upper-layer standards required to implement work zone information data exchanges. The I-I: Guaranteed Secure Internet (ITS) standards include lower-layer standards that support secure communications with guaranteed delivery between ITS equipment using X.509 or IEEE 1609.2 security certificates.
US: WZDx - Secure Internet (ITS)	This solution is used within the U.S.. It combines standards associated with US: WZDx with those for I-I: Secure Internet (ITS). The US: WZDx standards include upper-layer standards required to implement work zone information data exchanges. The I-I: Secure Internet (ITS) standards include lower-layer standards that support secure communications between ITS equipment using X.509 or IEEE 1609.2 security certificates.

10 Agreements

Table 8 identifies the list of existing and future agreements between each of the stakeholder organizations whose ITS systems will be exchanging information. This list identifies the agreements that should be established but does not define the agreements themselves.

Table 8 – Agreements

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
001	City of Indianapolis Incident Response	Unspecified	Existing	The Indianapolis DPW is available 24/7, and will provide incident traffic control (barricades, vehicles, etc.) as deemed necessary by IPD and IFD. This agreement includes HAZMAT response coordination.	Indianapolis Department of Public Works	<ul style="list-style-type: none"> Indianapolis Department of Public Works Indianapolis Fire Department Indianapolis Police Department
002	City of Indianapolis/INDOT Traffic Signal Jurisdiction	Unspecified	Existing	Transfer of jurisdiction of State Routes 40, 36, and 67 from INDOT to the City of Indianapolis	Indianapolis Department of Public Works	<ul style="list-style-type: none"> Indiana Department of Transportation District Level Indianapolis Department of Public Works
003	City of Indianapolis/INDOT Traffic Signal Jurisdiction/Maintenance	Unspecified	Existing	Transfer of jurisdiction and of maintenance responsibilities for State Routes 31, 37, 67, and 135 (includes traffic signal maintenance) from INDOT to the City of Indianapolis.	Indianapolis Department of Public Works	<ul style="list-style-type: none"> Indiana Department of Transportation District Level Indianapolis Department of Public Works
004	Indianapolis DPW South and East County Line Route Maintenance Jurisdiction	Unspecified	Existing	City of Indianapolis DPW provides maintenance (including signals) of routes along the south and east county line of Marion County.	Indianapolis Department of Public Works	<ul style="list-style-type: none"> Indianapolis Department of Public Works Surrounding Counties
005	City of Indianapolis/IDI Traffic Control	Unspecified	Existing	City provides barricades, etc. for large events (Black Expo, Circle City Classic, etc.).	Indianapolis Department of Public Works	<ul style="list-style-type: none"> Event Promoters/Special Events

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
006	Municipal Traffic Signal Maintenance	Unspecified	Existing		Indianapolis Department of Public Works	<ul style="list-style-type: none"> • City of Beech Grove • City of Lawrence • Indiana Department of Transportation District Level • Indianapolis Department of Public Works • Town of Speedway
007	Know-Zone Action Day Messages	Unspecified	Existing	INDOT to display "Know-Zone" Action Day messages on INDOT dynamic message signs as advised by the City of Indianapolis.	Indiana Department of Transportation District Level	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indianapolis Department of Public Works • Indianapolis MPO
008	INDOT Indianapolis TMC	Unspecified	Existing	Costs for INDOT Indianapolis Traffic Management Center, including overall funding (INDOT cost), construction (INDOT cost), building security (ISP cost), and maintenance (ISP cost).	Indiana Department of Transportation District Level	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indiana State Police

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
009	INDOT/ISP Operations	Unspecified	Existing	Information sharing for operations, including ISP input for INDOT dynamic message signs and ISP access to INDOT freeway cameras (no control).	Indiana Department of Transportation District Level	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indiana State Police
010	INDOT/ISP Work Zone Agreement	Unspecified	Existing	Indiana State Police provide work zone speed enforcement and INDOT compensates ISP for overtime hours worked.	Indiana Department of Transportation District Level	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indiana State Police
011	INDOT Media Agreements	Unspecified	Planned	Sharing of traffic information collected by INDOT assets.	Indiana Department of Transportation	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Media Services

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
012	Rideshare Messages	Unspecified	Existing	INDOT to display rideshare messages on INDOT dynamic message signs as advised by IndyGo.	Indiana Department of Transportation District Level	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indianapolis Public Transportation Corporation/ IndyGo
013	IPTC/IndyGo/MECA Radio Use	Unspecified	Existing	IndyGo provided access to MECA's System 2 (public safety) for their use.	MECA	<ul style="list-style-type: none"> • Indianapolis Public Transportation Corporation/ IndyGo • MECA
014	City of Indianapolis GIS Sharing	Unspecified	Existing	City of Indianapolis provides IndyGo with GIS data.	Indianapolis Department of Public Works	<ul style="list-style-type: none"> • Indianapolis Department of Public Works • Indianapolis Public Transportation Corporation/ IndyGo

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
015	Central Indiana Commuter Services	Unspecified	Existing	CICS program promotes the use of alternative commuting options such as ridesharing by carpooling or vanpooling, and public transportation.	Indianapolis Public Transportation Corporation/IndyGo	<ul style="list-style-type: none"> • Indiana Department of Transportation • Indiana Department of Transportation District Level • Indianapolis Public Transportation Corporation/ IndyGo
016	Various Special Event Agreements	Unspecified	Existing	Event-specific agreements for transit use during special events.	Indianapolis Public Transportation Corporation/IndyGo	<ul style="list-style-type: none"> • Event Promoters/Special Events • Indianapolis Public Transportation Corporation/ IndyGo
017	Race Day Incident Management	Unspecified	Existing	Various municipalities perform incident management functions at the Indianapolis Motor Speedway on race days.	Indianapolis Motor Speedway	<ul style="list-style-type: none"> • City of Lawrence • Indianapolis Motor Speedway • Suburban Municipalities
018	IPS Mutual Aid Agreements	Unspecified	Existing	Agreements between Indianapolis Public Schools and municipal/county law enforcement for mutual aid during incident response.	Indianapolis Schools	<ul style="list-style-type: none"> • Indianapolis Police Department • Marion County Sheriffs Department

Agreement Number	Agreement Title	Agreement Type	Agreement Status	Description	Lead Stakeholder	Associated Stakeholders
019	Eli Lilly Emergency Management	Unspecified	Existing	Emergency management coordination between Eli Lilly \$ Co. and City/County emergency management agencies.	Major Employers	<ul style="list-style-type: none"> Indianapolis Fire Department Indianapolis Police Department Major Employers Marion County Sheriffs Department
020	Indianapolis Airport Mutual Aid	Unspecified	Existing	Agreements between Indianapolis Airport and municipal/county law enforcement for mutual aid during incident response.	Indianapolis Airport Authority	<ul style="list-style-type: none"> Indianapolis Airport Authority Marion County Sheriffs Department Suburban Municipalities Surrounding Counties
021	Bomb Squad Agreement	Unspecified	Existing	Agreement for bomb squad action.	Indianapolis Airport Authority	<ul style="list-style-type: none"> Indianapolis Airport Authority Indianapolis Police Department
022	Indianapolis Airport Emergency Response	Unspecified	Planned	Response agreement for airport emergencies.	Indianapolis Airport Authority	<ul style="list-style-type: none"> Indiana State Police Indianapolis Airport Authority Indianapolis Police Department Marion County Sheriffs Department

11 ITS Projects

The Indianapolis RITSA is ultimately implemented one ITS project at a time. Table 9 lists the projects that have been identified as part of the RITSA definition.

Table 9 – ITS Projects

Name	Description	Status	Geographic Scope
City of Carmel Electric Vehicle Charging	The City of Carmel has deployed eight (8) public Electric Vehicle (EV) Chargers located in three (3) public parking garages for testing and research. The City has added electrical infrastructure in 2023 that allows it to deploy up to thirty (30) dedicated EV charging spots in Civic Square parking garage. The city is still in the early phase of reviewing street charging solutions.	Planned	City of Carmel
City of Carmel Fiber Installation	The City of Carmel's Information Communications Systems (ICS) group is currently working on installing a fiber loop throughout the City that will connect fire stations and some schools, with the ability to have future connections to ITS devices.	Planned	City of Carmel
City of Carmel ITS Traffic Cameras	After implementing an additional 70 miles of new fiber optic, City of Carmel has begun installing ITS Traffic Cameras. In 2023, 35 new cameras have been installed on Keystone Parkway and various roundabouts throughout the City. Camera video processing is tracking vehicles, bikes, and pedestrians providing real time analytics to public safety and engineering department. Project partners are Volkswagen, Purdue University, and Aptiv. The city now has 117 dedicated traffic cameras with plans to add 40-50 additional cameras and sensors in 2024.	Planned	City of Carmel
City of Carmel Smart Parking	City of Carmel is researching and implementing smart parking solutions for on street and parking garages. Phase I is identifying available parking (per space) for usage tracking and display to public for open parking wayfinding. Phase II involves researching solutions for navigation aids in parking garages allowing for autonomous parking.	Planned	City of Carmel
City of Greenwood Signal and Detection Implementation	The City of Greenwood would deploy signals, detection (video, wireless etc.) and other associated equipment at various intersections on the city owned roadways.	Planned	City of Greenwood
City of Greenwood Signal Preemption	This project would deploy emergency signal preemption on all City-owned signalized intersections in the City of Greenwood.	Planned	City of Greenwood
City of Greenwood Traffic Flow and Queue Mitigation	This was a roundabout project that included some wireless pucks to help control adjacent City-owned traffic signal to try to help control traffic flow and mitigate queuing.	Existing	City of Greenwood

Name	Description	Status	Geographic Scope
IMPO Mobile Data Products	The Indianapolis MPO Mobile Data Products project will replace the IMPO's current mobile data source with a variety of mobile data products related to origin-destination, traffic speed, and traffic volume to support the IMPO's planning operations.	Planned	Central Indiana Region
Indianapolis Transit Signal Priority	This project will implement transit signal priority at intersections operated by the City of Indianapolis on the city-maintained roads.	Existing	City of Indianapolis
INDOT Automated Work Zone Speed Limit Enforcement	This project would install ITS equipment that would monitor vehicle speed traveling in the work zone area and would notify the speed information to an enforcement agency. Leveraging this information INDOT Indianapolis TMC would improve operations within and around the work zones in the state of Indiana.	Planned	State of Indiana
INDOT I-465 Hard Shoulder Running	This project would install ITS equipment, overhead signs, camera and other associated equipment that would be utilized by INDOT Indianapolis TMC to designate I-465 shoulder as a travel lane and to manage and control it.	Future	State of Indiana
INDOT I-465 Ramp Metering	This project would install ramp metering equipment and perform traffic metering on I-465 on-ramp.	Planned	State of Indiana
INDOT Marion County Signal and CCTV	In 2020-2021 in Marion County, INDOT planned to install approximately 10 new CCTV cameras to monitor traffic, approximately 200 existing signals were given GPS cards to ensure properly clock synchronization, and approximately 200 existing signals had remote timing control technology added.	Existing	Marion County
INDOT Truck Parking Information Management System (TPIMS)	The INDOT Truck Parking Information Management System (TPIMS) informs truck drivers of the number of available truck parking spaces at upcoming rest areas. TPIMS consists of vehicle detection, CCTV and DMS to display the number of open truck parking spaces at upcoming rest areas.	Planned	State of Indiana
INDOT Variable Speed Limit Enforcement	This project would install ITS equipment that would monitor vehicle speed and would convey excessive speed information to an enforcement agency. Leveraging this information, INDOT Indianapolis TMC would post safer driving speed limits during adverse or congested conditions.	Planned	State of Indiana
IndyGo Bus Rapid Transit System	This project will deploy a bus rapid transit system in the City of Indianapolis area.	Planned	City of Indianapolis
z Electric Vehicle Charging Stations (example project)	The Electric Vehicle Charging Station project is an example framework for electric vehicle charging stations as a reference/guide in support of stakeholder discussion and ITS planning.	Planned	Central Indiana Region

Name	Description	Status	Geographic Scope
z Multimodal Accessible Travel En-Route Guidance (example project)	Multimodal Accessible Travel (MAT) En-Route Guidance offers route planning and turn-by-turn guidance that is responsive to current conditions. The route may be determined by the center or the user equipment and turn-by-turn guidance is provided as the traveler progresses along the route. Real-time guidance updates may be provided during the trip as conditions change.	Future	City of Indianapolis
z Multimodal Accessible Travel Payment Integration (example project)	Multimodal Accessible Travel (MAT) Integrated Multimodal Payment provides electronic payment capability for transit fares, tolls, road use, parking, and other areas requiring electronic payments. It enables the provision of payment for transportation services using a single account for multiple public transportation providers. The transportation user establishes an account with a financial service provider, and payment administration center (PAC) communicates with various public transportation providers to coordinate charges. It supports the management of transportation user access rights (i.e., this user can use the subway but not the bus). Payment transactions are centralized; the user provides only a secure, registered token (the 'secureID') to the transportation provider's access control equipment. The transportation provider uses that token and context to initiate transactions with the PAC.	Planned	City of Indianapolis
z Multimodal Accessible Travel Planning (example project)	Multimodal Accessible Travel (MAT) Trip Planning offers the user trip planning and pre-trip guidance services. It generates a trip plan, including a multimodal route and associated service information (e.g., parking information), based on traveler preferences and constraints. The trip plan will be confirmed by the traveler reservations for transit and alternate mode (e.g., airline, rail, and ferry) trip segments, and ancillary services are accepted and processed.	Future	City of Indianapolis
z Roundabout Traffic Surveillance and Analytics (example project)	The Roundabout Traffic Surveillance and Analytics project is an example framework for traffic surveillance on roundabouts to analyze near misses and traffic flows. The project deploys cameras to gather data and analytics to identify safety and traffic issues.	Planned	Central Indiana Region
z Suburban Municipality Intersection CAV (example project)	The Suburban Municipality Connected and Automated Vehicle (CAV) project is an example framework for future CAV systems as a reference/guide in support of stakeholder discussion, ITS planning, or grant applications. The project includes basic CAV support, vehicle-based traffic surveillance, pedestrian and cyclist safety, and intersection safety warning and collision avoidance services.	Future	Central Indiana Region

Name	Description	Status	Geographic Scope
z Vulnerable Road User Safety (example project)	<p>The Vulnerable Road User Safety project is an example framework for future CAV systems as a reference/guide in support of stakeholder discussion, ITS planning, or grant applications. The project includes the sensing and warning systems used to interact with pedestrians, cyclists, wheel chair users, scooter riders, and other vulnerable road users that are on pathways that are immediately adjacent to or intersect the roadway. These systems allow automated warning or active protection for vulnerable road users. It integrates traffic and vulnerable road user information from roadside or intersection detectors and data from wirelessly connected, traveler-carried mobile devices to request right-of-way or to inform pedestrians when to cross and how to remain aligned with the crosswalk or pathway based on real-time Signal Phase and Timing (SPaT) and MAP information. In some cases, priority will be given to non-motorized travelers, such as persons with disabilities who need additional crossing time, or in special conditions (e.g., weather) where non-motorized travelers may warrant priority or additional crossing time.</p>	Planned	Central Indiana Region

Appendix A. Functional Requirements

Each ITS system operated by the stakeholders must perform certain functions to effectively deliver the envisioned project capabilities. The primary functions that each system needs to perform are broadly defined in the Indianapolis RITSA as a set of Functional Objects that make up the physical elements of the architecture. As projects get implemented requirements will need to be written to determine what each element must do in order to achieve its given set of functions. Table 10 lists the functional requirements defined for inventory elements in the Indianapolis RITSA.

Table 10 – Functional Requirements Table

Element Name	Functional Object	Req #	Requirement	Status
Ambulance Dispatch	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Ambulance Dispatch	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Ambulance Dispatch	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
Ambulance Dispatch	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Ambulance Dispatch	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Ambulance Dispatch	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Ambulance Dispatch	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Ambulance Dispatch	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Ambulance Dispatch	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Ambulance Dispatch	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
Ambulance Dispatch	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Ambulance Dispatch	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Ambulance Dispatch	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Ambulance Dispatch	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Ambulance Dispatch	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Ambulance Dispatch	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Ambulance Dispatch	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Ambulance Dispatch	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Ambulance Dispatch	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Ambulance Dispatch	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Ambulance Dispatch	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Ambulance Dispatch	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Ambulance Dispatch	Emergency Routing	3	The center shall receive status information from care facilities to determine the appropriate facility and its location.	Existing
Ambulance Dispatch	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Ambulance Dispatch	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
Ambulance Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Ambulance Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Ambulance Vehicles	EV On-Board En Route Support	7	The emergency vehicle shall send patient status information to the care facility along with a request for further information.	Existing
Ambulance Vehicles	EV On-Board En Route Support	8	The emergency vehicle shall forward care facility status information to emergency vehicle personnel, including the location, specialized services, quality of care, waiting time, number of rooms available, and emergency room status of hospitals or emergency care providers.	Existing
Ambulance Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Ambulance Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Ambulance Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Beech Grove Public Safety	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Beech Grove Public Safety	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Safety	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Beech Grove Public Safety	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Beech Grove Public Safety	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Beech Grove Public Safety	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Beech Grove Public Safety	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Beech Grove Public Safety	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Beech Grove Public Safety	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Beech Grove Public Safety	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Beech Grove Public Safety	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Beech Grove Public Safety	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Beech Grove Public Safety	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Safety	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Beech Grove Public Safety	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Beech Grove Public Safety	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Beech Grove Public Safety	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Beech Grove Public Safety	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Beech Grove Public Safety	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Beech Grove Public Safety	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Beech Grove Public Safety	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Beech Grove Public Safety	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Safety	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Beech Grove Public Safety	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Beech Grove Public Safety	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Beech Grove Public Safety	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Beech Grove Public Safety	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Beech Grove Public Safety	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Safety	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Beech Grove Public Safety	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Beech Grove Public Safety	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Beech Grove Public Safety	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Beech Grove Public Safety	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Beech Grove Public Safety	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Beech Grove Public Safety	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Beech Grove Public Safety	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Beech Grove Public Safety	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Beech Grove Public Safety	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Beech Grove Public Safety	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Safety	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Beech Grove Public Safety	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Beech Grove Public Safety	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Beech Grove Public Safety	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Beech Grove Public Safety	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
Beech Grove Public Safety	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Beech Grove Public Works Operations	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Planned
Beech Grove Public Works Operations	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Beech Grove Public Works Operations	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Beech Grove Public Works Operations	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Beech Grove Public Works Operations	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Beech Grove Public Works Operations	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Beech Grove Public Works Operations	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
Beech Grove Public Works Operations	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Beech Grove Public Works Operations	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Beech Grove Public Works Operations	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Beech Grove Public Works Operations	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Beech Grove Public Works Operations	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Beech Grove Public Works Operations	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing
Beech Grove Public Works Operations	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Beech Grove Public Works Operations	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Beech Grove Public Works Operations	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Beech Grove Public Works Operations	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Beech Grove Public Works Operations	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Beech Grove Public Works Operations	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Planned
Beech Grove Public Works Operations	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Public Works Operations	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Beech Grove Public Works Operations	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Beech Grove Public Works Operations	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned
Beech Grove Public Works Operations	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Planned
Beech Grove Public Works Operations	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Beech Grove Public Works Operations	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Beech Grove Public Works Operations	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
Beech Grove Public Works Operations	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Planned
Beech Grove Public Works Operations	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
Beech Grove Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Beech Grove Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Beech Grove Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Beech Grove Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Beech Grove Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Beech Grove Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing
Beech Grove Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Beech Grove Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Beech Grove Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Beech Grove Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Beech Grove Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Beech Grove Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Beech Grove Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Beech Grove Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Beech Grove Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Beech Grove Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Beech Grove Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Beech Grove Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Beech Grove Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Carmel CityOS	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Planned
Carmel CityOS	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Carmel CityOS	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.	Planned
Carmel CityOS	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.	Planned
Carmel CityOS	Parking Management	1	The center shall monitor parking area current operational status including current parking occupancy and rates.	Planned
Carmel CityOS	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Carmel CityOS	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Planned
Carmel CityOS	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.	Planned
Carmel CityOS	TMC Basic Surveillance	7	The center shall remotely control devices to detect traffic.	Planned
Carmel Engineering Department Operations	TIC Data Collection	5	The center shall collect, process, and store parking information, including location, availability, and fees.	Planned
Carmel Engineering Department Operations	TIC Interactive Traveler Information	4	The center shall disseminate customized parking information to travelers, including location, availability, and fees upon request.	Planned
Carmel Engineering Department Operations	TIC Interactive Traveler Information	12	The center shall accept requests for parking space information from travelers.	Planned
Carmel Engineering Department Operations	TIC Travel Services Information and Reservation	7	The center shall provide electric charging station information identifying the location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure for each station to travelers.	Planned
Carmel Engineering Department Operations	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned



Element Name	Functional Object	Req #	Requirement	Status
Carmel Engineering Department Operations	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Planned
Carmel Engineering Department Operations	TMC Basic Surveillance	7	The center shall remotely control devices to detect traffic.	Planned
Carmel Engineering Department Operations	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Planned
Carmel Engineering Department Operations	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Planned
Carmel Engineering Department Operations	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.	Planned
Carmel Engineering Department Operations	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.	Planned
Carmel Engineering Department Operations	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Planned
Carmel ITS Cameras	Field Secure Area Sensor Monitoring	1	The field element shall include security sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Planned
Carmel ITS Cameras	Field Secure Area Sensor Monitoring	3	The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Planned
Carmel ITS Cameras	Field Secure Area Sensor Monitoring	6	The field element shall include motion and intrusion detection sensors.	Planned
Carmel ITS Cameras	Field Secure Area Sensor Monitoring	9	The field element shall remotely process security sensor data and provide an indication of potential incidents or threats to a center.	Planned
Carmel ITS Cameras	Field Secure Area Surveillance	1	The field element shall include video and/or audio surveillance of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Planned
Carmel ITS Cameras	Field Secure Area Surveillance	2	The field element shall be remotely controlled by a center.	Planned
Carmel ITS Cameras	Field Secure Area Surveillance	3	The field element shall provide equipment status and fault indication of surveillance equipment to a center.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Carmel ITS Cameras	Field Secure Area Surveillance	5	The field element shall remotely process video and audio data and provide an indication of potential incidents or threats to a center.	Planned
Carmel ITS Cameras	Parking Area Management	1	The parking element shall maintain static parking lot information including hours of operation, rates, location, entrance locations, capacity, type, and constraints.	Planned
Carmel ITS Cameras	Parking Area Management	2	The parking element shall maintain dynamic parking lot information including current state of the lot, occupancy, arrival rates, and departure rates.	Planned
Carmel ITS Cameras	Parking Area Management	3	The parking element shall determine and maintain the number and availability of parking spaces.	Planned
Carmel ITS Cameras	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Carmel ITS Cameras	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
Carmel Parking Area Equipment	Parking Area Management	1	The parking element shall maintain static parking lot information including hours of operation, rates, location, entrance locations, capacity, type, and constraints.	Planned
Carmel Parking Area Equipment	Parking Area Management	3	The parking element shall determine and maintain the number and availability of parking spaces.	Planned
Carmel Parking Area Equipment	Parking Area Management	8	The parking element shall provide precise parking space location information to Centers.	Planned
Carmel Parking Management System	Parking Account and Fee Management	1	The center shall support parking electronic fare collection.	Planned
Carmel Parking Management System	Parking Account and Fee Management	3	The center shall provide parking pricing and user account information.	Planned
Carmel Parking Management System	Parking Coordination	2	The parking element shall provide parking management data to traffic management centers upon request as part of the implementation of demand management programs in the region. This could include changes to hours of operation or pricing.	Planned
Carmel Parking Management System	Parking Coordination	7	The parking facility shall determine availability of parking spaces.	Planned
Carmel Parking Management System	Parking Management	1	The center shall monitor parking area current operational status including current parking occupancy and rates.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Carmel Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Carmel Roadside Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
Carmel Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Planned
Carmel Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Planned
Carmel Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Planned
Carmel Roadside Equipment	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Planned
Carmel Vehicle Charging Stations	Electric Charging Station Management	3	The field element shall provide charging station information, including location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure, to traveler information systems.	Planned
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	1	The Center shall be capable of monitoring the operational status of Connected Vehicle Roadside Equipment applications.	Future
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	2	The Center shall be capable of modifying the operational status of Connected Vehicle Roadside Equipment applications.	Future
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	3	The Center shall request Connected Vehicle Roadside Equipment maintenance actions from other responsible centers.	Future
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	4	The Center shall be capable of modifying the operational status of Connected Vehicle Roadside Equipment.	Future
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	5	The Center shall track the status of Connected Vehicle Roadside Equipment maintenance actions.	Future

Element Name	Functional Object	Req #	Requirement	Status
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	6	The Center shall be capable of installing software applications on Connected Vehicle Roadside Equipment.	Future
CAV Authorizing Center	Center Connected Vehicle Infrastructure Management	7	The Center shall accept information from other Centers that indicates which Connected Vehicle Roadside Equipment needs maintenance.	Future
CAV-ITS Map Update System	Map Management	5	The Center shall provide basemap updates to other Centers.	Future
CAV-ITS Map Update System	Map Management	20	The Center shall provide basemap updates to Personal devices.	Future
CAV-ITS Map Update System	Map Management	21	The Center shall provide intersection geometry updates to Vehicles.	Future
CAV-ITS Map Update System	Map Management	22	The Center shall provide basemap updates to Vehicles.	Future
CAV-ITS Map Update System	Map Management	24	The Center shall provide intersection geometry updates to Personal Devices.	Future
CAV-ITS Map Update System	Map Management	27	The Center shall provide basemap updates to Connected Vehicle Roadside Equipment.	Future
CICS Website	TIC Dynamic Ridesharing	1	The center shall accept requests from traveler interface systems for ridesharing as part of a trip plan request.	Existing
CICS Website	TIC Dynamic Ridesharing	2	The center shall provide a rideshare match based on origin and destination of the traveler's proposed trip, any routing constraints, preferences specified by the traveler, compatibility of this rideshare with rideshares confirmed by other travelers, the requesting traveler's eligibility data, and traffic data.	Existing
CICS Website	TIC Dynamic Ridesharing	3	The center shall process rideshare requests by balancing the relative benefits of the rideshare to each rideshare participant.	Existing
CICS Website	TIC Dynamic Ridesharing	4	The center shall arrange connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing.	Existing
CICS Website	TIC Dynamic Ridesharing	5	The center shall provide a confirmation of the traveler's rideshare match and provide the capability to support a payment transaction for the rideshare service.	Existing
CICS Website	TIC Dynamic Ridesharing	6	The center shall store all rideshare matches and traveler eligibility data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Downtown Indy Website	TIC Interactive Traveler Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	2	The center shall disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	3	The center shall disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	4	The center shall disseminate customized parking information to travelers, including location, availability, and fees upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	6	The center shall disseminate customized weather information to travelers upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	8	The center shall disseminate customized event information to travelers upon request.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	15	The center shall provide the capability to exchange information with another traveler information service provider current or predicted data for road links that are outside the area served by the local supplier.	Planned
Downtown Indy Website	TIC Interactive Traveler Information	16	The center shall provide the capability to support requests from the media for traffic and incident data.	Existing
Downtown Indy Website	TIC Interactive Traveler Information	17	The center shall provide the capability for a system operator to control the type and update frequency of traveler information.	Existing
Electric Charging Management Center	Electric Charging Management	1	The center shall monitor the current operational status of charging stations under its management.	Future
Electric Charging Management Center	Electric Charging Management	2	The center shall maintain the current charging rates for the charging stations under its management.	Future
Electric Charging Management Center	Electric Charging Management	3	The center shall manage reservations and payment of charging services.	Future
Electric Charging Management Center	Electric Charging Management	4	The center shall interface receive charging station power status from electric utilities in order to identify any power issues that might affect charging operations.	Future
Electric Charging Management Center	Electric Charging Management	5	The center shall provide charging station information to traveler information systems.	Future



Element Name	Functional Object	Req #	Requirement	Status
Electric Vehicle Charging Stations	Electric Charging Station Management	3	The field element shall provide charging station information, including location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure, to traveler information systems.	Planned
Emergency Operations Center	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Emergency Operations Center	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
Emergency Operations Center	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Emergency Operations Center	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Emergency Operations Center	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
Emergency Operations Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Emergency Operations Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Emergency Operations Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Emergency Operations Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Emergency Operations Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Emergency Operations Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Emergency Operations Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Emergency Operations Center	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Emergency Operations Center	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Emergency Operations Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Emergency Operations Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Emergency Operations Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Emergency Operations Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Emergency Operations Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Emergency Operations Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Emergency Operations Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.	Existing
Emergency Operations Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.	Existing
Emergency Operations Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Emergency Operations Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Emergency Operations Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Emergency Operations Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Emergency Operations Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Emergency Operations Center	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.	Existing
Emergency Operations Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Emergency Operations Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Emergency Operations Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Emergency Operations Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Emergency Operations Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Emergency Operations Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Emergency Operations Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Emergency Operations Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Emergency Operations Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Emergency Operations Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Emergency Operations Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Emergency Operations Center	Emergency Response Management	10	The center shall provide the capability to request transit resource availability from transit centers for use during disaster and evacuation operations.	Existing
Emergency Operations Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Emergency Operations Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Emergency Operations Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Emergency Operations Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Emergency Operations Center	Emergency Routing	3	The center shall receive status information from care facilities to determine the appropriate facility and its location.	Existing
Emergency Operations Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.	Existing
Emergency Operations Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.	Existing
Emergency Operations Center	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.	Existing
Emergency Operations Center	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Emergency Operations Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.	Existing
Emergency Operations Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.	Existing
Emergency Operations Center	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.	Existing
IMS Command Center	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
IMS Command Center	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
IMS Command Center	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
IMS Command Center	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
IMS Command Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
IMS Command Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
IMS Command Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
IMS Command Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
IMS Command Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
IMS Command Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IMS Command Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
IMS Command Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
IMS Command Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
IMS Command Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
IMS Command Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
IMS Command Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
IMS Command Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
IMS Command Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
IMS Command Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
IMS Command Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
IMS Command Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IMS Command Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
IMS Command Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
IMS Command Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
IMS Command Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IMS Command Center	TMC Incident Dispatch Coordination	10	The center shall coordinate information and controls with other traffic management centers.	Existing
IMS Command Center	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Indianapolis Airport Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Indianapolis Airport Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Indianapolis Airport Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Indianapolis Airport Field Devices	Field Secure Area Sensor Monitoring	1	The field element shall include security sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
Indianapolis Airport Field Devices	Field Secure Area Sensor Monitoring	3	The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Existing
Indianapolis Airport Field Devices	Field Secure Area Sensor Monitoring	4	The field element shall include environmental threat sensors (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological).	Existing
Indianapolis Airport Field Devices	Field Secure Area Sensor Monitoring	7	The field element shall include object detection sensors (such as metal detectors).	Existing
Indianapolis Airport Field Devices	Field Secure Area Sensor Monitoring	8	The field element shall provide raw security sensor data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Field Devices	Field Secure Area Surveillance	1	The field element shall include video and/or audio surveillance of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
Indianapolis Airport Field Devices	Field Secure Area Surveillance	3	The field element shall provide equipment status and fault indication of surveillance equipment to a center.	Existing
Indianapolis Airport Field Devices	Field Secure Area Surveillance	4	The field element shall provide raw video or audio data.	Existing
Indianapolis Airport Field Devices	Roadway Barrier System Control	1	The field element shall activate barrier systems for transportation facilities and infrastructure under center control. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Existing
Indianapolis Airport Field Devices	Roadway Environmental Monitoring	2	The field element shall include environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
Indianapolis Airport Field Devices	Roadway Environmental Monitoring	3	The field element's environmental sensors shall be remotely controlled by a maintenance center.	Existing
Indianapolis Airport Field Devices	Roadway Environmental Monitoring	7	The field element shall provide environmental sensor equipment operational status to the controlling center or maintenance vehicle.	Existing
Indianapolis Airport Field Devices	Roadway Environmental Monitoring	8	The field element shall provide environmental sensor equipment fault indication to the controlling center or maintenance vehicle.	Existing
Indianapolis Airport Field Devices	Roadway Environmental Monitoring	10	The field element shall provide weather and road surface condition data to centers.	Existing
Indianapolis Airport Field Devices	Roadway Safeguard System Control	1	The field element shall activate safeguard systems, equipment used to mitigate the impact of incidents on transportation infrastructure (e.g., blast shields, tunnel exhaust systems, etc.) under center control.	Existing
Indianapolis Airport Maintenance Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Maintenance Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Indianapolis Airport Management Systems	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Indianapolis Airport Management Systems	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Indianapolis Airport Management Systems	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.	Existing
Indianapolis Airport Management Systems	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.	Existing
Indianapolis Airport Management Systems	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.	Existing
Indianapolis Airport Management Systems	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Indianapolis Airport Management Systems	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Indianapolis Airport Management Systems	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Indianapolis Airport Management Systems	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Indianapolis Airport Management Systems	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Indianapolis Airport Management Systems	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Indianapolis Airport Management Systems	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Indianapolis Airport Management Systems	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Indianapolis Airport Management Systems	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).	Existing
Indianapolis Airport Management Systems	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.	Existing
Indianapolis Airport Management Systems	MCM Environmental Information Processing	1	The center shall respond to control data from center personnel regarding environmental information processing.	Existing
Indianapolis Airport Management Systems	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Existing
Indianapolis Airport Management Systems	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	MCM Environmental Information Processing	4	The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
Indianapolis Airport Management Systems	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Indianapolis Airport Management Systems	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Indianapolis Airport Management Systems	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Indianapolis Airport Management Systems	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Indianapolis Airport Management Systems	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	6	The center shall collect the status and fault data from the centers that operate the equipment, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Indianapolis Airport Management Systems	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Indianapolis Airport Management Systems	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing
Indianapolis Airport Management Systems	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Indianapolis Airport Management Systems	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Indianapolis Airport Management Systems	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Indianapolis Airport Management Systems	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Indianapolis Airport Management Systems	TMC Barrier System Management	1	The center shall remotely control barrier systems for transportation facilities and infrastructure. Barrier systems include automated or remotely controlled gates, barriers and other systems that manage entry to roadways.	Existing
Indianapolis Airport Management Systems	TMC Barrier System Management	3	The center shall collect barrier system operational status.	Existing
Indianapolis Airport Management Systems	TMC Barrier System Management	4	The center shall collect barrier system fault data and send to the maintenance center for repair.	Existing
Indianapolis Airport Parking System	Parking Coordination System	6	The parking element shall support requests for parking reservations.	Existing
Indianapolis DPW Operations Center	Emergency Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Indianapolis DPW Operations Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Indianapolis DPW Operations Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Indianapolis DPW Operations Center	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.	Existing
Indianapolis DPW Operations Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.	Existing
Indianapolis DPW Operations Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Indianapolis DPW Operations Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Indianapolis DPW Operations Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Indianapolis DPW Operations Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Indianapolis DPW Operations Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Indianapolis DPW Operations Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Indianapolis DPW Operations Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Indianapolis DPW Operations Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Indianapolis DPW Operations Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Indianapolis DPW Operations Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Indianapolis DPW Operations Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Indianapolis DPW Operations Center	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Existing
Indianapolis DPW Operations Center	MCM Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the maintenance and construction data or for the data itself.	Planned
Indianapolis DPW Operations Center	MCM Data Collection	4	The maintenance and construction management center shall produce sample products of the data available.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Collection	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Environmental Information Collection	5	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic and traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles and the broader population of vehicle probes.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Collection	6	The center shall provide weather and road condition information to weather service providers and center personnel.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Collection	7	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Collection	8	The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Collection	9	The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Processing	1	The center shall respond to control data from center personnel regarding environmental information processing.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Existing
Indianapolis DPW Operations Center	MCM Environmental Information Processing	4	The center shall disseminate current and forecasted road weather and road condition information to weather service providers (such as the National Weather Service and value-added sector specific meteorological services) as well as other agencies including traffic, emergency, and transit management, traveler information providers, rail operations centers, media, and other maintenance management centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Indianapolis DPW Operations Center	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Indianapolis DPW Operations Center	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Indianapolis DPW Operations Center	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Indianapolis DPW Operations Center	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	1	The center shall maintain an interface with asset management systems to track the inventory, restrictions, repair needs and status updates of transportation assets (pavement, bridges, signs, etc.) including location, installation and materials information, vendor/contractor, current maintenance status, standard height, width, and weight restrictions.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Planned
Indianapolis DPW Operations Center	MCM Roadway Maintenance	6	The center shall collect the status and fault data from the centers that operate the equipment, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Indianapolis DPW Operations Center	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Indianapolis DPW Operations Center	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Indianapolis DPW Operations Center	MCM Vehicle Maintenance Management	3	The center shall schedule preventative and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Indianapolis DPW Operations Center	MCM Work Activity Coordination	1	The center shall provide work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits. This information may be augmented with images that provide a visual indication of current work zone status and traffic impacts.	Existing
Indianapolis DPW Operations Center	MCM Work Activity Coordination	2	The center shall provide status information about scheduled maintenance and construction activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, multimodal transportation providers, rail operations, and the media.	Existing
Indianapolis DPW Operations Center	MCM Work Activity Coordination	3	The center shall collect and respond to feedback concerning scheduled maintenance and construction activities with other management centers such as traffic, emergency, transit, and rail operations.	Existing
Indianapolis DPW Operations Center	MCM Work Activity Coordination	4	The center shall collect and disseminate asset restriction information levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.	Existing
Indianapolis DPW Operations Center	MCM Work Activity Coordination	6	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance and construction activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Indianapolis DPW Operations Center	MCM Work Zone Management	2	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.	Planned
Indianapolis DPW Operations Center	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Indianapolis DPW Operations Center	MCM Work Zone Management	4	The center shall control traffic in work zones by providing remote control of dynamic message signs, highway advisory radio systems, gates, and barriers located in or near the work zone.	Planned
Indianapolis DPW Operations Center	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Indianapolis DPW Operations Center	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Indianapolis DPW Operations Center	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Planned
Indianapolis DPW Operations Center	TMC Basic Surveillance	3	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.	Planned
Indianapolis DPW Operations Center	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.	Planned
Indianapolis DPW Operations Center	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Existing
Indianapolis DPW Operations Center	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	TMC Environmental Monitoring	2	The traffic center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
Indianapolis DPW Operations Center	TMC Environmental Monitoring	3	The traffic center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from roadway maintenance operations, and environmental data collected from sensors deployed on and about the roadway.	Existing
Indianapolis DPW Operations Center	TMC Environmental Monitoring	4	The traffic center shall receive road condition information from weather service providers.	Existing
Indianapolis DPW Operations Center	TMC Evacuation Support	1	The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.	Existing
Indianapolis DPW Operations Center	TMC Evacuation Support	2	The center shall support requests from emergency management centers to preempt the current traffic control strategy, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems to support evacuation traffic control plans.	Existing
Indianapolis DPW Operations Center	TMC Evacuation Support	3	The center shall coordinate evacuation information and controls with other traffic management centers.	Planned
Indianapolis DPW Operations Center	TMC Evacuation Support	4	The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc.	Existing
Indianapolis DPW Operations Center	TMC Incident Detection	1	The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Indianapolis DPW Operations Center	TMC Incident Detection	2	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents.	Planned
Indianapolis DPW Operations Center	TMC Incident Detection	3	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	TMC Incident Detection	4	The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Indianapolis DPW Operations Center	TMC Incident Detection	5	The center shall support requests from emergency management centers and border inspection systems to remotely control sensor and surveillance equipment located in the field.	Planned
Indianapolis DPW Operations Center	TMC Incident Detection	6	The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents.	Existing
Indianapolis DPW Operations Center	TMC Incident Detection	7	The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents.	Planned
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Planned
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	7	The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	10	The center shall coordinate information and controls with other traffic management centers.	Planned
Indianapolis DPW Operations Center	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Indianapolis DPW Operations Center	TMC Multi-Modal Coordination	1	The center shall respond to requests from transit management centers for signal priority at one or more intersections along a particular transit route.	Existing
Indianapolis DPW Operations Center	TMC Multi-Modal Coordination	2	The center shall exchange information with transit management centers including details current transit routes, the level of service on each route, and the progress of individual vehicles along their routes.	Existing
Indianapolis DPW Operations Center	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Planned
Indianapolis DPW Operations Center	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).	Planned
Indianapolis DPW Operations Center	TMC Reversible Lane Management	3	The center shall remotely control automated reversible lane equipment and driver information systems (such as lane control signals) that control traffic in reversible lanes on surface streets.	Existing
Indianapolis DPW Operations Center	TMC Reversible Lane Management	5	The center shall collect operational status for the reversible lane field equipment.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	TMC Reversible Lane Management	6	The center shall collect fault data for the reversible lane field equipment and send to the maintenance center for repair.	Existing
Indianapolis DPW Operations Center	TMC Reversible Lane Management	7	The center shall provide the capability for center personnel to control access and management of reversible lane facilities, including the direction of traffic flow changes during the day, especially between the peak hours and dedication of more lanes to the congestion direction during special events.	Existing
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Existing
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.	Planned
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Existing
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	4	The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.	Planned
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	5	The center shall collect environmental sensor operational status.	Existing
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	6	The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair.	Existing
Indianapolis DPW Operations Center	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Existing
Indianapolis DPW Operations Center	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Indianapolis DPW Operations Center	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Indianapolis DPW Operations Center	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Operations Center	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Existing
Indianapolis DPW Operations Center	TMC Signal Control	10	The center shall adjust signal timing in respond to a signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other requests for right-of-way.	Existing
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Planned
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Planned
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Planned
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	5	The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself.	Existing
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers.	Existing
Indianapolis DPW Operations Center	TMC Traffic Information Dissemination	8	The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media.	Existing
Indianapolis DPW Operations Center	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Indianapolis DPW Roadside Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Roadside Equipment	Roadway Basic Surveillance	3	The field element shall collect, digitize, and send multimodal crossing and high occupancy vehicle (HOV), and high occupancy toll (HOT) lane sensor data to the center for further analysis and storage.	Planned
Indianapolis DPW Roadside Equipment	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Basic Surveillance	5	The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Existing
Indianapolis DPW Roadside Equipment	Roadway Reversible Lanes	2	The field element shall include automated reversible lane equipment and driver information systems (such as lane control signals) that control traffic in reversible lanes on surface streets, under center control.	Existing
Indianapolis DPW Roadside Equipment	Roadway Reversible Lanes	4	The field element shall provide operational status for the reversible lane field equipment to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Reversible Lanes	5	The field element shall provide fault data for the reversible lane field equipment to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	2	The field element shall respond to pedestrian crossing requests by accommodating the pedestrian crossing.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	8	The field element shall report current transit priority status to the center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Signal Control	10	The field element shall receive request for transit vehicle signal priority.	Existing
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	5	The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner.	Existing
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	6	The field element shall control the dynamic message signs (DMS) in the vicinity of a highway-rail intersection (HRI) to advise drivers, cyclists, and pedestrians of approaching trains.	Planned
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	7	The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals.	Existing
Indianapolis DPW Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Indianapolis DPW Roadside Equipment	Roadway Work Zone Traffic Control	1	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Planned
Indianapolis DPW Roadside Equipment	Roadway Work Zone Traffic Control	2	Under traffic and maintenance center control, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around the work zone through which they are currently passing.	Planned
Indianapolis DPW Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Indianapolis DPW Roadside Equipment	Roadway Work Zone Traffic Control	5	The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.	Planned
Indianapolis DPW Roadside Equipment	Roadway Work Zone Traffic Control	6	The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.	Planned
Indianapolis DPW Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis DPW Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Indianapolis DPW Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	3	The emergency call-taking center shall receive emergency call information from vehicles and present the possible incident information to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	4	The emergency call-taking center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Indianapolis Fire Communications Center	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Communications Center	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
Indianapolis Fire Communications Center	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Indianapolis Fire Communications Center	Emergency Data Collection	4	The emergency management center shall produce sample products of the data available.	Existing
Indianapolis Fire Communications Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Indianapolis Fire Communications Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Indianapolis Fire Communications Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Indianapolis Fire Communications Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
Indianapolis Fire Communications Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Indianapolis Fire Communications Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Communications Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Indianapolis Fire Communications Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Communications Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Indianapolis Fire Communications Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Indianapolis Fire Communications Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Indianapolis Fire Communications Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Indianapolis Fire Communications Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Indianapolis Fire Communications Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Indianapolis Fire Communications Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Indianapolis Fire Communications Center	Emergency Notification Support	2	The center shall monitor subscribed vehicle data, including changes in velocity, attitude/orientation, position, and air bag status to determine when an emergency situation (crash) has happened.	Existing
Indianapolis Fire Communications Center	Emergency Notification Support	5	The center shall acknowledge the request for emergency assistance, whether originated by the driver, automatically by the vehicle's safety systems, or by a traveler via a personal handheld device.	Existing
Indianapolis Fire Communications Center	Emergency Notification Support	7	After the mayday becomes a verified incident, the center shall determine the appropriate response to the mayday message.	Existing
Indianapolis Fire Communications Center	Emergency Notification Support	8	The center shall determine whether the mayday message indicates an emergency that requires the attention of public safety agencies, and forward mayday emergency data to the appropriate agency as necessary.	Existing
Indianapolis Fire Communications Center	Emergency Notification Support	11	The center shall maintain a log of all mayday signals received from vehicles.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Communications Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Indianapolis Fire Communications Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Indianapolis Fire Communications Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Communications Center	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Indianapolis Fire Communications Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Indianapolis Fire Communications Center	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Indianapolis Fire Communications Center	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
Indianapolis Fire Communications Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.	Planned
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Planned
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Fire Department Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Indianapolis Fire Department Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Indianapolis MPO Planning Operations	TIC Operations Data Collection	1	The center shall collect traveler information data, such as parking lot data, rideshare data, road network use data, vehicle probe data, and other data from traveler information system operations.	Existing
Indianapolis MPO Planning Operations	TIC Operations Data Collection	4	The center shall receive and respond to requests from ITS Archives for either a catalog of the traveler information data or for the data itself.	Planned
Indianapolis MPO Planning Operations	TIC Operations Data Collection	5	The transportation information center shall produce sample products of the data available.	Existing
Indianapolis Police Department Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Indianapolis Police Department Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Indianapolis Police Department Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Indianapolis Police Department Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Police Department Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Indianapolis Police Department Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Indianapolis Police Dispatch	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Indianapolis Police Dispatch	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Indianapolis Police Dispatch	Emergency Data Collection	4	The emergency management center shall produce sample products of the data available.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Police Dispatch	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Indianapolis Police Dispatch	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Indianapolis Police Dispatch	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Indianapolis Police Dispatch	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Indianapolis Police Dispatch	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Indianapolis Police Dispatch	Emergency Dispatch	7	The center shall receive traffic images to support dispatch of emergency vehicles.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Police Dispatch	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Indianapolis Police Dispatch	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Indianapolis Police Dispatch	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Indianapolis Police Dispatch	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Police Dispatch	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Indianapolis Police Dispatch	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Indianapolis Police Dispatch	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Indianapolis Police Dispatch	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Indianapolis Police Dispatch	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Indianapolis Police Dispatch	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Indianapolis Police Dispatch	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Indianapolis Police Dispatch	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Indianapolis Police Dispatch	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Indianapolis Police Dispatch	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Indianapolis Police Dispatch	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Indianapolis Police Dispatch	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Indianapolis Police Dispatch	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Indianapolis Police Dispatch	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Indianapolis Police Dispatch	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Indianapolis Police Dispatch	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Indianapolis Police Dispatch	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Indianapolis Police Dispatch	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Indianapolis Police Dispatch	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
INDOT Arterial TMS	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Existing
INDOT Arterial TMS	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing
INDOT Arterial TMS	TMC Basic Surveillance	3	The center shall monitor, analyze, and store multimodal crossing, high occupancy vehicle (HOV) and high occupancy toll (HOT) lane sensor data under remote control of the center.	Existing
INDOT Arterial TMS	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Existing
INDOT Arterial TMS	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Arterial TMS	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Planned
INDOT Arterial TMS	TMC Regional Traffic Management	2	The center shall exchange traffic control information with other traffic management centers to support remote monitoring and control of traffic management devices (e.g. signs, sensors, signals, cameras, etc.).	Planned
INDOT Arterial TMS	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Existing
INDOT Arterial TMS	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.	Existing
INDOT Arterial TMS	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Existing
INDOT Arterial TMS	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Existing
INDOT Arterial TMS	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
INDOT Arterial TMS	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
INDOT Arterial TMS	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
INDOT Arterial TMS	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Existing
INDOT Arterial TMS	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.	Existing
INDOT Arterial TMS	TMC Signal Control	15	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements at or near signalized intersections.	Existing
INDOT Arterial TMS	TMC Traffic Metering	1	The center shall remotely control systems to manage use of the freeways, including ramp, interchange, and mainline metering.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT Arterial TMS	TMC Traffic Metering	4	The center shall implement control strategies, under control of center personnel, on some or all of the freeway network devices (e.g. ramp meters, interchange meters, and mainline meters), based on data from sensors monitoring traffic conditions upstream, downstream, and queue data on the approaches to the meters.	Planned
INDOT Arterial TMS	TMC Traffic Metering	5	The center shall, under control of center personnel, use collected environmental and vehicle emissions data to regulate the flow of traffic on ramps, interchanges, and the mainline.	Planned
INDOT Arterial Traffic Signals and Detection	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Basic Surveillance	3	The field element shall collect, digitize, and send multimodal crossing and high occupancy vehicle (HOV), and high occupancy toll (HOT) lane sensor data to the center for further analysis and storage.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Basic Surveillance	5	The field element shall return sensor and CCTV system fault data to the controlling center for repair.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	2	The field element shall respond to pedestrian crossing requests by accommodating the pedestrian crossing.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Arterial Traffic Signals and Detection	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Standard Rail Crossing	5	The field element shall collect pedestrian images and pedestrian sensor data, and respond to pedestrian crossing requests via display, audio signal, or other manner.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Standard Rail Crossing	7	The field element shall close the highway-rail intersection (HRI) when a train is approaching using gates, lights/signs, barriers, and traffic control signals.	Existing
INDOT Arterial Traffic Signals and Detection	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
INDOT Hoosier Helper Vehicles	EV On-Board En Route Support	1	The emergency vehicle, including roadway service patrols, shall track its current location.	Planned
INDOT Hoosier Helper Vehicles	EV On-Board En Route Support	2	The emergency vehicle, including roadway service patrols, shall send the vehicle's location and operational data to the center for emergency management and dispatch.	Planned
INDOT Hoosier Helper Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
INDOT Hoosier Helper Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
INDOT Hoosier Helper Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
INDOT Hoosier Helper Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
INDOT Hoosier Helper Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Hoosier Helper Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
INDOT Indianapolis TMC	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
INDOT Indianapolis TMC	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
INDOT Indianapolis TMC	Emergency Call-Taking	8	The emergency call-taking center shall send a request for remote control of Closed-circuit Television (CCTV) systems from a traffic management center in order to verify the reported incident.	Existing
INDOT Indianapolis TMC	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
INDOT Indianapolis TMC	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
INDOT Indianapolis TMC	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
INDOT Indianapolis TMC	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
INDOT Indianapolis TMC	Emergency Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself.	Planned
INDOT Indianapolis TMC	Emergency Data Collection	4	The emergency management center shall produce sample products of the data available.	Existing
INDOT Indianapolis TMC	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
INDOT Indianapolis TMC	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
INDOT Indianapolis TMC	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Planned
INDOT Indianapolis TMC	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
INDOT Indianapolis TMC	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
INDOT Indianapolis TMC	Emergency Dispatch	7	The center shall receive traffic images to support dispatch of emergency vehicles.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
INDOT Indianapolis TMC	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
INDOT Indianapolis TMC	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
INDOT Indianapolis TMC	Emergency Environmental Monitoring	3	The center shall collect asset restrictions information from roadway maintenance operations.	Existing
INDOT Indianapolis TMC	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.	Existing
INDOT Indianapolis TMC	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
INDOT Indianapolis TMC	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
INDOT Indianapolis TMC	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
INDOT Indianapolis TMC	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
INDOT Indianapolis TMC	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
INDOT Indianapolis TMC	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
INDOT Indianapolis TMC	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
INDOT Indianapolis TMC	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
INDOT Indianapolis TMC	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
INDOT Indianapolis TMC	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
INDOT Indianapolis TMC	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
INDOT Indianapolis TMC	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
INDOT Indianapolis TMC	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
INDOT Indianapolis TMC	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
INDOT Indianapolis TMC	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
INDOT Indianapolis TMC	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
INDOT Indianapolis TMC	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
INDOT Indianapolis TMC	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
INDOT Indianapolis TMC	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
INDOT Indianapolis TMC	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).	Existing
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	11	The center shall exchange traveler images with other emergency management centers to support traveler image matching.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.	Existing
INDOT Indianapolis TMC	MCM Reduced Speed Zone Warning	1	The center shall be capable of remotely control and monitor reduced speed zone warning roadside equipment operations.	Planned
INDOT Indianapolis TMC	MCM Work Zone Safety Management	1	The center shall provide remote monitoring and control of work zone safety devices - including intrusion detection devices that have been installed in work zones or maintenance areas.	Planned
INDOT Indianapolis TMC	MCM Work Zone Safety Management	3	The center shall collect status information of work zone safety device status from field equipment or the maintenance and construction vehicles.	Planned
INDOT Indianapolis TMC	TIC Emergency Traveler Information	1	The center shall disseminate emergency evacuation information to the traveler interface systems, including evacuation zones, shelter information, available transportation modes, road closures and detours, changes to transit services, and traffic and road conditions at the origin, destination, and along the evacuation routes.	Existing
INDOT Indianapolis TMC	TIC Emergency Traveler Information	3	The center shall disseminate wide-area alert information to the traveler interface systems, including major emergencies such as a natural or man-made disaster, civil emergency, child abductions, severe weather watches and warnings, military activities, and law enforcement warnings.	Existing
INDOT Indianapolis TMC	TIC Emergency Traveler Information	4	The center shall provide the capability for a system operator to control the type and update frequency of emergency and wide-area alert information distributed to travelers.	Existing
INDOT Indianapolis TMC	TIC Operations Data Collection	1	The center shall collect traveler information data, such as parking lot data, rideshare data, road network use data, vehicle probe data, and other data from traveler information system operations.	Existing
INDOT Indianapolis TMC	TIC Operations Data Collection	4	The center shall receive and respond to requests from ITS Archives for either a catalog of the traveler information data or for the data itself.	Planned
INDOT Indianapolis TMC	TIC Operations Data Collection	5	The transportation information center shall produce sample products of the data available.	Existing
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	1	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	2	The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	4	The center shall disseminate parking information to travelers, including location, availability, and fees.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	6	The center shall disseminate weather information to travelers.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	7	The center shall disseminate event information to travelers.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	8	The center shall disseminate air quality information to travelers.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	9	The center shall provide traffic and incident data to the media.	Planned
INDOT Indianapolis TMC	TIC Traveler Information Broadcast	10	The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.	Existing
INDOT Indianapolis TMC	TIC Traveler Telephone Information	1	The center shall provide the capability to process voice-formatted requests for traveler information from a traveler telephone information system, and return the information in the requested format.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	2	The center shall provide the capability to process dual-tone multi-frequency (DTMF)-based requests (touch-tone) for traveler information from a traveler telephone information system.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	3	The center shall provide the capability to process traveler information requests from a traveler telephone information system.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	4	The center shall provide information on traffic conditions in the requested voice format and for the requested location.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	5	The center shall provide work zone and roadway maintenance information in the requested voice format and for the requested location.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TIC Traveler Telephone Information	6	The center shall provide roadway environment conditions information in the requested voice format and for the requested location.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	7	The center shall provide weather and event information in the requested voice format and for the requested location.	Planned
INDOT Indianapolis TMC	TIC Traveler Telephone Information	10	The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	1	The center shall provide the capability to provide specific pre-trip and en route directions to travelers (and drivers), including costs, arrival times, and transfer points.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	3	The center shall support on-line route guidance for travelers using personal devices (such as PDAs).	Planned
INDOT Indianapolis TMC	TIC Trip Planning	4	The center shall support on-line route guidance for drivers in vehicles.	Future
INDOT Indianapolis TMC	TIC Trip Planning	6	The center shall generate route plans based on current and/or predicted conditions of the road network, scheduled maintenance and construction work activities, and work zone activities.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	8	The center shall generate route plans based on current asset restrictions, such as height and weight restrictions on tunnels or bridges.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	10	The center shall exchange route segment information with other centers outside the area served by the local center.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	12	The center shall use the preferences and constraints specified by the traveler in the trip request to select the most appropriate mode of transport.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	13	The center shall provide the capability for the traveler to confirm the proposed trip plan.	Planned
INDOT Indianapolis TMC	TIC Trip Planning	14	The center shall provide the capability for center personnel to control route calculation parameters.	Planned
INDOT Indianapolis TMC	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Existing
INDOT Indianapolis TMC	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Basic Surveillance	4	The center shall distribute road network conditions data (raw or processed) based on collected and analyzed traffic sensor and surveillance data to other centers.	Existing
INDOT Indianapolis TMC	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Existing
INDOT Indianapolis TMC	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Existing
INDOT Indianapolis TMC	TMC Dynamic Lane Management and Shoulder Use	1	The center shall remotely monitor and control dynamically managed travel lanes.	Future
INDOT Indianapolis TMC	TMC Dynamic Lane Management and Shoulder Use	8	The center shall support temporary use of shoulders as travel lanes.	Future
INDOT Indianapolis TMC	TMC Dynamic Lane Management and Shoulder Use	9	The center shall activate lane management field equipment that is used to dynamically manage specific lanes and shoulders.	Future
INDOT Indianapolis TMC	TMC Environmental Monitoring	2	The traffic center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
INDOT Indianapolis TMC	TMC Environmental Monitoring	3	The traffic center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from roadway maintenance operations, and environmental data collected from sensors deployed on and about the roadway.	Existing
INDOT Indianapolis TMC	TMC Evacuation Support	1	The center shall coordinate planning for evacuation with emergency management centers - including pre-planning activities such as establishing routes, areas to be evacuated, timing, etc.	Existing
INDOT Indianapolis TMC	TMC Evacuation Support	4	The center shall coordinate execution of evacuation strategies with emergency management centers - including activities such as setting closures and detours, establishing routes, updating areas to be evacuated, timing the process, etc.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Incident Detection	1	The center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
INDOT Indianapolis TMC	TMC Incident Detection	2	The center shall collect and store traffic flow and image data from the field equipment to detect and verify incidents.	Planned
INDOT Indianapolis TMC	TMC Incident Detection	3	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters and traveler information service providers.	Existing
INDOT Indianapolis TMC	TMC Incident Detection	4	The center shall exchange incident and threat information with emergency management centers as well as maintenance and construction centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
INDOT Indianapolis TMC	TMC Incident Detection	5	The center shall support requests from emergency management centers and border inspection systems to remotely control sensor and surveillance equipment located in the field.	Existing
INDOT Indianapolis TMC	TMC Incident Detection	6	The center shall provide road network conditions and traffic images to emergency management centers to support the detection, verification, and classification of incidents.	Planned
INDOT Indianapolis TMC	TMC Incident Detection	7	The center shall provide video and traffic sensor control commands to the field equipment to detect and verify incidents.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Planned
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	7	The center shall provide road network conditions and traffic images to emergency management centers, maintenance and construction centers, and traveler information service providers.	Planned
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	10	The center shall coordinate information and controls with other traffic management centers.	Planned
INDOT Indianapolis TMC	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
INDOT Indianapolis TMC	TMC In-Vehicle Signing Management	1	The center shall format and output sign information such as traffic and road conditions to field equipment that supports in-vehicle signage communications.	Future

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC In-Vehicle Signing Management	2	The center shall format and output advisory information, such as detour information, wide-area alerts, work zone intrusion information, and other special information to field equipment that supports in-vehicle signage communications.	Future
INDOT Indianapolis TMC	TMC In-Vehicle Signing Management	3	The center shall monitor and manage output of indicator and fixed sign information, including static sign information (e.g., stop, curve warning, guide signs, service signs, and directional signs) and dynamic information (e.g., current signal states and local conditions warnings identified by local environmental sensors) by field equipment that supports in-vehicle signage communications.	Future
INDOT Indianapolis TMC	TMC In-Vehicle Signing Management	4	The center shall receive system operational status from field equipment that supports in-vehicle signage communications.	Future
INDOT Indianapolis TMC	TMC In-Vehicle Signing Management	5	The center shall receive system fault data from field equipment that supports in-vehicle signage communications.	Future
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Existing
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	2	The center shall collect and store CCTV surveillance system (traffic, pedestrian) operational status.	Existing
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Existing
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	4	The center shall collect and store CCTV surveillance system (traffic, pedestrian) fault data send to the maintenance center for repair.	Existing
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	5	The center shall collect environmental sensor operational status.	Existing
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	6	The center shall collect environmental sensor equipment fault data and send to the maintenance center for repair.	Existing



Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Existing
INDOT Indianapolis TMC	TMC Service Patrol Management	1	The center shall dispatch roadway service patrol vehicles to identified incident locations.	Existing
INDOT Indianapolis TMC	TMC Service Patrol Management	2	The center shall store the current status of all service patrol vehicles available for dispatch and those that have been dispatched.	Existing
INDOT Indianapolis TMC	TMC Service Patrol Management	3	The center shall share incident information collected by the service patrol with traffic, maintenance and construction, and traveler information centers for incident management, incident notification to travelers, and incident cleanup.	Existing
INDOT Indianapolis TMC	TMC Service Patrol Management	4	The center shall track the location and status of service patrol vehicles.	Planned
INDOT Indianapolis TMC	TMC Speed Warning	1	The center shall provide the capability to notify an enforcement agency when vehicle speeds in the work zone are in excess of the posted speed limit or are creating an unsafe condition based upon the current environmental or traffic conditions.	Planned
INDOT Indianapolis TMC	TMC Speed Warning	3	The center shall monitor reduced speed zone warning field equipment.	Planned
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	1	The center shall remotely control dynamic messages signs for dissemination of traffic and other information to drivers.	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	2	The center shall remotely control driver information systems that communicate directly from a center to the vehicle radio (such as Highway Advisory Radios) for dissemination of traffic and other information to drivers.	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	3	The center shall collect operational status for the driver information systems equipment (DMS, HAR, etc.).	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	4	The center shall collect fault data for the driver information systems equipment (DMS, HAR, etc.) for repair.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	5	The center shall retrieve locally stored traffic information, including current and forecasted traffic information, road and weather conditions, traffic incident information, information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements), and the definition of the road network itself.	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	6	The center shall distribute traffic data to maintenance and construction centers, transit centers, emergency management centers, parking facilities, and traveler information providers.	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	7	The center shall distribute traffic data to the media.	Planned
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	8	The center shall provide the capability for center personnel to control the nature of the data that is available to non-traffic operations centers and the media.	Existing
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	15	The center shall coordinate information dissemination with other traffic management centers.	Planned
INDOT Indianapolis TMC	TMC Traffic Information Dissemination	19	The center shall collect general parking information and status, including current parking availability, parking pricing, and parking space availability information.	Planned
INDOT Indianapolis TMC	TMC Traffic Metering	1	The center shall remotely control systems to manage use of the freeways, including ramp, interchange, and mainline metering.	Planned
INDOT Indianapolis TMC	TMC Traffic Metering	2	The center shall collect operational status from ramp meters, interchange meters, and mainline meters and compare against the control information sent by the center.	Planned
INDOT Indianapolis TMC	TMC Traffic Metering	3	The center shall collect fault data from ramp meters, interchange meters, and mainline meters.	Planned
INDOT Indianapolis TMC	TMC Traffic Network Performance Evaluation	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center to support overall network performance evaluations.	Existing
INDOT Indianapolis TMC	TMC Traffic Network Performance Evaluation	2	The center shall collect wide-area pollution data from emissions management centers to support overall network performance evaluations.	Planned



Element Name	Functional Object	Req #	Requirement	Status
INDOT Indianapolis TMC	TMC Traffic Network Performance Evaluation	5	The center shall exchange traffic information with other traffic management centers, including incidents, congestion data, traffic data, signal timing plans, and real-time signal control information to support overall network performance evaluations.	Existing
INDOT Indianapolis TMC	TMC Variable Speed Limits	2	Based on the measured data, the center shall calculate and set suitable speed limits by lane.	Planned
INDOT Indianapolis TMC	TMC Variable Speed Limits	4	The center shall monitor the operational status of the variable speed limit equipment, including fault reports.	Planned
INDOT Indianapolis TMC	TMC Work Zone Traffic Management	1	The center shall receive work zone images from a maintenance center.	Existing
INDOT Indianapolis TMC	TMC Work Zone Traffic Management	2	The center shall analyze work zone images for indications of a possible incident.	Existing
INDOT Indianapolis TMC	TMC Work Zone Traffic Management	3	The center shall remotely control driver information systems (such as dynamic messages signs, highway advisory radios) to advise drivers of activity around a work zone.	Existing
INDOT Indianapolis TMC	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
INDOT Lane Management Field Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Future
INDOT Lane Management Field Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Future
INDOT Lane Management Field Equipment	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Future
INDOT Lane Management Field Equipment	Roadway Dynamic Lane Management and Shoulder Use	1	The field element shall measure traffic conditions per lane, under center control.	Future
INDOT Lane Management Field Equipment	Roadway Dynamic Lane Management and Shoulder Use	3	The field element shall receive lane management control information from the controlling center.	Future

Element Name	Functional Object	Req #	Requirement	Status
INDOT Lane Management Field Equipment	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Future
INDOT MCO Field Devices	Roadway Automated Treatment	1	The field element shall activate automated roadway treatment systems based on environmental or atmospheric conditions. Treatments can be in the form of fog dispersion, anti-icing chemicals, etc.	Existing
INDOT MCO Field Devices	Roadway Automated Treatment	3	The field element shall return automated roadway treatment system and associated environmental sensor operational status to the maintenance center.	Existing
INDOT MCO Field Devices	Roadway Automated Treatment	4	The field element shall return automated roadway treatment system and associated environmental sensor fault data to the maintenance center for repair.	Existing
INDOT MCO Field Devices	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Existing
INDOT MCO Field Devices	Roadway Traffic Information Dissemination	3	The field element shall provide operational status for the driver information systems equipment (DMS, HAR, etc.) to the center.	Existing
INDOT MCO Field Devices	Roadway Traffic Information Dissemination	4	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Existing
INDOT MCO Field Devices	Roadway Work Zone Traffic Control	1	The field element shall collect, process, and send work zone images to the center for further analysis and distribution, under center control.	Existing
INDOT MCO Field Devices	Roadway Work Zone Traffic Control	2	Under traffic and maintenance center control, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around the work zone through which they are currently passing.	Existing
INDOT MCO Field Devices	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Field Devices	Roadway Work Zone Traffic Control	5	The field element shall provide operational status for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center.	Existing
INDOT MCO Field Devices	Roadway Work Zone Traffic Control	6	The field element shall provide fault data for the surveillance (e.g. CCTV), driver information systems, and gates/barriers in work zones to the maintenance center for repair.	Existing
INDOT MCO Management	MCM Automated Treatment System Control	2	The center shall remotely control the environmental sensors that upon detecting changes in environmental or atmospheric conditions, automatically activate roadway treatment systems.	Existing
INDOT MCO Management	MCM Automated Treatment System Control	3	The center shall collect automated roadway treatment system and associated environmental sensor operational status.	Existing
INDOT MCO Management	MCM Automated Treatment System Control	4	The center shall collect automated roadway treatment system and associated environmental sensor fault data and request repair.	Existing
INDOT MCO Management	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Existing
INDOT MCO Management	MCM Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the maintenance and construction data or for the data itself.	Planned
INDOT MCO Management	MCM Data Collection	4	The maintenance and construction management center shall produce sample products of the data available.	Existing
INDOT MCO Management	MCM Environmental Information Collection	2	The center shall remotely control environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
INDOT MCO Management	MCM Environmental Information Collection	5	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services), data from traffic and traveler information providers, and environmental data collected from sensors deployed on and about the roadway as well as the fleet of maintenance and construction vehicles and the broader population of vehicle probes.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Environmental Information Collection	7	The center shall respond to control data from center personnel regarding environmental sensor control and weather data collection.	Existing
INDOT MCO Management	MCM Environmental Information Collection	8	The center shall collect operational status for the roadside and vehicle-based environmental sensor equipment.	Existing
INDOT MCO Management	MCM Environmental Information Collection	9	The center shall collect fault data for the roadside and vehicle-based environmental sensor equipment for repair.	Existing
INDOT MCO Management	MCM Environmental Information Processing	1	The center shall respond to control data from center personnel regarding environmental information processing.	Existing
INDOT MCO Management	MCM Environmental Information Processing	2	The center shall assimilate current and forecast road conditions and surface weather information using a combination of weather service provider information (such as the National Weather Service and value-added sector specific meteorological services) and local environmental sensor data.	Existing
INDOT MCO Management	MCM Environmental Information Processing	3	The center shall use the various data inputs of environmental sensors and road weather data to develop a view of current and predicted road weather and road conditions.	Existing
INDOT MCO Management	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
INDOT MCO Management	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
INDOT MCO Management	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
INDOT MCO Management	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
INDOT MCO Management	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
INDOT MCO Management	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
INDOT MCO Management	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
INDOT MCO Management	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
INDOT MCO Management	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
INDOT MCO Management	MCM Maintenance Decision Support	4	The center shall provide dispatch information to maintenance and construction vehicles based on the outputs of the decision support system, including recommended roadway treatment actions.	Existing
INDOT MCO Management	MCM Roadway Maintenance	1	The center shall maintain an interface with asset management systems to track the inventory, restrictions, repair needs and status updates of transportation assets (pavement, bridges, signs, etc.) including location, installation and materials information, vendor/contractor, current maintenance status, standard height, width, and weight restrictions.	Existing



Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
INDOT MCO Management	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
INDOT MCO Management	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing
INDOT MCO Management	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
INDOT MCO Management	MCM Roadway Maintenance	6	The center shall collect the status and fault data from the centers that operate the equipment, including data for traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
INDOT MCO Management	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
INDOT MCO Management	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing



Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
INDOT MCO Management	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing
INDOT MCO Management	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
INDOT MCO Management	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
INDOT MCO Management	MCM Vehicle Tracking	2	The center shall present location data to center personnel for the fleet of maintenance and construction vehicles and other equipment.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing
INDOT MCO Management	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
INDOT MCO Management	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
INDOT MCO Management	MCM Work Zone Management	2	The center shall control the collection of work zone status information including video images from cameras located in or near the work zone.	Existing
INDOT MCO Management	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
INDOT MCO Management	MCM Work Zone Management	4	The center shall control traffic in work zones by providing remote control of dynamic message signs, highway advisory radio systems, gates, and barriers located in or near the work zone.	Existing

Element Name	Functional Object	Req #	Requirement	Status
INDOT MCO Management	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
INDOT MCO Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
INDOT MCO Vehicles	MCV Winter Maintenance	2	The maintenance and construction vehicle shall respond to control information from the center to allow remote operation of the on-board vehicle systems. These systems include winter maintenance equipment for plowing, treating, and anti-icing.	Existing
INDOT MCO Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
INDOT MCO Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
INDOT Ramp Metering System	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
INDOT Ramp Metering System	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
INDOT Ramp Metering System	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Planned
INDOT Ramp Metering System	Roadway Traffic Information Dissemination	4	The field element shall provide fault data for the driver information systems equipment (DMS, HAR, etc.) to the center for repair.	Planned
INDOT Ramp Metering System	Roadway Traffic Information Dissemination	7	The field element shall include devices that receive configuration data from other field element devices, without center control.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT Ramp Metering System	Roadway Traffic Metering	1	The field element shall regulate the flow of traffic on ramps, interchanges, and the mainline, under center control.	Planned
INDOT Ramp Metering System	Roadway Traffic Metering	2	The field element shall monitor operation of ramp, interchange, and mainline meters and report to the center any conflicts between received control plans and current system operation.	Planned
INDOT Ramp Metering System	Roadway Traffic Metering	3	The field element shall return ramp, interchange, and mainline meter operational status to the controlling center.	Planned
INDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	1	The field element shall include security sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	2	The field element sensor monitoring shall be remotely controlled by a center.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	3	The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	8	The field element shall provide raw security sensor data.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	9	The field element shall remotely process security sensor data and provide an indication of potential incidents or threats to a center.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Surveillance	1	The field element shall include video and/or audio surveillance of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Surveillance	2	The field element shall be remotely controlled by a center.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Surveillance	3	The field element shall provide equipment status and fault indication of surveillance equipment to a center.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Surveillance	4	The field element shall provide raw video or audio data.	Existing
INDOT Security Monitoring Field Equipment	Field Secure Area Surveillance	5	The field element shall remotely process video and audio data and provide an indication of potential incidents or threats to a center.	Existing
INDOT TPIMS	Parking Coordination	1	The parking element shall exchange parking management data with other parking facilities including location, hours, availability, status, lot usage, operating strategies, and charging information.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT TPIMS	Parking Data Collection	1	The parking element shall collect parking management data including lot usage and charging information.	Planned
INDOT TPIMS	Parking Management	1	The center shall monitor parking area current operational status including current parking occupancy and rates.	Planned
INDOT TPIMS Equipment	Parking Area Management	1	The parking element shall maintain static parking lot information including hours of operation, rates, location, entrance locations, capacity, type, and constraints.	Planned
INDOT TPIMS Equipment	Parking Area Management	5	The parking element shall manage local dynamic message signs that display messages to travelers such as the parking lot state, number of spaces available, location of entrances, and current charges.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Speed Monitoring and Warning	1	The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Speed Monitoring and Warning	5	The field element shall monitor notify an enforcement agency when a speed violation is detected.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Traffic Information Dissemination	1	The field element shall include dynamic message signs for dissemination of traffic and other information to drivers, under center control; the DMS may be either those that display variable text messages, or those that have fixed format display(s) (e.g. vehicle restrictions, or lane open/close).	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Variable Speed Limits	3	The field element shall receive commands from the controlling center that establish speed limits by lane.	Planned
INDOT Variable Speed Limits Field Equipment	Roadway Variable Speed Limits	4	The field element shall display the current speed limits per lane to drivers.	Planned
INDOT Work Zone Speed Monitoring Field Equipment	Roadway Work Zone Safety	1	The field element shall include work zone intrusion detection devices that detect when a vehicle has intruded upon the boundary of a work zone, under center control.	Planned

Element Name	Functional Object	Req #	Requirement	Status
INDOT Work Zone Speed Warning Field Equipment	Roadway Speed Monitoring and Warning	1	The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Planned
INDOT Work Zone Speed Warning Field Equipment	Roadway Speed Monitoring and Warning	3	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).	Planned
INDOT Work Zone Speed Warning Field Equipment	Roadway Speed Monitoring and Warning	5	The field element shall monitor notify an enforcement agency when a speed violation is detected.	Planned
IndyGo Kiosks	Transit Stop Information Services	1	The public interface for travelers shall collect and provide real-time travel-related information at transit stops, multi-modal transfer points, and other public transportation areas.	Planned
IndyGo Kiosks	Transit Stop Information Services	2	The public interface for travelers shall collect and present to the transit traveler information on transit routes, schedules, and real-time schedule adherence.	Planned
IndyGo Kiosks	Transit Stop Information Services	3	The public interface for travelers shall provide support for general announcement and/or display of imminent arrival information and other information of general interest to transit users.	Planned
IndyGo Kiosks	Transit Stop Information Services	4	The public interface for travelers shall present information to the traveler in a form suitable for travelers with physical disabilities including travelers who are visually impaired.	Planned
IndyGo Kiosks	Traveler Fare Management	1	The public interface for travelers shall accept and process current transit passenger fare collection information.	Planned
IndyGo Kiosks	Traveler Fare Management	2	The public interface for travelers shall calculate a fare based on the origin and destination provided by the traveler, in conjunction with transit routing, transit fare category, and transit user history.	Planned
IndyGo Kiosks	Traveler Fare Management	3	The public interface for travelers shall provide an interface to a transit user traveler card in support of payment for transit fares, tolls, and/or parking lot charges. The stored credit value data from the card shall be collected and updated based on the fare or other charges, or the credit identity shall be collected.	Planned
IndyGo Kiosks	Traveler Fare Management	4	The public interface for travelers shall provide information to the center for financial authorization and transaction processing.	Planned



Element Name	Functional Object	Req #	Requirement	Status
IndyGo Kiosks	Traveler Fare Management	6	The public interface for travelers shall determine the routing based on the traveler's destination and the location of the closest transit stop from which a route request is being made.	Planned
IndyGo Kiosks	Traveler Fare Management	7	The public interface for travelers shall create fare statistics data based upon data collected at a transit stop.	Planned
IndyGo Kiosks	Traveler Fare Management	8	The public interface for travelers shall present information to the traveler in a form suitable for travelers with physical disabilities.	Planned
IndyGo Kiosks	Traveler Interactive Information	2	The public interface for travelers shall receive transit information from a center and present it to the traveler upon request.	Planned
IndyGo Kiosks	Traveler Interactive Information	10	The public interface for travelers shall support interactive traveler input in audio or manual form.	Planned
IndyGo Kiosks	Traveler Interactive Information	11	The public interface for travelers shall present interactive information to the traveler in audible or visual forms consistent with a kiosk, including those that are suitable for travelers with hearing or vision physical disabilities.	Planned
IndyGo Kiosks	Traveler Interactive Information	12	The public interface for travelers shall store frequently requested data.	Planned
IndyGo Kiosks	Traveler Trip Planning	1	The public interface for travelers shall receive traffic information from a center and present it to the traveler to support trip planning.	Future
IndyGo Kiosks	Traveler Trip Planning	2	The public interface for transit shall receive traffic information from a center and present it to the traveler to support trip planning.	Future
IndyGo Kiosks	Traveler Trip Planning	4	The public interface for travelers shall base requests to support trip planning on the traveler's current location or a specific location identified by the traveler, and filter the provided information accordingly.	Future
IndyGo Kiosks	Traveler Trip Planning	5	The public interface for travelers shall support traveler trip planning input in audio or manual form.	Future
IndyGo Kiosks	Traveler Trip Planning	6	The public interface for travelers shall present trip planning information to the traveler in audible or visual forms consistent with a kiosk, including those that are suitable for travelers with hearing or vision physical disabilities.	Future
IndyGo Kiosks	Traveler Trip Planning	8	The traveler support equipment shall provide a mechanism for its user to create/modify a trip plan including selection of mode, route and parking.	Future

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Kiosks	Traveler Trip Planning	9	The traveler support equipment shall receive information on available parking including available spaces with associated information about parking restrictions and location for each available space.	Future
IndyGo Operations Center	Archive Data Repository	1	The center shall collect data from centers.	Existing
IndyGo Operations Center	Archive Data Repository	3	The center shall store collected data in an information repository.	Existing
IndyGo Operations Center	Archive Data Repository	6	The center shall include capabilities for archive to archive coordination.	Existing
IndyGo Operations Center	Archive Data Repository	10	The center shall respond to requests from the administrator interface function to manage the archive data.	Existing
IndyGo Operations Center	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
IndyGo Operations Center	Emergency Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the emergency management data or for the data itself.	Existing
IndyGo Operations Center	Emergency Data Collection	4	The emergency management center shall produce sample products of the data available.	Existing
IndyGo Operations Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
IndyGo Operations Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
IndyGo Operations Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
IndyGo Operations Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
IndyGo Operations Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
IndyGo Operations Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
IndyGo Operations Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
IndyGo Operations Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
IndyGo Operations Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
IndyGo Operations Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
IndyGo Operations Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
IndyGo Operations Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
IndyGo Operations Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
IndyGo Operations Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
IndyGo Operations Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
IndyGo Operations Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Emergency Secure Area Alarm Support	1	The center shall collect silent and audible alarms received from travelers in secure areas (such as transit stops, rest areas, park and ride lots, modal interchange facilities).	Planned
IndyGo Operations Center	Emergency Secure Area Alarm Support	2	The center shall collect silent and audible alarms received from transit vehicles, originated by the traveler or the transit vehicle operator.	Existing
IndyGo Operations Center	Emergency Secure Area Alarm Support	3	After the alarm message has been received, the center shall generate an alarm acknowledgment to the sender.	Existing
IndyGo Operations Center	Emergency Secure Area Alarm Support	4	After the alarm message becomes a verified incident, the center shall determine the appropriate response.	Existing
IndyGo Operations Center	Emergency Secure Area Alarm Support	5	The center shall determine whether the alarm message indicates an emergency that requires the attention of public safety agencies, and forward alarm message data to the appropriate agency as necessary.	Existing
IndyGo Operations Center	Emergency Secure Area Alarm Support	6	The center shall forward the alarm message to center personnel and respond to the traveler or transit vehicle operator as directed by the personnel.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Planned
IndyGo Operations Center	Emergency Secure Area Sensor Management	4	The center shall exchange security sensor data with other emergency centers.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.	Existing
IndyGo Operations Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.	Existing
IndyGo Operations Center	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.	Planned
IndyGo Operations Center	Emergency Secure Area Surveillance	3	The center shall remotely monitor video images and audio surveillance data collected on-board transit vehicles. The data may be raw or pre-processed in the field.	Planned
IndyGo Operations Center	Emergency Secure Area Surveillance	4	The center shall exchange surveillance data with other emergency centers.	Existing
IndyGo Operations Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.	Existing
IndyGo Operations Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.	Existing
IndyGo Operations Center	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).	Planned
IndyGo Operations Center	Emergency Secure Area Surveillance	9	The center shall remotely control security surveillance devices on-board transit vehicles.	Planned
IndyGo Operations Center	Shared Use Account and Fee Management	1	The center shall acquire information from the payment center describing payment methods the institution is willing to accept.	Planned

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	TIC Data Collection	2	The center shall select real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, transit information, parking information, special event and incident information.	Future
IndyGo Operations Center	TIC Data Collection	3	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.	Future
IndyGo Operations Center	TIC Data Collection	4	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information.	Future
IndyGo Operations Center	TIC Data Collection	12	The center shall collect information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.	Future
IndyGo Operations Center	TIC Data Collection	24	The center shall collect, process, and store pathway information.	Future
IndyGo Operations Center	TIC Dynamic Ridesharing	1	The center shall accept requests from traveler interface systems for ridesharing as part of a trip plan request.	Existing
IndyGo Operations Center	TIC Dynamic Ridesharing	2	The center shall provide a rideshare match based on origin and destination of the traveler's proposed trip, any routing constraints, preferences specified by the traveler, compatibility of this rideshare with rideshares confirmed by other travelers, the requesting traveler's eligibility data, and traffic data.	Existing
IndyGo Operations Center	TIC Dynamic Ridesharing	3	The center shall process rideshare requests by balancing the relative benefits of the rideshare to each rideshare participant.	Existing
IndyGo Operations Center	TIC Dynamic Ridesharing	4	The center shall arrange connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing.	Existing
IndyGo Operations Center	TIC Dynamic Ridesharing	5	The center shall provide a confirmation of the traveler's rideshare match and provide the capability to support a payment transaction for the rideshare service.	Existing
IndyGo Operations Center	TIC Dynamic Ridesharing	6	The center shall store all rideshare matches and traveler eligibility data.	Existing
IndyGo Operations Center	TIC Interactive Traveler Information	3	The center shall disseminate customized transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information to travelers upon request.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	TIC Interactive Traveler Information	15	The center shall provide the capability to exchange information with another traveler information service provider current or predicted data for road links that are outside the area served by the local supplier.	Planned
IndyGo Operations Center	TIC Interactive Traveler Information	16	The center shall provide the capability to support requests from the media for traffic and incident data.	Existing
IndyGo Operations Center	TIC Interactive Traveler Information	17	The center shall provide the capability for a system operator to control the type and update frequency of traveler information.	Existing
IndyGo Operations Center	TIC Operations Data Collection	1	The center shall collect traveler information data, such as parking lot data, rideshare data, road network use data, vehicle probe data, and other data from traveler information system operations.	Existing
IndyGo Operations Center	TIC Operations Data Collection	2	The center shall collect traveler requests, confirmations, and payment transaction data for traveler services provided.	Existing
IndyGo Operations Center	TIC Operations Data Collection	4	The center shall receive and respond to requests from ITS Archives for either a catalog of the traveler information data or for the data itself.	Existing
IndyGo Operations Center	TIC Operations Data Collection	5	The transportation information center shall produce sample products of the data available.	Existing
IndyGo Operations Center	TIC Payment Support	1	The center shall coordinate with payment administration centers that serve as a clearing house for a regional payment system in order to perform payment reconciliation.	Planned
IndyGo Operations Center	TIC Trip Planning	1	The center shall provide the capability to provide specific pre-trip and en route directions to travelers (and drivers), including costs, arrival times, and transfer points.	Planned
IndyGo Operations Center	TIC Trip Planning	2	The center shall include bicycle routes, walkways, skyways, and multi-use trails in the pre-trip and en route directions it provides to travelers.	Future
IndyGo Operations Center	TIC Trip Planning	3	The center shall support on-line route guidance for travelers using personal devices (such as PDAs).	Future
IndyGo Operations Center	TIC Trip Planning	6	The center shall generate route plans based on current and/or predicted conditions of the road network, scheduled maintenance and construction work activities, and work zone activities.	Existing
IndyGo Operations Center	TIC Trip Planning	7	The center shall generate route plans based on transit services, including fares, schedules, and requirements for travelers with special needs.	Existing
IndyGo Operations Center	TIC Trip Planning	8	The center shall generate route plans based on current asset restrictions, such as height and weight restrictions on tunnels or bridges.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	TIC Trip Planning	11	The center shall generate trips based on the use of more than one mode of transport.	Future
IndyGo Operations Center	TIC Trip Planning	12	The center shall use the preferences and constraints specified by the traveler in the trip request to select the most appropriate mode of transport.	Planned
IndyGo Operations Center	TIC Trip Planning	13	The center shall provide the capability for the traveler to confirm the proposed trip plan.	Planned
IndyGo Operations Center	TIC Trip Planning	14	The center shall provide the capability for center personnel to control route calculation parameters.	Existing
IndyGo Operations Center	Transit Center Connection Protection	1	The center shall manage service requests for routing of an individual through the transit system.	Future
IndyGo Operations Center	Transit Center Connection Protection	2	The center shall provide transit plans for both fixed and demand responsive transit to transit passengers.	Future
IndyGo Operations Center	Transit Center Connection Protection	3	The center shall coordinate with Other Transit Management systems or Multimodal Transportation Service Providers in order to provide a complete multimodal trip plan.	Existing
IndyGo Operations Center	Transit Center Connection Protection	5	The center shall track transit vehicles and identify when connections between transit routes are in jeopardy due to the late arrival of a transit vehicle at a transfer stop or station.	Future
IndyGo Operations Center	Transit Center Connection Protection	7	The center shall provide a traveler with updates regarding their transit trip, including connection protection actions taken by the center.	Future
IndyGo Operations Center	Transit Center Data Collection	1	The center shall collect transit management data such as transit fares and passenger use, transit services, paratransit operations, transit vehicle maintenance data, etc.	Existing
IndyGo Operations Center	Transit Center Data Collection	3	The center shall receive and respond to requests from ITS Archives for either a catalog of the transit data or for the data itself.	Existing
IndyGo Operations Center	Transit Center Data Collection	4	The transit management center shall produce sample products of the data available.	Existing
IndyGo Operations Center	Transit Center Fare Management	1	The center shall manage the actual value of transit fares for each segment of each regular transit route, including the transmission of the information to transit vehicles and transit stops or stations.	Planned

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Transit Center Fare Management	2	The center shall provide the capability for a system operator to manage the transit fares and control the exchange of transit fare information.	Planned
IndyGo Operations Center	Transit Center Fare Management	3	The center shall process the financial requests from the transit vehicles or roadside and manage an interface to a Financial Institution.	Planned
IndyGo Operations Center	Transit Center Fare Management	4	The center shall support the payment of transit fare transactions using data provided by the traveler cards / payment instruments.	Existing
IndyGo Operations Center	Transit Center Fare Management	6	The center shall process requests for transit fares to be paid in advance.	Planned
IndyGo Operations Center	Transit Center Fare Management	7	The center shall maintain a list of invalid traveler credit identities or bad tag lists that can be forwarded to transit vehicles and transit stops or stations.	Planned
IndyGo Operations Center	Transit Center Fare Management	8	The center shall collect fare statistics data to implement variable and flexible fare structures.	Existing
IndyGo Operations Center	Transit Center Fare Management	10	The center shall provide transit fare information to traveler information providers upon request.	Existing
IndyGo Operations Center	Transit Center Fixed-Route Operations	1	The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, incident information, operational data on current routes and schedules, and digitized map data.	Planned
IndyGo Operations Center	Transit Center Fixed-Route Operations	2	The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes	Planned
IndyGo Operations Center	Transit Center Fixed-Route Operations	3	The center shall generate special routes and schedules to support an incident, disaster, evacuation, or other emergency.	Existing
IndyGo Operations Center	Transit Center Fixed-Route Operations	5	The center shall collect transit operational data for use in the generation of routes and schedules.	Existing
IndyGo Operations Center	Transit Center Fixed-Route Operations	7	The center shall manage large deviations of individual transit vehicles, deviations in rural areas, and deviations of large numbers of vehicles.	Existing
IndyGo Operations Center	Transit Center Fixed-Route Operations	8	The center shall generate the necessary corrective actions which may involve more than the vehicles concerned and more far reaching action, such as, the introduction of extra vehicles, wide area signal priority by traffic management, the premature termination of some services, etc.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Transit Center Fixed-Route Operations	9	The center shall exchange information with Maintenance and Construction Operations concerning work zones, roadway conditions, asset restrictions, work plans, etc.	Existing
IndyGo Operations Center	Transit Center Fixed-Route Operations	10	The center shall disseminate up-to-date schedules and route information to other centers for fixed and flexible route services.	Planned
IndyGo Operations Center	Transit Center Information Services	1	The center shall provide travelers using public transportation with traffic and advisory information upon request. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Planned
IndyGo Operations Center	Transit Center Information Services	2	The center shall provide transit information to the media including details of deviations from schedule of regular transit services.	Existing
IndyGo Operations Center	Transit Center Information Services	3	The center shall exchange transit schedules, real-time arrival information, fare schedules, and general transit service information with other transit organizations to support transit traveler information systems.	Planned
IndyGo Operations Center	Transit Center Information Services	4	The center shall provide transit service information to traveler information service providers including routes, schedules, schedule adherence, and fare information as well as transit service information during evacuation.	Existing
IndyGo Operations Center	Transit Center Information Services	6	The center shall broadcast transit advisory data, including alerts and advisories pertaining to major emergencies, or man made disasters.	Planned
IndyGo Operations Center	Transit Center Multi-Modal Coordination	1	The center shall coordinate schedules and services with traffic management, parking management, and event planning systems.	Existing
IndyGo Operations Center	Transit Center Multi-Modal Coordination	2	The center shall share transfer cluster and transfer point information with other transit centers. A transfer cluster is a collection of stop points, stations, or terminals where transfers can be made conveniently.	Existing
IndyGo Operations Center	Transit Center Multi-Modal Coordination	3	The center shall accept requests from traffic management to change routes and schedules as part of the implementation of demand management strategies.	Existing
IndyGo Operations Center	Transit Center Paratransit Operations	1	The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers.	Existing
IndyGo Operations Center	Transit Center Paratransit Operations	2	The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off.	Planned



Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Transit Center Paratransit Operations	3	The center shall generate demand response transit (including paratransit) routes and schedules based on such factors as parameters input by the system operator, what other demand responsive transit schedules have been planned, the availability and location of vehicles, the relevance of any fixed transit routes and schedules, road network information, and incident information.	Planned
IndyGo Operations Center	Transit Center Paratransit Operations	5	The center shall exchange information with Maintenance and Construction Operations concerning work zones, roadway conditions, asset restrictions, work plans, etc., that affect paratransit operations	Existing
IndyGo Operations Center	Transit Center Paratransit Operations	6	The center shall disseminate up-to-date schedules and route information to other centers for demand responsive transit services (paratransit).	Planned
IndyGo Operations Center	Transit Center Priority Management	1	The center shall analyze transit vehicle schedule performance to determine the need for priority along certain routes or at certain intersections.	Existing
IndyGo Operations Center	Transit Center Security	1	The center shall monitor transit vehicle operational data to determine if the transit vehicle is off-route and assess whether a security incident is occurring.	Planned
IndyGo Operations Center	Transit Center Security	2	The center shall receive reports of emergencies on-board transit vehicles entered directly by the transit vehicle operator or from a traveler through interfaces such as panic buttons or alarm switches.	Existing
IndyGo Operations Center	Transit Center Security	3	The center shall support the back-office portion of functionality to authenticate transit vehicle operators.	Existing
IndyGo Operations Center	Transit Center Security	4	The center shall provide transit incident information along with other service data to emergency centers.	Existing
IndyGo Operations Center	Transit Center Security	5	The center shall receive information pertaining to a wide-area alert such as weather alerts, disaster situations, or child abductions. This information may come from Emergency Management or from other Alerting and Advisory Systems.	Existing
IndyGo Operations Center	Transit Center Security	6	The center shall send wide-area alert information to travelers (on-board transit vehicles or at stations/stops) and transit vehicle operators.	Planned
IndyGo Operations Center	Transit Center Security	7	The center shall coordinate the response to security incidents involving transit with other agencies including Emergency Management, other transit agencies, media, traffic management, and traveler information service providers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Transit Center Vehicle Tracking	1	The center shall monitor the locations of all transit vehicles within its network.	Planned
IndyGo Operations Center	Transit Center Vehicle Tracking	2	The center shall determine adherence of transit vehicles to their assigned schedule.	Planned
IndyGo Operations Center	Transit Center Vehicle Tracking	3	The center shall provide transit operational data to traveler information service providers.	Planned
IndyGo Operations Center	Transit Evacuation Support	1	The center shall manage the use of transit resources to support evacuation and subsequent reentry of a population in the vicinity of a disaster or other emergency.	Existing
IndyGo Operations Center	Transit Evacuation Support	2	The center shall coordinate regional evacuation plans with Emergency Management - identifying the transit role in an evacuation and the transit resources that would be used.	Existing
IndyGo Operations Center	Transit Evacuation Support	3	The center shall coordinate the use of transit and school bus fleets during an evacuation, supporting evacuation of those with special needs and the general population.	Existing
IndyGo Operations Center	Transit Evacuation Support	4	The center shall adjust and update transit service and fare schedules and provide that information to other agencies as they coordinate evacuations.	Existing
IndyGo Operations Center	Transit Garage Maintenance	1	The center shall collect operational and maintenance data from transit vehicles.	Existing
IndyGo Operations Center	Transit Garage Maintenance	2	The center shall monitor the condition of a transit vehicle to analyze brake, drive train, sensors, fuel, steering, tire, processor, communications equipment, and transit vehicle mileage to identify mileage based maintenance, out-of-specification or imminent failure conditions.	Existing
IndyGo Operations Center	Transit Garage Maintenance	3	The center shall generate transit vehicle maintenance schedules that identify the maintenance or repair to be performed and when the work is to be done.	Existing
IndyGo Operations Center	Transit Garage Maintenance	4	The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning based, in part, on the transit vehicle maintenance schedule.	Existing
IndyGo Operations Center	Transit Garage Maintenance	5	The center shall assign technicians to a transit vehicle maintenance schedule, based upon such factors as personnel eligibility, work assignments, preferences and seniority.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Operations Center	Transit Garage Maintenance	6	The center shall verify that the transit vehicle maintenance activities were performed correctly, using the transit vehicle's status, the maintenance personnel's work assignment, and the transit maintenance schedules.	Existing
IndyGo Operations Center	Transit Garage Maintenance	7	The center shall generate a time-stamped maintenance log of all maintenance activities performed on a transit vehicle.	Existing
IndyGo Operations Center	Transit Garage Maintenance	8	The center shall provide transit operations personnel with the capability to update transit vehicle maintenance information and receive reports on all transit vehicle operations data.	Existing
IndyGo Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	2	The field element sensor monitoring shall be remotely controlled by a center.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	3	The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	8	The field element shall provide raw security sensor data.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	9	The field element shall remotely process security sensor data and provide an indication of potential incidents or threats to a center.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	10	The field element shall include security sensors that monitor conditions in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	1	The field element shall include video and/or audio surveillance of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	2	The field element shall be remotely controlled by a center.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	3	The field element shall provide equipment status and fault indication of surveillance equipment to a center.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	4	The field element shall provide raw video or audio data.	Planned
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	5	The field element shall remotely process video and audio data and provide an indication of potential incidents or threats to a center.	Planned

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Security Monitoring Field Equipment	Field Secure Area Surveillance	6	The field element shall include video and/or audio surveillance of traveler secure areas including transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and traveler information centers).	Planned
IndyGo Security Monitoring Field Equipment	Traveler Security	1	The public interface for travelers shall provide the capability for a traveler to report an emergency and summon assistance from secure areas such as transit stops, transit stations, modal transfer facilities, rest stops, park-and-ride areas, travel information areas, and emergency pull off areas.	Planned
IndyGo Security Monitoring Field Equipment	Traveler Security	2	When initiated by a traveler, the public interface for travelers shall forward a request for assistance to an emergency management function and acknowledge the request.	Planned
IndyGo Security Monitoring Field Equipment	Traveler Security	3	The public interface for travelers shall provide the capability to broadcast a message to advise or warn a traveler.	Existing
IndyGo Security Monitoring Field Equipment	Traveler Security	4	The public interface for travelers shall accept input and provide information to the traveler in a form suitable for travelers with physical disabilities.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Fare Management	1	The transit vehicle shall read data from the traveler card / payment instrument presented by boarding passengers.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Fare Management	3	The transit vehicle shall determine the traveler's travel routing based on the transit vehicle's current location and the traveler's destination.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Fare Management	6	The transit vehicle shall provide a transit fare payment interface that is suitable for travelers with physical disabilities.	Existing
IndyGo Transit Vehicles	Transit Vehicle On-Board Fare Management	9	The transit vehicle shall provide fare statistics data to the center.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Fare Management	12	The transit vehicle fare system shall deduct the trip fare from the traveler's smart card.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Information Services	1	The transit vehicle shall enable traffic and travel advisory information to be requested and output to the traveler. Such information may include transit routes, schedules, transfer options, fares, real-time schedule adherence, current incidents, weather conditions, and special events.	Planned

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Transit Vehicles	Transit Vehicle On-Board Information Services	2	The transit vehicle shall broadcast advisories about the imminent arrival of the transit vehicle at the next stop via an on-board automated annunciation system.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Information Services	3	The transit vehicle shall support input and output forms that are suitable for travelers with physical disabilities.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Information Services	5	The transit vehicle shall tailor the output of the request traveler information based on the current location of the transit vehicle.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Maintenance	2	The transit vehicle shall collect and process the transit vehicle's operating conditions such as engine temperature, oil pressure, brake wear, internal lighting, environmental controls, etc.	Existing
IndyGo Transit Vehicles	Transit Vehicle On-Board Paratransit Operations	2	The transit vehicle shall receive the status of demand responsive or flexible-route transit schedules and passenger loading from the transit vehicle operator.	Existing
IndyGo Transit Vehicles	Transit Vehicle On-Board Trip Monitoring	1	The transit vehicle shall track the current location of the transit vehicle.	Planned
IndyGo Transit Vehicles	Transit Vehicle On-Board Trip Monitoring	2	The transit vehicle shall support the computation of the location of a transit vehicle using on-board sensors to augment the location determination function. This may include proximity to the transit stops or other known reference points as well as recording trip length.	Planned
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	1	The transit vehicle shall receive a vehicle assignment including transit route information, transit service instructions, traffic information, road conditions, and other information for the operator.	Existing
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	2	The transit vehicle shall use the route information and its current location to determine the deviation from the predetermined schedule.	Existing
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	3	The transit vehicle shall calculate the estimated times of arrival (ETA) at transit stops.	Planned
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	4	The transit vehicle shall determine scenarios to correct the schedule deviation.	Planned

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	5	The transit vehicle shall provide the schedule deviations and instructions for schedule corrections to the transit vehicle operator if the deviation is small, or the transit vehicle is operating in an urban area.	Planned
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	6	The transit vehicle shall send the schedule deviation and estimated arrival time information to the center.	Planned
IndyGo Transit Vehicles	Transit Vehicle Schedule Management	7	The transit vehicle shall support the operations of a flexible route service. This may include requests for route deviations that would then lead to schedule corrective actions.	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	1	The transit vehicle shall perform video and audio surveillance inside of transit vehicles and output raw video or audio data for either local monitoring (for processing or direct output to the transit vehicle operator), remote monitoring or for local storage (e.g., in an event recorder).	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	2	The transit vehicle shall perform local monitoring of video or audio surveillance data collected inside of transit vehicles, and identify potential incidents or threats based on received processing parameters.	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	3	The transit vehicle shall output an indication of potential incidents or threats and the processed video or audio information to the center along with the vehicle's current location.	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	6	The transit vehicle shall output an indication of potential incidents or threats and the processed sensor information to the center along with the vehicle's current location.	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	8	The transit vehicle shall monitor and output surveillance and sensor equipment status and fault indications.	Planned
IndyGo Transit Vehicles	Transit Vehicle Security	9	The transit vehicle shall accept emergency inputs from either the transit vehicle operator or a traveler through such interfaces as panic buttons, silent or audible alarms, etc.	Existing
IndyGo Transit Vehicles	Transit Vehicle Security	10	The transit vehicle shall output reported emergencies to the center.	Existing
IndyGo Transit Vehicles	Transit Vehicle Security	11	The transit vehicle shall receive acknowledgments of the emergency request from the center and output this acknowledgment to the transit vehicle operator or to the travelers.	Existing
IndyGo Transit Vehicles	Transit Vehicle Security	12	The transit vehicle shall be capable of receiving an emergency message for broadcast to the travelers or to the transit vehicle operator.	Existing

Element Name	Functional Object	Req #	Requirement	Status
IndyGo Transit Vehicles	Transit Vehicle Security	14	The transit vehicle shall perform authentication of the transit vehicle operator.	Existing
IndyGo Transit Vehicles	Transit Vehicle Signal Priority	2	The transit vehicle shall send priority requests to traffic signal controllers at intersections, pedestrian crossings, and multimodal crossings on the roads (surface streets) and freeway (ramp controls) network that enable a transit vehicle schedule deviation to be corrected.	Existing
IndyGo Transit Vehicles	Transit Vehicle Signal Priority	4	The transit vehicle shall prevent a priority request from being sent when the transit vehicle cannot use the priority (e.g., when the transit vehicle makes a passenger stop on the approach to an intersection).	Planned
Intelligence Fusion Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Intelligence Fusion Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Intelligence Fusion Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Intelligence Fusion Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Intelligence Fusion Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Intelligence Fusion Center	Emergency Early Warning System	7	The center shall broadcast wide-area alerts and advisories to transit management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Intelligence Fusion Center	Emergency Early Warning System	9	The center shall broadcast wide-area alerts and advisories to traveler information service providers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Intelligence Fusion Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Intelligence Fusion Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Intelligence Fusion Center	Emergency Early Warning System	13	The center shall process status information from each of the centers that have been sent the wide-area alert.	Existing
Intelligence Fusion Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Intelligence Fusion Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Intelligence Fusion Center	Emergency Environmental Monitoring	1	The center shall collect current and forecast road and weather information from weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Intelligence Fusion Center	Emergency Environmental Monitoring	4	The center shall assimilate current and forecast road conditions and surface weather information to support incident management.	Existing
Intelligence Fusion Center	Emergency Environmental Monitoring	5	The center shall provide the road and weather warning and advisories to the emergency responders.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Intelligence Fusion Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	6	The center shall request resources from transit agencies as needed to support the evacuation.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Intelligence Fusion Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Intelligence Fusion Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Intelligence Fusion Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Intelligence Fusion Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Intelligence Fusion Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Intelligence Fusion Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Intelligence Fusion Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Intelligence Fusion Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Intelligence Fusion Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	1	The center shall remotely monitor and control security sensor data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), infrastructure condition and integrity, intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	2	The center shall remotely monitor and control security sensor data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The types of security sensor data include environmental threat (e.g. chemical agent, toxic industrial chemical, biological, explosives, and radiological sensors), intrusion and motion, and object detection sensors. The data may be raw or pre-processed in the field.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	5	The center shall identify potential security threats based on collected security sensor data.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	6	The center shall verify potential security threats by correlating security sensor data from multiple sources.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	7	The center shall perform threat analysis based on correlations of security sensor and surveillance data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Intelligence Fusion Center	Emergency Secure Area Sensor Management	8	The center shall exchange threat analysis data with Alerting and Advisory Systems and use that data in local threat analysis processing.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	9	The center shall disseminate threat information to other agencies, including traffic, transit, maintenance, rail operations, and other emergency management centers.	Existing
Intelligence Fusion Center	Emergency Secure Area Sensor Management	10	The center shall respond to control data from center personnel regarding security sensor data collection, processing, threat detection, and threat analysis.	Existing
Intelligence Fusion Center	Emergency Secure Area Surveillance	1	The center shall remotely monitor video images and audio surveillance data collected in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways). The data may be raw or pre-processed in the field.	Planned
Intelligence Fusion Center	Emergency Secure Area Surveillance	2	The center shall remotely monitor video images and audio surveillance data collected in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers). The data may be raw or pre-processed in the field.	Planned
Intelligence Fusion Center	Emergency Secure Area Surveillance	5	The center shall identify potential security threats based on collected security surveillance data.	Existing
Intelligence Fusion Center	Emergency Secure Area Surveillance	6	The center shall verify potential security threats by correlating security surveillance data from multiple sources.	Existing
Intelligence Fusion Center	Emergency Secure Area Surveillance	7	The center shall remotely control security surveillance devices in secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Planned
Intelligence Fusion Center	Emergency Secure Area Surveillance	8	The center shall remotely control security surveillance devices in traveler secure areas, which include transit stations, transit stops, rest areas, park and ride lots, and other fixed sites along travel routes (e.g., emergency pull-off areas and travel information centers).	Planned
Intelligence Fusion Center	Emergency Secure Area Surveillance	12	The center shall respond to control data from center personnel regarding security surveillance data collection, processing, threat detection, and image matching.	Existing



Element Name	Functional Object	Req #	Requirement	Status
ISP Dispatch	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Planned
ISP Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
ISP Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
ISP Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
ISP Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
ISP Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
ISP Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Lawrence Public Safety	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Lawrence Public Safety	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Lawrence Public Safety	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Safety	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Lawrence Public Safety	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Lawrence Public Safety	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Lawrence Public Safety	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Lawrence Public Safety	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Lawrence Public Safety	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Lawrence Public Safety	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Lawrence Public Safety	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Lawrence Public Safety	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Lawrence Public Safety	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Lawrence Public Safety	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Lawrence Public Safety	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Safety	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Lawrence Public Safety	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Lawrence Public Safety	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Lawrence Public Safety	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Lawrence Public Safety	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Lawrence Public Safety	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Lawrence Public Safety	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Lawrence Public Safety	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Lawrence Public Safety	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Lawrence Public Safety	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Lawrence Public Safety	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Safety	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Lawrence Public Safety	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Lawrence Public Safety	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Lawrence Public Safety	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.	Existing
Lawrence Public Safety	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Lawrence Public Safety	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Lawrence Public Safety	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Lawrence Public Safety	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Lawrence Public Safety	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Lawrence Public Safety	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Lawrence Public Safety	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Lawrence Public Safety	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Safety	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Lawrence Public Safety	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Lawrence Public Safety	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Lawrence Public Safety	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Lawrence Public Safety	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Lawrence Public Safety	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Lawrence Public Safety	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Lawrence Public Safety	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Lawrence Public Safety	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Lawrence Public Safety	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Lawrence Public Safety	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Lawrence Public Safety	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Safety	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Lawrence Public Works/Street Department	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Planned
Lawrence Public Works/Street Department	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
Lawrence Public Works/Street Department	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Lawrence Public Works/Street Department	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Lawrence Public Works/Street Department	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Lawrence Public Works/Street Department	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Lawrence Public Works/Street Department	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing
Lawrence Public Works/Street Department	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Lawrence Public Works/Street Department	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Lawrence Public Works/Street Department	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Lawrence Public Works/Street Department	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Lawrence Public Works/Street Department	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Lawrence Public Works/Street Department	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Lawrence Public Works/Street Department	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Planned
Lawrence Public Works/Street Department	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Lawrence Public Works/Street Department	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Lawrence Public Works/Street Department	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Lawrence Public Works/Street Department	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Public Works/Street Department	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Planned
Lawrence Public Works/Street Department	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Lawrence Public Works/Street Department	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Lawrence Public Works/Street Department	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
Lawrence Public Works/Street Department	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Planned
Lawrence Public Works/Street Department	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
Lawrence Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Lawrence Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Lawrence Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
Lawrence Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Lawrence Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Lawrence Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Lawrence Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Lawrence Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Lawrence Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Lawrence Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Lawrence Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Lawrence Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Lawrence Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Lawrence Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Lawrence Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Lawrence Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lawrence Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Lawrence Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Lawrence Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Lucas Oil Stadium Command Center	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Lucas Oil Stadium Command Center	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Lucas Oil Stadium Command Center	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Lucas Oil Stadium Command Center	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Lucas Oil Stadium Command Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Lucas Oil Stadium Command Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Major Employer Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Major Employer Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Major Employer Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Major Employer Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Major Employer Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Major Employer Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Major Employer Management Systems	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Major Employer Management Systems	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Major Employer Management Systems	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Major Employer Management Systems	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Major Employer Management Systems	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
Major Employer Management Systems	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Major Employer Management Systems	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Major Employer Management Systems	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Major Employer Management Systems	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Major Employer Management Systems	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Major Employer Management Systems	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Major Employer Management Systems	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Major Employer Management Systems	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Major Employer Management Systems	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Major Employer Management Systems	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Major Employer Management Systems	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Major Employer Management Systems	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Major Employer Management Systems	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Major Employer Management Systems	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Major Employer Management Systems	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Major Employer Management Systems	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Major Employer Management Systems	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Major Employer Management Systems	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Major Employer Management Systems	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Major Employer Management Systems	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Marion County Sheriff Dispatch	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Marion County Sheriff Dispatch	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Marion County Sheriff Dispatch	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Marion County Sheriff Dispatch	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Marion County Sheriff Dispatch	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Marion County Sheriff Dispatch	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Marion County Sheriff Dispatch	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Marion County Sheriff Dispatch	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Marion County Sheriff Dispatch	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Marion County Sheriff Dispatch	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Marion County Sheriff Dispatch	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Marion County Sheriff Dispatch	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Marion County Sheriff Dispatch	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Marion County Sheriff Dispatch	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Marion County Sheriff Dispatch	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Marion County Sheriff Dispatch	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Marion County Sheriff Dispatch	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Marion County Sheriff Dispatch	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Marion County Sheriff Dispatch	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Marion County Sheriff Dispatch	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Marion County Sheriff Dispatch	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Marion County Sheriff Dispatch	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Marion County Sheriff Dispatch	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Marion County Sheriff Dispatch	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Marion County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
MESA System	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
MESA System	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing

Element Name	Functional Object	Req #	Requirement	Status
MESA System	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
MESA System	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
MESA System	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Micro-Mobility Services	Shared Use Account and Fee Management	1	The center shall acquire information from the payment center describing payment methods the institution is willing to accept.	Planned
Micro-Mobility Services	Shared Use Account and Fee Management	2	The center shall request payment through the financial institution for shared use services when such services are requested by the traveler.	Planned
Micro-Mobility Services	Shared Use Account and Fee Management	4	The center shall provide updated user account information to the payment center.	Planned
Micro-Mobility Services	Shared Use Operations	1	The center shall accept requests for shared use transportation.	Future
Micro-Mobility Services	Shared Use Operations	4	The center shall provide to public transportation the status of the shared use operations.	Future
Micro-Mobility Services	Shared Use Operations	6	The center shall accept traveler-specific information sufficient to establish an account for the traveler's use of shared services from the traveler's personal device.	Future
Other Suburban Municipality Street Department Dispatch	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Existing
Payment Administration Center	PAC Payment Administration	3	The center shall provide secure user account management, providing user access to rules and policies, current billing status, invoices, payments, and mechanisms for review and challenge of the collected data.	Planned
Payment Administration Center	PAC Payment Administration	12	The center shall register users for an electronic payment system, establishing accounts that identify owner billing information and preferences.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Payment Administration Center	PAC Payment Administration	13	The center shall provide secure user account management for the electronic payment system, providing user access to rules and policies, current billing status, invoices, payments, and mechanisms for review and challenge of the collected data.	Planned
Payment Administration Center	PAC Payment Administration	16	The center shall receive traveler payment information and compute the cost of using the portion of the transportation system.	Planned
Payment Administration Center	PAC Payment Administration	17	The center shall process and clear payments from travelers and vehicle owners.	Planned
Payment Administration Center	PAC Payment Administration	24	The center shall calculate the cost of a complete trip according to a trip plan, accommodating multiple modes if the trip plan uses more than one mode.	Planned
Payment Administration Center	PAC Payment Administration	25	The center shall be able to authenticate and charge transactions with financial institutions.	Planned
Payment Administration Center	PAC Payment Administration	26	The center shall be able to charge trips to managed accounts.	Planned
Payment Administration Center	PAC Payment Administration	27	The center shall provide a bank card / fare pair to a financial processor for conditional approval of fare payment.	Planned
Payment Administration Center	PAC Payment Administration	33	The center shall access service metrics for all modes of transport for which they bill. Relevant metrics may include service cost, availability, allowed payments, fare caps and discounts.	Planned
Payment Administration Center	PAC Payment Administration	34	The center shall provide fare payment to the transport provider when payment for travel on the transport provider vehicles is made with a regional payment system.	Planned
Payment Administration Center	PAC Payment Administration	35	The center shall discount a traveler's rate for different segments of a multimodal trip based on the eligibility of the traveler.	Planned
Personal Computing Devices	Personal Interactive Traveler Information	1	The personal traveler interface shall receive traffic information from a center and present it to the traveler upon request.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	2	The personal traveler interface shall receive transit information from a center and present it to the traveler upon request.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	4	The personal traveler interface shall receive event information from a center and present it to the traveler upon request.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	5	The personal traveler interface shall receive evacuation information from a center and present it to the traveler.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Personal Computing Devices	Personal Interactive Traveler Information	6	The personal traveler interface shall receive wide-area alerts and present it to the traveler.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	7	The personal traveler interface shall accept reservations for confirmed trip plans.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	8	The personal traveler interface shall support payment for services, such as confirmed trip plans, tolls, transit fares, parking lot charges, map updates, and advanced payment for tolls.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	9	The personal traveler interface shall provide an interface through which credit identity, stored credit value, or traveler information may be collected from a traveler card being used by a traveler with a personal device.	Planned
Personal Computing Devices	Personal Interactive Traveler Information	10	The personal traveler interface shall base requests from the traveler on the traveler's current location or a specific location identified by the traveler, and filter the provided information accordingly.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	11	The personal traveler interface shall support traveler input in audio or manual form.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	12	The personal traveler interface shall present interactive information to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	13	The personal traveler interface shall store frequently requested or used data, including the traveler's identity, home and work locations, etc.	Existing
Personal Computing Devices	Personal Interactive Traveler Information	19	The personal traveler interface shall provide the ability for a traveler to set up and modify a user account for a regional electronic payment system.	Planned
Personal Computing Devices	Personal Interactive Traveler Information	28	The personal traveler interface shall provide payment information for each segment of a multimodal trip.	Planned
Personal Computing Devices	Personal Pedestrian Safety	1	The personal information device shall provide the current location (latitude, longitude, and elevation) of the non-motorized travelers.	Existing
Personal Computing Devices	Personal Trip Planning and Route Guidance	1	The personal traveler interface shall allow a traveler to request and confirm multi-modal route guidance from a specified source to a destination.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	2	The personal traveler interface shall forward the request for route guidance to a traveler information center for route calculation.	Future

Element Name	Functional Object	Req #	Requirement	Status
Personal Computing Devices	Personal Trip Planning and Route Guidance	3	The personal traveler interface shall forward user preferences, background information, constraints, and payment information to the supplying traveler information center.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	4	The personal traveler interface shall present personal trip planning information to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	9	The personal traveler interface shall provide a mechanism for its user to create/modify a trip plan including selection of mode, route and parking.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	12	The personal traveler interface to identify trip planning parameters: Origin, Destination, departure time, arrival time, acceptable modes, so that they might plan for a single coordinated trip using multiple modes using a single action.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	14	The personal traveler interface shall be able to save regularly used trips.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	24	The personal traveler interface shall provide the capability for a traveler to obtain route guidance from a specified source to a destination.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	25	The personal traveler interface shall calculate the requested route using data obtained from a navigable map database stored in the device.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	26	The personal traveler interface shall provide multi-modal guidance for the shortest route, within the preferences and constraints specified by the traveler.	Future
Personal Computing Devices	Personal Trip Planning and Route Guidance	27	The personal traveler interface shall present local route guidance to the traveler in audible or visual forms consistent with a personal device, and suitable for travelers with hearing and vision physical disabilities.	Future
Private Parking Area Equipment	Parking Area Electronic Payment	2	The parking element shall read data from the payment device on-board the vehicle or by the traveler.	Planned
Private Parking Area Equipment	Parking Area Electronic Payment	6	The parking element shall process the financial requests and manage an interface to a Financial Institution.	Planned
Private Parking Area Equipment	Parking Area Electronic Payment	7	The parking element shall support the payment of parking lot transactions using data provided by the traveler cards / payment instruments.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Private Parking Area Equipment	Parking Area Electronic Payment	8	The parking element shall process requests for parking lot charges to be paid in advance.	Planned
Private Parking Management System	Parking Account and Fee Management	1	The center shall support parking electronic fare collection.	Planned
Private Parking Management System	Parking Account and Fee Management	2	The center shall support user electronic payment account registration.	Planned
Private Parking Management System	Parking Account and Fee Management	3	The center shall provide parking pricing and user account information.	Planned
Private Towing Companies	Emergency Call-Taking	4	The emergency call-taking center shall receive emergency call information from other emergency management centers, e.g. mayday service providers, and present the possible incident information to the emergency system operator.	Existing
Private Towing Companies	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Private Towing Companies	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Private Towing Companies	Emergency Commercial Vehicle Response	2	The center shall receive emergency notification information from commercial vehicles, commercial vehicle check stations, or commercial fleet operators and present the possible incident information to the emergency system operator. This may include detection of non-permitted transport of security sensitive hazmat, hazardous cargo spills, etc.	Existing
Private Towing Companies	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Private Towing Companies	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Private Towing Companies	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Private Towing Companies	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Private Towing Companies	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Private Towing Companies	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Private Towing Companies	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Private Towing Companies	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Private Towing Companies	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Private Towing Companies	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Private Towing Companies	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Private Traveler Services	Shared Use Account and Fee Management	1	The center shall acquire information from the payment center describing payment methods the institution is willing to accept.	Planned
Private Traveler Services	Shared Use Account and Fee Management	2	The center shall request payment through the financial institution for shared use services when such services are requested by the traveler.	Planned
Private Traveler Services	Shared Use Account and Fee Management	4	The center shall provide updated user account information to the payment center.	Planned
Private Traveler Services	Shared Use Operations	1	The center shall accept requests for shared use transportation.	Future
Private Traveler Services	Shared Use Operations	2	The center shall provide the traveler with a shared use transportation option.	Future
Private Traveler Services	Shared Use Operations	3	The center shall accept updates to the traveler's account as directed by the traveler's personal device.	Future

Element Name	Functional Object	Req #	Requirement	Status
Private Traveler Services	Shared Use Operations	6	The center shall accept traveler-specific information sufficient to establish an account for the traveler's use of shared services from the traveler's personal device.	Future
Private Traveler Services	Shared Use Operations	7	The center shall provide to the traveler the location of a shared use vehicle which the traveler has reserved.	Future
Private Traveler Services	Shared Use Operations	8	The center shall be able to send an access command to a shared use vehicle to allow the traveler to gain access of the vehicle.	Future
Private Traveler Services	TIC Data Collection	2	The center shall select real-time information on the state of the regional transportation system including current traffic and road conditions, weather conditions, transit information, parking information, special event and incident information.	Future
Private Traveler Services	TIC Data Collection	3	The center shall collect, process, and store maintenance and construction information, including scheduled maintenance and construction work activities and work zone activities.	Future
Private Traveler Services	TIC Data Collection	4	The center shall collect, process, and store transit routes and schedules, transit transfer options, transit fares, and real-time schedule adherence information.	Future
Private Traveler Services	TIC Data Collection	5	The center shall collect, process, and store parking information, including location, availability, and fees.	Future
Private Traveler Services	TIC Data Collection	6	The center shall collect, process, and store toll fee information.	Future
Private Traveler Services	TIC Data Collection	7	The center shall collect, process, and store current and forecast road conditions and surface weather conditions.	Future
Private Traveler Services	TIC Data Collection	24	The center shall collect, process, and store pathway information.	Future
Private Traveler Services	TIC Dynamic Ridesharing	4	The center shall arrange connections to transit or other multimodal services for portions of a multi-segment trip that includes ridesharing.	Future
Private Traveler Services	TIC Payment Support	1	The center shall coordinate with payment administration centers that serve as a clearing house for a regional payment system in order to perform payment reconciliation.	Planned
Private Traveler Services	TIC Travel Services Information and Reservation	7	The center shall provide electric charging station information identifying the location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure for each station to travelers.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Private Traveler Services	TIC Trip Planning	1	The center shall provide the capability to provide specific pre-trip and en route directions to travelers (and drivers), including costs, arrival times, and transfer points.	Future
Private Traveler Services	TIC Trip Planning	2	The center shall include bicycle routes, walkways, skyways, and multi-use trails in the pre-trip and en route directions it provides to travelers.	Future
Private Traveler Services	TIC Trip Planning	3	The center shall support on-line route guidance for travelers using personal devices (such as PDAs).	Future
Private Traveler Services	TIC Trip Planning	4	The center shall support on-line route guidance for drivers in vehicles.	Future
Private Traveler Services	TIC Trip Planning	6	The center shall generate route plans based on current and/or predicted conditions of the road network, scheduled maintenance and construction work activities, and work zone activities.	Future
Private Traveler Services	TIC Trip Planning	7	The center shall generate route plans based on transit services, including fares, schedules, and requirements for travelers with special needs.	Future
Private Traveler Services	TIC Trip Planning	11	The center shall generate trips based on the use of more than one mode of transport.	Future
Private Traveler Services	TIC Trip Planning	12	The center shall use the preferences and constraints specified by the traveler in the trip request to select the most appropriate mode of transport.	Future
Private Traveler Services	TIC Trip Planning	13	The center shall provide the capability for the traveler to confirm the proposed trip plan.	Future
Private Traveler Services	TIC Trip Planning	15	The center shall generate route plans to account for parking availability.	Future
Private Traveler Services	TIC Trip Planning	16	The center shall match a travelers trip plan with what is available or is projected to be available at the time of the trip, respecting all parameters the traveler provided.	Future
RWIS Sensors	Roadway Environmental Monitoring	2	The field element shall include environmental sensors that measure weather conditions including temperature, wind, humidity, precipitation, and visibility.	Existing
RWIS Sensors	Roadway Environmental Monitoring	3	The field element's environmental sensors shall be remotely controlled by a maintenance center.	Existing
RWIS Sensors	Roadway Environmental Monitoring	4	The field element's environmental sensors shall be remotely controlled by a traffic management center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
RWIS Sensors	Roadway Environmental Monitoring	7	The field element shall provide environmental sensor equipment operational status to the controlling center or maintenance vehicle.	Existing
RWIS Sensors	Roadway Environmental Monitoring	8	The field element shall provide environmental sensor equipment fault indication to the controlling center or maintenance vehicle.	Existing
RWIS Sensors	Roadway Environmental Monitoring	10	The field element shall provide weather and road surface condition data to centers.	Existing
School Buses	Transit Center Fixed-Route Operations	1	The center shall generate transit routes and schedules based on such factors as parameters input by the system operator, road network conditions, incident information, operational data on current routes and schedules, and digitized map data.	Existing
School Buses	Transit Center Fixed-Route Operations	2	The center shall provide the interface to the system operator to control the generation of new routes and schedules (transit services) including the ability to review and update the parameters used by the routes and schedules generation processes and to initiate these processes	Existing
School Buses	Transit Center Fixed-Route Operations	5	The center shall collect transit operational data for use in the generation of routes and schedules.	Existing
School Buses	Transit Center Fixed-Route Operations	7	The center shall manage large deviations of individual transit vehicles, deviations in rural areas, and deviations of large numbers of vehicles.	Existing
School Buses	Transit Garage Maintenance	1	The center shall collect operational and maintenance data from transit vehicles.	Existing
School Buses	Transit Garage Maintenance	3	The center shall generate transit vehicle maintenance schedules that identify the maintenance or repair to be performed and when the work is to be done.	Existing
School Buses	Transit Garage Maintenance	4	The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning based, in part, on the transit vehicle maintenance schedule.	Existing
School Buses	Transit Garage Maintenance	5	The center shall assign technicians to a transit vehicle maintenance schedule, based upon such factors as personnel eligibility, work assignments, preferences and seniority.	Existing
School Buses	Transit Garage Maintenance	6	The center shall verify that the transit vehicle maintenance activities were performed correctly, using the transit vehicle's status, the maintenance personnel's work assignment, and the transit maintenance schedules.	Existing

Element Name	Functional Object	Req #	Requirement	Status
School Buses	Transit Garage Maintenance	7	The center shall generate a time-stamped maintenance log of all maintenance activities performed on a transit vehicle.	Existing
School Buses	Transit Garage Maintenance	8	The center shall provide transit operations personnel with the capability to update transit vehicle maintenance information and receive reports on all transit vehicle operations data.	Existing
School Police Departments	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
School Police Departments	Emergency Call-Taking	6	The emergency call-taking center shall receive emergency notification information from public transit systems and present the possible incident information to the emergency system operator.	Existing
School Police Departments	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
School Police Departments	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
School Police Departments	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
School Police Departments	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
School Police Departments	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
School Police Departments	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
School Police Departments	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
School Police Departments	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
School Police Departments	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing

Element Name	Functional Object	Req #	Requirement	Status
School Police Departments	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
School Police Departments	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
School Police Departments	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
School Police Departments	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
School Police Departments	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
School Police Departments	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
School Police Departments	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
School Police Departments	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
School Police Departments	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
School Police Departments	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
School Police Departments	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing

Element Name	Functional Object	Req #	Requirement	Status
School Police Departments	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
School Police Departments	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
SCMS	CCMS Authorization	1	The Center shall generate credential identifiers using facilities that are independently owned and operated from one another.	Future
SCMS	CCMS Misbehavior Reporting and Action	1	The Center shall accept misbehavior reports from ITS Objects.	Future
SCMS	CCMS Provisioning	1	The Center shall provide security and regulatory policy information to ITS Objects.	Future
SCMS	CCMS Revocation	1	The Center shall place certificates on the revocation list of those certificates that are associated with misbehavior.	Future
SCMS	ITS Security Support	1	The ITS Object shall obtain security policy information from the Cooperative Intelligent Transportation System Credentials Management System (CCMS).	Future
Speedway Public Safety	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Speedway Public Safety	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Speedway Public Safety	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Speedway Public Safety	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Speedway Public Safety	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Safety	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Speedway Public Safety	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Speedway Public Safety	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Speedway Public Safety	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Speedway Public Safety	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Speedway Public Safety	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Speedway Public Safety	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Speedway Public Safety	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Speedway Public Safety	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Speedway Public Safety	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Speedway Public Safety	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Speedway Public Safety	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Safety	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Speedway Public Safety	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Speedway Public Safety	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Speedway Public Safety	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Speedway Public Safety	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Speedway Public Safety	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Speedway Public Safety	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Speedway Public Safety	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Speedway Public Safety	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Speedway Public Safety	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Speedway Public Safety	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Safety	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Speedway Public Safety	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Speedway Public Safety	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Speedway Public Safety	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Speedway Public Safety	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Speedway Public Safety	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Speedway Public Safety	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Speedway Public Safety	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Speedway Public Safety	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Speedway Public Safety	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Speedway Public Safety	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Speedway Public Safety	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Safety	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Speedway Public Safety	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Speedway Public Safety	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Speedway Public Safety	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Speedway Public Safety	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Speedway Public Safety	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Speedway Public Safety	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Speedway Public Safety	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Speedway Public Safety	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
Speedway Public Safety	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Speedway Public Works	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Speedway Public Works	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Speedway Public Works	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Speedway Public Works	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Speedway Public Works	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Speedway Public Works	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Speedway Public Works	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Speedway Public Works	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Speedway Public Works	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Speedway Public Works	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Speedway Public Works	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
Speedway Public Works	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Speedway Public Works	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Speedway Public Works	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Speedway Public Works	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Speedway Public Works	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Speedway Public Works	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing
Speedway Public Works	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Speedway Public Works	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Speedway Public Works	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Speedway Public Works	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Speedway Public Works	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Speedway Public Works	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Speedway Public Works	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Speedway Public Works	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Speedway Public Works	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Speedway Public Works	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Speedway Public Works	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Speedway Public Works	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Speedway Public Works	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Speedway Public Works	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Planned
Speedway Public Works	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned
Speedway Public Works	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Speedway Public Works	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Speedway Public Works	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Speedway Public Works	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Speedway Public Works	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Planned
Speedway Public Works	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Speedway Public Works	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Speedway Public Works	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
Speedway Public Works	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Planned
Speedway Public Works	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
Speedway Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Speedway Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Speedway Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
Speedway Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Speedway Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Speedway Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Speedway Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing
Speedway Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Speedway Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Speedway Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Speedway Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Speedway Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Speedway Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Speedway Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Speedway Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Speedway Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Speedway Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Speedway Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Speedway Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Suburban Municipality Emergency Dispatch	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Suburban Municipality Emergency Dispatch	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Suburban Municipality Emergency Dispatch	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Suburban Municipality Emergency Dispatch	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Suburban Municipality Emergency Dispatch	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Suburban Municipality Emergency Dispatch	Emergency Data Collection	1	The center shall collect emergency service data, emergency vehicle management data, emergency vehicle data, sensor and surveillance data, threat data, and incident data.	Existing
Suburban Municipality Emergency Dispatch	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Suburban Municipality Emergency Dispatch	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Suburban Municipality Emergency Dispatch	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Suburban Municipality Emergency Dispatch	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Emergency Dispatch	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Suburban Municipality Emergency Dispatch	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Emergency Dispatch	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Suburban Municipality Emergency Dispatch	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Suburban Municipality Emergency Dispatch	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Suburban Municipality Emergency Dispatch	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Emergency Dispatch	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Suburban Municipality Emergency Dispatch	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Suburban Municipality Emergency Dispatch	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Emergency Dispatch	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Suburban Municipality Emergency Dispatch	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing
Suburban Municipality Emergency Dispatch	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Suburban Municipality Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	1	The ITS Object shall provide its network address, service offerings and metrics characterizing those services to vehicles within the broadcast range of the ITS Object's short range communications equipment.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	2	The ITS Object shall provide its network address, service offerings and metrics characterizing those services to the Object Registration and Discovery Service.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	3	The ITS Object shall obtain network addresses from the Object Registration and Discovery Service.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	4	The ITS Object shall make network address information available to onboard applications.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	5	The ITS Object shall provide its configuration and operational status information to the Service Monitor	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Management Support	6	The ITS Object shall acquire regulatory information relevant to the operation of the ITS Object from the CCMS.	Existing
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	1	The ITS Object shall obtain security policy information from the Cooperative Intelligent Transportation System Credentials Management System (CCMS).	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	2	The ITS Object shall request enrollment credentials from the CCMS.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	3	The ITS Object shall obtain the CCMS' trust credentials.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	4	The ITS Object shall provide a mechanism for on-board applications to digitally sign messages using keys secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	5	The ITS Object shall provide a mechanism for on-board applications to authenticate messages secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	6	The ITS Object shall provide a mechanism for on-board applications to encrypt messages using keys secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	7	The ITS Object shall provide a mechanism for on-board applications to decrypt messages using keys secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	8	The ITS Object shall obtain a list of revoked credentials from the CCMS.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	9	The ITS Object shall make the list of revoked credentials available to on-board applications.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	10	The ITS Object shall maintain cryptographic secret information so that those secrets are accessible only to ITS Security Support, and not to any other Functional Object.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	11	The ITS Object shall request pseudonymous credentials from the CCMS.	Future
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	12	The ITS Object shall provide messages (that it receives) that indicate potential misbehavior/malfunction to the CCMS.	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department CAV Roadside Equipment	ITS Security Support	13	The ITS Object shall request permissions from the Center that manages permissions requests.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	1	The field element shall monitor the operational status (state of the device, configuration, and fault data) of connected sensors (such as traffic, infrastructure, environmental, security, speed) and devices (such as highway advisory radio, dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals, ramp meters, short range communications equipment, security surveillance equipment).	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	2	The field element shall send operational status of connected field equipment to the maintenance center.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	3	The field element shall send collected fault data to the maintenance center for repair.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	4	The field element shall include a local interface that provides operational status and fault data for connected field equipment to field personnel.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	5	The field element shall include a local interface that allows field personnel to command diagnostic tests on connected field equipment.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	6	The field element shall provide operational status information to the Service Monitor.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	7	The field element shall implement configuration commands received from an authorized Center.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	8	The field element shall implement operational status commands received from an authorized Center.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	9	The field element shall implement operational status commands received from authorized Field Support Equipment.	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department CAV Roadside Equipment	RSE Device Management	10	The field element shall implement configuration commands received from authorized Field Support Equipment.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Management	1	The field element shall communicate with passing vehicles to provide the current signal phase and timing information for all lanes and approaches at a signalized intersection.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Management	8	The field element shall send a signal service request to the traffic signal controller when its application status determines the need for a signal change.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Management	9	The field element shall collect current signal phase and timing data from the traffic signal controller.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	1	The roadway equipment shall collect the current location (latitude, longitude, and elevation) from personal information devices.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	2	The roadway equipment shall communicate with approaching vehicles to alert and warn drivers of potential stop sign, red light, and non-motorized user crossing conflicts or violations.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	3	The roadway equipment shall collect vehicle path information sent by a vehicle.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	4	The roadway equipment shall provide current crossing status including permission to cross, crossing time remaining.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	5	The roadway equipment shall send to Connected Vehicles intersection signal timing information in order for the vehicle to determine if it will safely cross the intersection given its current speed and location.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	6	The roadway equipment shall send to connected vehicles a warning if an intersection violation appears to be imminent.	Planned
Suburban Municipality Street Department CAV Roadside Equipment	RSE Intersection Safety	7	The field element shall collect current conflict monitor and intersection control data from the traffic signal controller.	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department CAV Roadside Equipment	RSE Map Management	1	The field element shall collect broadcasted vehicle location and motion information.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Map Management	2	The field element shall aggregate vehicle location data.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Map Management	3	The field element shall provide roadway geometry update information to proximate Vehicles.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Map Management	4	The field element shall provide parking facility geometry information to proximate Vehicles.	Future
Suburban Municipality Street Department CAV Roadside Equipment	RSE Traffic Monitoring	1	The field element shall communicate with on-board equipment on passing vehicles to collect current vehicle position, speed, and heading and a record of previous events (e.g., starts and stops, link travel times) that can be used to determine current traffic conditions.	Future
Suburban Municipality Street Department Operations/Dispatch	Center Connected Vehicle Infrastructure Management	1	The Center shall be capable of monitoring the operational status of Connected Vehicle Roadside Equipment applications.	Future
Suburban Municipality Street Department Operations/Dispatch	Center Connected Vehicle Infrastructure Management	2	The Center shall be capable of modifying the operational status of Connected Vehicle Roadside Equipment applications.	Future
Suburban Municipality Street Department Operations/Dispatch	Center Connected Vehicle Infrastructure Management	4	The Center shall be capable of modifying the operational status of Connected Vehicle Roadside Equipment.	Future
Suburban Municipality Street Department Operations/Dispatch	Center Map Management	1	The Center shall collect updates to basemaps from Map Update Systems	Future
Suburban Municipality Street Department Operations/Dispatch	Center Map Management	2	The Center shall collect updates to intersection geometry from Map Update Systems.	Future
Suburban Municipality Street Department Operations/Dispatch	Center Map Management	3	The Center shall provide roadway geometry updates to Map Update Systems.	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	Center Map Management	4	The Center shall provide intersection geometry updates to Map Update Systems.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	1	The ITS Object shall provide its network address, service offerings and metrics characterizing those services to vehicles within the broadcast range of the ITS Object's short range communications equipment.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	2	The ITS Object shall provide its network address, service offerings and metrics characterizing those services to the Object Registration and Discovery Service.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	3	The ITS Object shall obtain network addresses from the Object Registration and Discovery Service.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	4	The ITS Object shall make network address information available to onboard applications.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	5	The ITS Object shall provide its configuration and operational status information to the Service Monitor	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Management Support	6	The ITS Object shall acquire regulatory information relevant to the operation of the ITS Object from the CCMS.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	1	The ITS Object shall obtain security policy information from the Cooperative Intelligent Transportation System Credentials Management System (CCMS).	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	2	The ITS Object shall request enrollment credentials from the CCMS.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	3	The ITS Object shall obtain the CCMS' trust credentials.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	4	The ITS Object shall provide a mechanism for on-board applications to digitally sign messages using keys secured by the CCMS' trust authority.	Future



Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	5	The ITS Object shall provide a mechanism for on-board applications to authenticate messages secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	6	The ITS Object shall provide a mechanism for on-board applications to encrypt messages using keys secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	7	The ITS Object shall provide a mechanism for on-board applications to decrypt messages using keys secured by the CCMS' trust authority.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	8	The ITS Object shall obtain a list of revoked credentials from the CCMS.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	9	The ITS Object shall make the list of revoked credentials available to on-board applications.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	10	The ITS Object shall maintain cryptographic secret information so that those secrets are accessible only to ITS Security Support, and not to any other Functional Object.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	11	The ITS Object shall request pseudonymous credentials from the CCMS.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	12	The ITS Object shall provide messages (that it receives) that indicate potential misbehavior/malfunction to the CCMS.	Future
Suburban Municipality Street Department Operations/Dispatch	ITS Security Support	13	The ITS Object shall request permissions from the Center that manages permissions requests.	Future
Suburban Municipality Street Department Operations/Dispatch	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Planned
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Suburban Municipality Street Department Operations/Dispatch	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Basic Surveillance	2	The center shall monitor, analyze, and distribute traffic images from CCTV systems under remote control of the center.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Basic Surveillance	7	The center shall remotely control devices to detect traffic.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Intersection Safety	2	The center shall provide warnings to drivers when non-motorized users are occupying a cross walk or other mixed use path crossing.	Future
Suburban Municipality Street Department Operations/Dispatch	TMC Intersection Safety	3	The center shall provide warnings to pedestrians or bicyclists when vehicles are infringing on a cross walk or other mixed use path crossing.	Future

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	TMC Intersection Safety	5	The field element shall be capable of configuring roadside equipment to perform the collection and transmission of information to support intersection safety.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Passive Surveillance	1	The center shall collect time stamped vehicle identities from field equipment.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Passive Surveillance	2	The center shall correlate the time stamped vehicle identities in order to calculate link travel times and derive other traffic measures.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Regional Traffic Management	1	The center shall exchange traffic information with other traffic management centers including incident information, congestion data, traffic data, signal timing plans, and real-time signal control information.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	6	The center shall implement control plans to coordinate signalized intersections based on data from sensors.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	8	The center shall maintain traffic signal coordination including synchronizing clocks throughout the system.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	9	The center shall implement control plans to coordinate signalized intersections based on data from sensors and connected vehicles.	Future
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	10	The center shall adjust signal timing in respond to a signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other requests for right-of-way.	Planned
Suburban Municipality Street Department Operations/Dispatch	TMC Signal Control	15	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements at or near signalized intersections.	Future
Suburban Municipality Street Department Operations/Dispatch	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Suburban Municipality Street Department Roadside Equipment	Roadway Basic Surveillance	2	The field element shall collect, process, and send traffic images to the center for further analysis and distribution.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Basic Surveillance	4	The field element shall return sensor and CCTV system operational status to the controlling center.	Planned
Suburban Municipality Street Department Roadside Equipment	Roadway Mixed Use Crossing Safety	1	The field element shall collect images or sensor data for pedestrians or bicyclists and respond to pedestrian or bicyclist crossing requests via display, audio signal, or other manner.	Future
Suburban Municipality Street Department Roadside Equipment	Roadway Mixed Use Crossing Safety	3	The field element shall inform pedestrians and bicyclists of the status of the intersection including the amount of time left for crossing the intersection.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Roadside Equipment	Roadway Passive Monitoring	1	The field element shall collect, process, and send data to the center to uniquely identify passing vehicles in order to support travel time measurement	Planned
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Control	15	The field element shall receive requests for emergency vehicle signal preemption.	Planned
Suburban Municipality Street Department Roadside Equipment	Roadway Signal Preemption	1	The field element shall respond to signal preemption requests from emergency vehicles.	Planned
Suburban Municipality Street Department Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Suburban Municipality Street Department Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Suburban Municipality Street Department Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Suburban Municipality Street Department Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Suburban Municipality Street Department Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Suburban Municipality Street Department Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Surrounding County Highway Operations/Dispatch	MCM Data Collection	1	The center shall collect maintenance and construction data (such as field equipment status, infrastructure status, maintenance and construction activity data) gathered from roadway, traffic, and other maintenance and construction sources.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	1	The maintenance center shall receive inputs from the Alerting and Advisory System concerning the possibility or occurrence of severe weather, terrorist activity, or other major emergency, including information provided by the Emergency Alert System.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	2	The maintenance center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, etc.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	3	The maintenance center shall exchange incident and threat information with emergency management centers as well as traffic management centers; including notification of existence of incident and expected severity, location, time and nature of incident.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	4	The maintenance center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	MCM Incident Management	5	The maintenance center shall respond to requests from emergency management to provide maintenance and construction resources to implement response plans, assist in clean up, verify an incident, etc. This may also involve coordination with traffic management centers and other maintenance centers.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	6	The maintenance center shall exchange road network status assessment information with emergency management and traffic management centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	7	The maintenance center shall provide work zone activities affecting the road network during traffic incidents including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.	Existing
Surrounding County Highway Operations/Dispatch	MCM Incident Management	8	The maintenance center shall receive information indicating the damage sustained by transportation assets, derived from aerial surveillance, field reports, inspections, tests, and analyses to support incident management.	Existing
Surrounding County Highway Operations/Dispatch	MCM Maintenance Decision Support	1	The center shall provide the center personnel with tailored external information, including weather or road condition observations, forecasted weather information or road conditions, current usage of treatments and materials, available resources, equipment and vehicle availability, road network information, and source reliability information.	Existing
Surrounding County Highway Operations/Dispatch	MCM Maintenance Decision Support	2	The center shall tailor the decision support information to include filtering (selection from a large amount of external information), error reduction ('smoothing' the information), fusion (combination of disparate information to match the decision needs), and analysis (creating the decision).	Existing
Surrounding County Highway Operations/Dispatch	MCM Maintenance Decision Support	3	The center shall provide an interface to the center personnel to input control parameters for the decision support process and receive decisions or information presentation.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	2	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other roadway maintenance.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	3	The center shall exchange information with administrative systems to support the planning and scheduling of maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	4	The center shall provide emergency management and traffic management centers with information about scheduled maintenance and construction work activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	5	The center shall collect the status and fault data from roadside equipment, such as traffic, infrastructure, and environmental sensors, highway advisory radio and dynamic message signs, automated roadway treatment systems, barrier and safeguard systems, cameras, traffic signals and override equipment, ramp meters, short range communications equipment, security sensors and surveillance equipment, etc., and provide a cohesive view of equipment repair needs.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	7	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of roadway maintenance and construction activities.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	8	The center shall collect current and forecast traffic and weather information from traffic management centers and weather service providers (such as the National Weather Service and value-added sector specific meteorological services).	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	9	The center shall dispatch and route maintenance and construction vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing
Surrounding County Highway Operations/Dispatch	MCM Roadway Maintenance	11	The center shall track the status of roadway maintenance and construction activities by monitoring collected data from the dispatched vehicles and equipment.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	MCM Vehicle Maintenance Management	2	The center shall exchange information with equipment repair facilities including status and history of repairs concerning maintenance and construction vehicles. This information includes vehicle status and diagnostic information, vehicle utilization, and coordination of when vehicles will be available for preventative and corrective maintenance.	Existing
Surrounding County Highway Operations/Dispatch	MCM Vehicle Maintenance Management	3	The center shall schedule preventive and corrective vehicle maintenance with the equipment repair facility based on fleet health reports, maintenance records, vehicle utilization and vehicle availability schedules.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	1	The center shall respond to requests from emergency management and traffic management centers for hazard removal, field equipment repair, and other winter roadway maintenance.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	2	The center shall exchange information with administrative systems to support the planning and scheduling of winter maintenance activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	3	The center shall provide status information about scheduled winter maintenance activities including anticipated closures and impact to the roadway, alternate routes, anticipated delays, closure times, and durations. The information is provided to other management centers such as traffic, emergency, transit, traveler information providers, other maintenance centers, and the media.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	4	The center shall receive equipment availability and materials storage status information from storage facilities to support the scheduling of winter maintenance activities.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	6	The center shall collect real-time information on the state of the regional transportation system from other centers including current traffic and road conditions, weather conditions, special event and incident information and use the collected information to support winter maintenance operations.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	7	The center shall dispatch and route winter maintenance vehicle drivers and support them with route-specific environmental, incident, advisory, threat, alert, and traffic congestion information.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	8	The center shall determine the need for roadway treatment based on current and forecasted weather information, current usage of treatments and materials, available resources, requests for action from other agencies, and recommendations from the Maintenance Decision Support system, specifically under winter conditions. This supports winter maintenance such as plowing, treating, anti-icing, etc.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	9	The center shall provide dispatch instructions for vehicle operators based on input parameters from center personnel, specifically for winter conditions. This could include a treatment route, treatment application rates, start and end times, and other treatment instructions.	Existing
Surrounding County Highway Operations/Dispatch	MCM Winter Maintenance Management	11	The center shall assess the current status of all winter maintenance activities, including actual work activities performed, current locations and operational conditions of vehicles, materials and equipment inventories, field equipment status, environmental information, etc.	Existing
Surrounding County Highway Operations/Dispatch	MCM Work Zone Management	1	The center shall generate new work zone activity schedules for use by maintenance and construction vehicles, maintenance and construction operators, and for information coordination purposes.	Existing
Surrounding County Highway Operations/Dispatch	MCM Work Zone Management	3	The center shall disseminate work zone information to other agencies and centers including traffic, transit, emergency management centers, other maintenance centers, traveler information centers, and the media.	Existing
Surrounding County Highway Operations/Dispatch	MCM Work Zone Management	5	The center shall exchange information with administrative systems to support the planning and scheduling of work zone activities. This information includes: equipment and consumables resupply purchase request status, personnel qualifications including training and special certifications, environmental regulations and rules that may impact maintenance activities, and requests and project requirements from contract administration.	Existing
Surrounding County Highway Operations/Dispatch	MCM Work Zone Safety Management	1	The center shall provide remote monitoring and control of work zone safety devices - including intrusion detection devices that have been installed in work zones or maintenance areas.	Existing
Surrounding County Highway Operations/Dispatch	MCM Work Zone Safety Management	2	The center shall provide remote monitoring and control of intrusion alert devices that have been installed in work zones or maintenance areas.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	TMC Basic Surveillance	1	The center shall monitor, analyze, and store traffic sensor data (speed, volume, occupancy) collected from field elements under remote control of the center.	Planned
Surrounding County Highway Operations/Dispatch	TMC Basic Surveillance	5	The center shall respond to control data from center personnel regarding sensor and surveillance data collection, analysis, storage, and distribution.	Planned
Surrounding County Highway Operations/Dispatch	TMC Basic Surveillance	6	The center shall maintain a database of surveillance equipment and sensors and associated data (including the roadway on which they are located, the type of data collected, and the ownership of each).	Planned
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	1	The center shall exchange alert information and status with emergency management centers. The information includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The information may include the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This may also identify specific information that should not be released to the public.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	2	The center shall coordinate planning for incidents with emergency management centers - including pre-planning activities for disaster response, evacuation, and recovery operations.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	3	The center shall support requests from emergency management centers to remotely control sensor and surveillance equipment located in the field, provide special routing for emergency vehicles, and to provide responding emergency vehicles with signal preemption.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	4	The center shall exchange incident information with emergency management centers, maintenance and construction centers, transit centers, information service providers, and the media including description, location, traffic impact, status, expected duration, and response information.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	5	The center shall share resources with allied agency centers to implement special traffic control measures, assist in clean up, verify an incident, etc. This may also involve coordination with maintenance centers.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	6	The center shall receive inputs concerning upcoming events that would effect the traffic network from event promoters, traveler information service providers, media, border crossings, and rail operations centers.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	9	The center shall exchange road network status assessment information with emergency management and maintenance centers including an assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	Existing
Surrounding County Highway Operations/Dispatch	TMC Incident Dispatch Coordination	11	The center shall receive inputs from emergency management and transit management centers to develop an overall status of the transportation system including emergency transit schedules in effect and current status and condition of the transportation infrastructure.	Existing
Surrounding County Highway Operations/Dispatch	TMC Roadway Equipment Monitoring	1	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) operational status.	Planned
Surrounding County Highway Operations/Dispatch	TMC Roadway Equipment Monitoring	3	The center shall collect and store sensor (traffic, pedestrian, multimodal crossing) fault data and send to the maintenance center for repair.	Planned
Surrounding County Highway Operations/Dispatch	TMC Roadway Equipment Monitoring	7	The center shall exchange data with maintenance centers concerning the reporting of faulty equipment and the schedule/status of their repair. Information exchanged includes details of new equipment faults, and clearances when the faults are cleared.	Planned
Surrounding County Highway Operations/Dispatch	TMC Signal Control	1	The center shall remotely control traffic signal controllers.	Existing
Surrounding County Highway Operations/Dispatch	TMC Signal Control	3	The center shall collect traffic signal controller operational status and compare against the control information sent by the center.	Existing
Surrounding County Highway Operations/Dispatch	TMC Signal Control	4	The center shall collect traffic signal controller fault data from the field.	Existing
Surrounding County Highway Operations/Dispatch	TMC Signal Control	5	The center shall manage (define, store and modify) control plans to coordinate signalized intersections, to be engaged at the direction of center personnel or according to a daily schedule.	Existing
Surrounding County Highway Operations/Dispatch	TMC Work Zone Traffic Management	6	The center shall receive proposed maintenance and construction work plans, analyze the activity as a possible traffic incident, and provide work plan feedback to the sending center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Roadside Equipment	Roadway Basic Surveillance	1	The field element shall collect, process, digitize, and send traffic sensor data (speed, volume, and occupancy) to the center for further analysis and storage, under center control.	Planned
Surrounding County Highway Roadside Equipment	Roadway Signal Control	1	The field element shall control traffic signals under center control.	Existing
Surrounding County Highway Roadside Equipment	Roadway Signal Control	4	The field element shall report the current signal control information to the center.	Existing
Surrounding County Highway Roadside Equipment	Roadway Signal Control	5	The field element shall report current preemption status to the center.	Existing
Surrounding County Highway Roadside Equipment	Roadway Signal Control	6	The field element shall return traffic signal controller operational status to the center.	Existing
Surrounding County Highway Roadside Equipment	Roadway Signal Control	7	The field element shall return traffic signal controller fault data to the center.	Existing
Surrounding County Highway Roadside Equipment	Roadway Speed Monitoring and Warning	1	The field element shall include sensors to detect vehicle speeds, under traffic or maintenance center control.	Existing
Surrounding County Highway Roadside Equipment	Roadway Speed Monitoring and Warning	3	If the speed detected by vehicle speed sensors is determined to be excessive, the field element shall provide a safe speed advisory to passing drivers via a driver information system (such as portable messages signs, field to vehicle communications to in-vehicle signing systems, etc.).	Existing
Surrounding County Highway Roadside Equipment	Roadway Speed Monitoring and Warning	6	The field element shall return operational status for the vehicle speed sensors to the controlling traffic or maintenance center; including measured speeds, warning messages displayed, and violation records.	Existing
Surrounding County Highway Roadside Equipment	Roadway Speed Monitoring and Warning	8	The field element shall return fault data for the vehicle speed sensors to the controlling center for repair.	Existing
Surrounding County Highway Roadside Equipment	Roadway Standard Rail Crossing	1	The field element shall collect and process, traffic sensor data in the vicinity of a highway-rail intersection (HRI).	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Highway Roadside Equipment	Roadway Standard Rail Crossing	2	The field element shall monitor the status of the highway-rail intersection (HRI) equipment, including both the current state and mode of operation and the current equipment condition, to be forwarded on to the traffic management center.	Existing
Surrounding County Highway Roadside Equipment	Roadway Standard Rail Crossing	8	The field element shall support the integrated control of adjacent traffic signals to clear an area in advance of an approaching train and to manage traffic around the intersection.	Existing
Surrounding County Highway Roadside Equipment	Roadway Work Zone Traffic Control	3	Under the control of field personnel within maintenance vehicles, the field element shall include driver information systems (such as dynamic messages signs and highway advisory radios) that advise drivers of activity around a work zone through which they are currently passing.	Existing
Surrounding County Highway Vehicles	MCV Roadway Maintenance and Construction	4	The maintenance and construction vehicle shall respond to dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Surrounding County Highway Vehicles	MCV Winter Maintenance	4	The maintenance and construction vehicle shall respond to winter maintenance dispatch information from the center, presented to the vehicle operator for acknowledgement and returning status.	Existing
Surrounding County Highway Vehicles	MCV Work Zone Support	2	The maintenance and construction vehicle shall provide an interface for field personnel to input status of their work zone activities.	Existing
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	1	The field element shall include security sensors that monitor conditions of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	2	The field element sensor monitoring shall be remotely controlled by a center.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	3	The field element shall provide equipment status and fault indication of security sensor equipment to a center.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	5	The field element shall include infrastructure condition and integrity monitoring sensors.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	6	The field element shall include motion and intrusion detection sensors.	Future

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	8	The field element shall provide raw security sensor data.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Sensor Monitoring	9	The field element shall remotely process security sensor data and provide an indication of potential incidents or threats to a center.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Surveillance	1	The field element shall include video and/or audio surveillance of secure areas including facilities (e.g. transit yards) and transportation infrastructure (e.g. bridges, tunnels, interchanges, roadway infrastructure, and transit railways or guideways).	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Surveillance	2	The field element shall be remotely controlled by a center.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Surveillance	3	The field element shall provide equipment status and fault indication of surveillance equipment to a center.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Surveillance	4	The field element shall provide raw video or audio data.	Future
Surrounding County Security Monitoring Field Equipment	Field Secure Area Surveillance	5	The field element shall remotely process video and audio data and provide an indication of potential incidents or threats to a center.	Future
Surrounding County Sheriff Communications Center	Emergency Call-Taking	1	The emergency call-taking center shall support the interface to the Emergency Telecommunications System (e.g. 911 or 7-digit call routing) to receive emergency notification information and provide it to the emergency system operator.	Existing
Surrounding County Sheriff Communications Center	Emergency Call-Taking	2	The emergency call-taking center shall receive emergency call information from 911 services and present the possible incident information to the emergency system operator.	Existing
Surrounding County Sheriff Communications Center	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Sheriff Communications Center	Emergency Call-Taking	7	The emergency call-taking center shall coordinate, correlate, and verify all emergency inputs, including those identified based on external calls and internal analysis of security sensor and surveillance data, and assign each a level of confidence.	Existing
Surrounding County Sheriff Communications Center	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	4	The center shall track the location and status of emergency vehicles responding to an emergency based on information from the emergency vehicle.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing
Surrounding County Sheriff Communications Center	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	1	The center shall monitor information from Alerting and Advisory Systems such as the Information Sharing and Analysis Centers (ISACs), the National Infrastructure Protection Center (NIPC), the Homeland Security Advisory System (HSAS), etc. The information may include assessments (general incident and vulnerability awareness information), advisories (identification of threats or recommendations to increase preparedness levels), or alerts (information on imminent or in-progress emergencies).	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	2	The center shall receive incident information from other transportation management centers to support the early warning system.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	3	The center shall support the entry of alert and advisory information directly from the emergency system operator.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	5	The center shall provide the capability to correlate alerts and advisories, incident information, and security sensor and surveillance data.	Existing



Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Sheriff Communications Center	Emergency Early Warning System	6	The center shall broadcast wide-area alerts and advisories to traffic management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	10	The center shall broadcast wide-area alerts and advisories to maintenance centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	11	The center shall broadcast wide-area alerts and advisories to other emergency management centers for emergency situations such as severe weather events, civil emergencies, child abduction (AMBER alert system), military activities, and other situations that pose a threat to life and property.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	14	The center shall coordinate the broadcast of wide-area alerts and advisories with other emergency management centers.	Existing
Surrounding County Sheriff Communications Center	Emergency Early Warning System	15	The center shall present the alert and advisory information and the status of the actions taken in response to the alert by the other centers to the emergency system operator as received from other system inputs.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	1	The center shall manage inter-agency coordination of evacuation operations, from initial planning through the evacuation process and reentry.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	2	The center shall develop and exchange evacuation plans with allied agencies prior to the occurrence of a disaster.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	3	The center shall provide an interface to the emergency system operator to enter evacuation plans and procedures and present the operator with other agencies' plans.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	4	The center shall coordinate evacuation destinations and shelter needs with shelter providers (e.g., the American Red Cross) in the region.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	5	The center shall provide evacuation information to traffic, transit, maintenance and construction, rail operations, and other emergency management centers as needed.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	7	The center shall request traffic management agencies to implement special traffic control strategies and to control evacuation traffic, including traffic on local streets and arterials as well as the major evacuation routes.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	8	The center shall provide traveler information systems with evacuation guidance including basic information to assist potential evacuees in determining whether evacuation is necessary and when it is safe to return.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	9	The center shall monitor the progress or status of the evacuation once it begins and exchange tactical plans, prepared during the incident, with allied agencies.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	10	The center shall monitor the progress of the reentry process.	Existing
Surrounding County Sheriff Communications Center	Emergency Evacuation Support	11	The center shall submit evacuation information to toll administration centers along with requests for changes in the toll services or fee collection during an evacuation.	Existing
Surrounding County Sheriff Communications Center	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Surrounding County Sheriff Communications Center	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Surrounding County Sheriff Communications Center	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Surrounding County Sheriff Communications Center	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Surrounding County Sheriff Communications Center	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	1	The center shall provide strategic emergency response capabilities provided by an Emergency Operations Center for large-scale incidents and disasters.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	2	The center shall manage coordinated inter-agency responses to and recovery from large-scale emergencies. Such agencies include traffic management, transit, maintenance and construction management, rail operations, and other emergency management agencies.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Sheriff Communications Center	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	7	The center shall receive event scheduling information from Event Promoters.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	11	The center shall assimilate the damage assessment of the transit, traffic, rail, maintenance, and other emergency center services and systems to create an overall transportation system status, and disseminate to each of these centers and the traveling public via traveler information providers.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing
Surrounding County Sheriff Communications Center	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Surrounding County Sheriff Communications Center	Emergency Routing	1	The center shall collect current traffic and road condition information for emergency vehicle route calculation.	Existing
Surrounding County Sheriff Communications Center	Emergency Routing	2	The center shall receive information on the location and status of traffic control equipment and work zones along potential emergency routes.	Existing
Surrounding County Sheriff Communications Center	Emergency Routing	4	The center shall receive asset restriction information to support the dispatching of appropriate emergency resources.	Existing
Surrounding County Sheriff Communications Center	Emergency Routing	7	The center shall calculate emergency vehicle routes, under center personnel control, based on the collected traffic and road conditions information.	Existing
Surrounding County Sheriff Communications Center	Emergency Routing	8	The center shall request and receive ingress and egress routes or other specialized emergency access routes from the traffic management center.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Surrounding County Sheriff Communications Center	Emergency Routing	9	The center shall provide the capability to request special traffic control measures, such as signal preemption, from the traffic management center to facilitate emergency vehicle progress along the suggested route.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board En Route Support	3	The emergency vehicle, including roadway service patrols, shall receive incident details and a suggested route when dispatched to a scene.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board En Route Support	4	The emergency vehicle shall send the current en route status (including estimated time of arrival) and requests for emergency dispatch updates.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board En Route Support	5	The emergency vehicle shall send requests to traffic signal control equipment at the roadside to preempt the signal.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board En Route Support	6	The emergency vehicle shall provide the personnel on-board with dispatch information, including incident type and location, and forward an acknowledgment from personnel to the center that the vehicle is on its way to the incident scene.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	1	The emergency vehicle shall receive dispatch instructions sufficient to enable emergency personnel in the field to implement an effective incident response. It includes local traffic, road, and weather conditions, hazardous material information, and the current status of resources that have been allocated to an incident.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	2	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the incident site such as the extent of injuries, identification of vehicles and people involved, hazardous material, etc.	Existing
Surrounding County Sheriff Emergency Vehicles	EV On-Board Incident Management Communication	3	The emergency vehicle shall provide an interface to the center for emergency personnel to transmit information about the current incident response status such as the identification of the resources on site, site management strategies in effect, and current clearance status.	Existing
Taxi Services	Transit Center Paratransit Operations	1	The center shall process trip requests for demand responsive transit services, i.e. paratransit. Sources of the requests may include traveler information service providers.	Existing
Taxi Services	Transit Center Paratransit Operations	2	The center shall monitor the operational status of the demand response vehicles including status of passenger pick-up and drop-off.	Existing
Taxi Services	Transit Center Paratransit Operations	5	The center shall exchange information with Maintenance and Construction Operations concerning work zones, roadway conditions, asset restrictions, work plans, etc., that affect paratransit operations	Existing

Element Name	Functional Object	Req #	Requirement	Status
Taxi Services	Transit Garage Maintenance	1	The center shall collect operational and maintenance data from transit vehicles.	Existing
Taxi Services	Transit Garage Maintenance	3	The center shall generate transit vehicle maintenance schedules that identify the maintenance or repair to be performed and when the work is to be done.	Existing
Taxi Services	Transit Garage Maintenance	4	The center shall generate transit vehicle availability listings, current and forecast, to support transit vehicle assignment planning based, in part, on the transit vehicle maintenance schedule.	Existing
Taxi Services	Transit Garage Maintenance	5	The center shall assign technicians to a transit vehicle maintenance schedule, based upon such factors as personnel eligibility, work assignments, preferences and seniority.	Existing
Taxi Services	Transit Garage Maintenance	6	The center shall verify that the transit vehicle maintenance activities were performed correctly, using the transit vehicle's status, the maintenance personnel's work assignment, and the transit maintenance schedules.	Existing
Taxi Services	Transit Garage Maintenance	7	The center shall generate a time-stamped maintenance log of all maintenance activities performed on a transit vehicle.	Existing
Taxi Services	Transit Garage Maintenance	8	The center shall provide transit operations personnel with the capability to update transit vehicle maintenance information and receive reports on all transit vehicle operations data.	Existing
Traffic Data Archive	Archive Data Repository	1	The center shall collect data from centers.	Planned
Traffic Data Archive	Archive Data Repository	2	The center shall collect data catalogs from one or more data sources. A catalog describes the data contained in the collection of archived data and may include descriptions of the schema or structure of the data, a description of the contents of the data; e.g., time range of entries, number of entries; or a sample of the data (e. g. a thumbnail).	Planned
Traffic Data Archive	Archive Data Repository	3	The center shall store collected data in an information repository.	Planned
Traffic Data Archive	Archive Data Repository	4	The center shall perform quality checks on collected data.	Planned
Traffic Data Archive	Archive Data Repository	5	The center shall notify the system operator of errors related to data collection, analysis and archival.	Planned
Traffic Data Archive	Archive Data Repository	6	The center shall include capabilities for archive to archive coordination.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Traffic Data Archive	Archive Data Repository	7	The center shall provide the capability to execute methods on the incoming data such as cleansing, summarizations, aggregations, or transformations applied to the data before it is stored in the archive.	Planned
Traffic Data Archive	Archive Data Repository	8	The center shall collect data from data distribution systems and other data sources.	Planned
Traffic Data Archive	Archive Data Repository	9	The center shall respond to requests from the administrator interface function to manage center-sourced data collection.	Planned
Traffic Data Archive	Archive Data Repository	10	The center shall respond to requests from the administrator interface function to manage the archive data.	Planned
Traffic Data Archive	Archive Data Repository	11	The center shall respond to requests for archive data from archive data users (centers, field devices).	Planned
Traffic Data Archive	Archive Data Repository	12	The center shall provide a mechanism for archive data users to request archive data by meta-data range.	Planned
Traffic Data Archive	Archive Data Repository	13	The center shall associate meta-data with archived data, including catalog data, statistical products determined from method execution and data longevity.	Planned
Traffic Data Archive	Archive Government Reporting	1	The center shall provide archive data to federal, state, and local government reporting systems.	Planned
Traffic Data Archive	Archive Government Reporting	3	The center shall provide the capability to format data suitable for input into government reports.	Planned
Traffic Data Archive	Archive Government Reporting	4	The center shall provide the applicable meta-data for any ITS archived data to satisfy government reporting system requests. Meta-data may include attributes that describe the source and quality of the data and the conditions surrounding the collection of the data.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	1	The center shall respond to requests for archive data from center users.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	2	The center shall provide the capability to perform activities such as data mining, data fusion, summarizations, aggregations, and recreation from archive data. This may include multidimensional analysis, selective summarization and expansion of data details, and many other advanced analysis services.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	3	The center shall collect regional data from data distribution centers.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Traffic Data Archive	Archive On-Line Analysis and Mining	4	The center shall respond to users systems requests for a catalog of the archived data analysis products available.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	5	The center shall be capable of processing vehicle probe data into transportation network performance measures.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	6	The center shall be capable of processing vehicle probe data to support infrastructure conditions monitoring performed by Archived Data User Systems including maintenance and construction management centers.	Planned
Traffic Data Archive	Archive On-Line Analysis and Mining	7	The center shall be capable of processing vehicle probe data to determine roadway environmental conditions for non operational uses such as maintenance planning and research.	Planned
Traffic Data Archive	Archive Situation Data Archival	2	The center shall respond to requests from the administrator interface function to manage field-sourced data collection.	Planned
Traffic Data Archive	Archive Situation Data Archival	4	The center shall collect vehicle traffic probe data for performance monitoring and analysis.	Planned
Traffic Data Archive	Archive Situation Data Archival	5	The center shall be capable of archiving vehicle traffic probe data.	Planned
Traffic Data Archive	Archive Situation Data Archival	6	The center shall provide the capability to execute methods on the incoming field data such as aggregation and statistical measures before the data is stored in the archive.	Planned
Traffic Data Archive	Archive Situation Data Archival	7	The center shall respond to requests from the administrator interface function to select and manage data stored in the archive.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	1	The center shall disseminate customized traffic and highway condition information to travelers, including incident information, detours and road closures, recommended routes, and current speeds on specific routes upon request.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	2	The center shall disseminate customized maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities upon request.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	6	The center shall disseminate customized weather information to travelers upon request.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	8	The center shall disseminate customized event information to travelers upon request.	Planned

Element Name	Functional Object	Req #	Requirement	Status
TrafficWise Traveler Information System	TIC Interactive Traveler Information	10	The center shall provide all traveler information based on the traveler's current location or a specific location identified by the traveler, and filter or customize the provided information accordingly.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	15	The center shall provide the capability to exchange information with another traveler information service provider current or predicted data for road links that are outside the area served by the local supplier.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	16	The center shall provide the capability to support requests from the media for traffic and incident data.	Planned
TrafficWise Traveler Information System	TIC Interactive Traveler Information	17	The center shall provide the capability for a system operator to control the type and update frequency of traveler information.	Planned
TrafficWise Traveler Information System	TIC Travel Services Information and Reservation	7	The center shall provide electric charging station information identifying the location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure for each station to travelers.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	1	The center shall disseminate traffic and highway condition information to travelers, including incident information, detours and road closures, event information, recommended routes, and current speeds on specific routes.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	2	The center shall disseminate maintenance and construction information to travelers, including scheduled maintenance and construction work activities and work zone activities.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	6	The center shall disseminate weather information to travelers.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	7	The center shall disseminate event information to travelers.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	9	The center shall provide traffic and incident data to the media.	Planned
TrafficWise Traveler Information System	TIC Traveler Information Broadcast	10	The center shall provide the capability for a system operator to control the type and update frequency of broadcast traveler information.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	1	The center shall provide the capability to process voice-formatted requests for traveler information from a traveler telephone information system, and return the information in the requested format.	Planned

Element Name	Functional Object	Req #	Requirement	Status
TrafficWise Traveler Information System	TIC Traveler Telephone Information	2	The center shall provide the capability to process dual-tone multi-frequency (DTMF)-based requests (touch-tone) for traveler information from a traveler telephone information system.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	3	The center shall provide the capability to process traveler information requests from a traveler telephone information system.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	4	The center shall provide information on traffic conditions in the requested voice format and for the requested location.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	5	The center shall provide work zone and roadway maintenance information in the requested voice format and for the requested location.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	7	The center shall provide weather and event information in the requested voice format and for the requested location.	Planned
TrafficWise Traveler Information System	TIC Traveler Telephone Information	10	The center shall provide the capability to support both specific caller requests as well as bulk upload of regional traveler information.	Planned
Utility Emergency Repair/Response	Emergency Call-Taking	5	The emergency call-taking center shall receive emergency notification information from other public safety agencies and present the possible incident information to the emergency system operator.	Existing
Utility Emergency Repair/Response	Emergency Call-Taking	9	The emergency call-taking center shall forward the verified emergency information to the responding agency based on the location and nature of the emergency.	Existing
Utility Emergency Repair/Response	Emergency Call-Taking	10	The emergency call-taking center shall update the incident information log once the emergency system operator has verified the incident.	Existing
Utility Emergency Repair/Response	Emergency Dispatch	1	The center shall dispatch emergency vehicles to respond to verified emergencies under center personnel control.	Existing
Utility Emergency Repair/Response	Emergency Dispatch	2	The center shall store the current status of all emergency vehicles available for dispatch and those that have been dispatched.	Existing
Utility Emergency Repair/Response	Emergency Dispatch	3	The center shall relay location and incident details to the responding vehicles.	Existing
Utility Emergency Repair/Response	Emergency Dispatch	5	The center shall store and maintain the emergency service responses in an action log.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Utility Emergency Repair/Response	Emergency Dispatch	6	The center shall coordinate response to incidents with other Emergency Management centers to ensure appropriate resources are dispatched and utilized.	Existing
Utility Emergency Repair/Response	Emergency Incident Command	1	The center shall provide tactical decision support, resource coordination, and communications integration for first responders to support local management of an incident.	Existing
Utility Emergency Repair/Response	Emergency Incident Command	2	The center shall provide incident command communications with public safety, emergency management, transportation, and other allied response agency centers.	Existing
Utility Emergency Repair/Response	Emergency Incident Command	3	The center shall track and maintain resource information and action plans pertaining to the incident command.	Existing
Utility Emergency Repair/Response	Emergency Incident Command	4	The center shall share incident command information with other public safety agencies including resource deployment status, hazardous material information, rail incident information, evacuation advice as well as traffic, road, and weather conditions.	Existing
Utility Emergency Repair/Response	Emergency Incident Command	5	The center shall assess the status of responding emergency vehicles as part of an incident command.	Existing
Utility Emergency Repair/Response	Emergency Response Management	3	The center shall provide the capability to implement response plans and track progress through the incident by exchanging incident information and response status with allied agencies.	Existing
Utility Emergency Repair/Response	Emergency Response Management	4	The center shall develop, coordinate with other agencies, and store emergency response plans.	Existing
Utility Emergency Repair/Response	Emergency Response Management	5	The center shall track the availability of resources and coordinate resource sharing with allied agency centers including traffic, maintenance, or other emergency centers.	Existing
Utility Emergency Repair/Response	Emergency Response Management	6	The center shall allocate the appropriate emergency services, resources, and vehicle (s) to respond to incidents, and shall provide the capability to override the current allocation to suit the special needs of a current incident.	Existing
Utility Emergency Repair/Response	Emergency Response Management	12	The center shall provide information to the media concerning the status of an emergency response.	Existing

Element Name	Functional Object	Req #	Requirement	Status
Utility Emergency Repair/Response	Emergency Response Management	13	The center shall provide the capability for center personnel to provide inputs to the management of incidents, disasters and evacuations.	Existing
Vehicles	Light Vehicle Electric Charging Assist	1	Vehicle shall provide the operational status of the electrical system, the charging capacity and charging rate for the vehicle, and % charge complete to an electric charging station.	Planned
Vehicles	Light Vehicle Payment Service	5	The vehicle shall provide payment information on request under control of the vehicle owner/operator.	Planned
Vehicles	Light Vehicle Payment Service	7	The vehicle shall receive and present to the vehicle operator the actual cost of vehicle electric charge.	Planned
Vehicles	Light Vehicle Payment Service	9	The vehicle shall receive and present to the vehicle operator the actual cost of parking used when requested by the vehicle operator.	Planned
Vehicles	Light Vehicle Trip Planning and Route Guidance	1	The vehicle shall provide the capability for a driver to request and confirm multi-modal route guidance from a specified source to a destination.	Future
Vehicles	Light Vehicle Trip Planning and Route Guidance	2	The vehicle shall forward the request for route guidance to a traveler information center for route calculation.	Future
Vehicles	Light Vehicle Trip Planning and Route Guidance	3	The vehicle shall forward user preferences, background information, constraints, and payment information to the supplying traveler information center.	Future
Vehicles	Light Vehicle Trip Planning and Route Guidance	4	The vehicle shall present trip information to the driver in audible or visual forms without impairing the driver's ability to control the vehicle in a safe manner.	Future
Vehicles	Light Vehicle Trip Planning and Route Guidance	5	The vehicle shall provide a mechanism for its user to create/modify a trip plan including selection of mode, route and parking.	Future
Vehicles	Light Vehicle Trip Planning and Route Guidance	6	The vehicle shall provide the capability for a driver to obtain route guidance from a specified source to a destination.	Future
Vehicles	Vehicle Basic Safety Communication	2	The vehicle shall provide its location with lane-level accuracy to on-board applications.	Future
Vehicles	Vehicle Basic Safety Communication	7	The vehicle shall receive warnings, informational road signs, traffic meters, and signals provided by infrastructure devices.	Planned

Element Name	Functional Object	Req #	Requirement	Status
Vehicles	Vehicle Control Automation	1	The vehicle shall monitor the area behind and in front of the vehicle to determine the proximity of other objects to the vehicle.	Future
Vehicles	Vehicle Intersection Warning	1	Vehicle shall provide vehicle path information to identify if vehicle is performing an unpermitted movement at an intersection such as a stop sign violation or running a red light.	Future
Vehicles	Vehicle Intersection Warning	3	The vehicle shall receive intersection signal timing information in order for the vehicle to determine if it will safely cross the intersection given its current location and speed.	Future
Vehicles	Vehicle Intersection Warning	4	The vehicle shall be capable of providing warnings to the driver based upon information received regarding pedestrians, cyclists, and other non-motorized users that are sharing the roadway with the vehicle.	Planned
Vehicles	Vehicle Map Management	1	The Vehicle shall make basemap, roadway geometry, intersection geometry and parking facility geometry information available to other onboard vehicle applications.	Future
Vehicles	Vehicle Situation Data Monitoring	1	The Vehicle shall obtain data collection parameters from Connected Vehicle Roadside Equipment.	Future



Appendix B. Interface Details

The interfaces of the transportation systems in the Indianapolis RITSA are based on ARC-IT and tailored to reflect the plan for the region. Architecture diagrams display the transportation systems in the Indianapolis RITSA, and more importantly, how these systems are and will be connected with one another so information can be exchanged and transportation services can be coordinated. Stakeholders may use these diagrams to identify integration opportunities.

The following diagrams are information flow diagrams showing the information (i.e. information flows) movement between the various systems. Descriptions of the information flows are included at the end of the Appendix.

Information about the interfaces of the systems in the region is contained in the RAD-IT database. RAD-IT can be used to create tailored interconnect and information flow diagrams for any system in the database.

Indianapolis RITSA Interface Diagrams

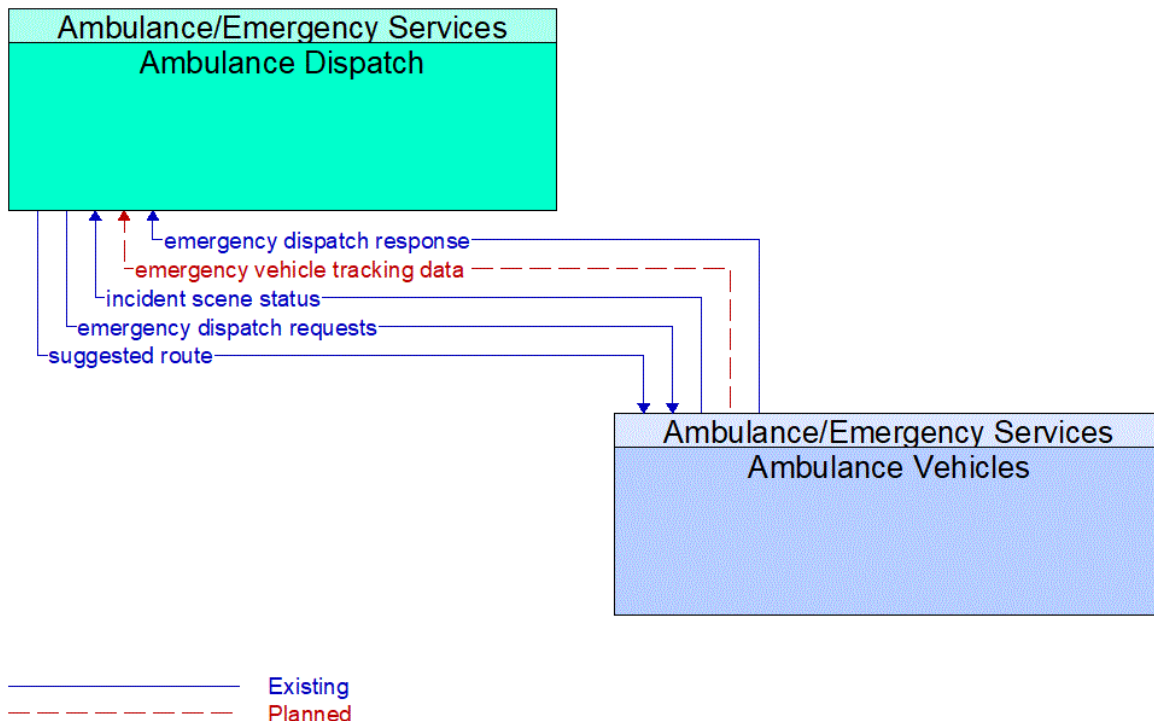


Figure 1: Ambulance Dispatch - Ambulance Vehicles Interface

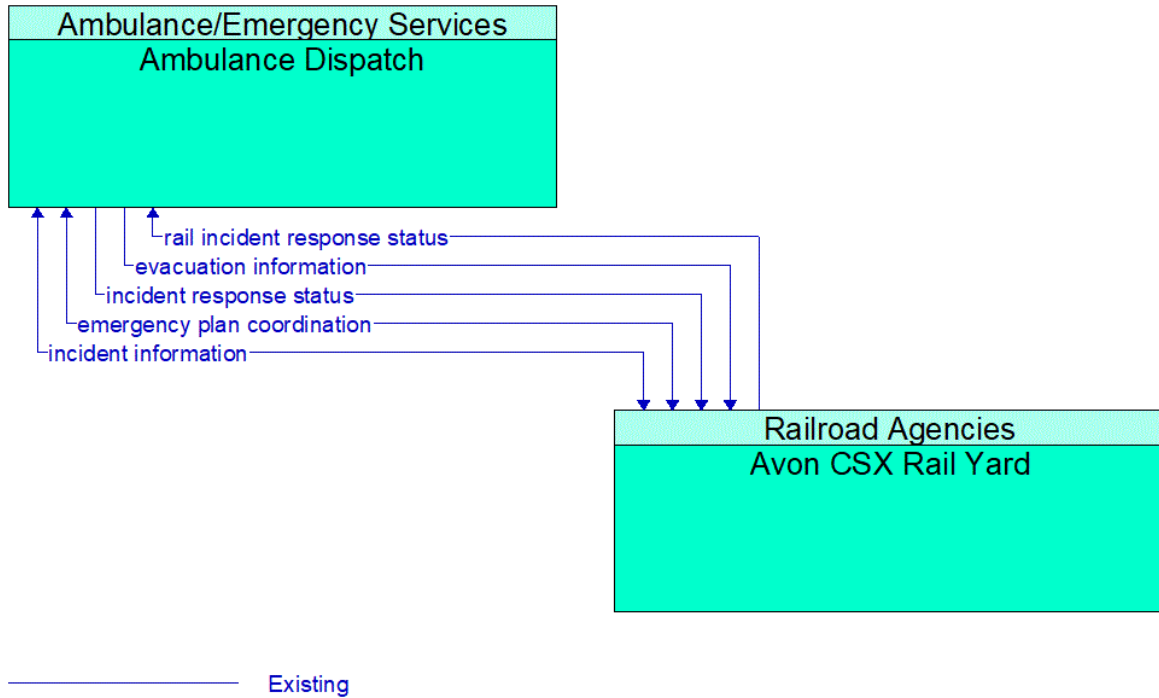


Figure 2: Ambulance Dispatch - Avon CSX Rail Yard Interface

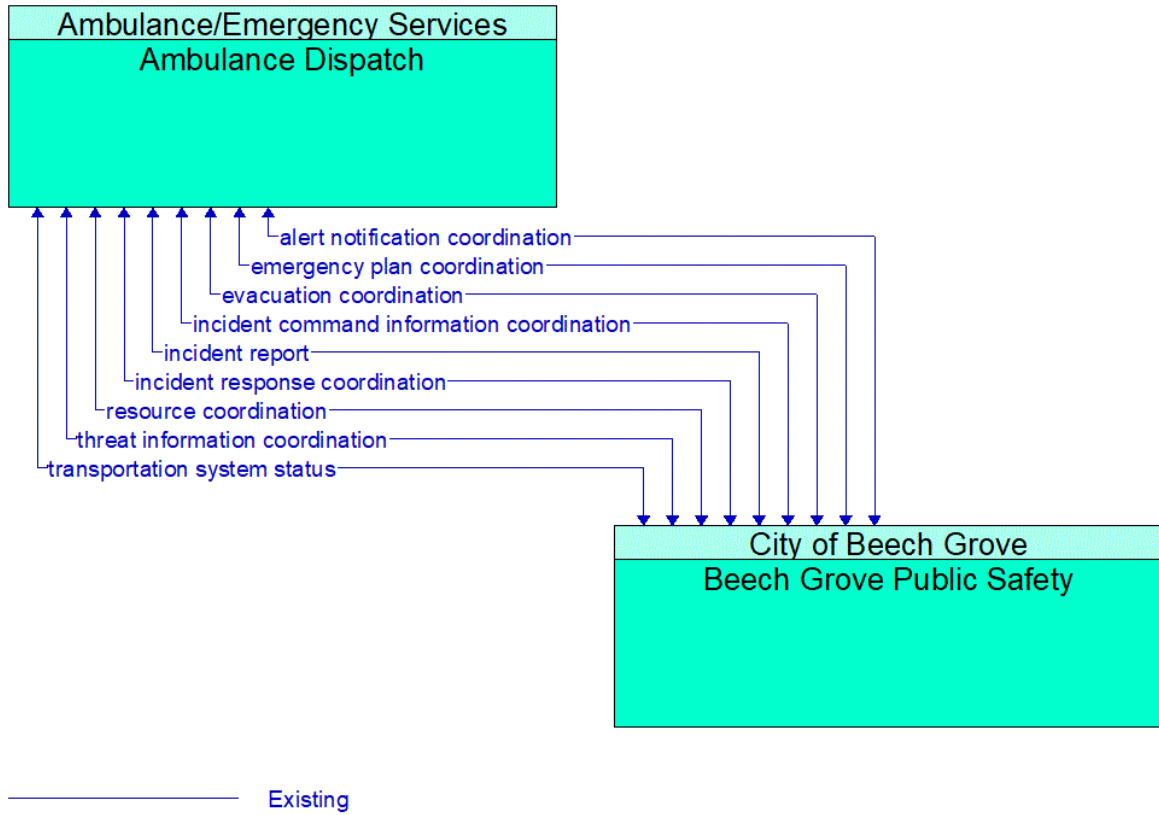


Figure 3: Ambulance Dispatch - Beech Grove Public Safety Interface

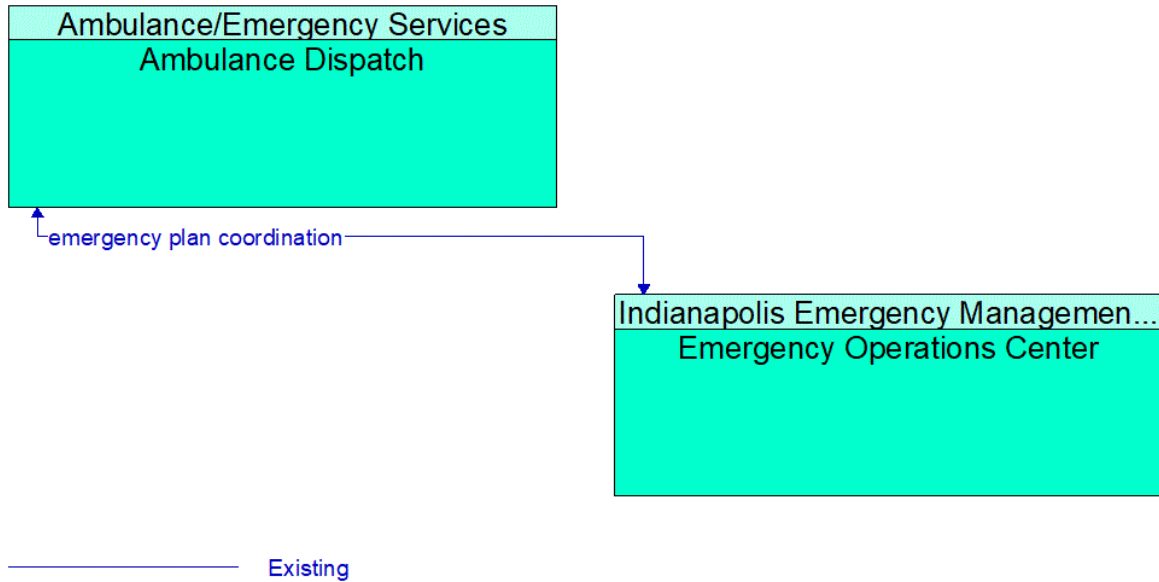


Figure 4: Ambulance Dispatch - Emergency Operations Center Interface

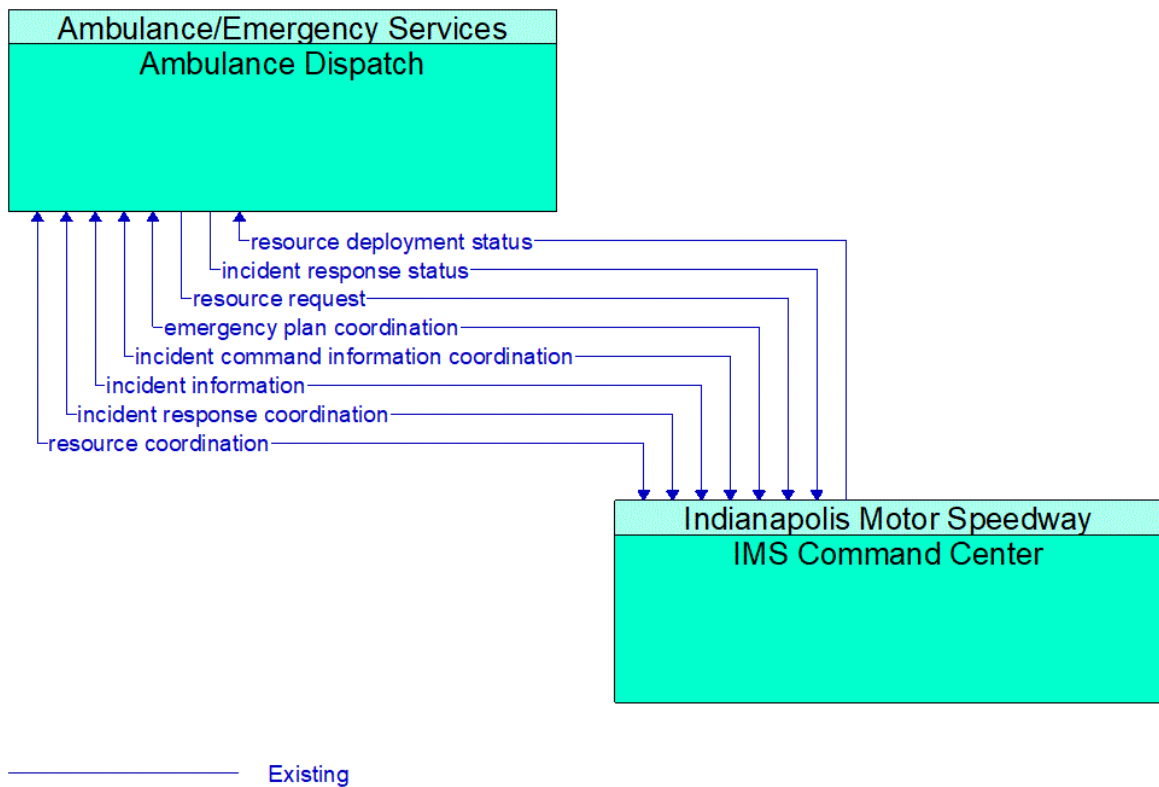


Figure 5: Ambulance Dispatch - IMS Command Center Interface

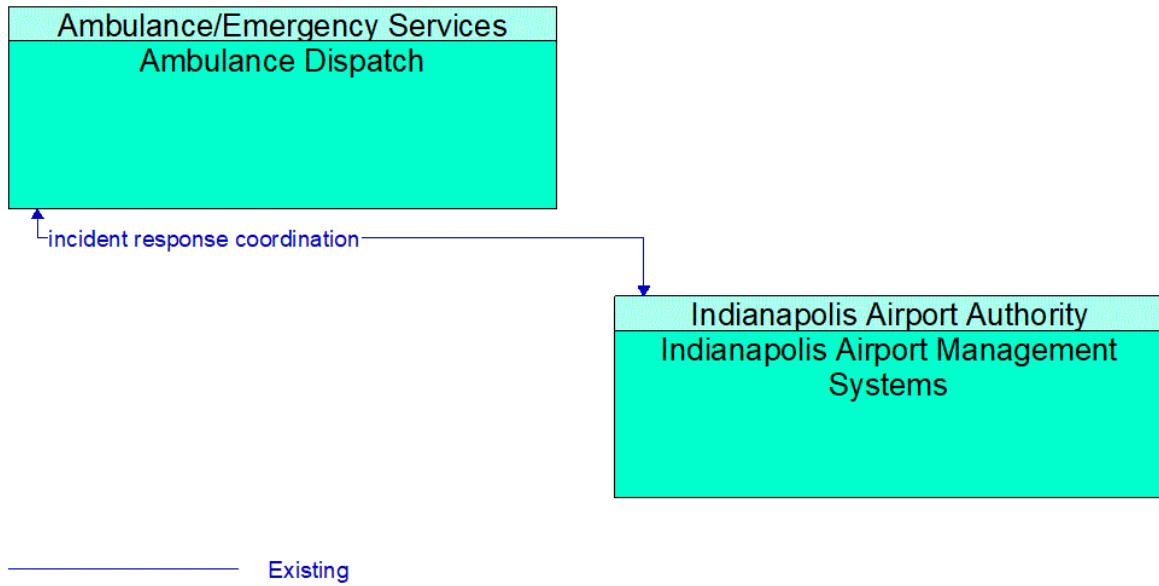
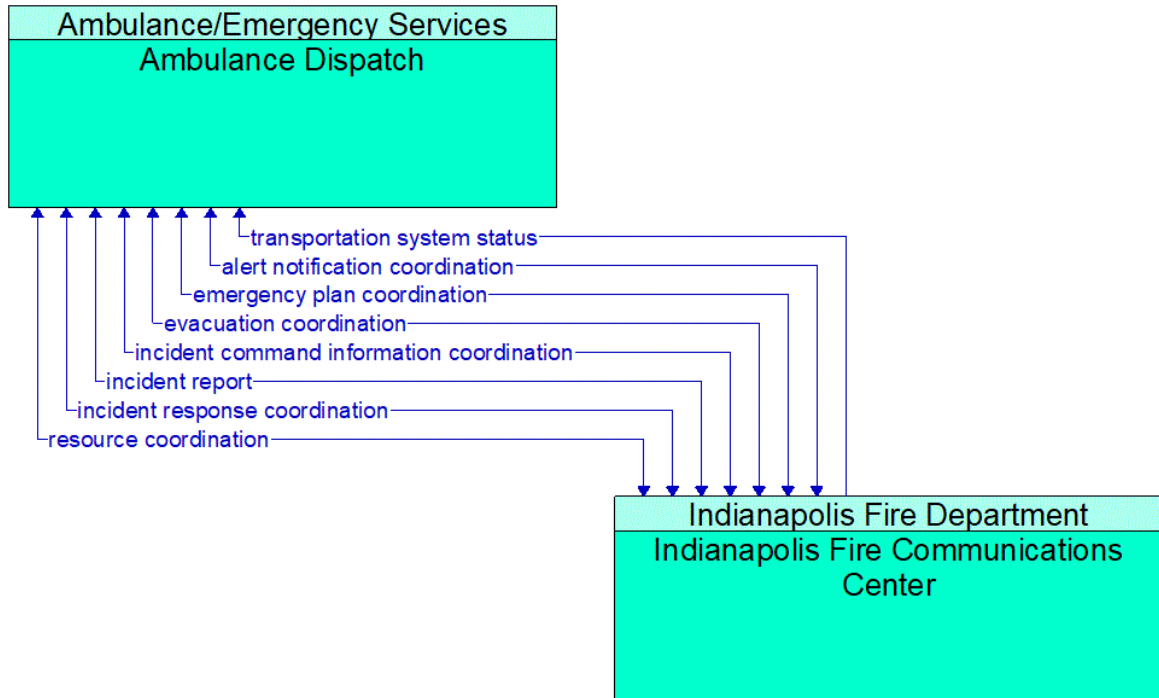


Figure 6: Ambulance Dispatch - Indianapolis Airport Management Systems Interface



Existing

Figure 7: Ambulance Dispatch - Indianapolis Fire Communications Center Interface

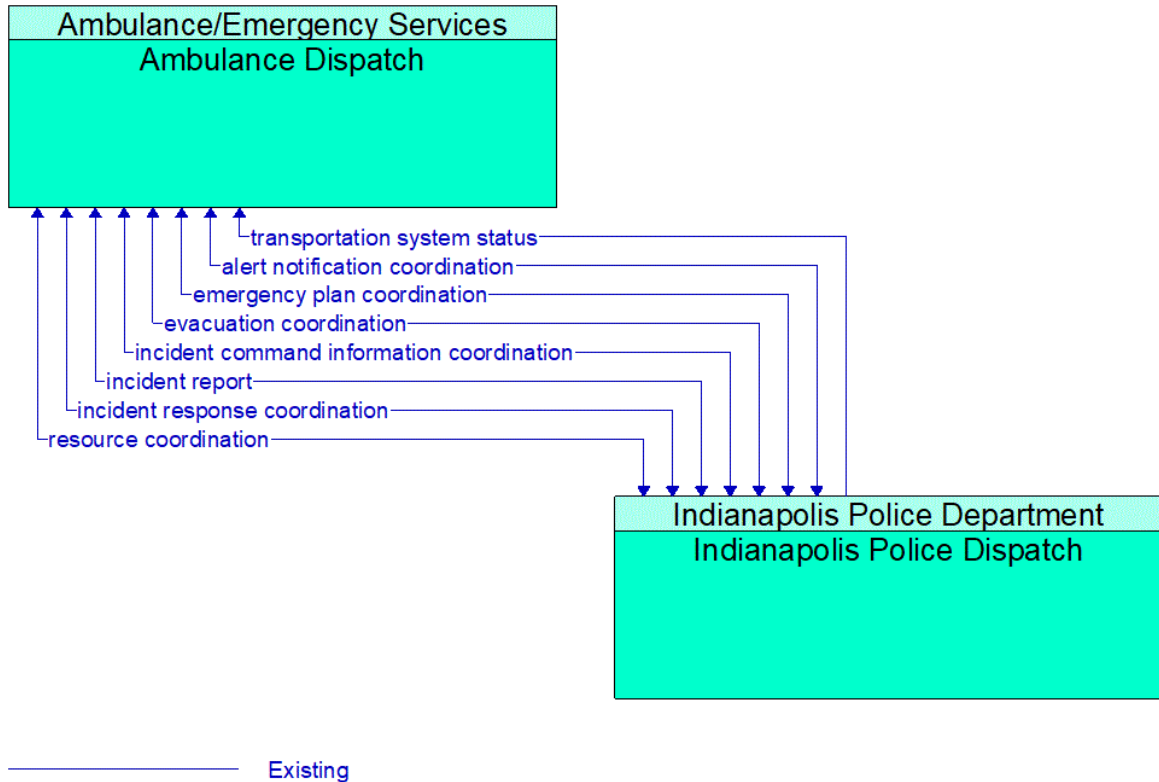


Figure 8: Ambulance Dispatch - Indianapolis Police Dispatch Interface

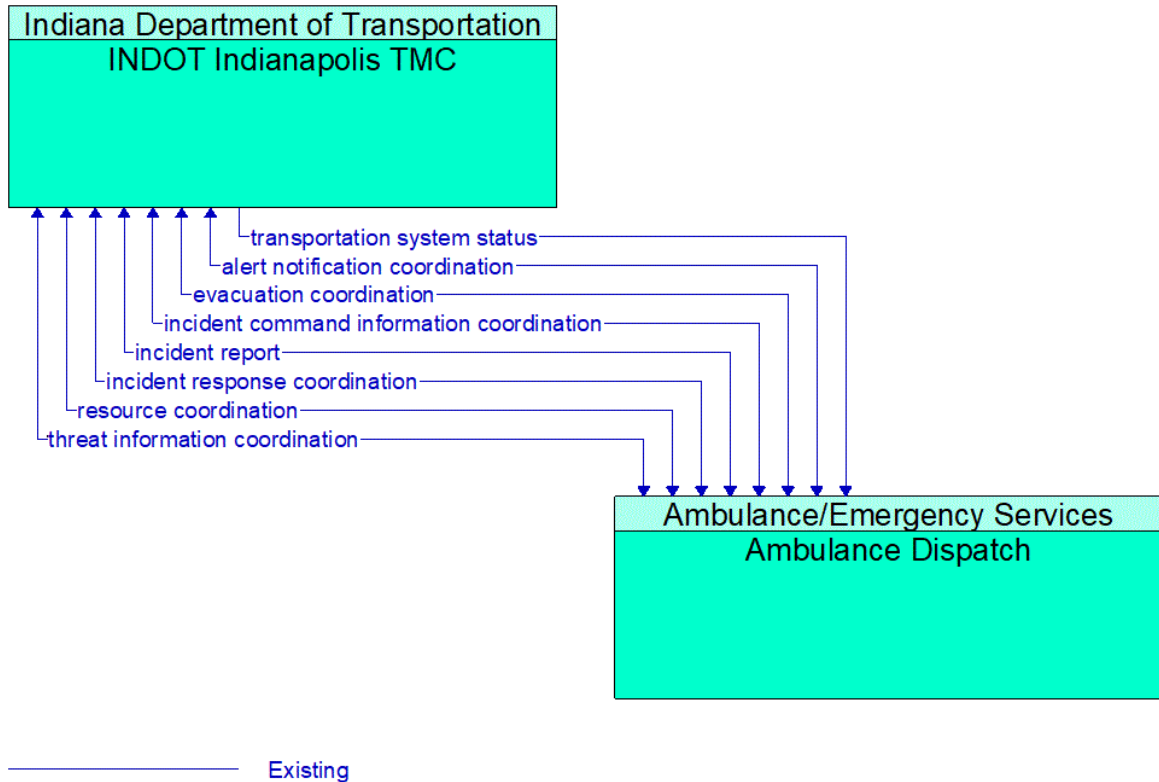


Figure 9: Ambulance Dispatch - INDOT Indianapolis TMC Interface

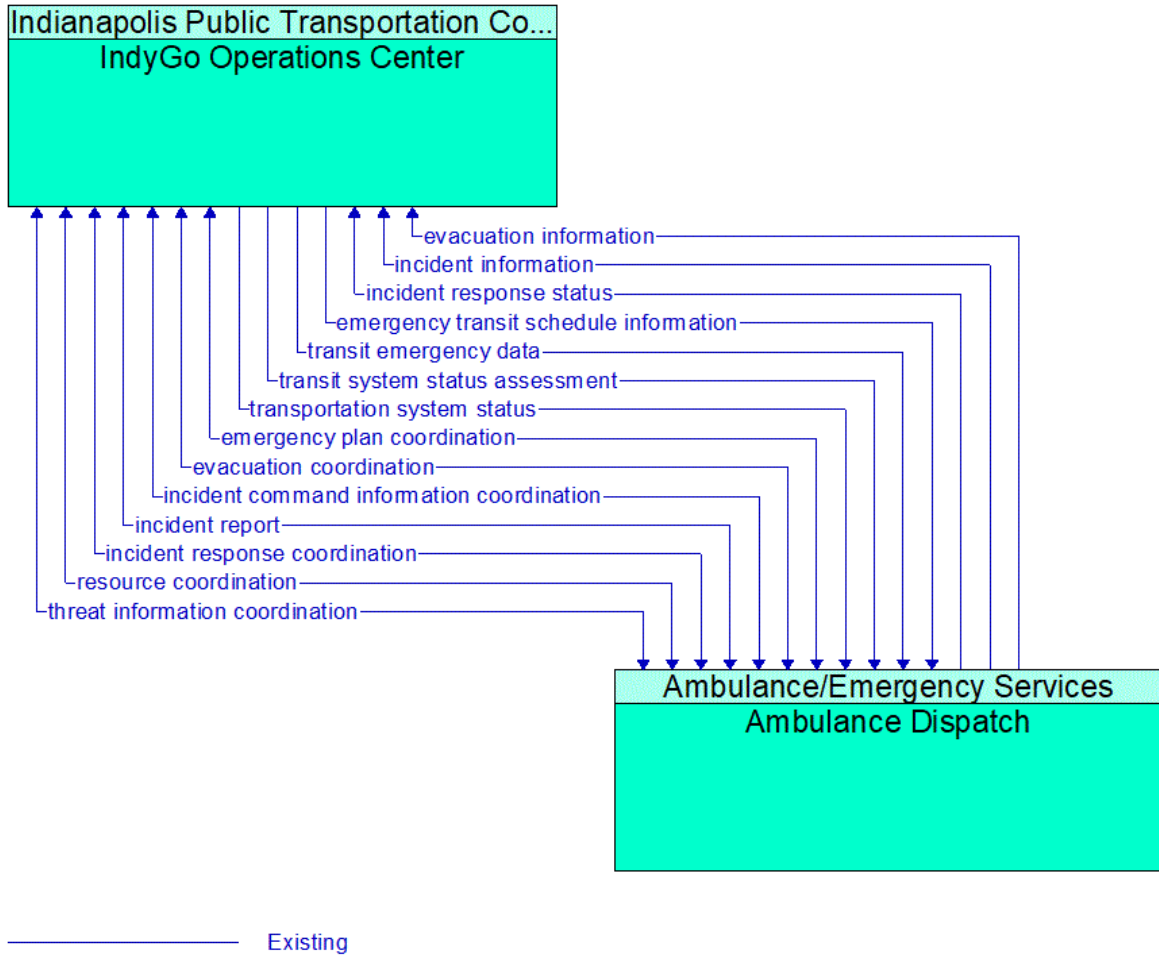


Figure 10: Ambulance Dispatch - IndyGo Operations Center Interface

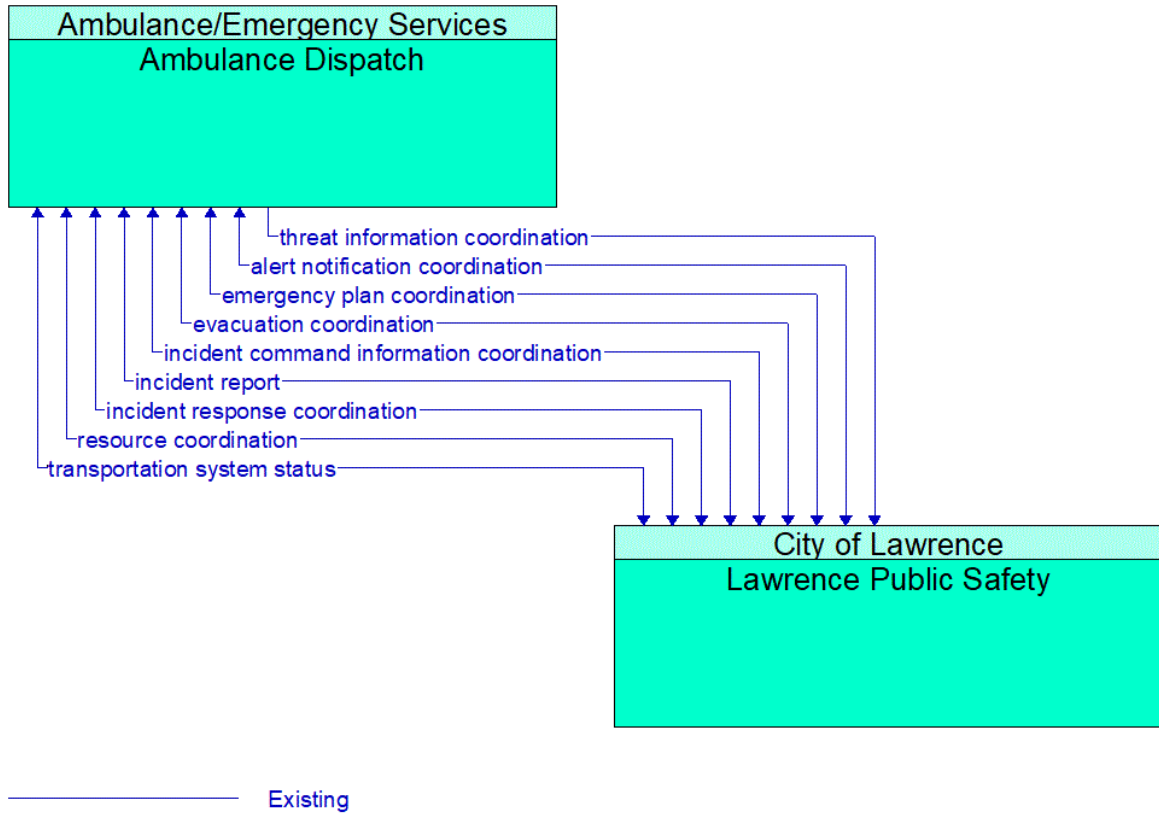


Figure 11: Ambulance Dispatch - Lawrence Public Safety Interface

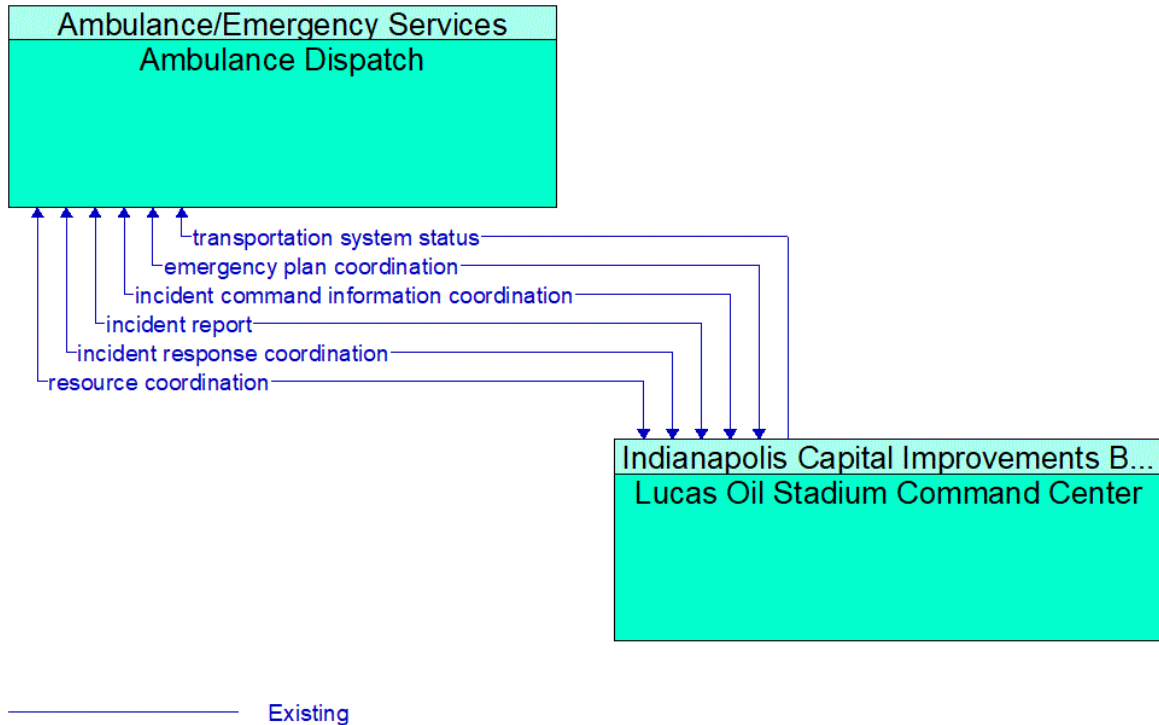


Figure 12: Ambulance Dispatch - Lucas Oil Stadium Command Center Interface

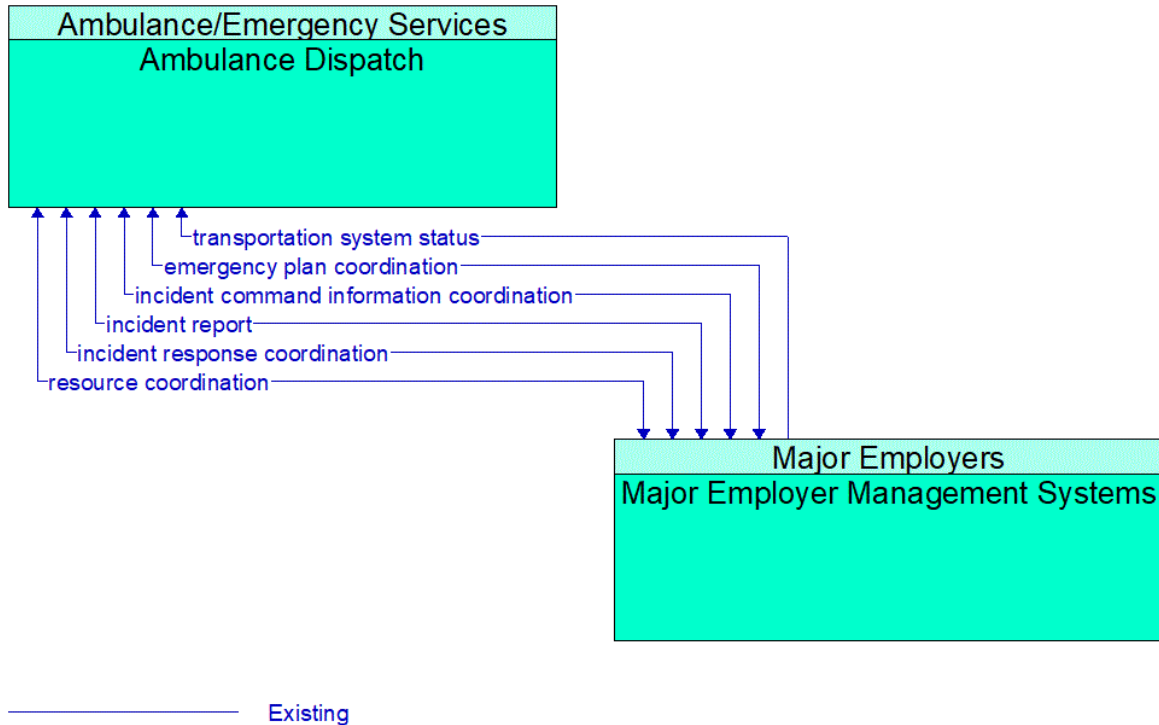


Figure 13: Ambulance Dispatch - Major Employer Management Systems Interface

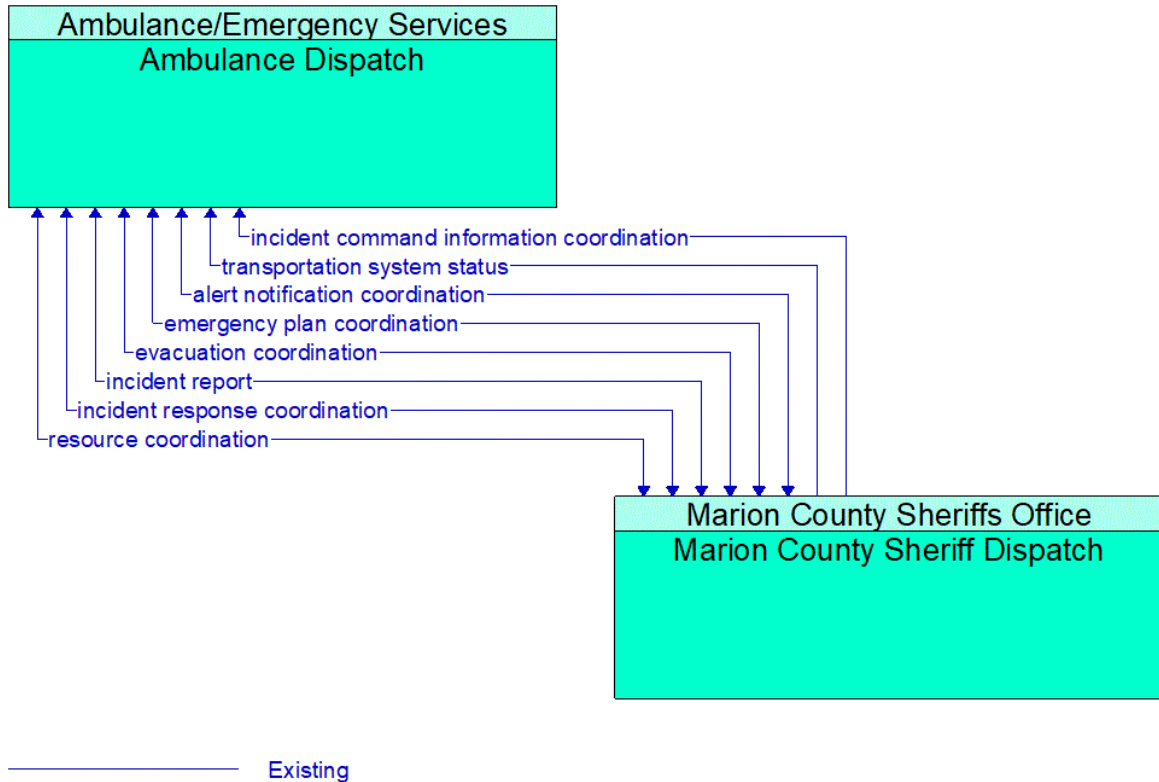
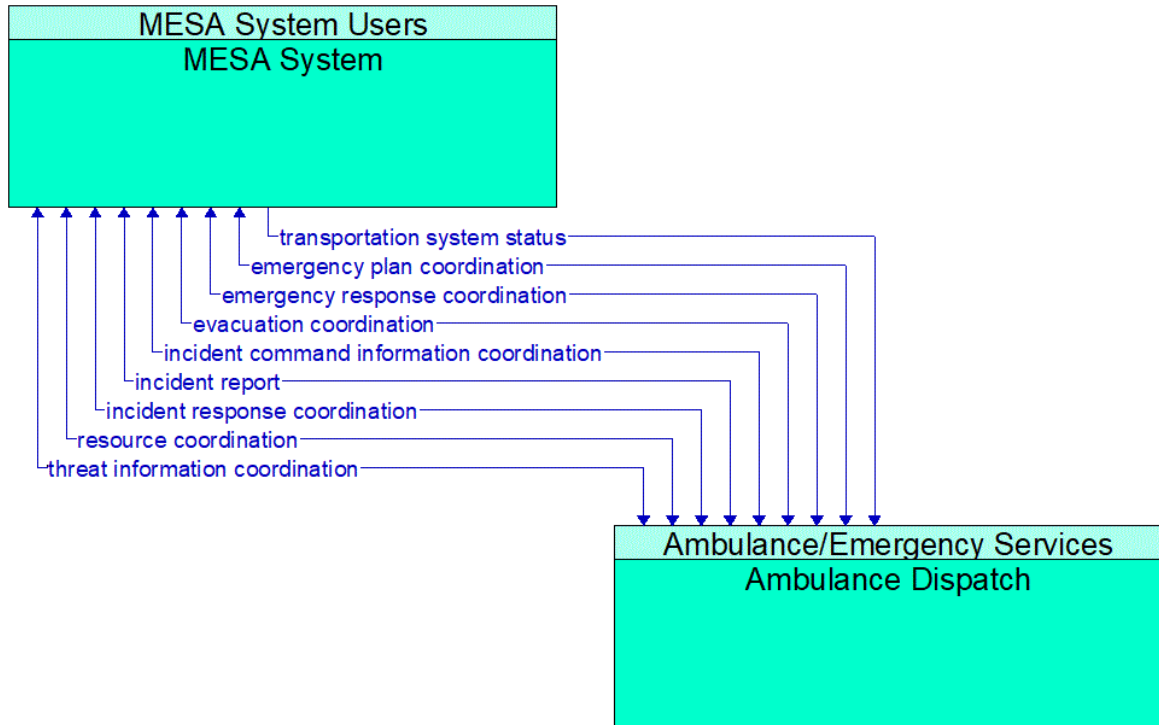


Figure 14: Ambulance Dispatch - Marion County Sheriff Dispatch Interface



Existing

Figure 15: Ambulance Dispatch - MESA System Interface

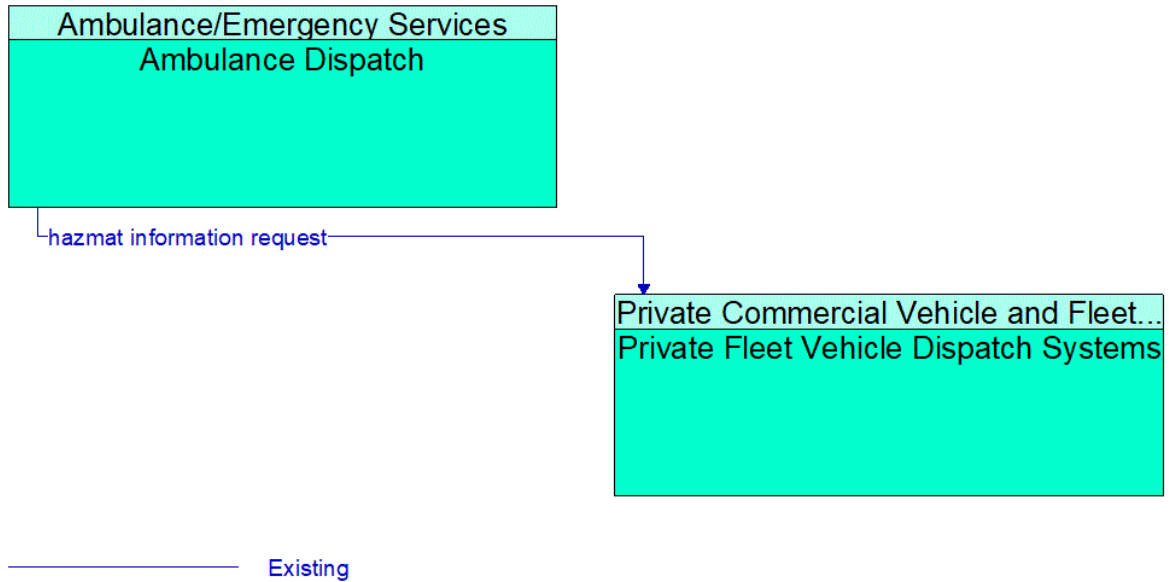


Figure 16: Ambulance Dispatch - Private Fleet Vehicle Dispatch Systems Interface

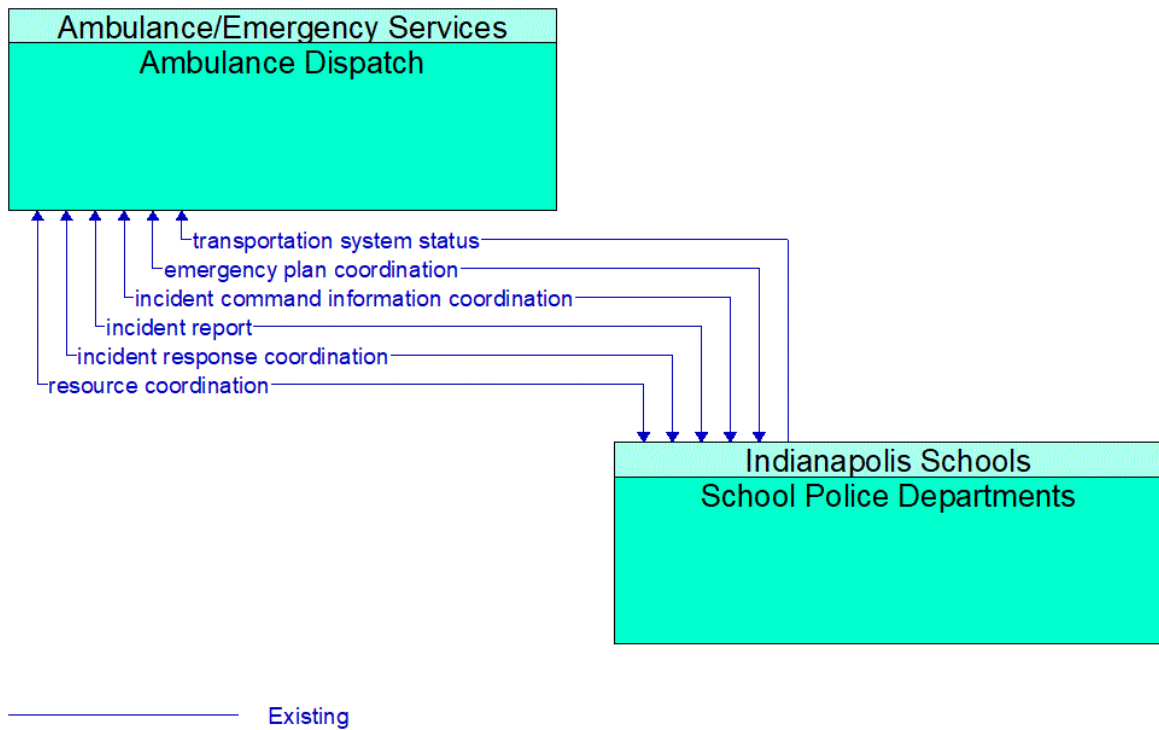


Figure 17: Ambulance Dispatch - School Police Departments Interface

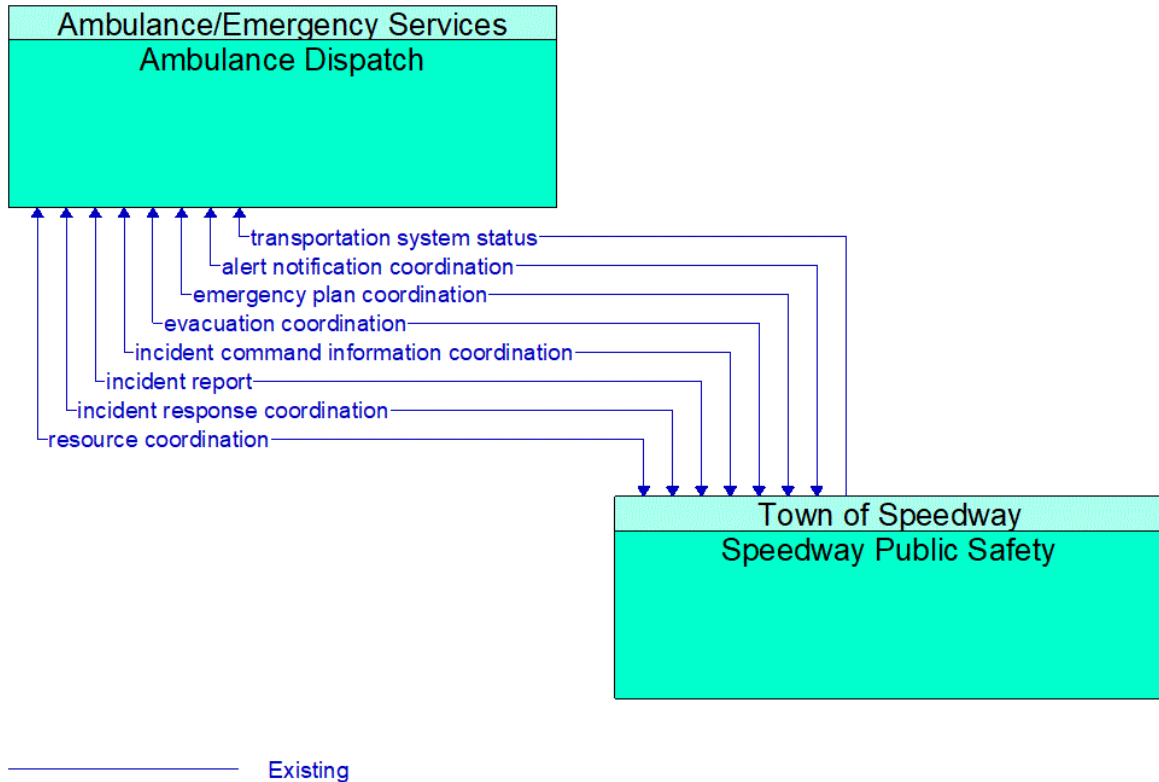
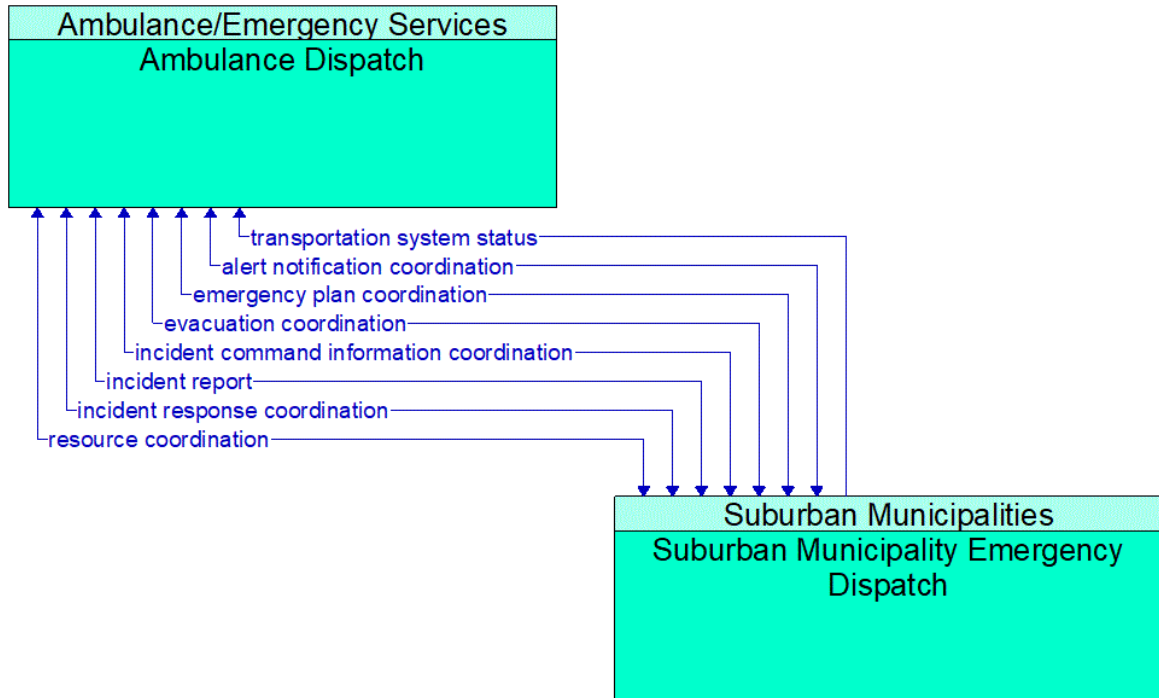
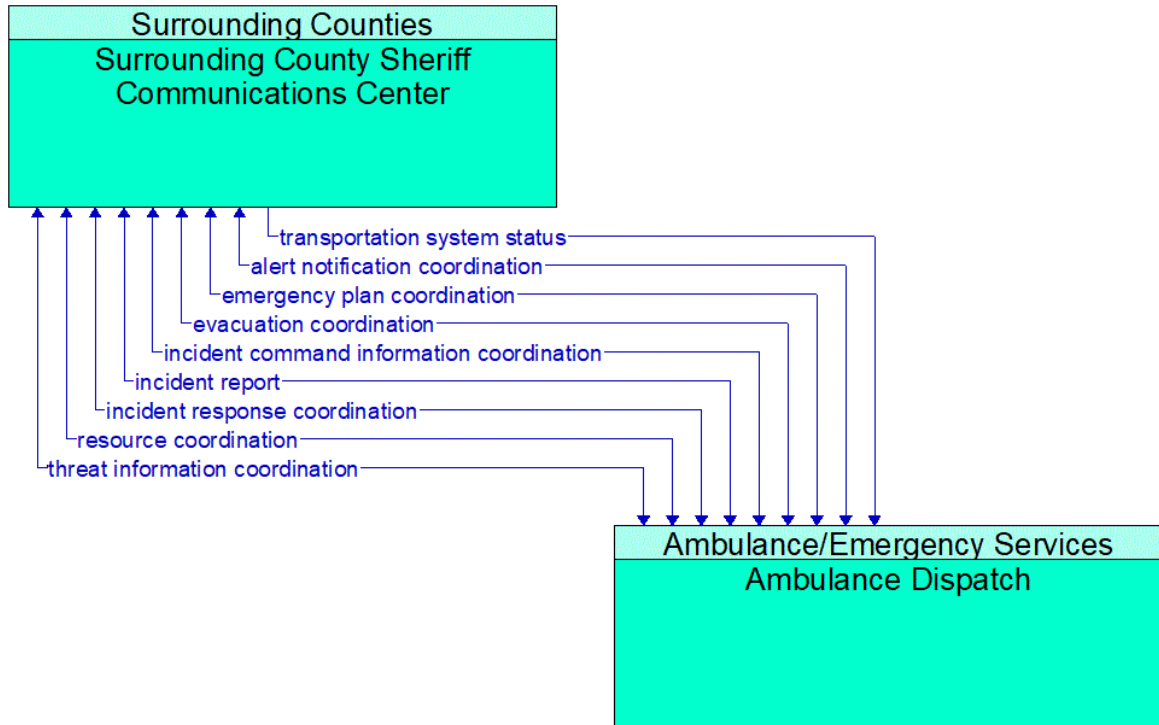


Figure 18: Ambulance Dispatch - Speedway Public Safety Interface



Existing

Figure 19: Ambulance Dispatch - Suburban Municipality Emergency Dispatch Interface



Existing

Figure 20: Ambulance Dispatch - Surrounding County Sheriff Communications Center Interface

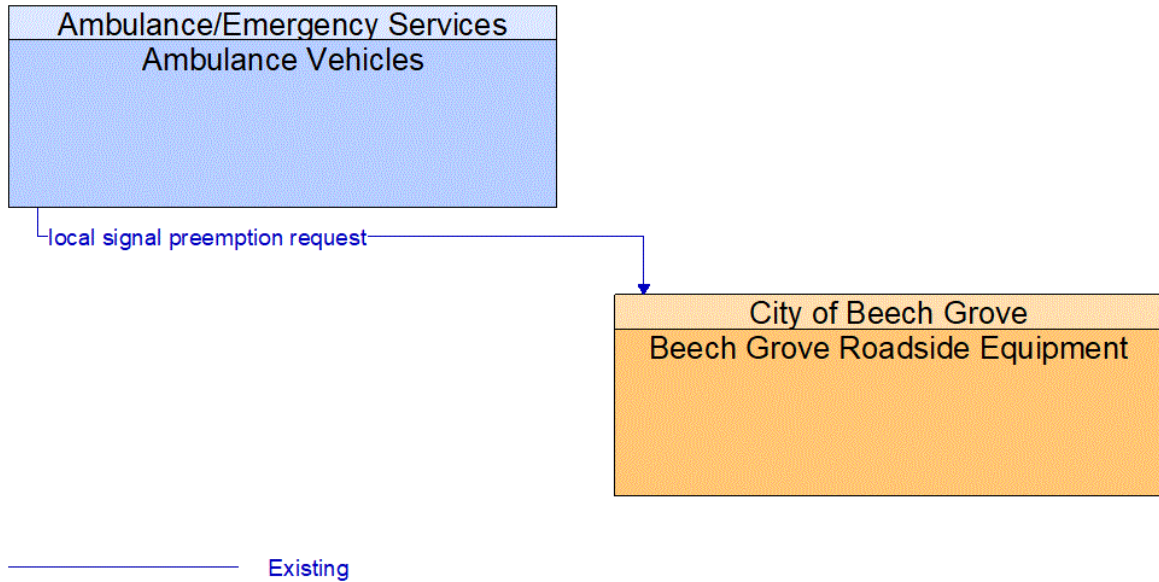


Figure 21: Ambulance Vehicles - Beech Grove Roadside Equipment Interface

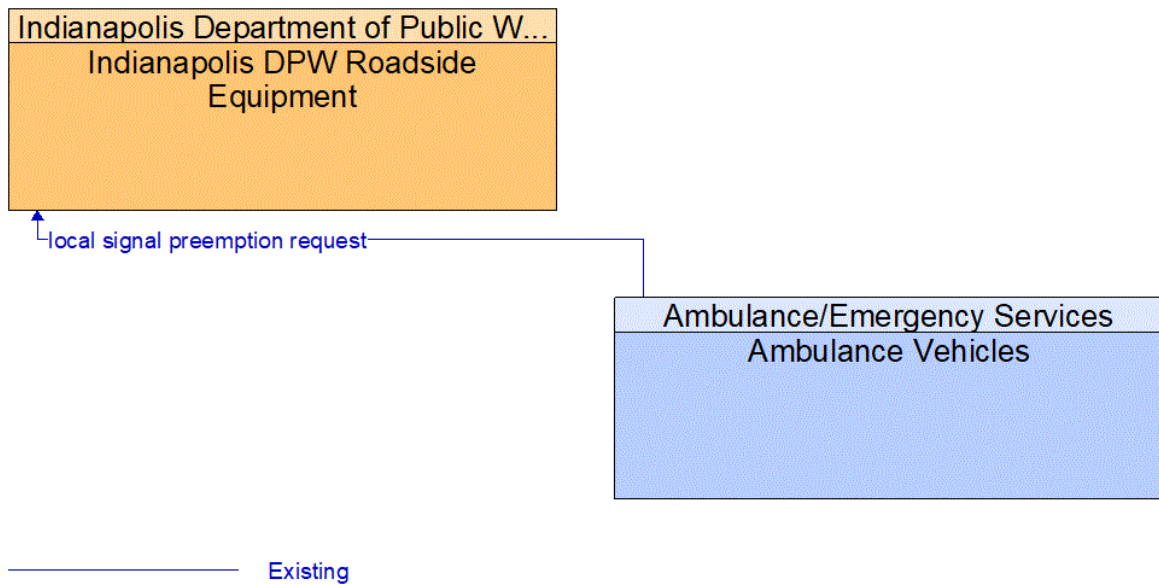


Figure 22: Ambulance Vehicles - Indianapolis DPW Roadside Equipment Interface

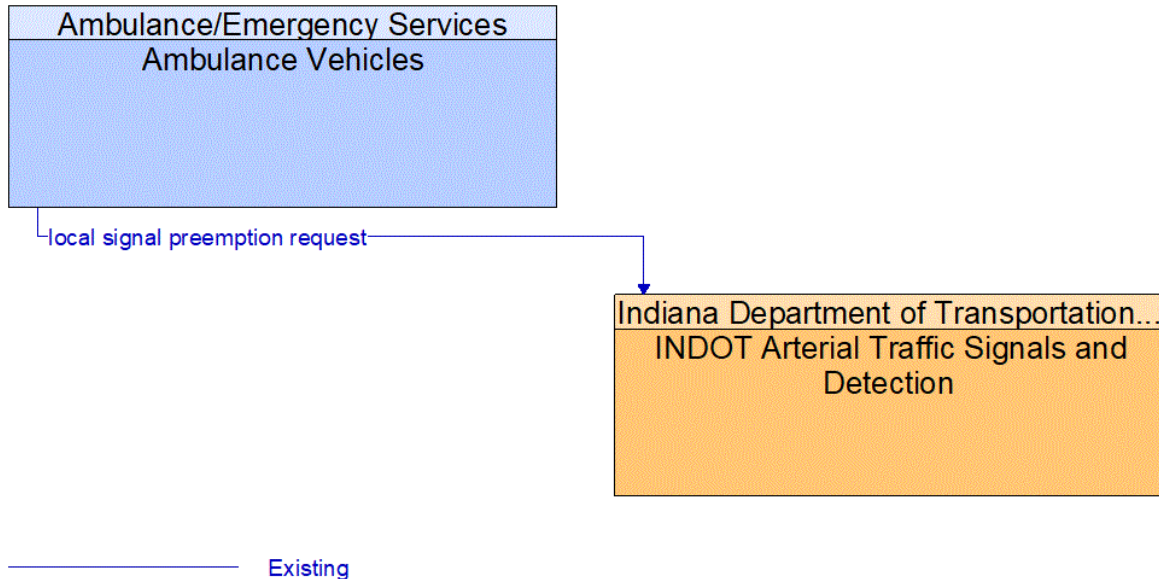


Figure 23: Ambulance Vehicles - INDOT Arterial Traffic Signals and Detection Interface

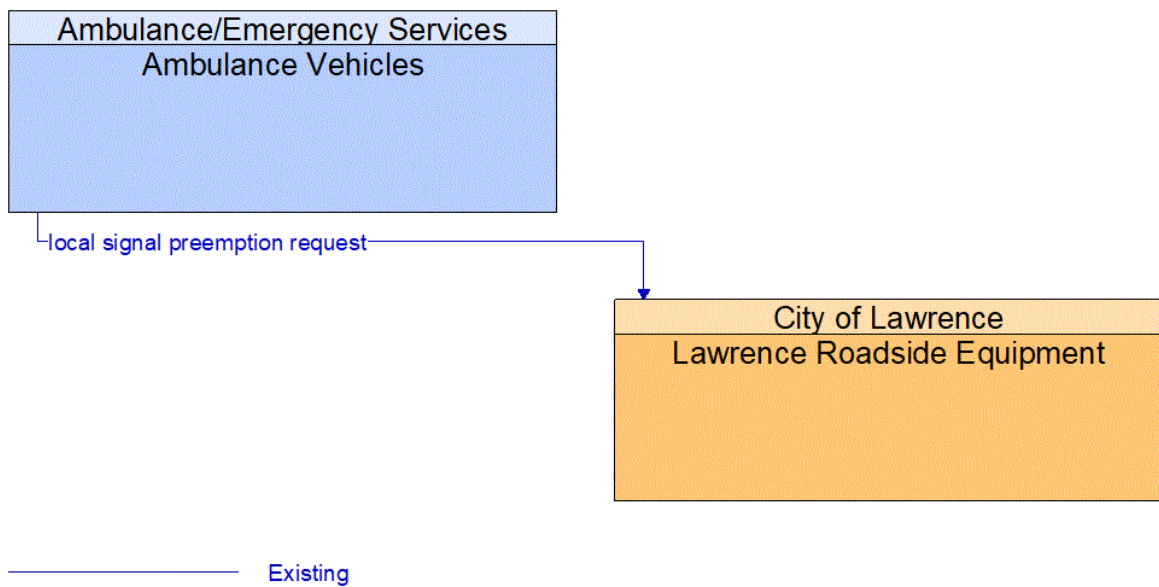


Figure 24: Ambulance Vehicles - Lawrence Roadside Equipment Interface

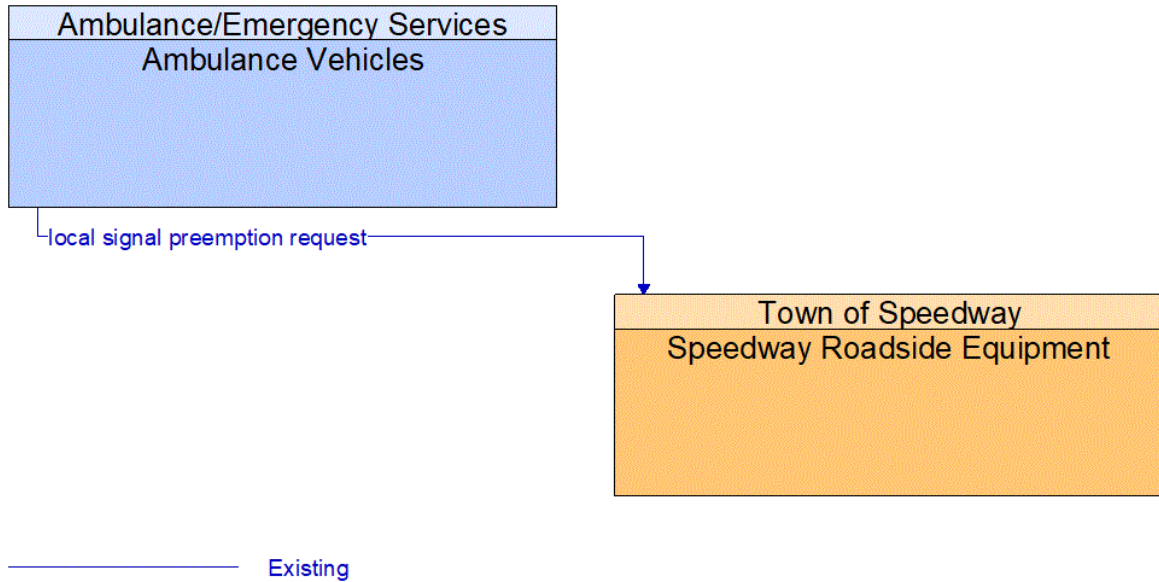


Figure 25: Ambulance Vehicles - Speedway Roadside Equipment Interface

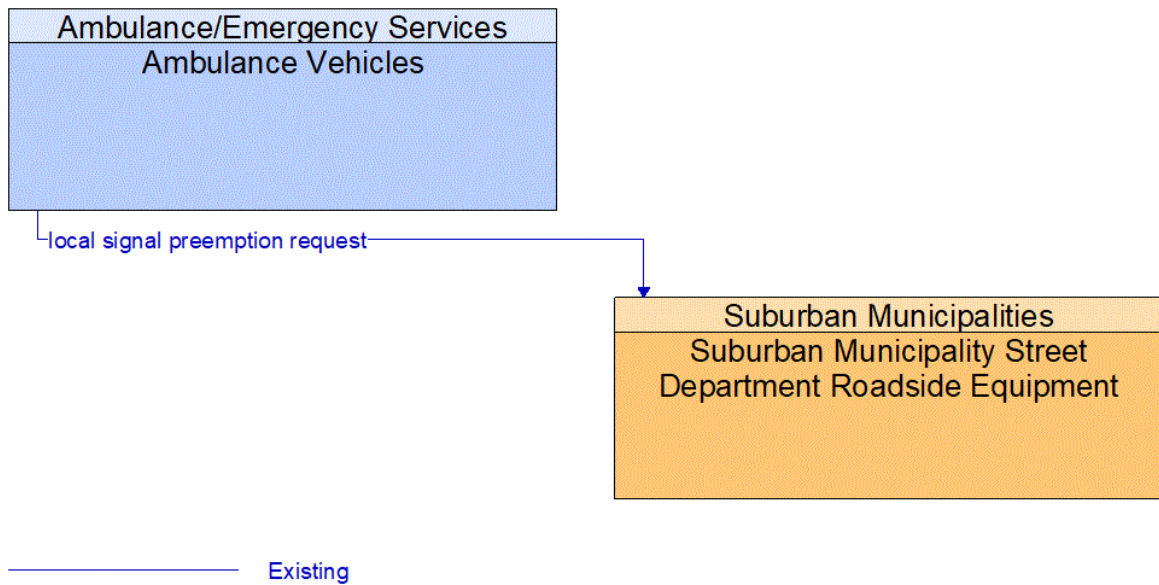


Figure 26: Ambulance Vehicles - Suburban Municipality Street Department Roadside Equipment Interface

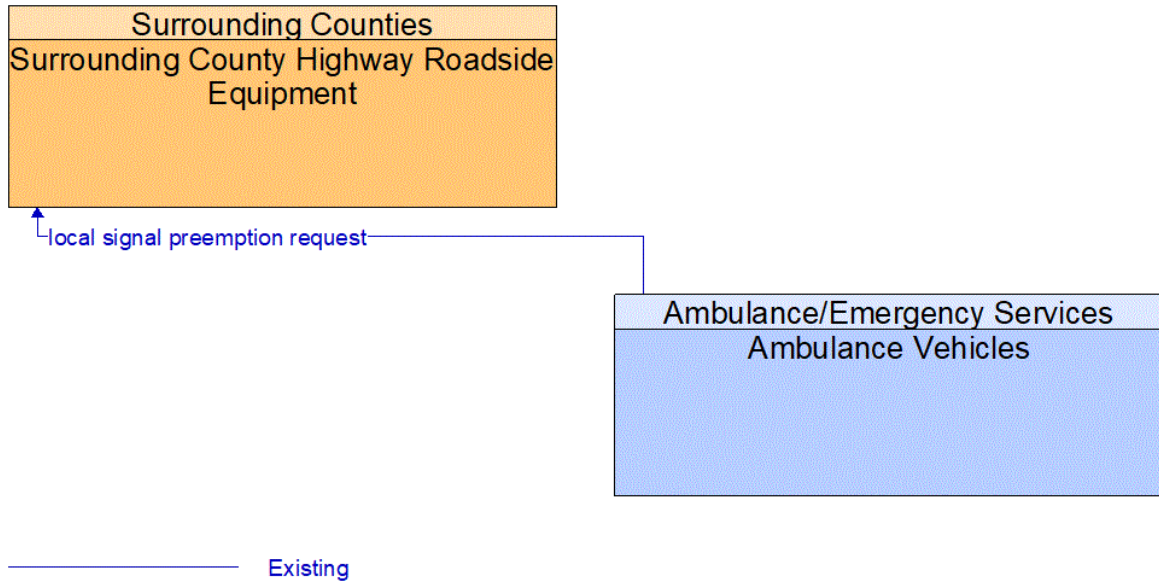


Figure 27: Ambulance Vehicles - Surrounding County Highway Roadside Equipment Interface

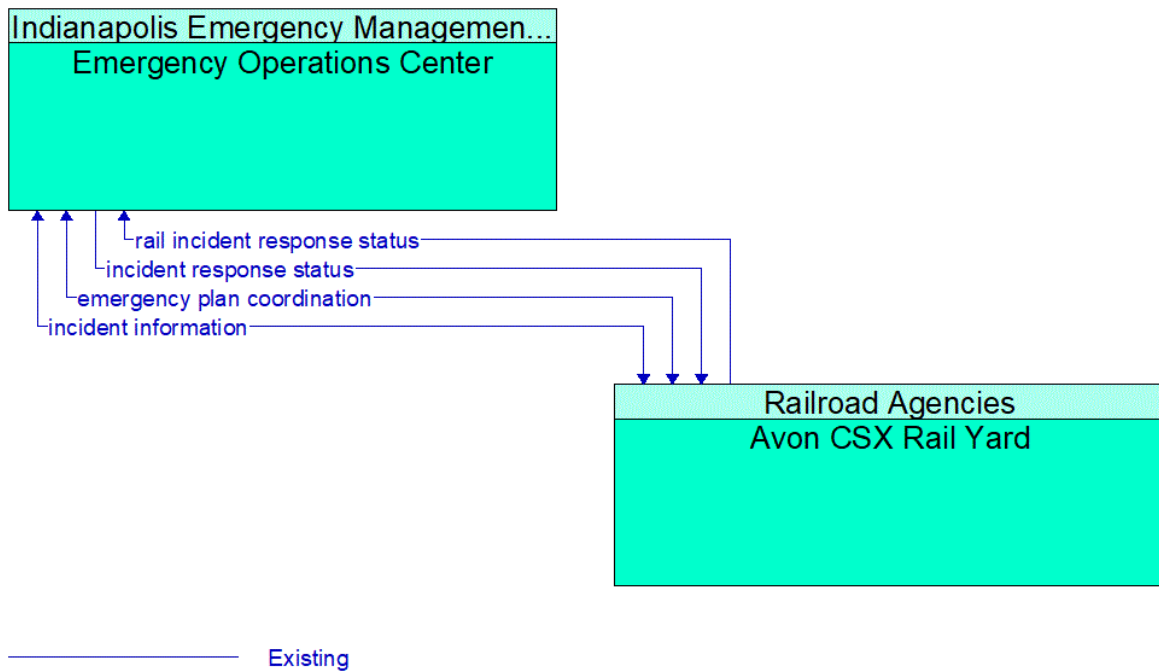


Figure 28: Avon CSX Rail Yard - Emergency Operations Center Interface

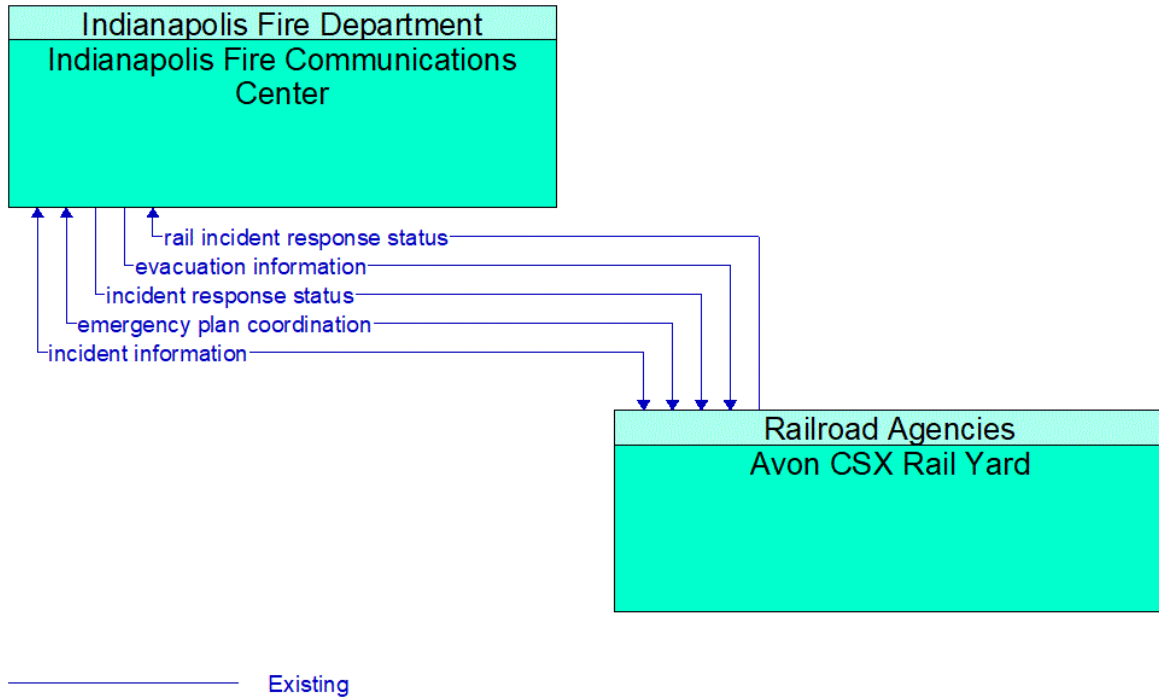


Figure 29: Avon CSX Rail Yard - Indianapolis Fire Communications Center Interface

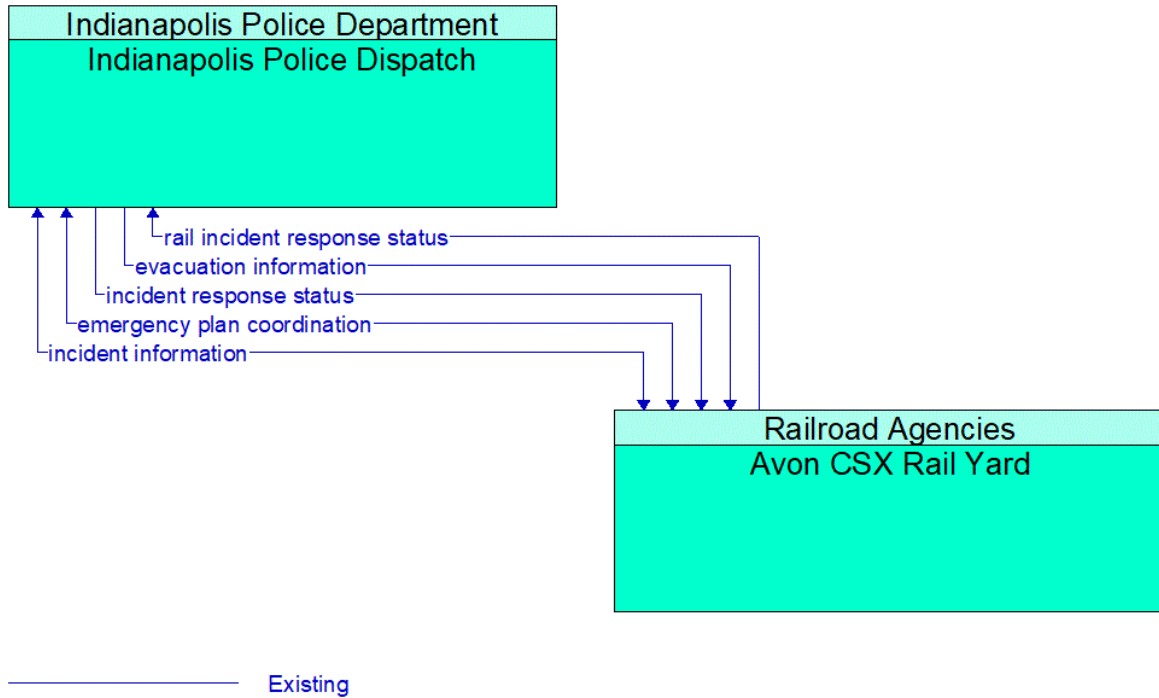


Figure 30: Avon CSX Rail Yard - Indianapolis Police Dispatch Interface

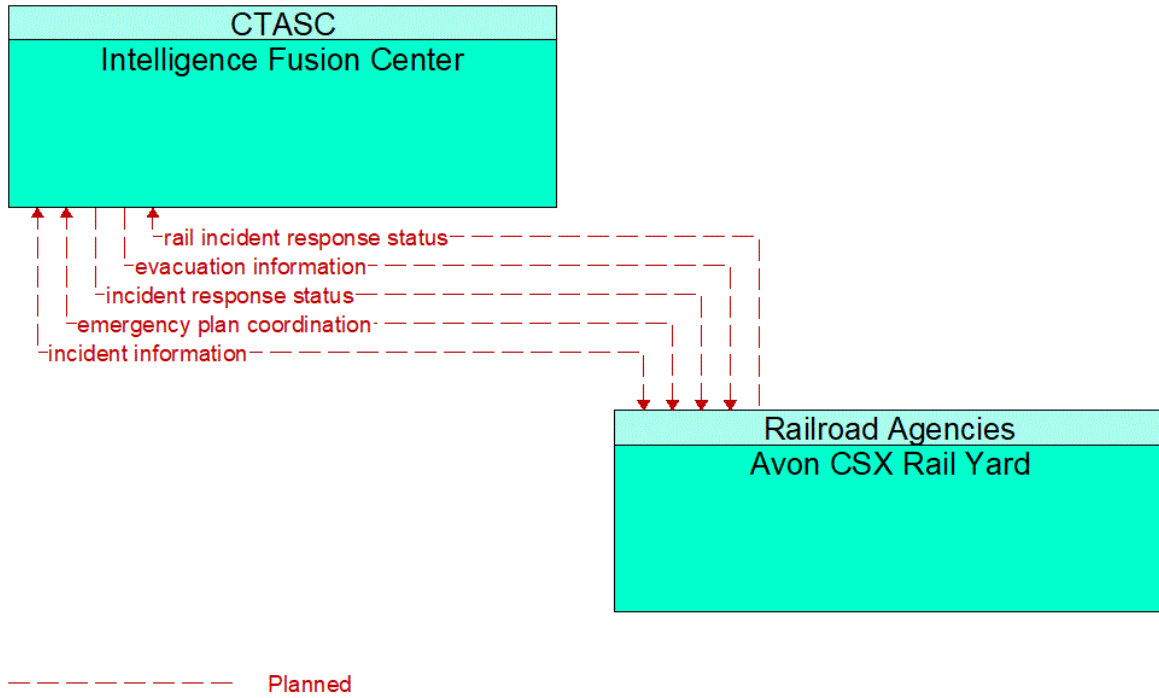


Figure 31: Avon CSX Rail Yard - Intelligence Fusion Center Interface

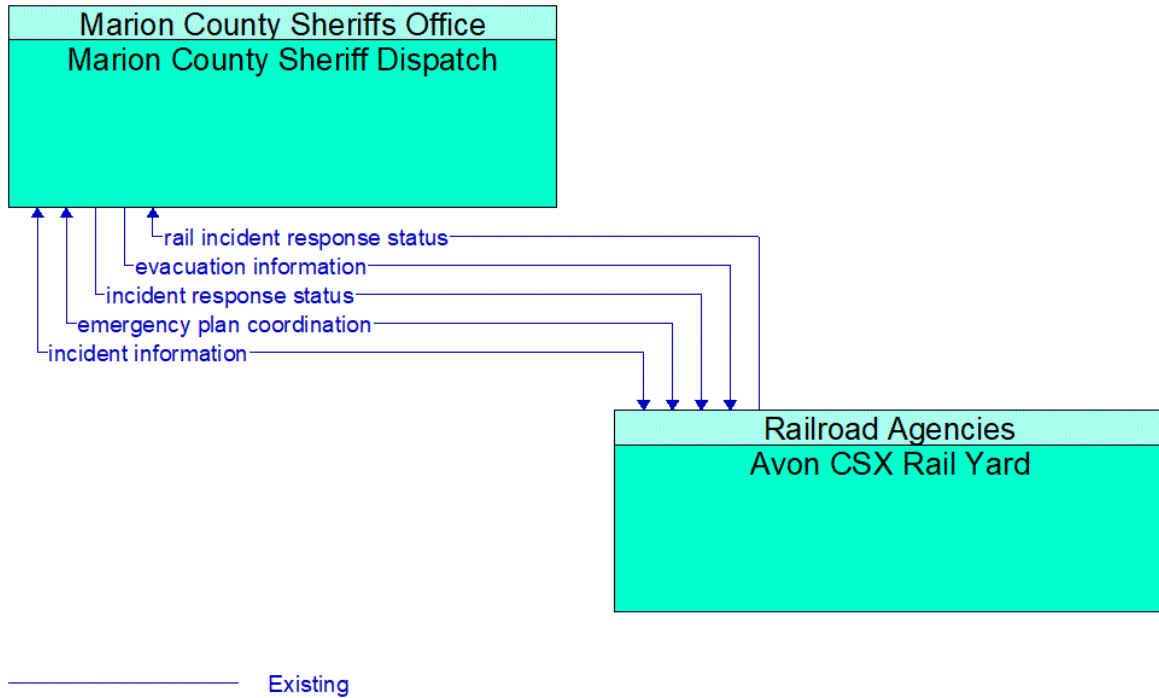


Figure 32: Avon CSX Rail Yard - Marion County Sheriff Dispatch Interface

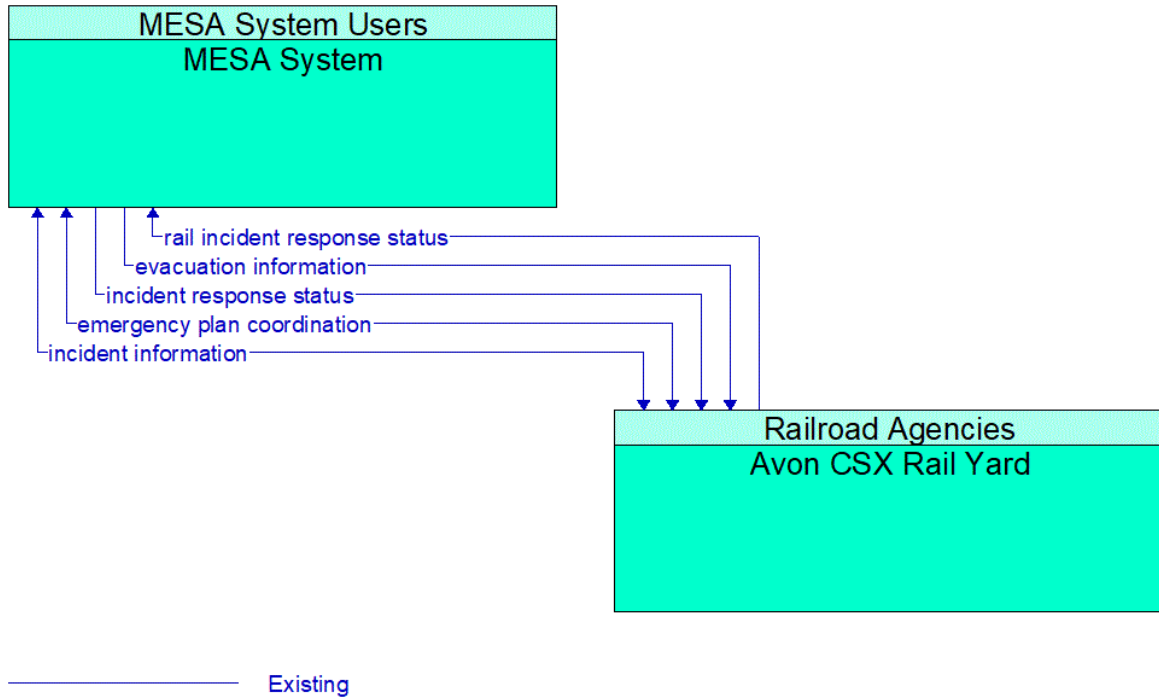


Figure 33: Avon CSX Rail Yard - MESA System Interface

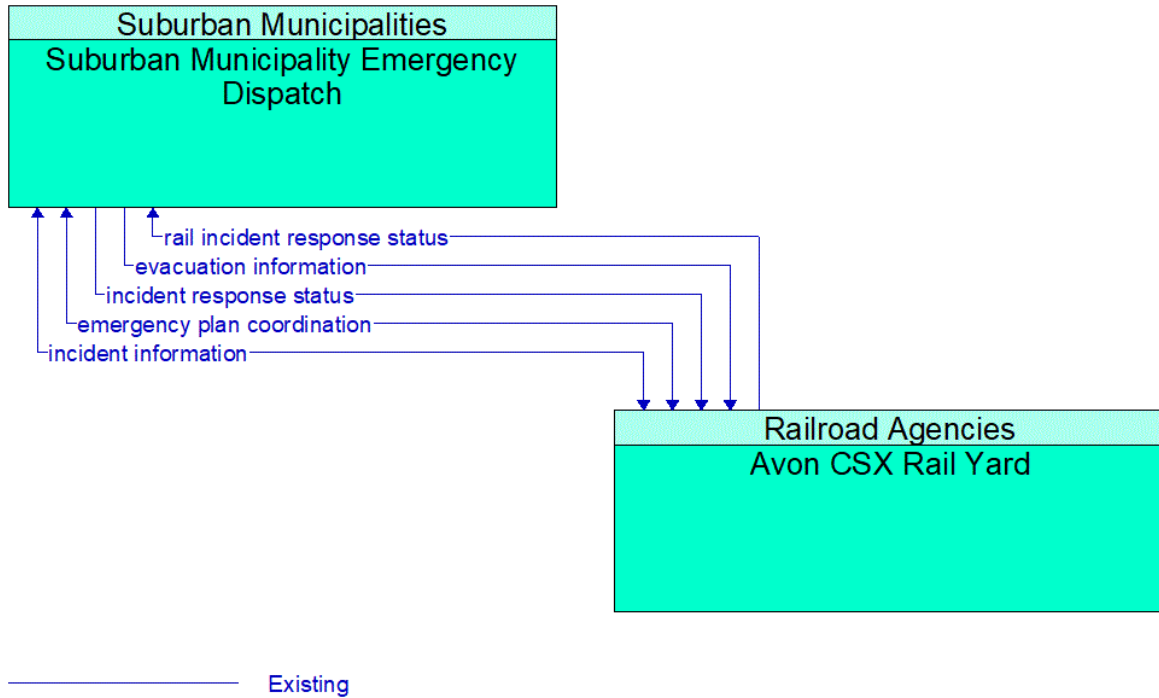


Figure 34: Avon CSX Rail Yard - Suburban Municipality Emergency Dispatch Interface

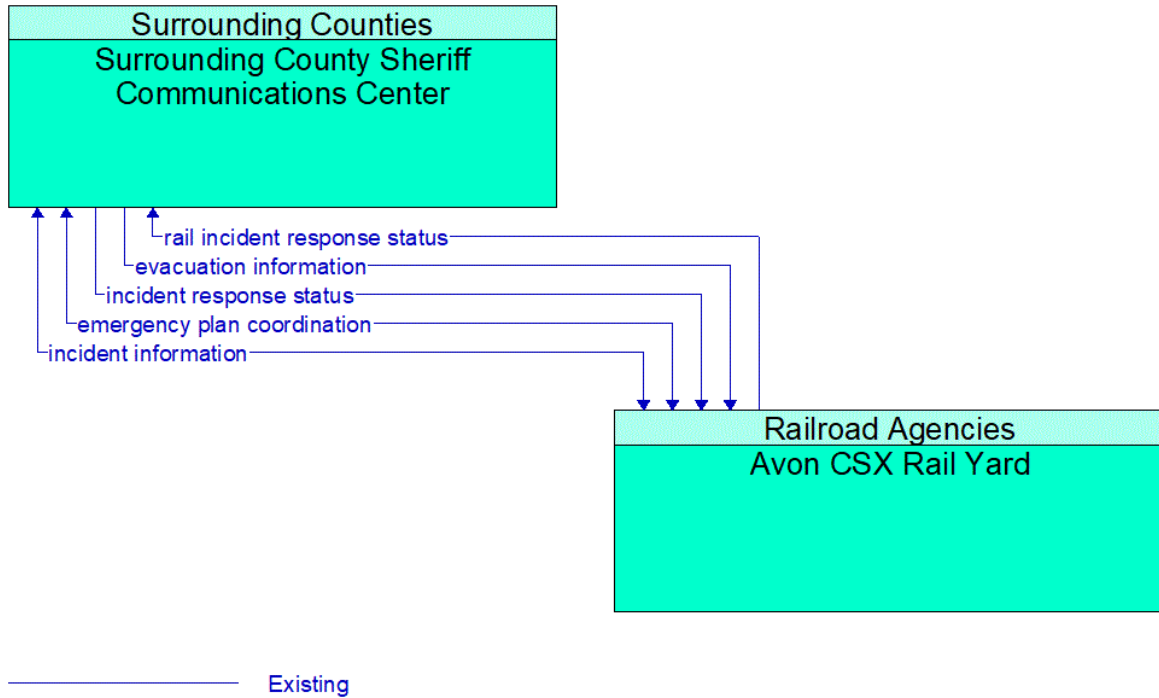


Figure 35: Avon CSX Rail Yard - Surrounding County Sheriff Communications Center Interface

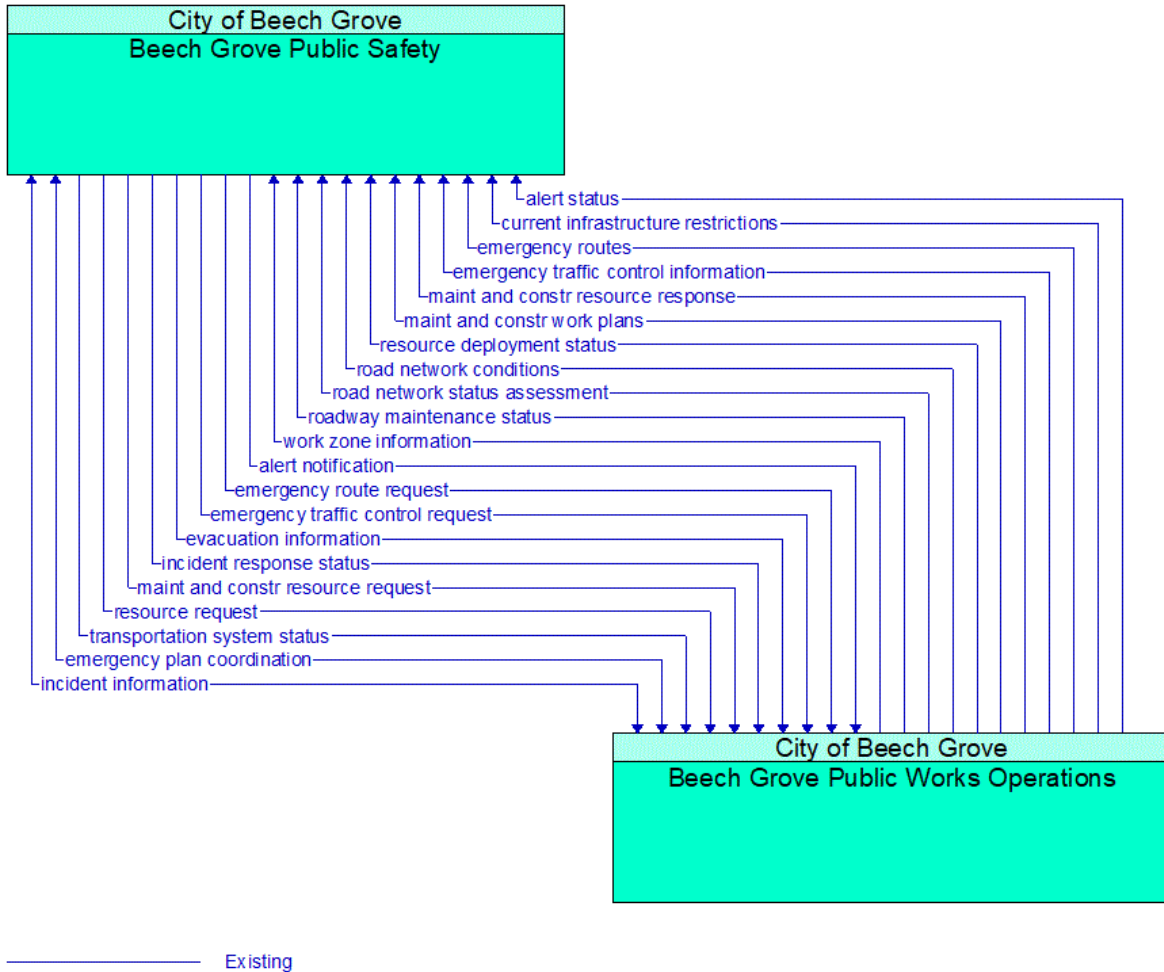


Figure 36: Beech Grove Public Safety - Beech Grove Public Works Operations Interface

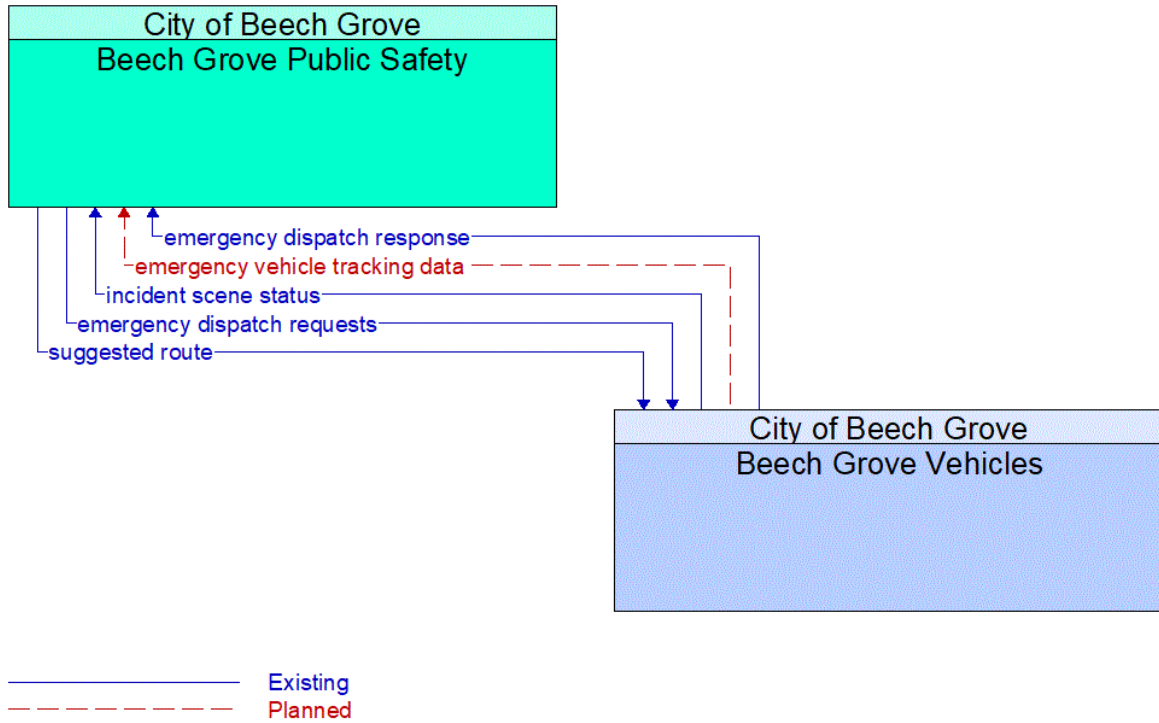


Figure 37: Beech Grove Public Safety - Beech Grove Vehicles Interface

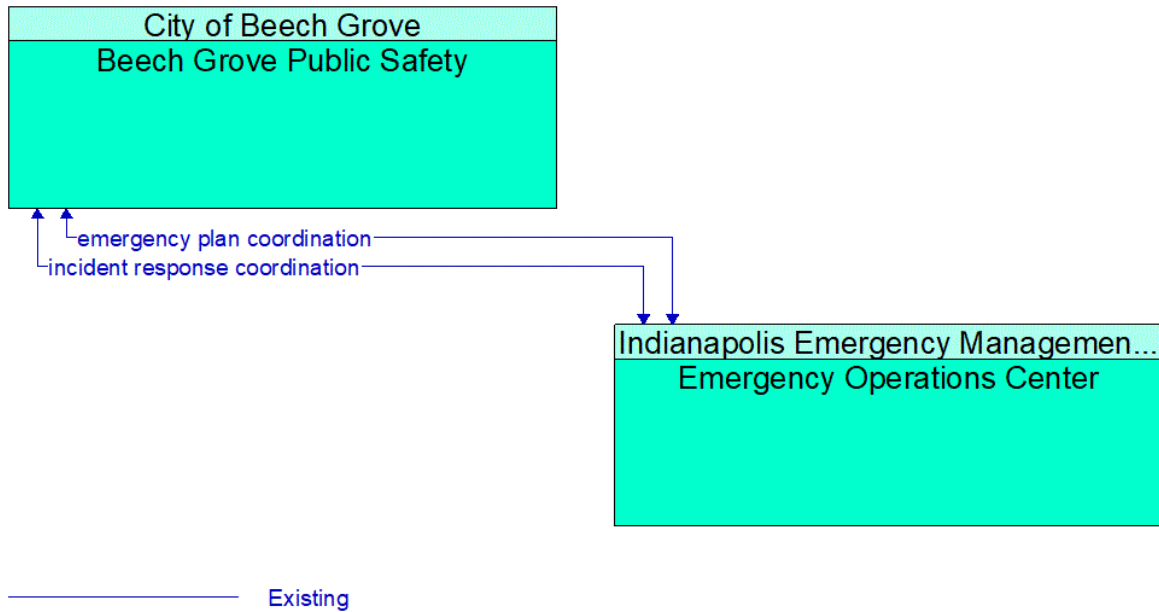


Figure 38: Beech Grove Public Safety - Emergency Operations Center Interface

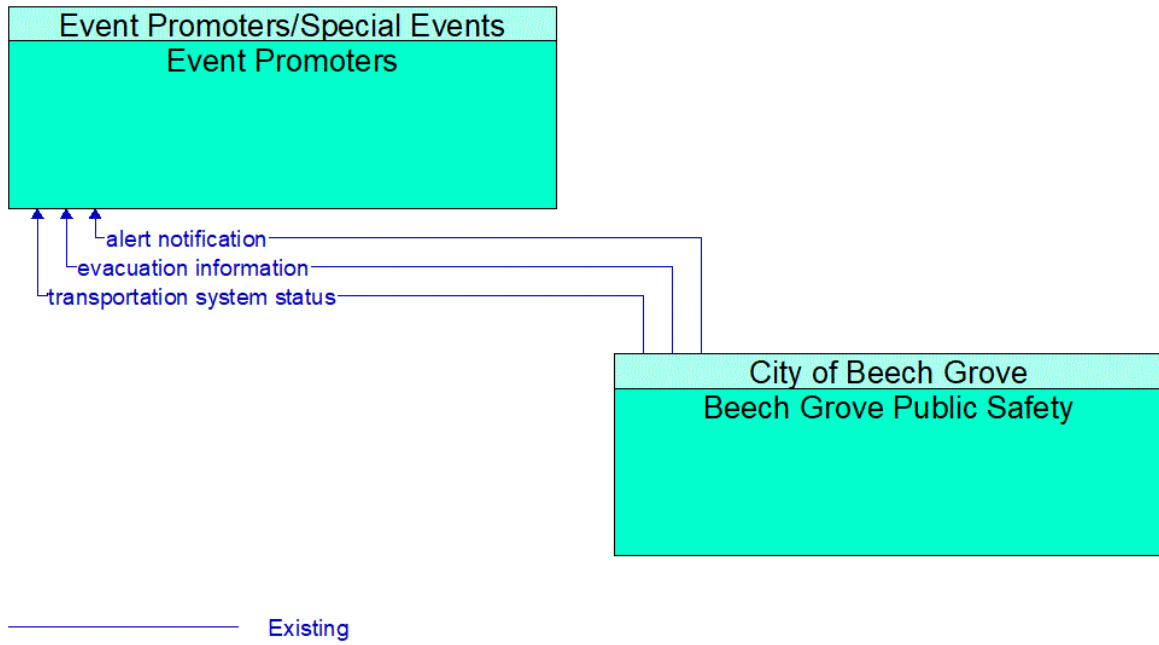


Figure 39: Beech Grove Public Safety - Event Promoters Interface

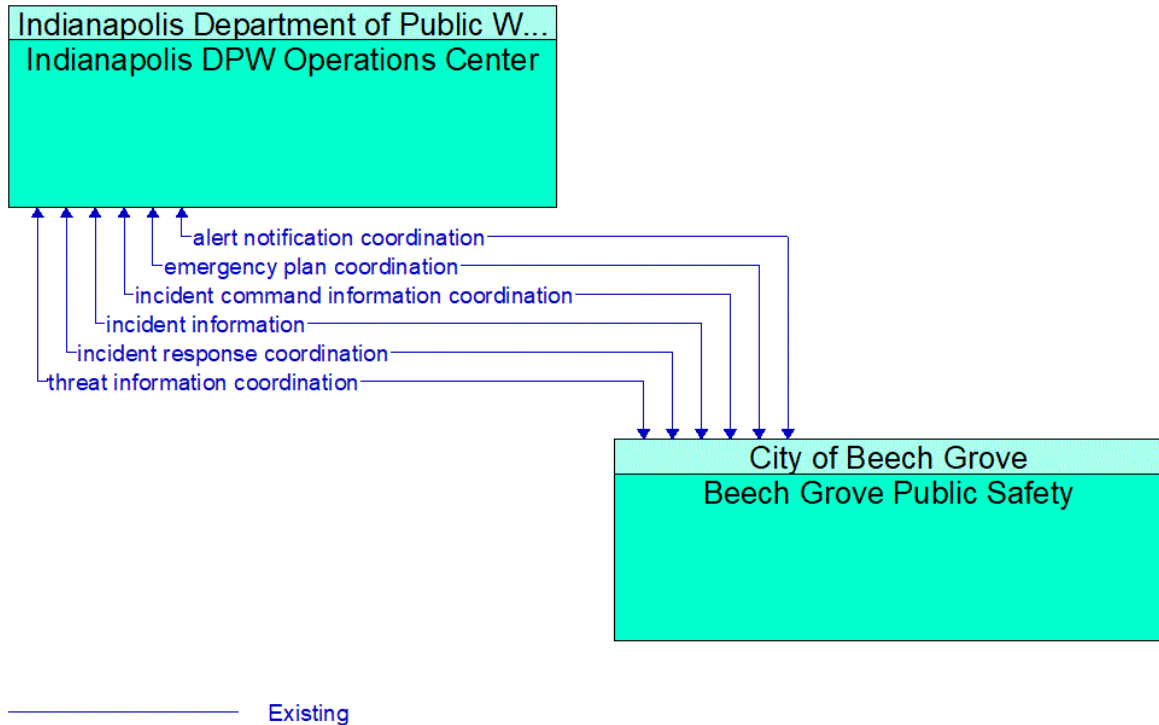


Figure 40: Beech Grove Public Safety - Indianapolis DPW Operations Center Interface

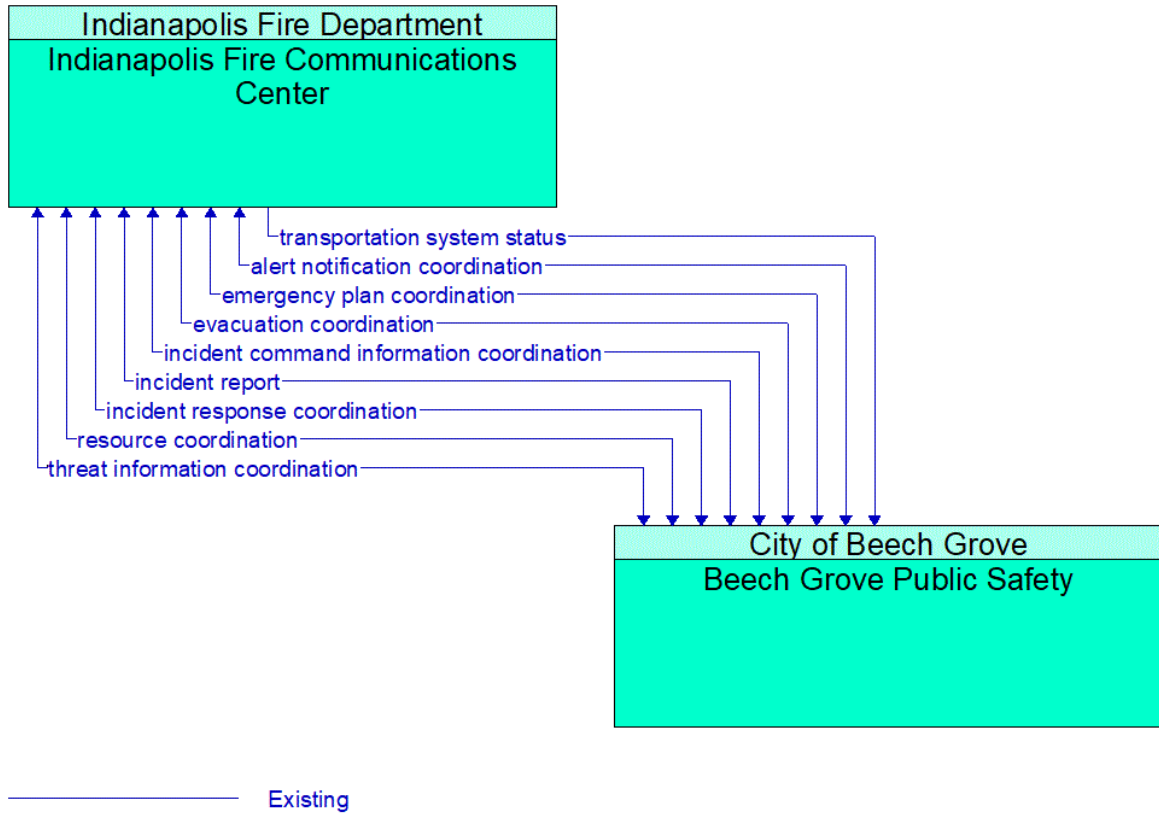
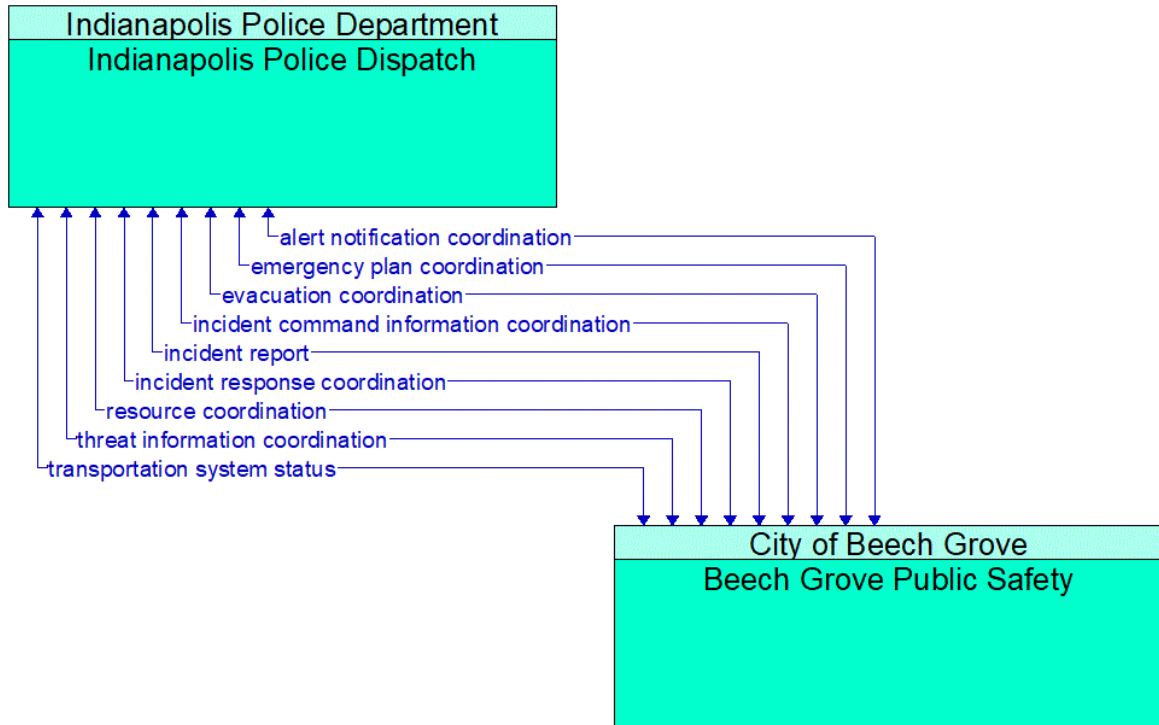


Figure 41: Beech Grove Public Safety - Indianapolis Fire Communications Center Interface



Existing

Figure 42: Beech Grove Public Safety - Indianapolis Police Dispatch Interface

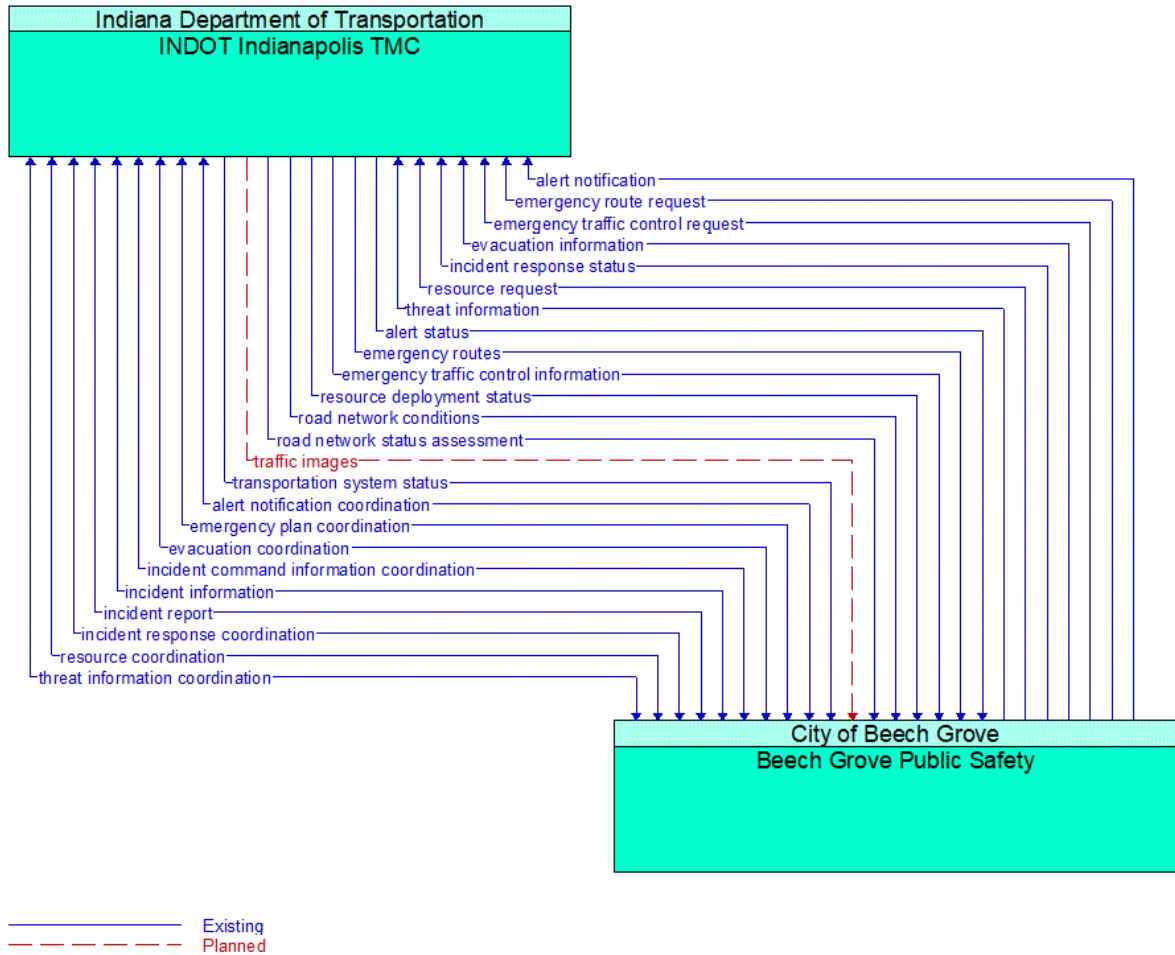


Figure 43: Beech Grove Public Safety - INDOT Indianapolis TMC Interface

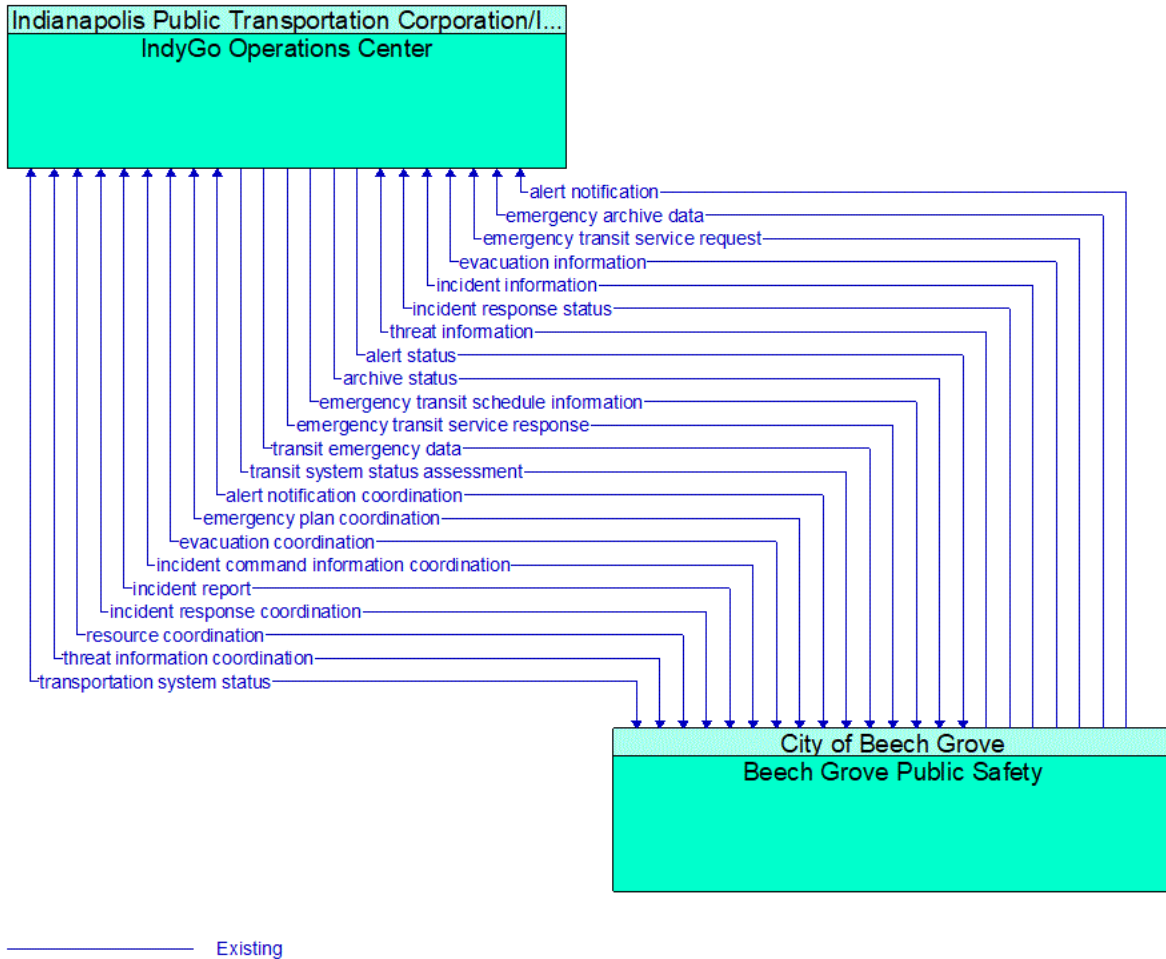


Figure 44: Beech Grove Public Safety - IndyGo Operations Center Interface

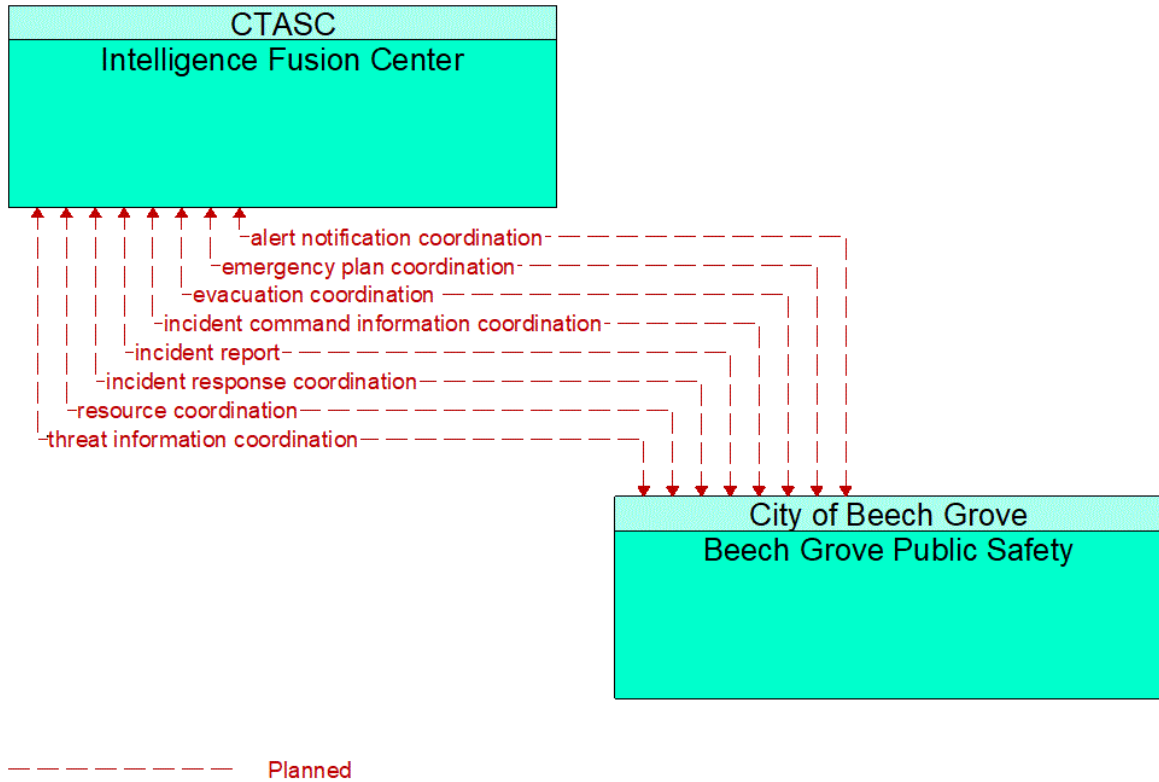


Figure 45: Beech Grove Public Safety - Intelligence Fusion Center Interface

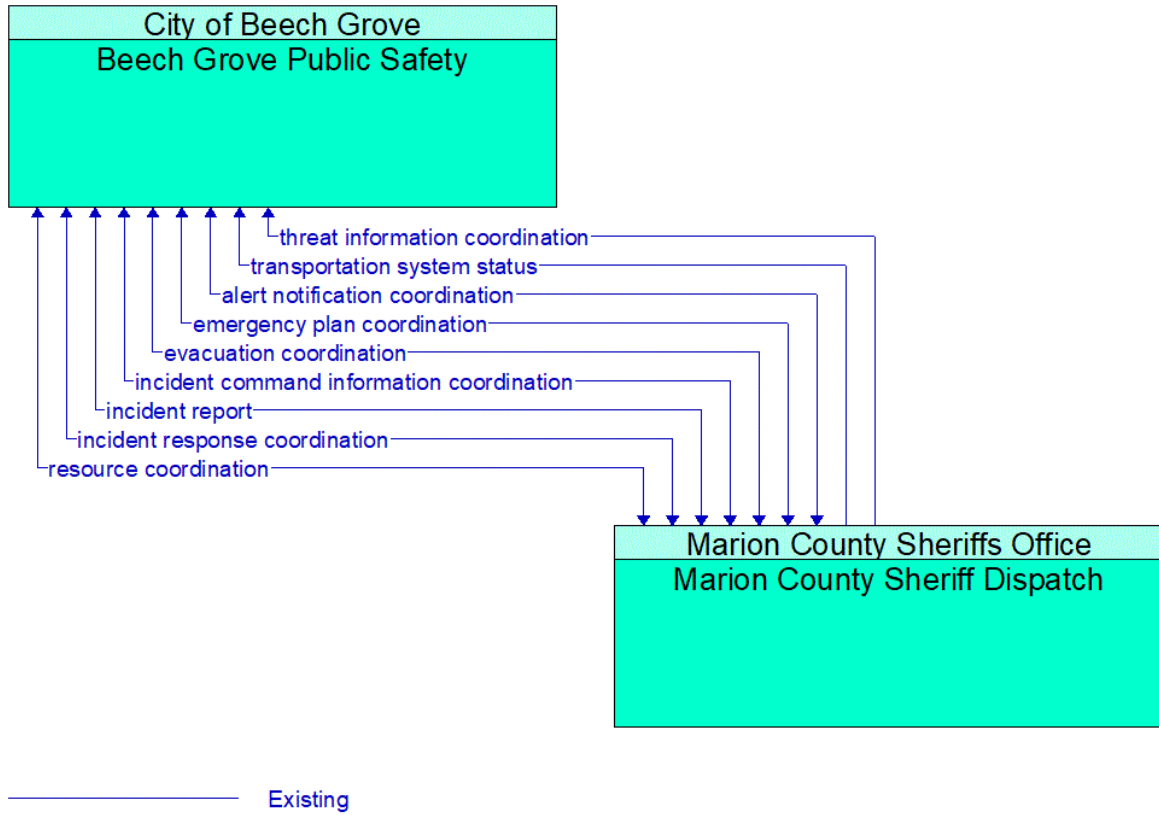


Figure 46: Beech Grove Public Safety - Marion County Sheriff Dispatch Interface

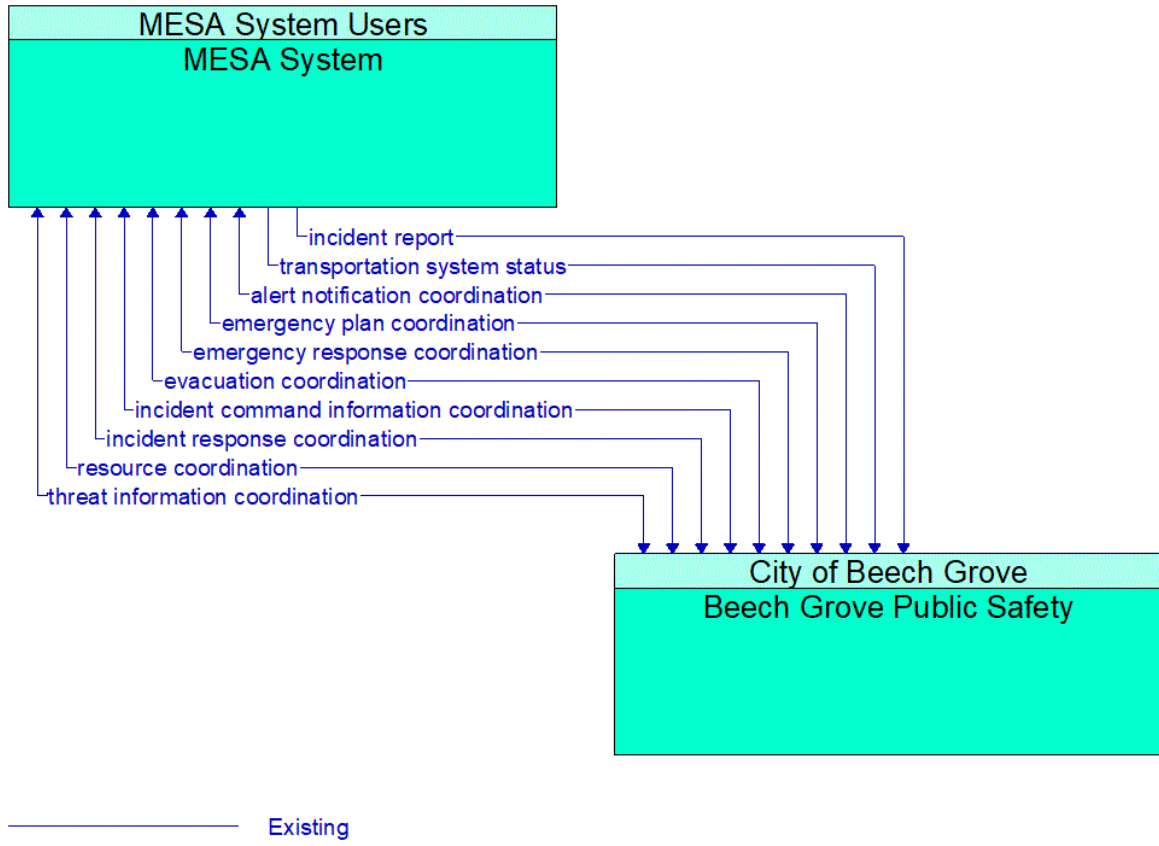


Figure 47: Beech Grove Public Safety - MESA System Interface

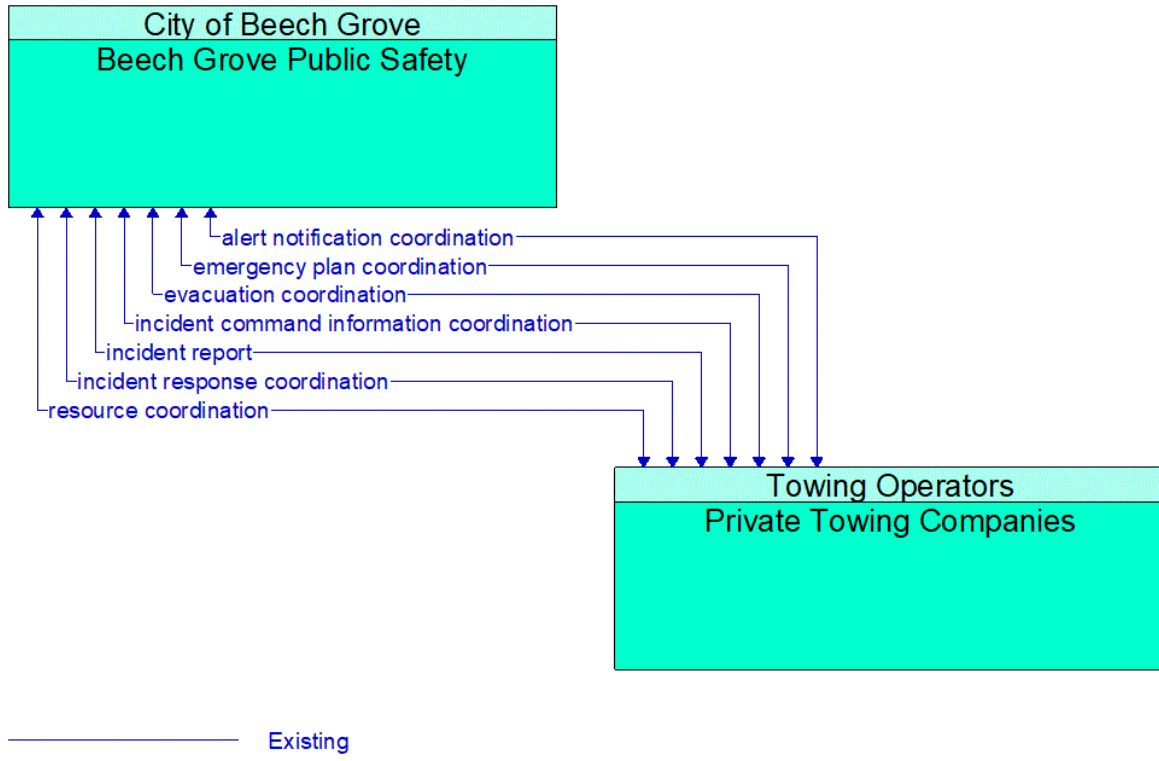
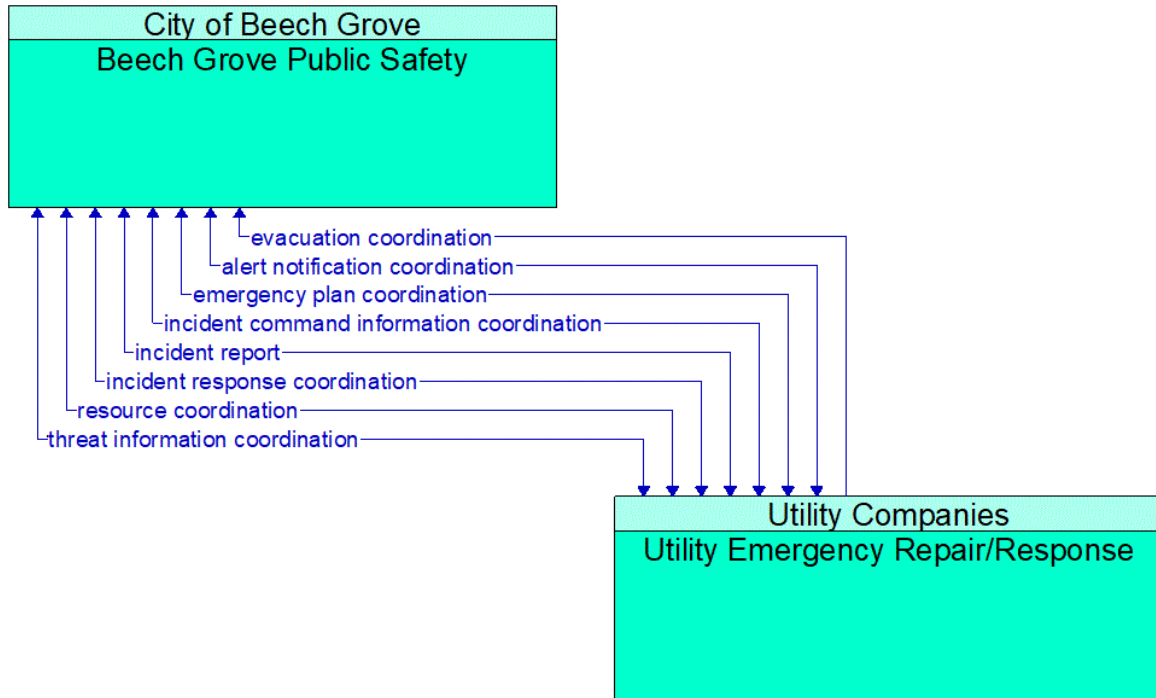
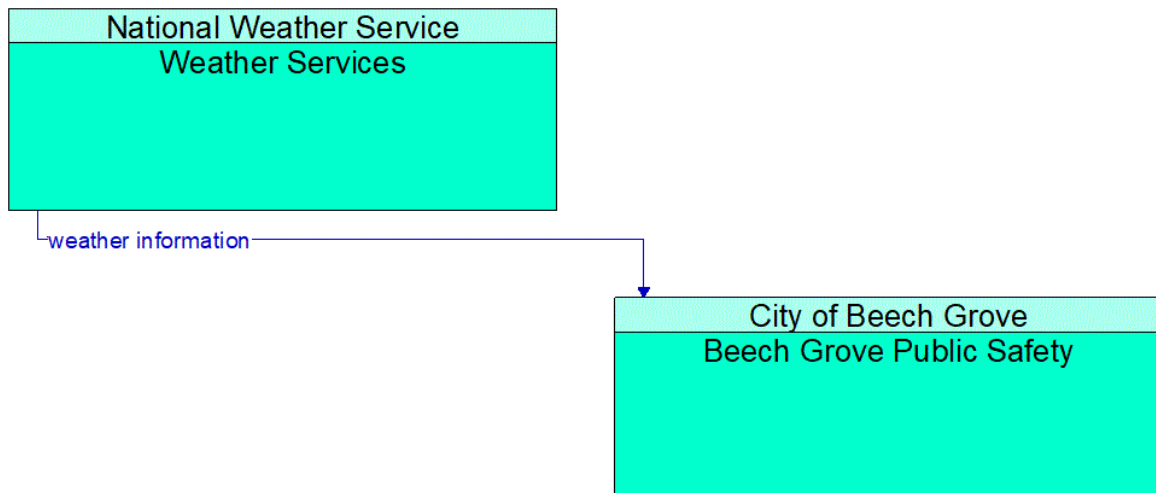


Figure 48: Beech Grove Public Safety - Private Towing Companies Interface



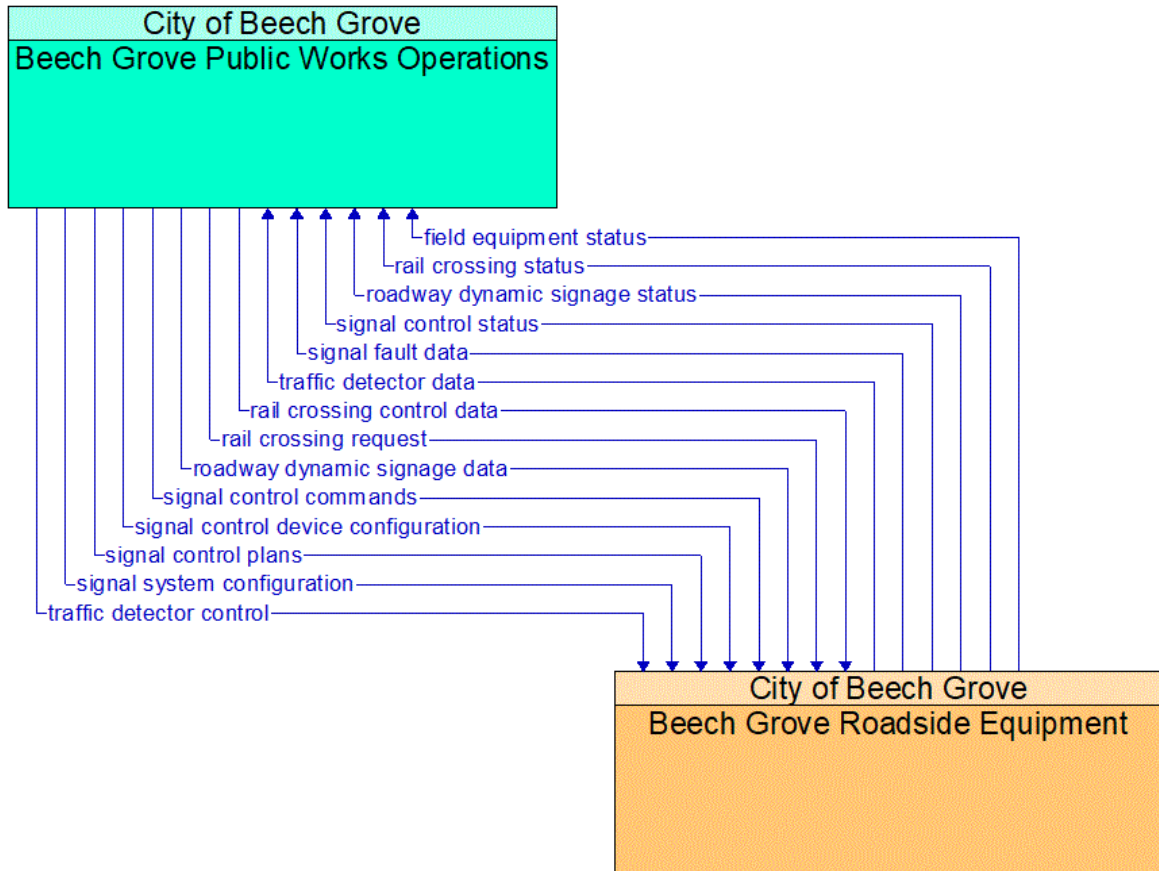
Existing

Figure 49: Beech Grove Public Safety - Utility Emergency Repair/Response Interface



Existing

Figure 50: Beech Grove Public Safety - Weather Services Interface



Existing

Figure 51: Beech Grove Public Works Operations - Beech Grove Roadside Equipment Interface

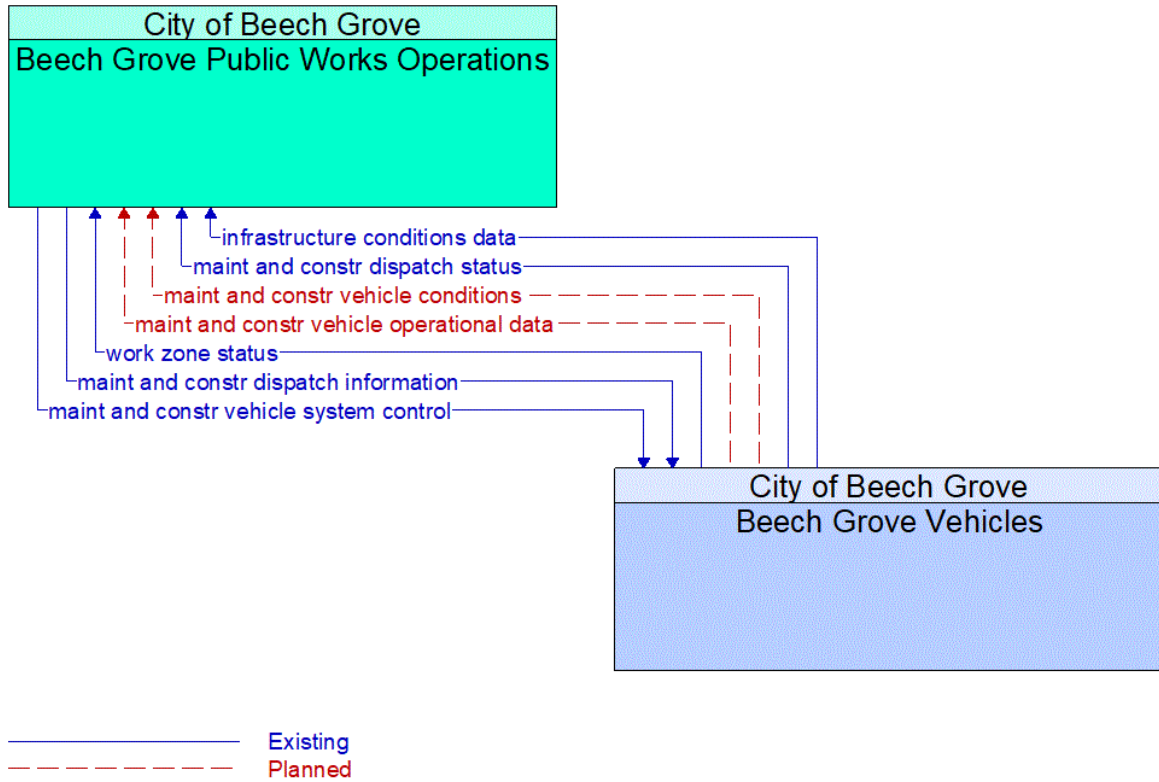


Figure 52: Beech Grove Public Works Operations - Beech Grove Vehicles Interface

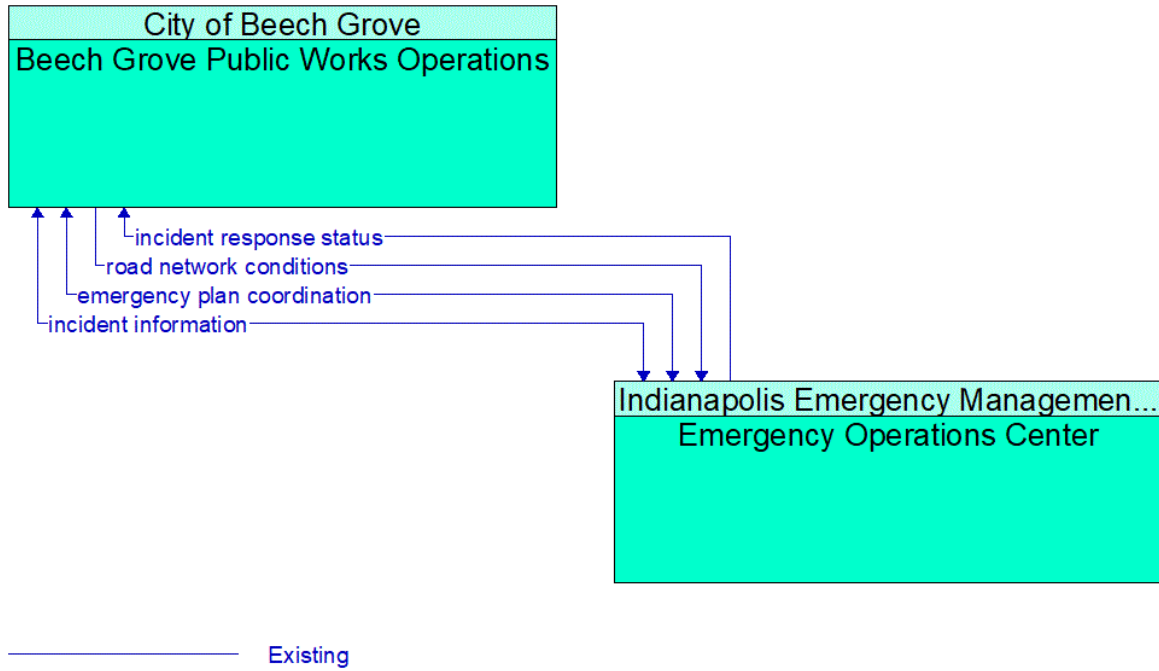


Figure 53: Beech Grove Public Works Operations - Emergency Operations Center Interface

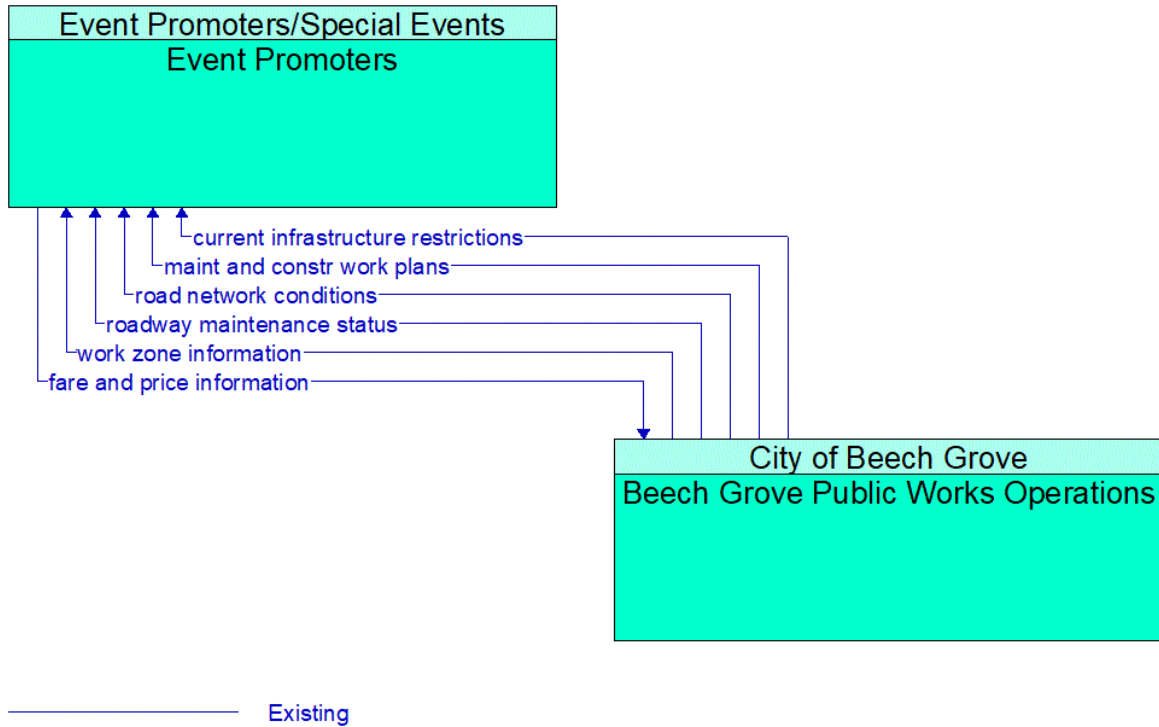


Figure 54: Beech Grove Public Works Operations - Event Promoters Interface

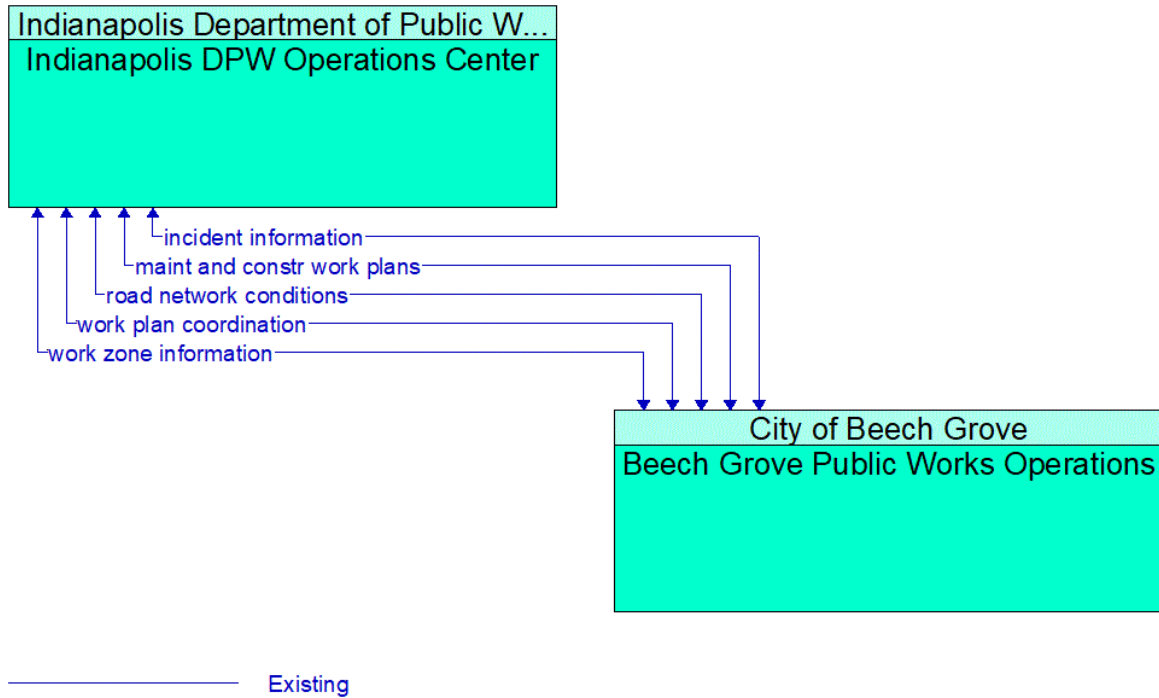


Figure 55: Beech Grove Public Works Operations - Indianapolis DPW Operations Center Interface

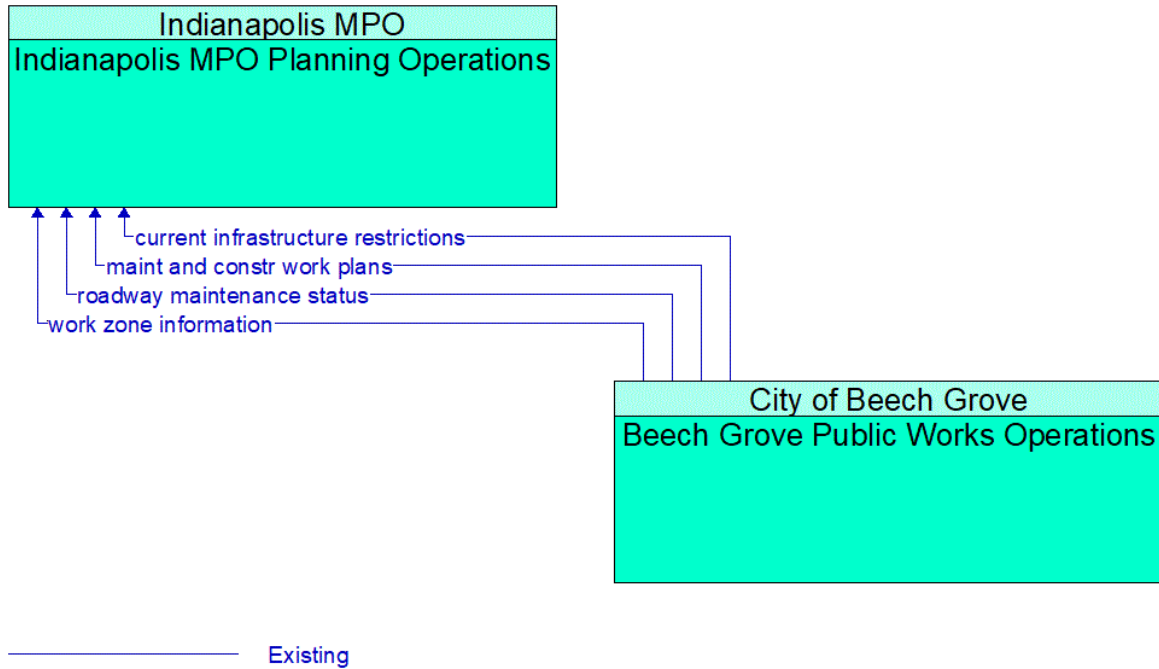


Figure 56: Beech Grove Public Works Operations - Indianapolis MPO Planning Operations Interface

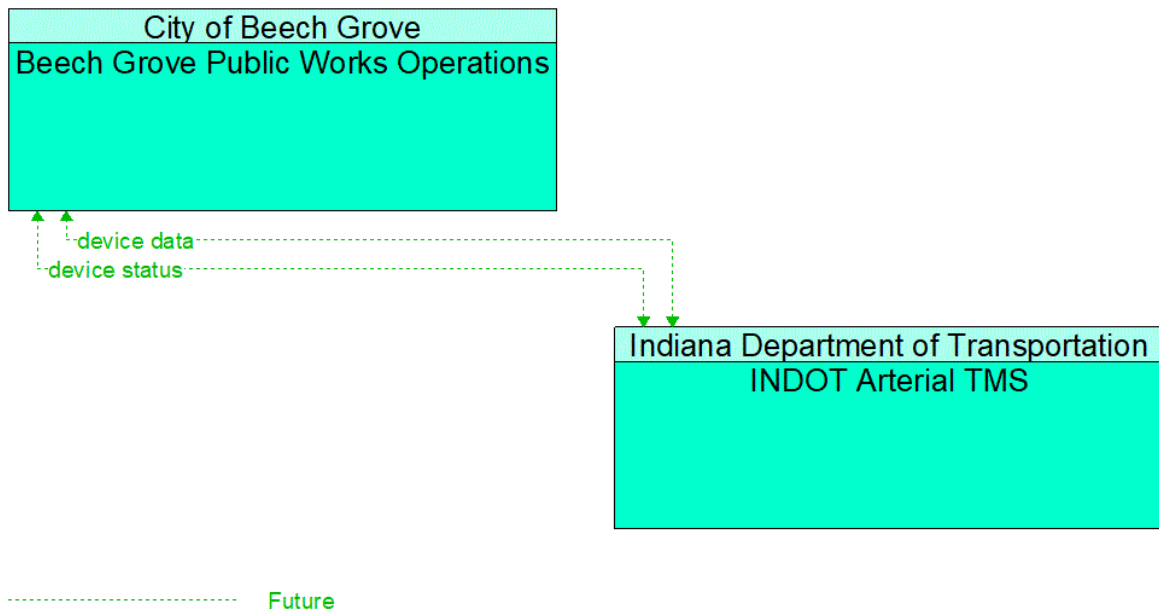


Figure 57: Beech Grove Public Works Operations - INDOT Arterial TMS Interface

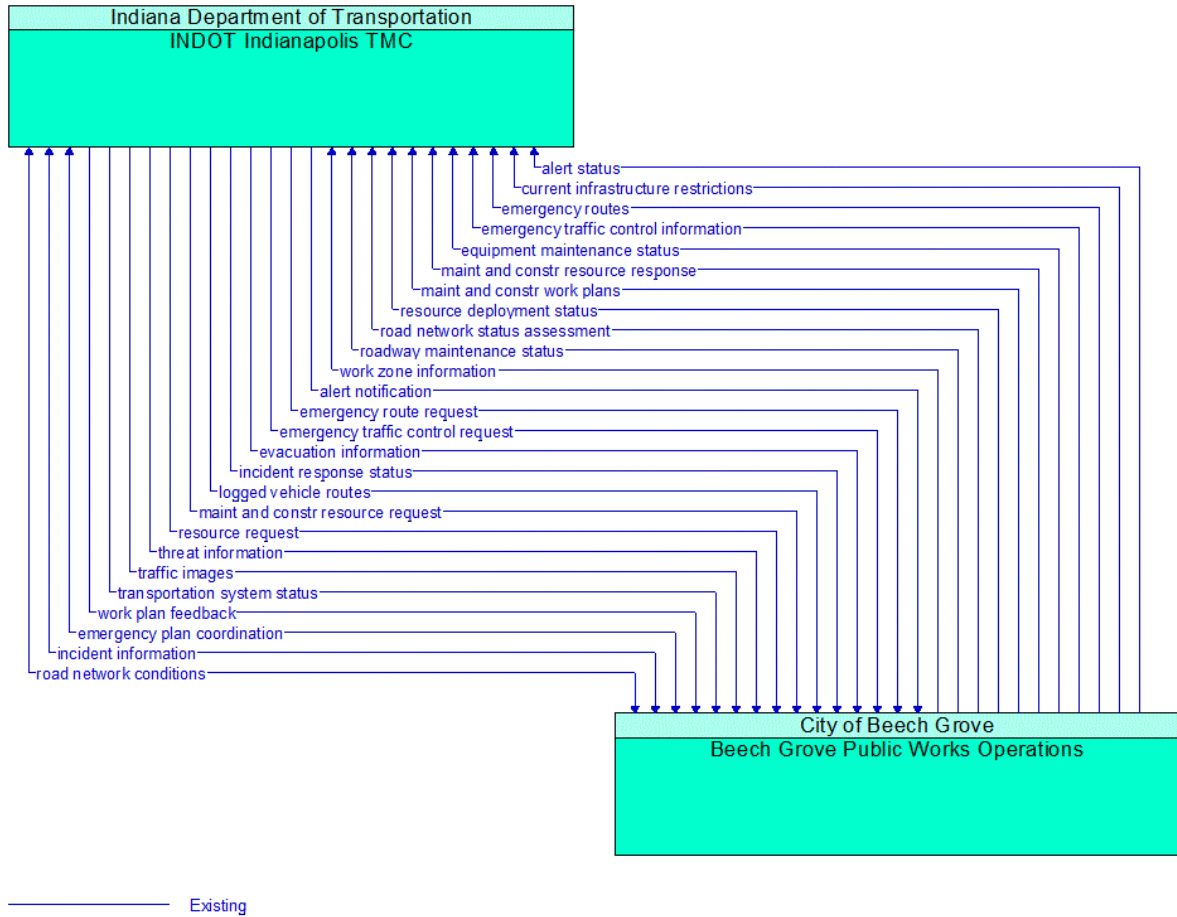


Figure 58: Beech Grove Public Works Operations - INDOT Indianapolis TMC Interface

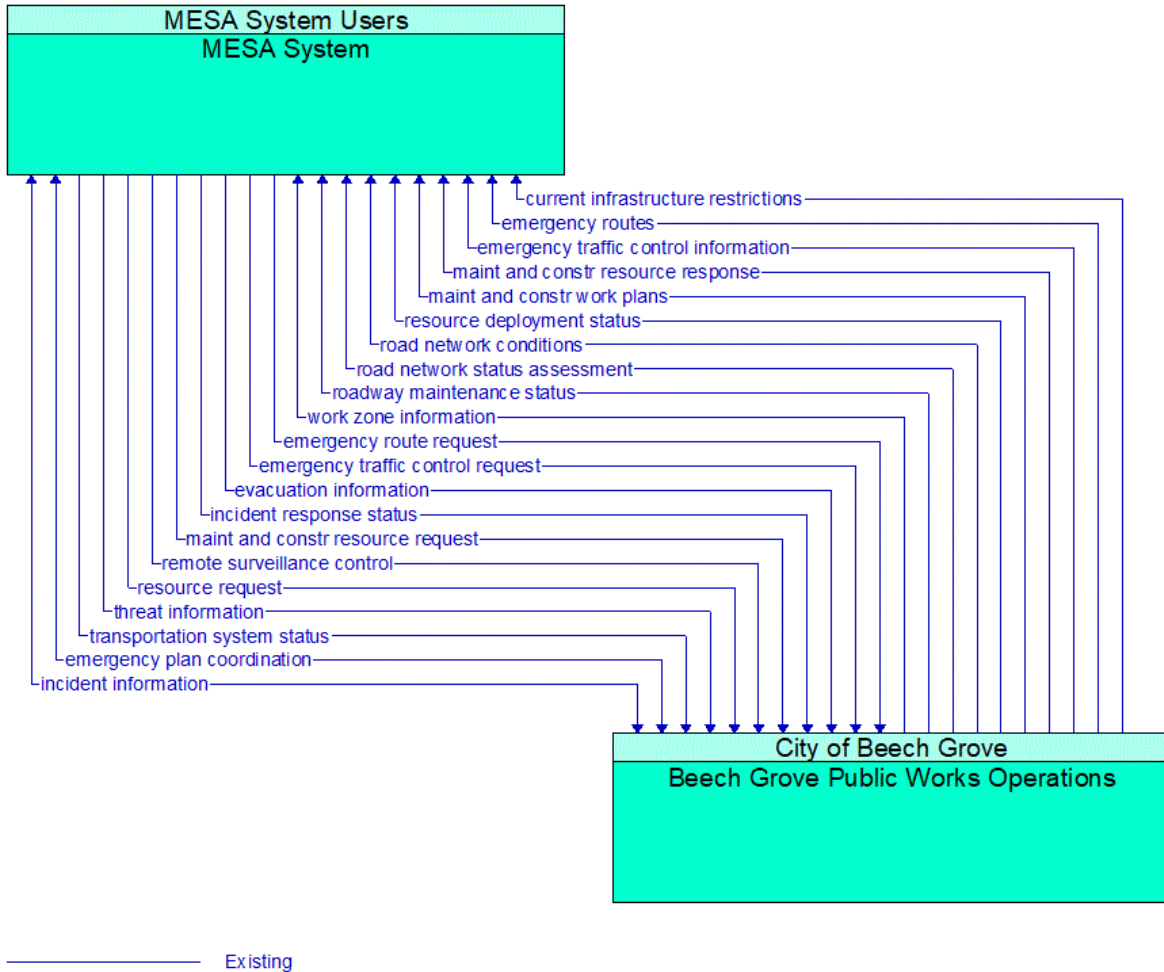
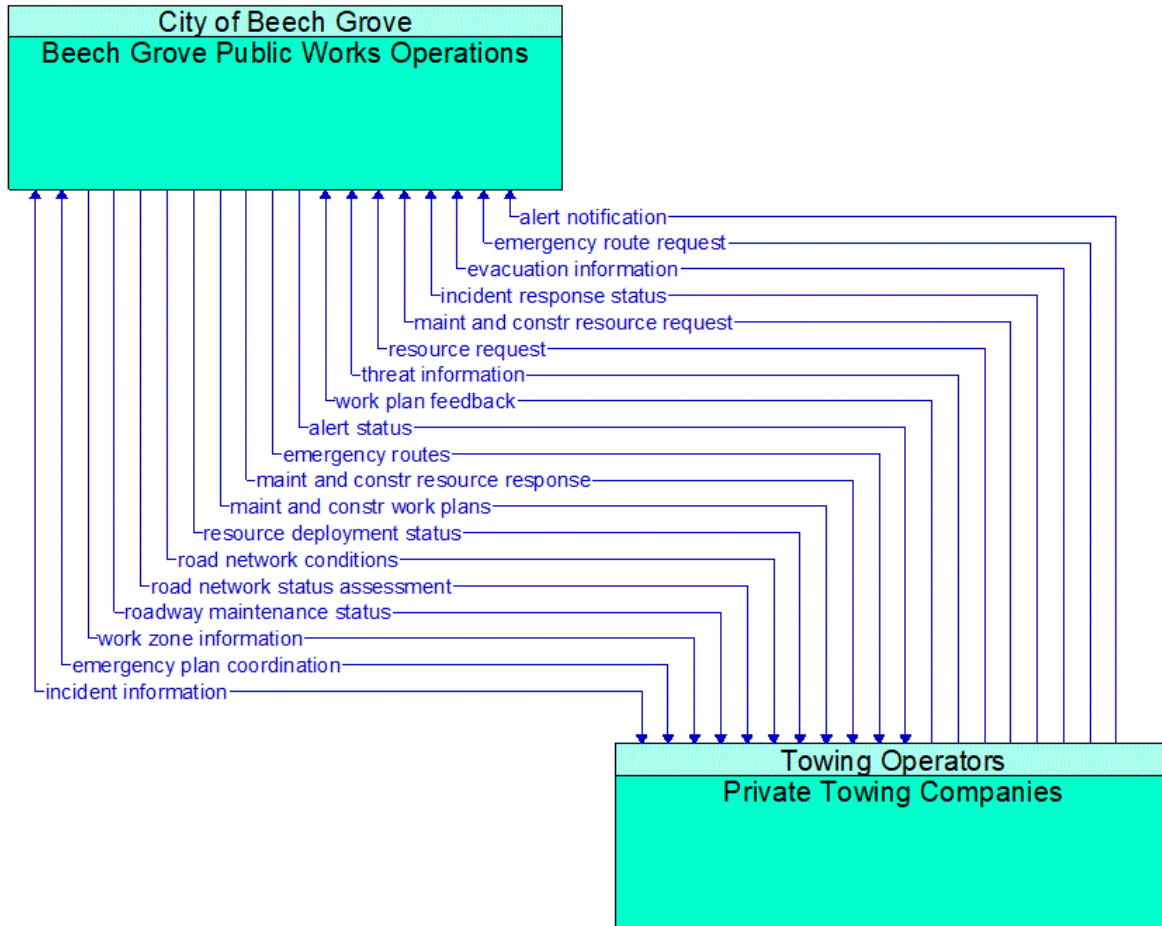


Figure 59: Beech Grove Public Works Operations - MESA System Interface



Existing

Figure 60: Beech Grove Public Works Operations - Private Towing Companies Interface

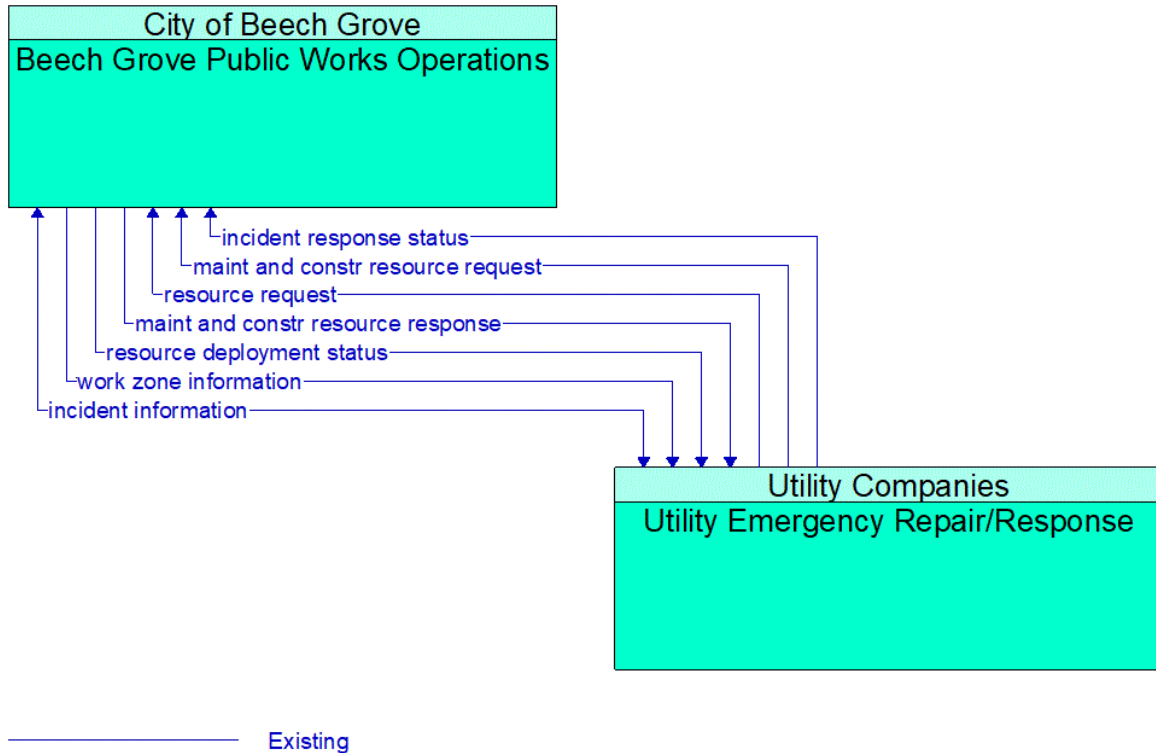


Figure 61: Beech Grove Public Works Operations - Utility Emergency Repair/Response Interface

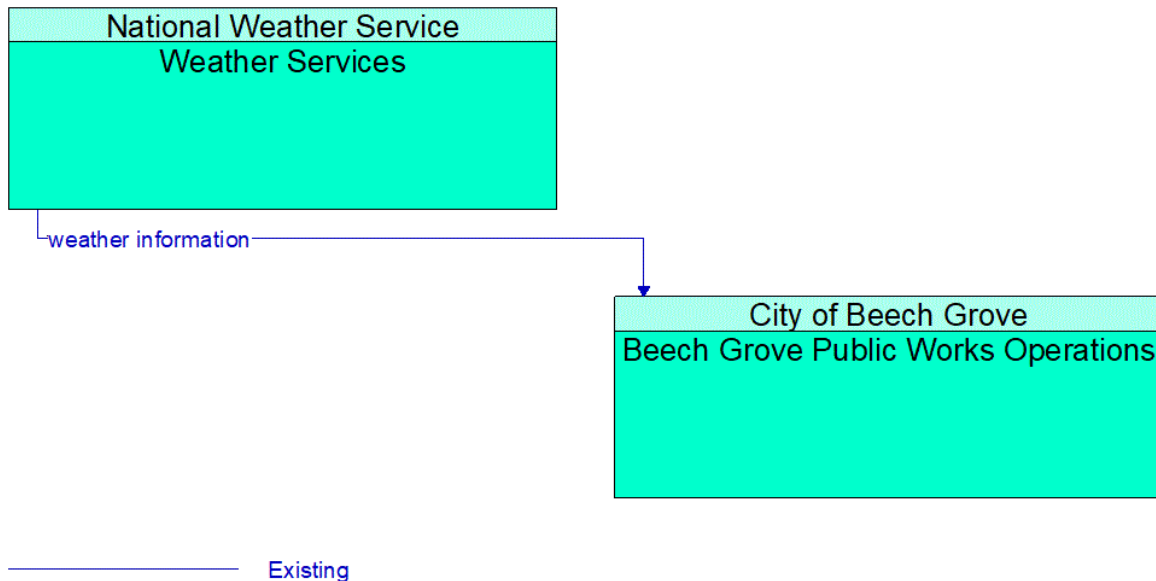


Figure 62: Beech Grove Public Works Operations - Weather Services Interface

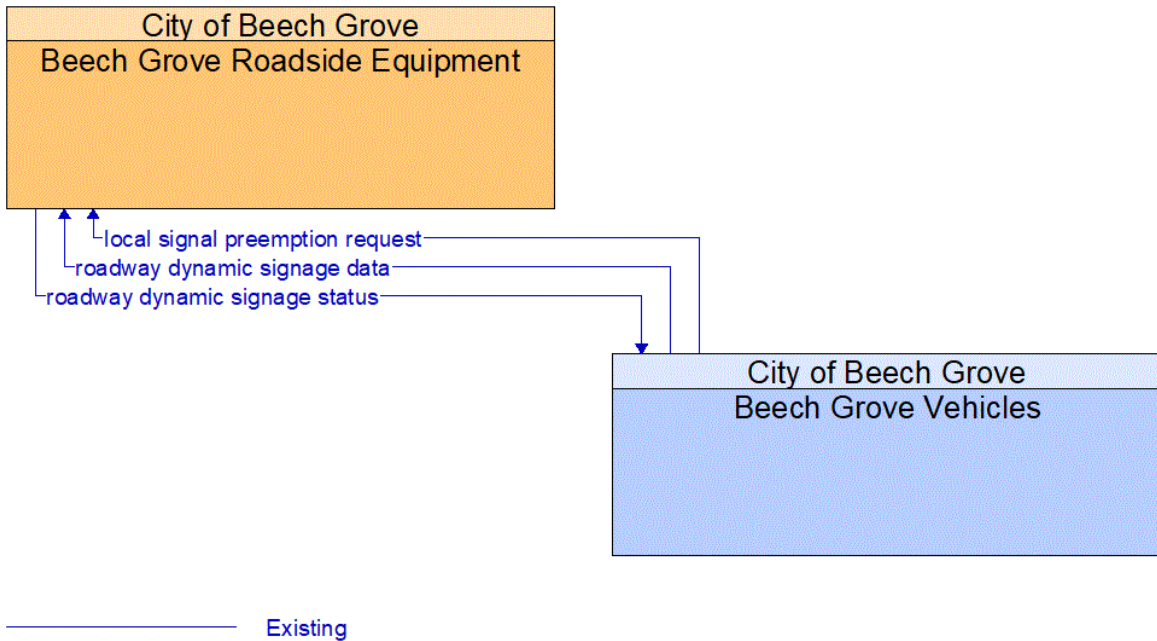


Figure 63: Beech Grove Roadside Equipment - Beech Grove Vehicles Interface

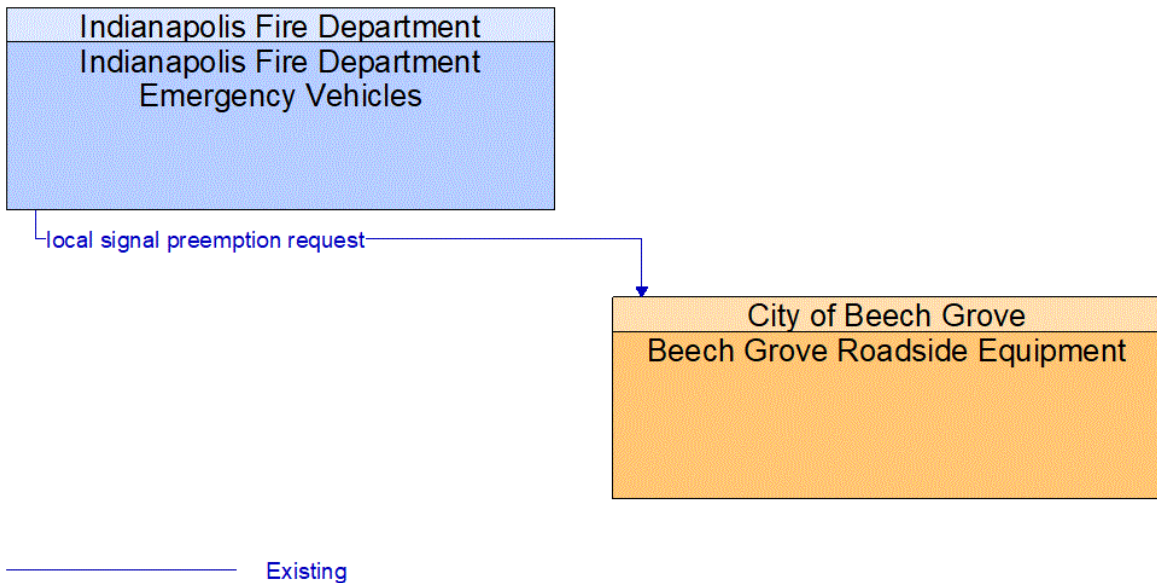


Figure 64: Beech Grove Roadside Equipment - Indianapolis Fire Department Emergency Vehicles Interface

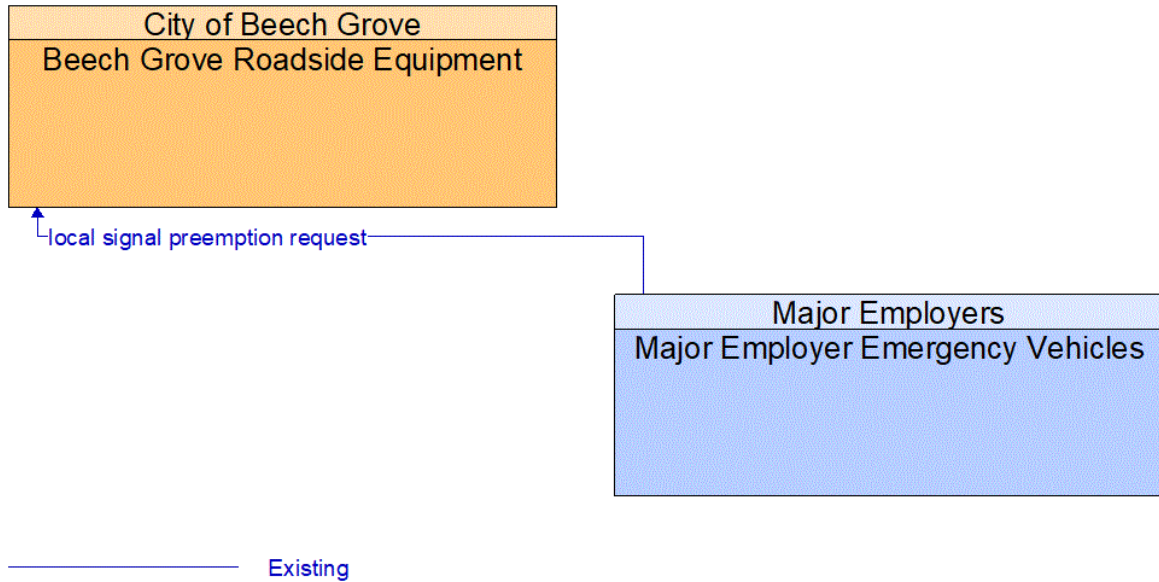


Figure 65: Beech Grove Roadside Equipment - Major Employer Emergency Vehicles Interface

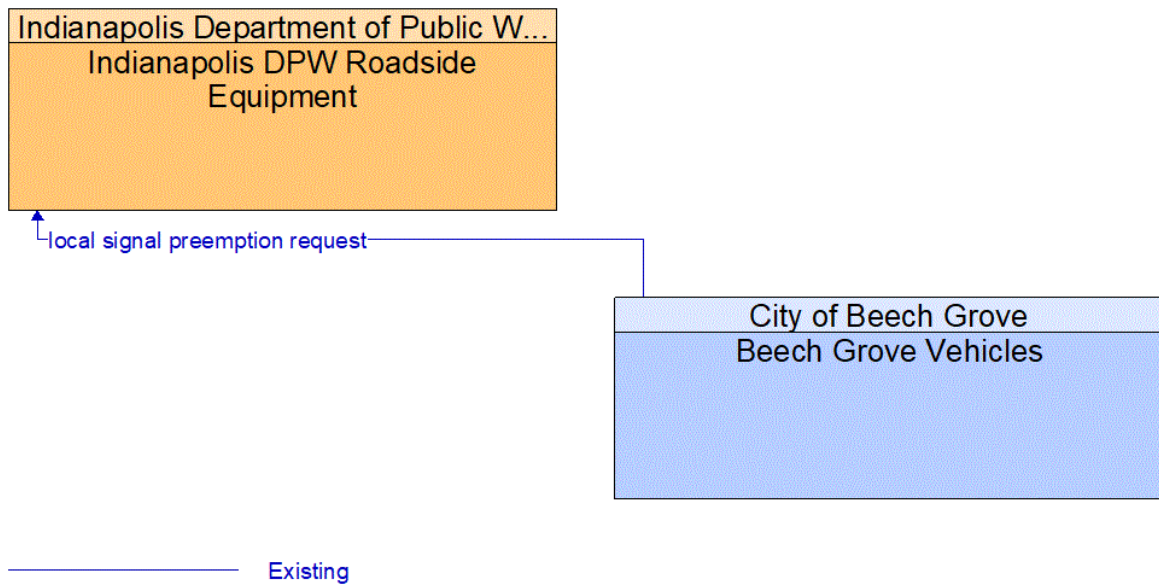


Figure 66: Beech Grove Vehicles - Indianapolis DPW Roadside Equipment Interface

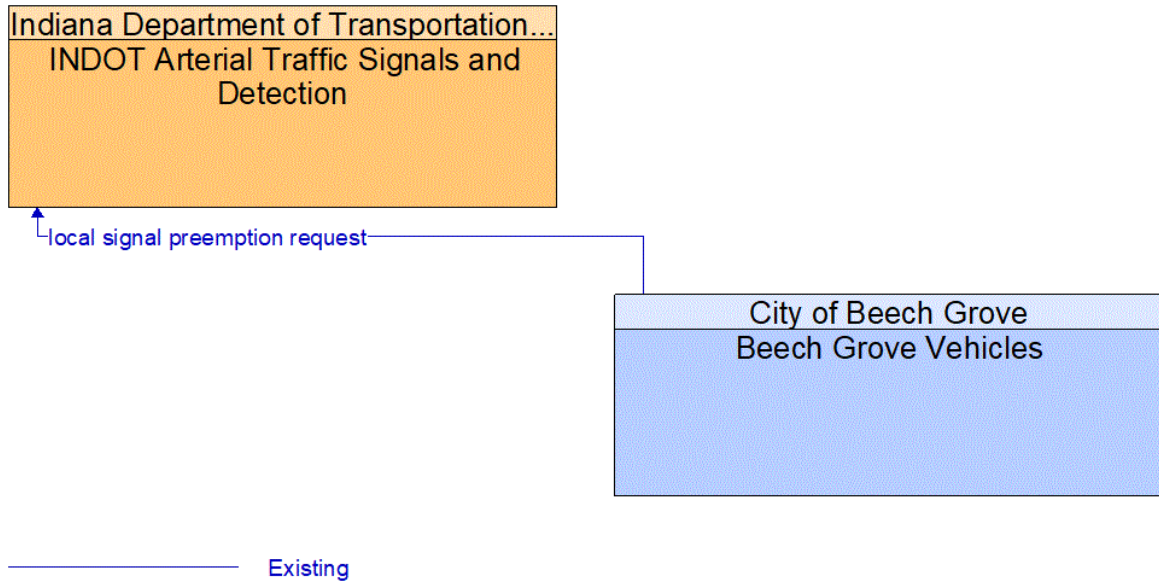


Figure 67: Beech Grove Vehicles - INDOT Arterial Traffic Signals and Detection Interface

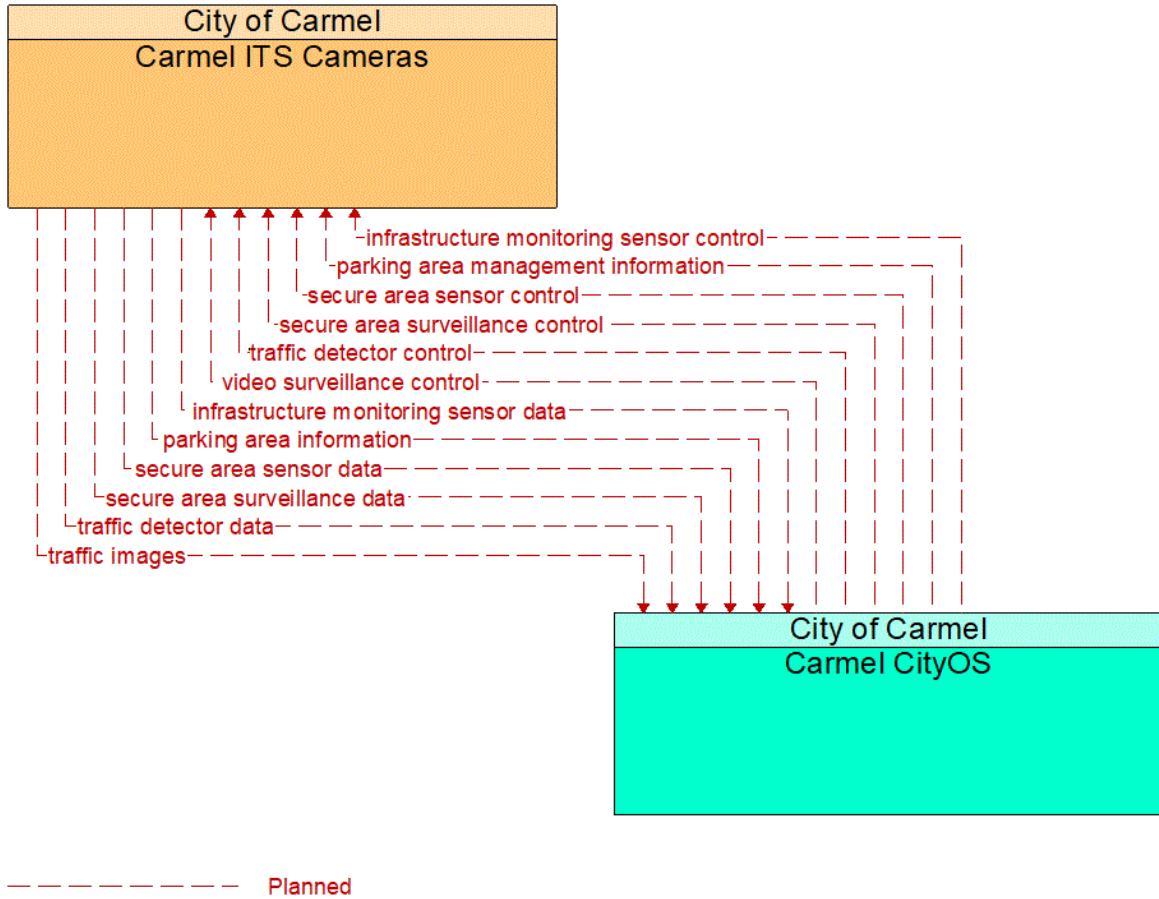


Figure 68: Carmel CityOS - Carmel ITS Cameras Interface

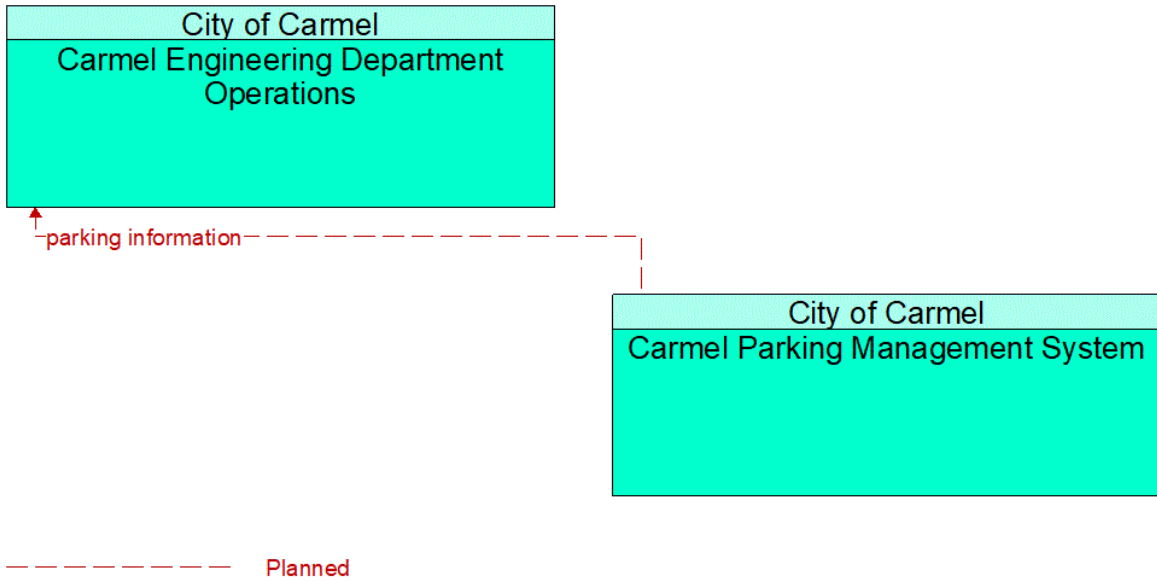


Figure 69: Carmel Engineering Department Operations - Carmel Parking Management System Interface

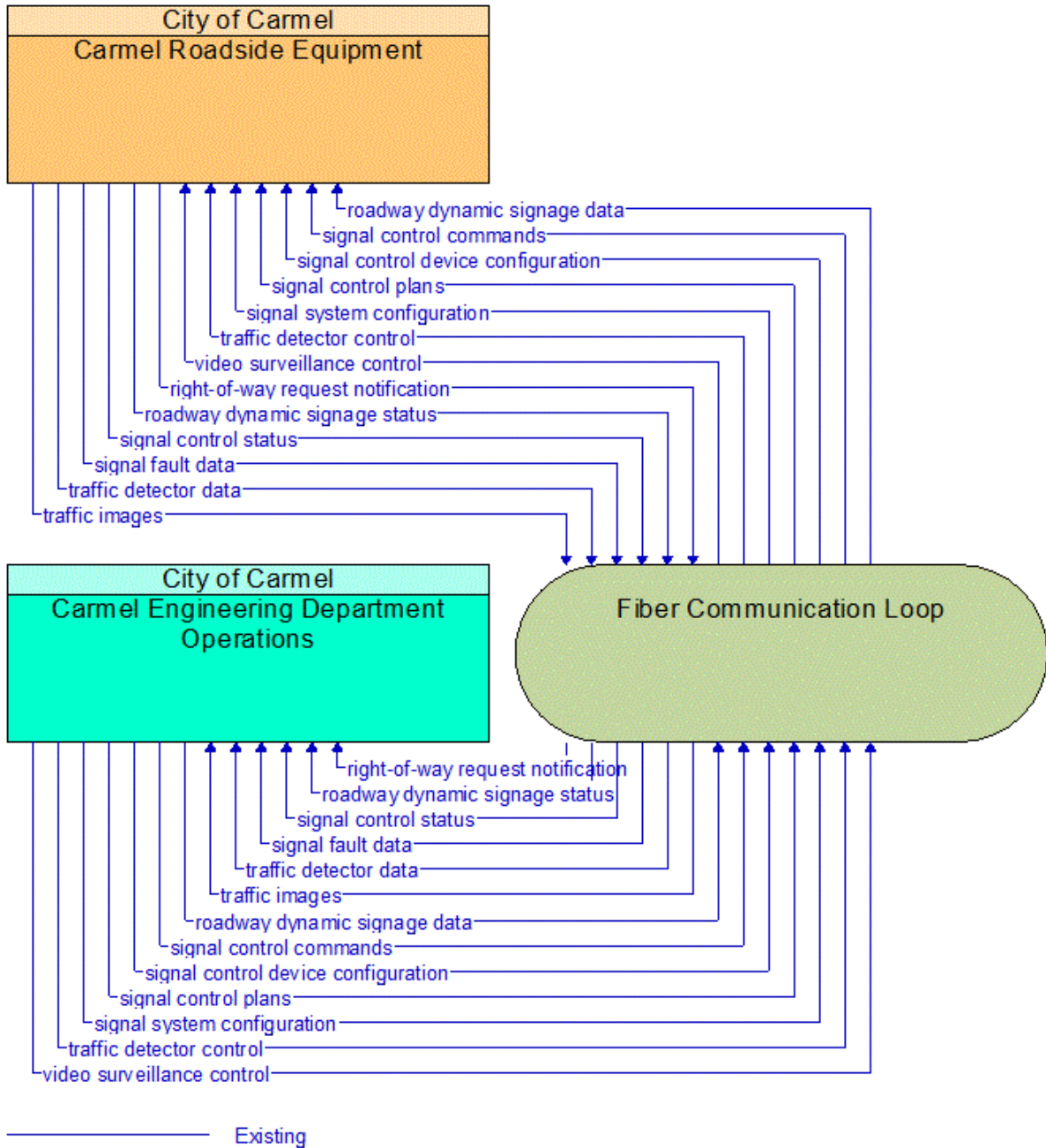


Figure 70: Carmel Engineering Department Operations - Carmel Roadside Equipment Interface

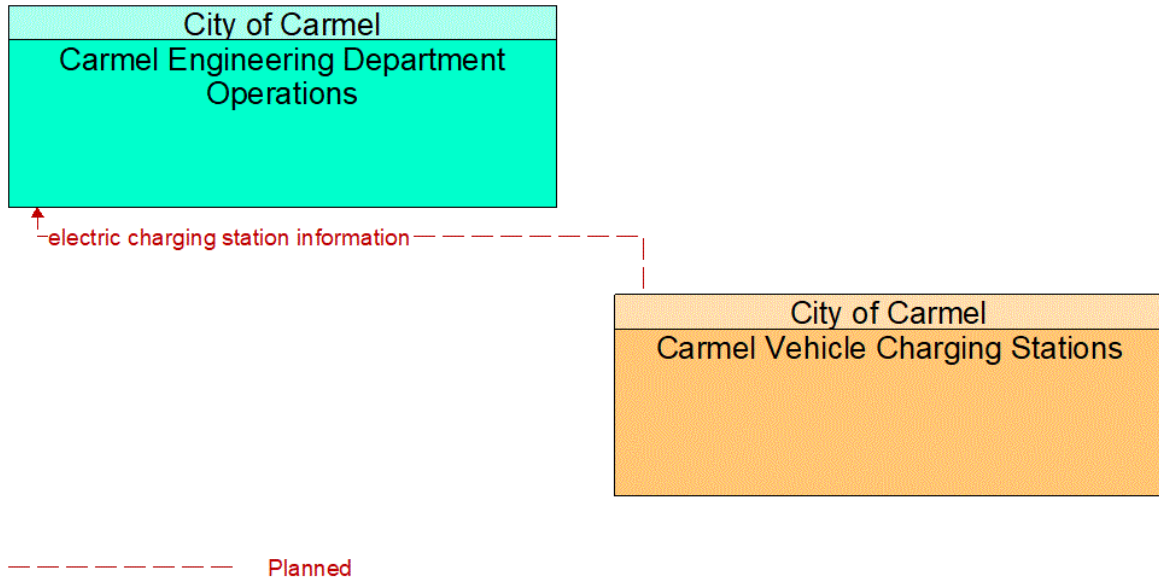


Figure 71: Carmel Engineering Department Operations - Carmel Vehicle Charging Stations Interface

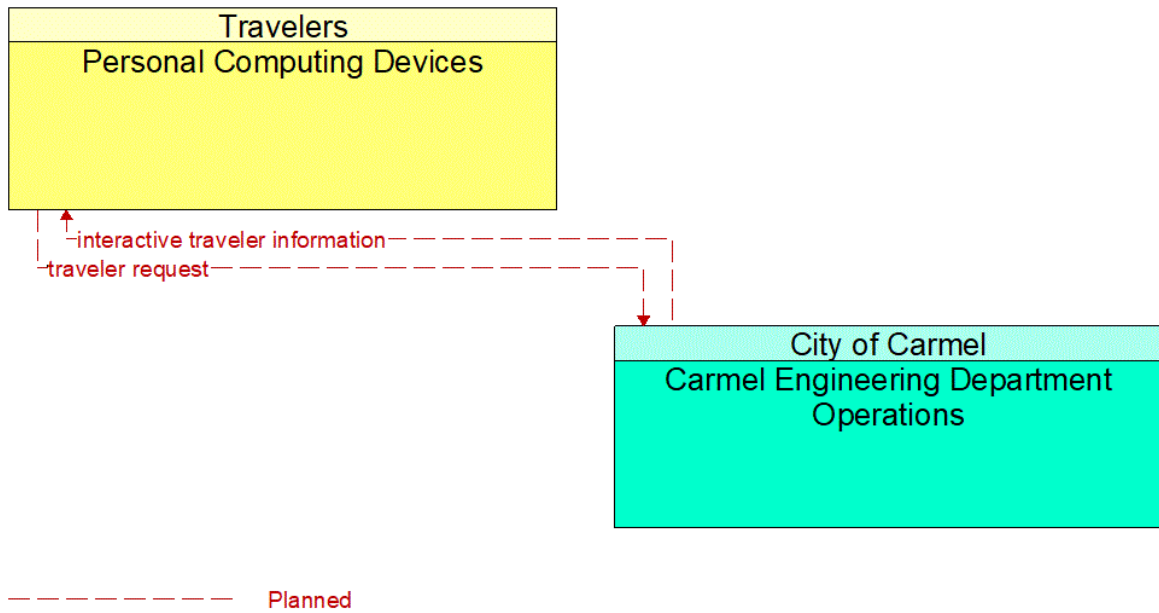


Figure 72: Carmel Engineering Department Operations - Personal Computing Devices Interface

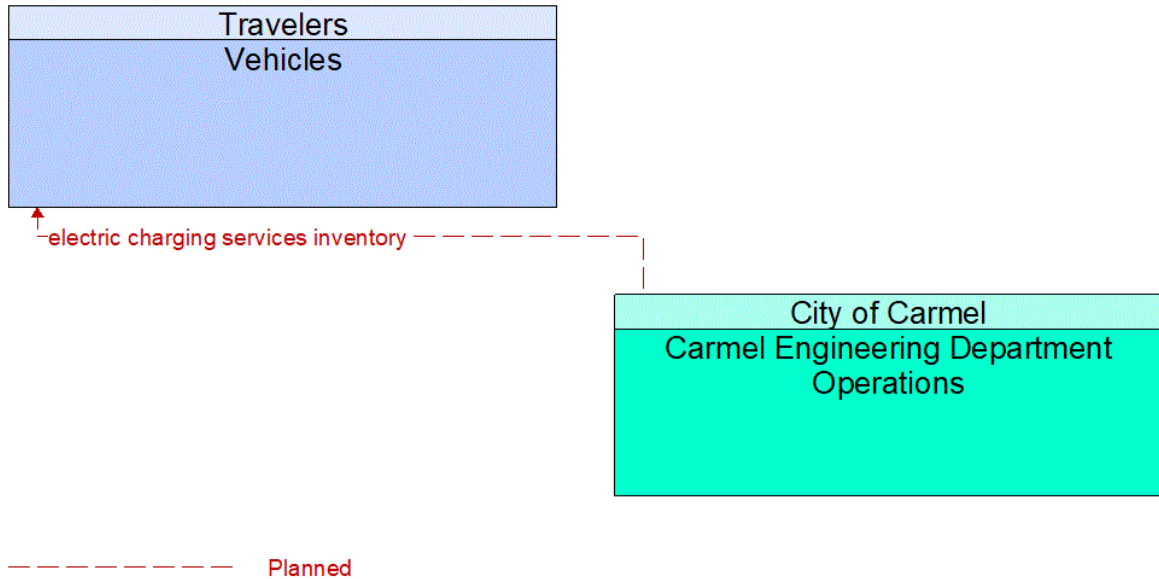


Figure 73: Carmel Engineering Department Operations - Vehicles Interface

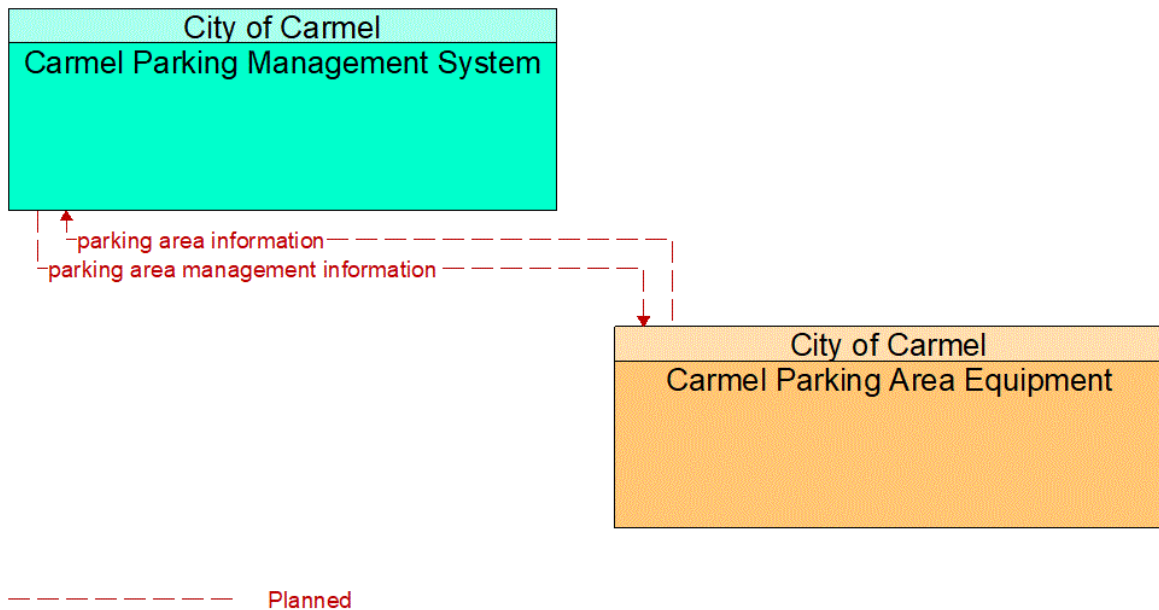


Figure 74: Carmel Parking Area Equipment - Carmel Parking Management System Interface

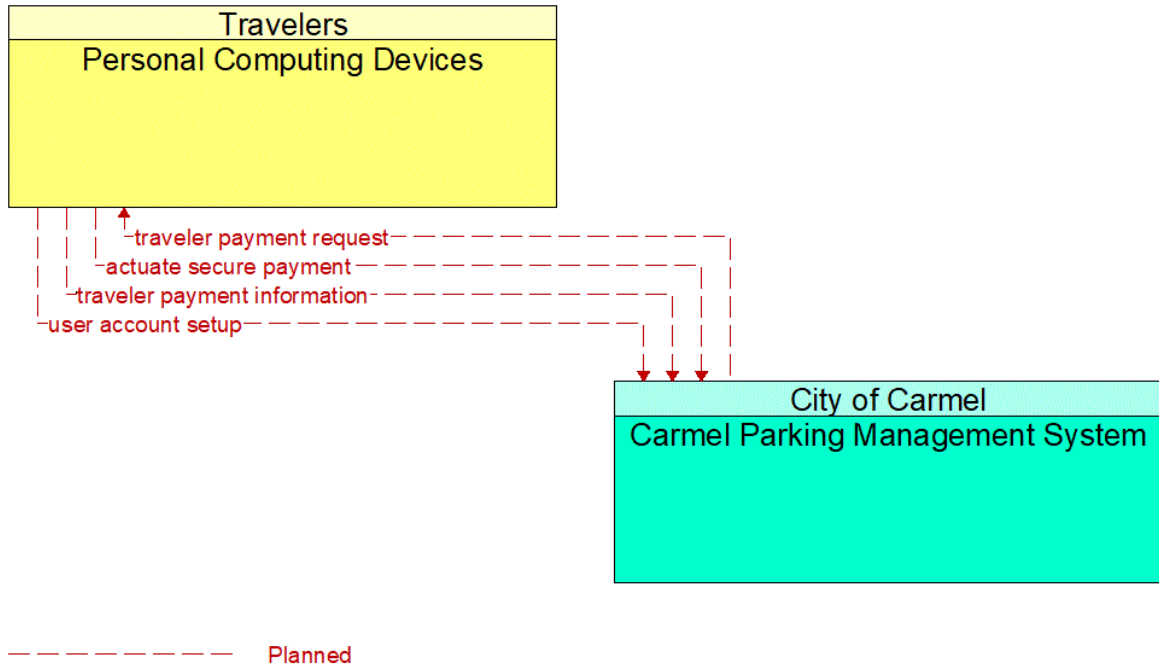


Figure 75: Carmel Parking Management System - Personal Computing Devices Interface

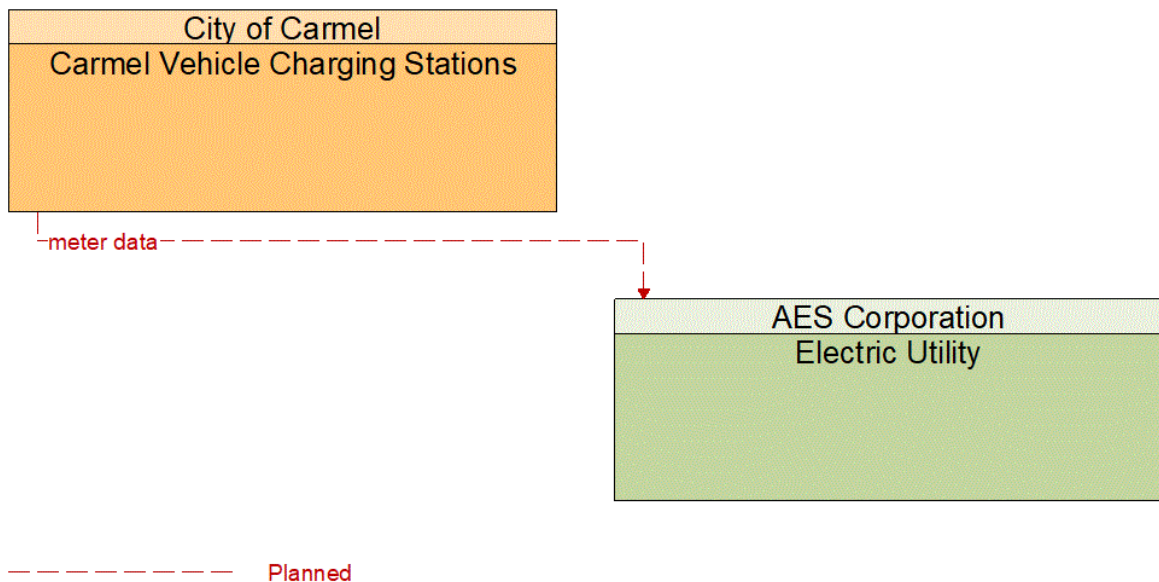


Figure 76: Carmel Vehicle Charging Stations - Electric Utility Interface

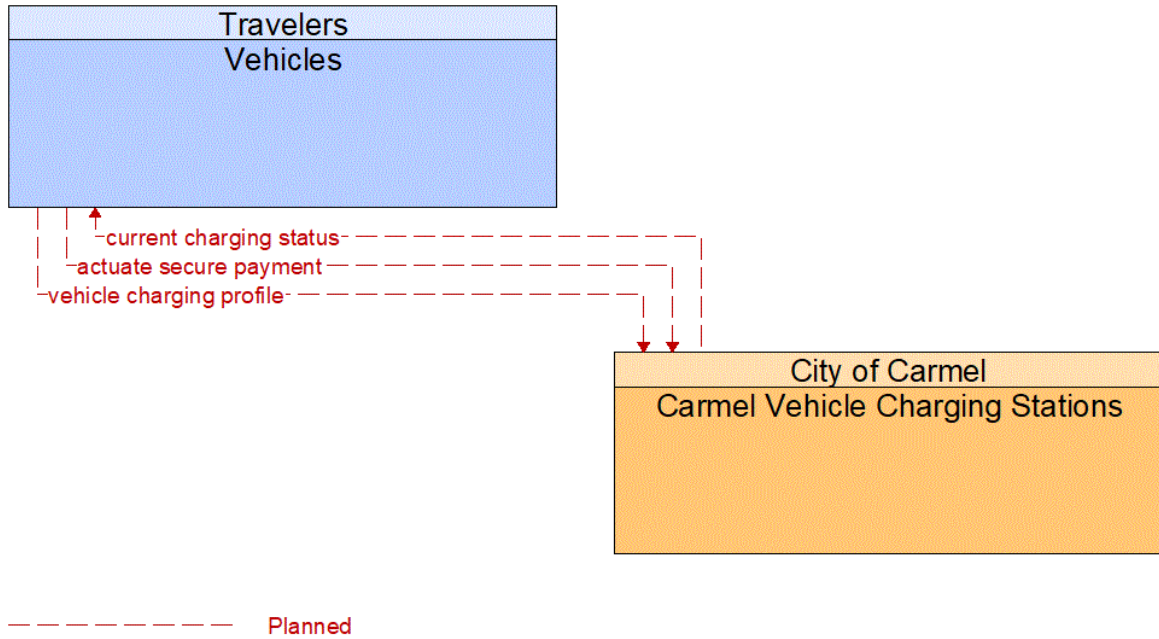


Figure 77: Carmel Vehicle Charging Stations - Vehicles Interface

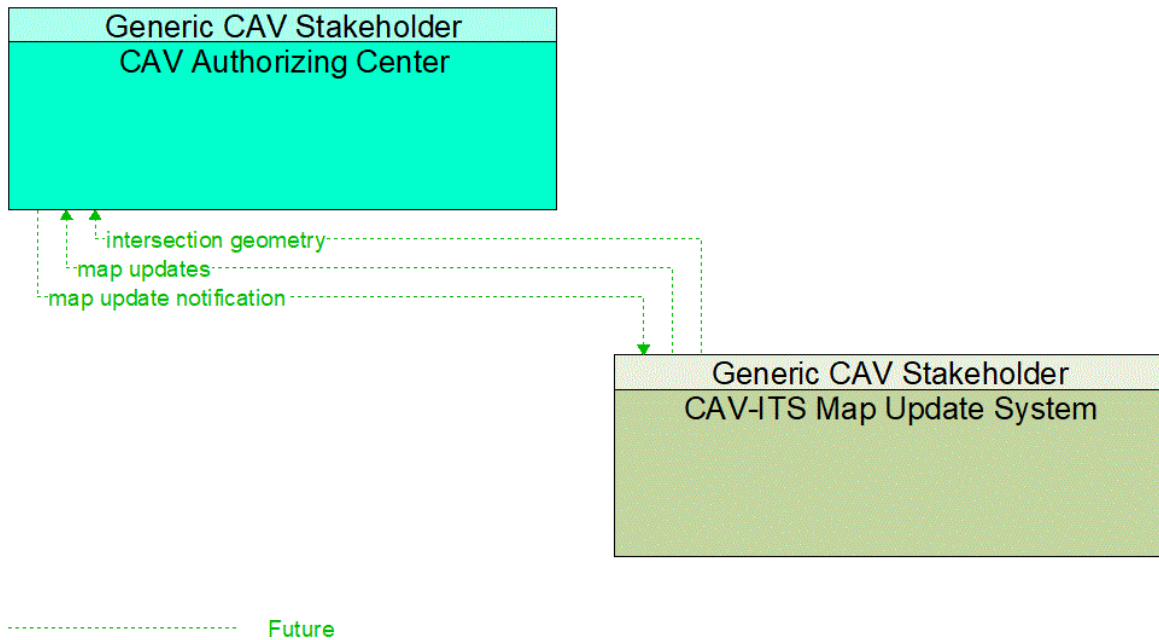


Figure 78: CAV Authorizing Center - CAV-ITS Map Update System Interface

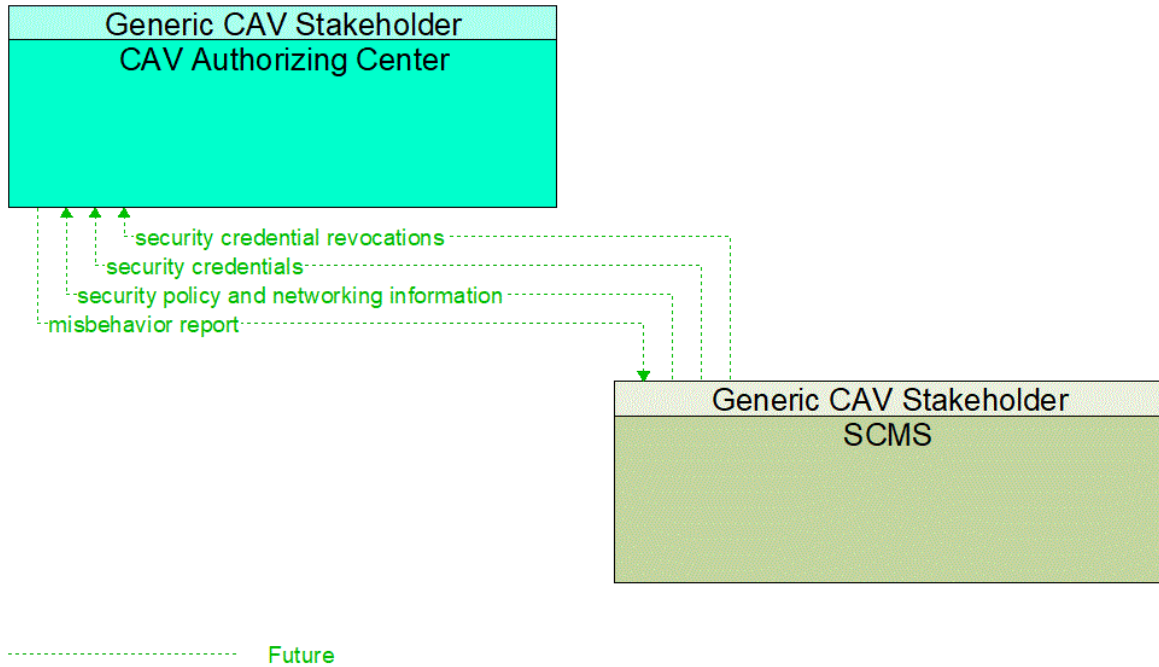


Figure 79: CAV Authorizing Center - SCMS Interface

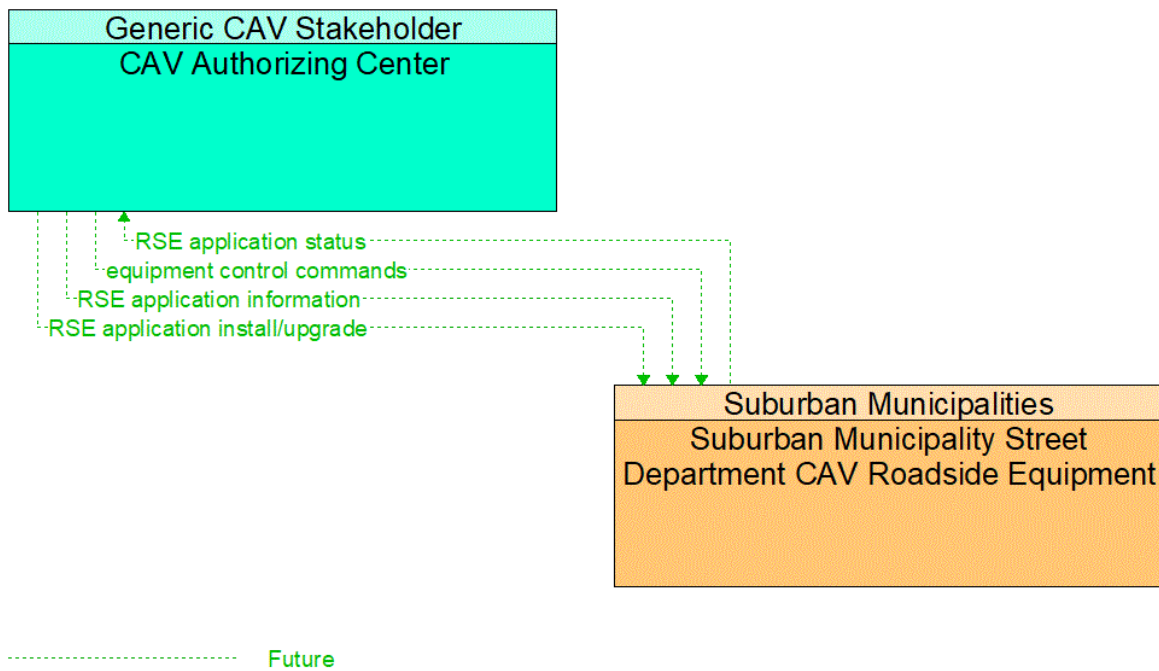


Figure 80: CAV Authorizing Center - Suburban Municipality Street Department CAV Roadside Equipment Interface

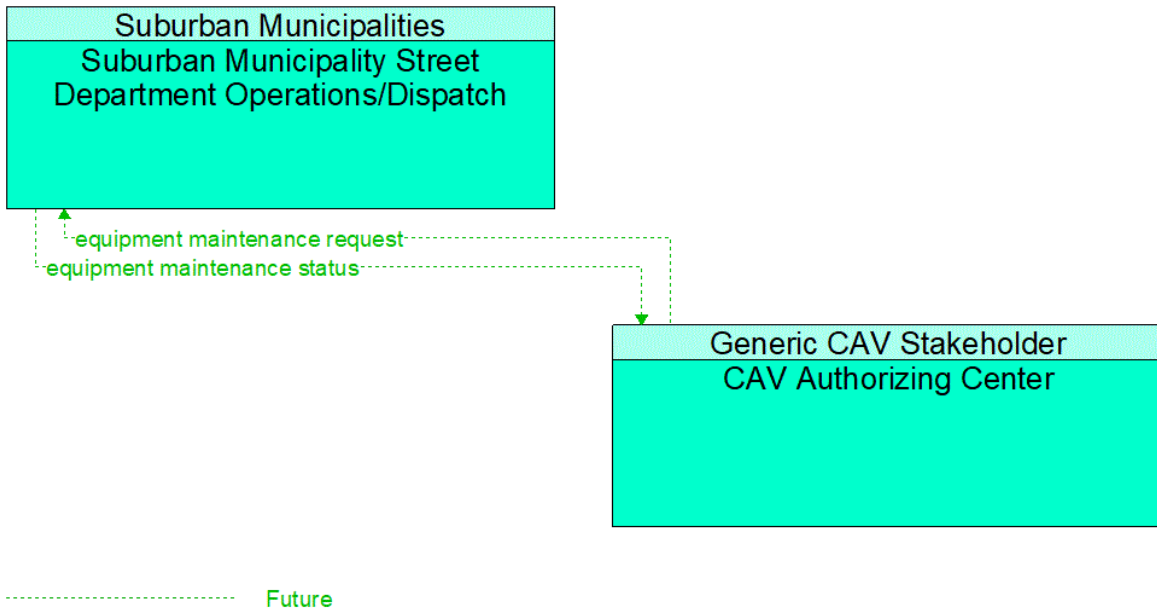


Figure 81: CAV Authorizing Center - Suburban Municipality Street Department Operations/Dispatch Interface

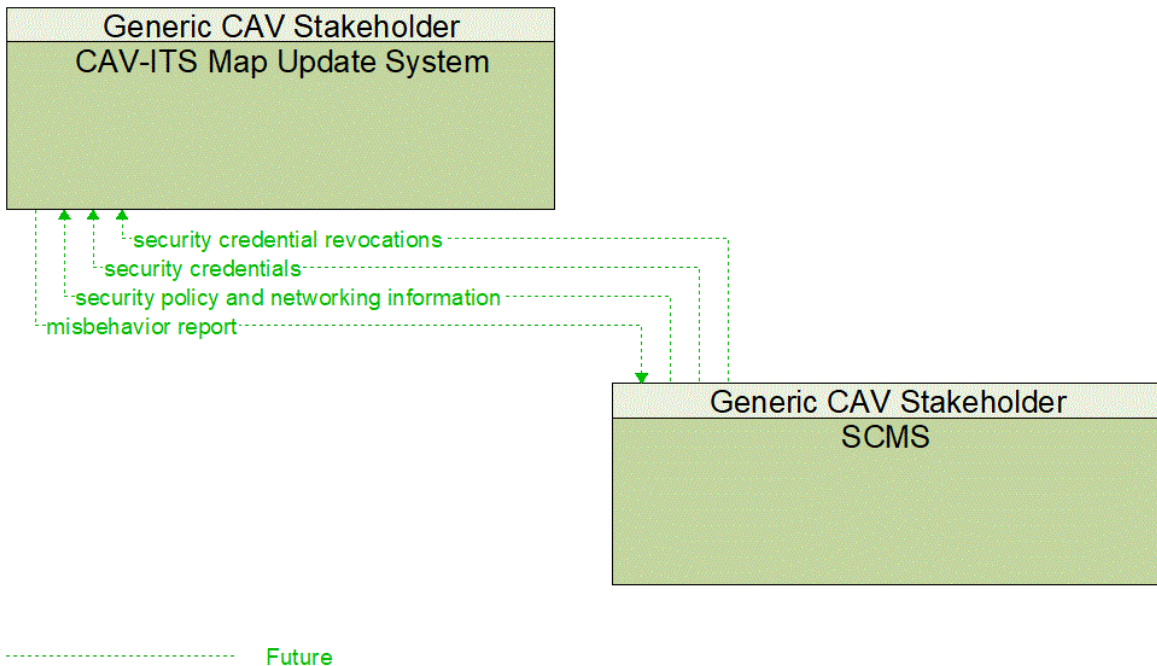


Figure 82: CAV-ITS Map Update System - SCMS Interface

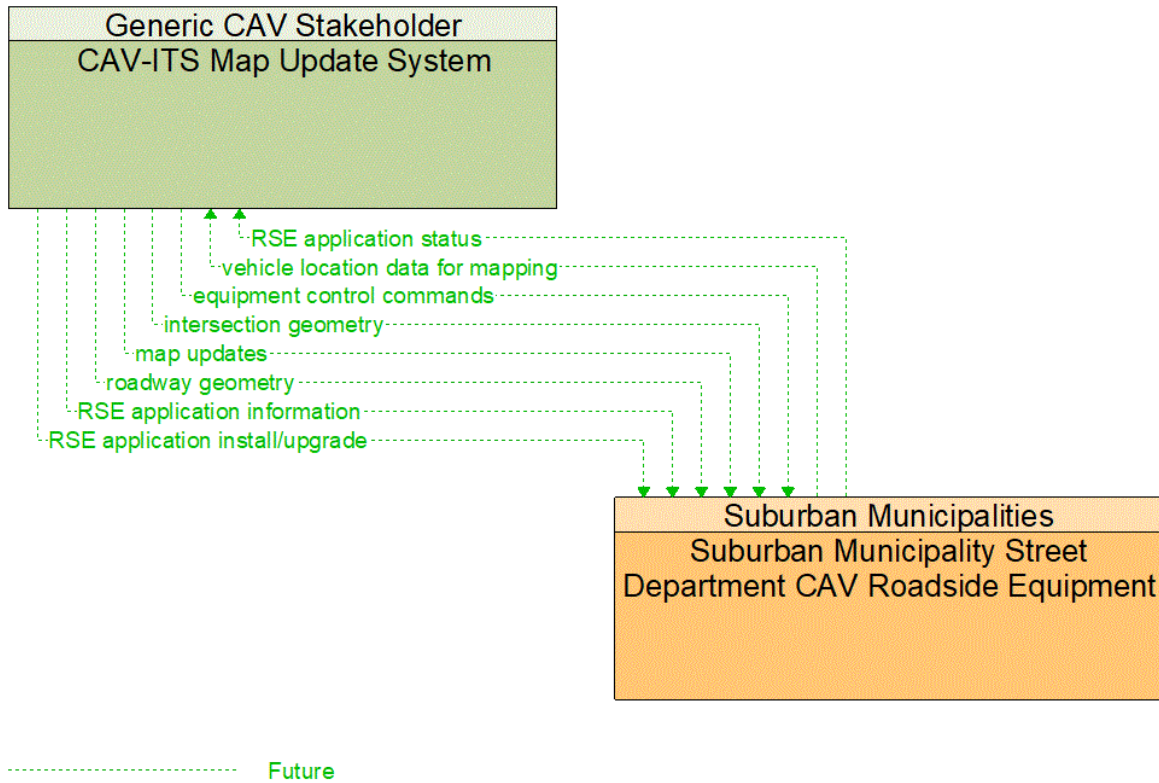


Figure 83: CAV-ITS Map Update System - Suburban Municipality Street Department CAV Roadside Equipment Interface

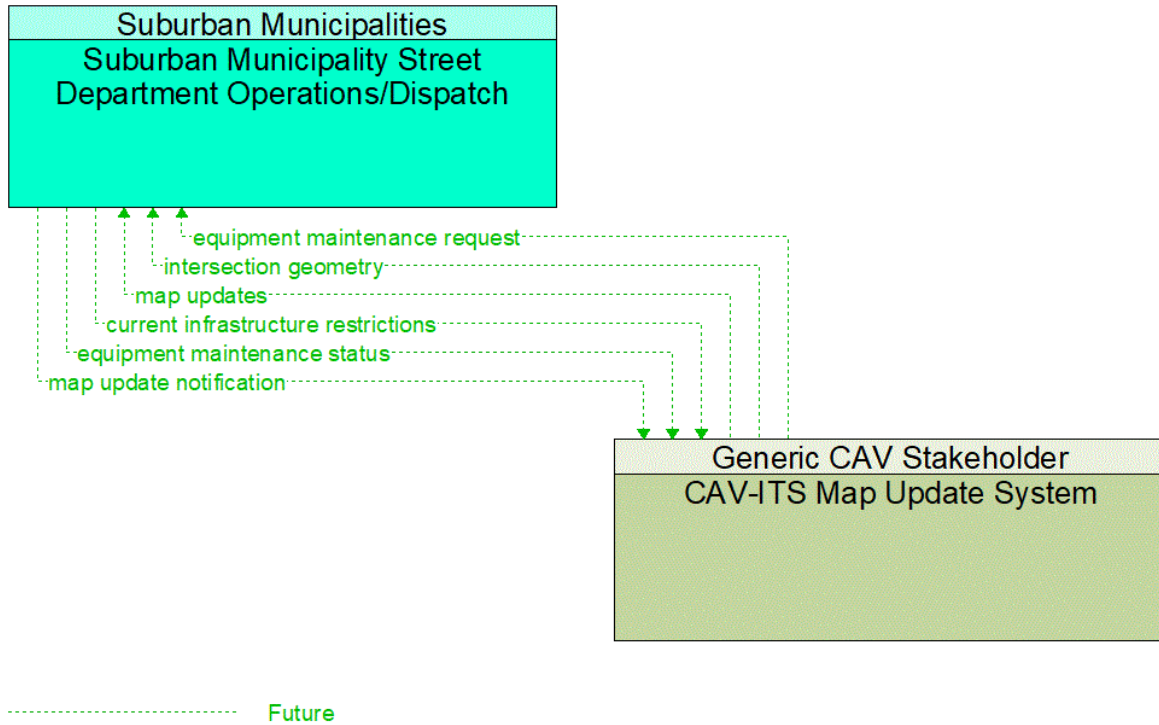


Figure 84: CAV-ITS Map Update System - Suburban Municipality Street Department Operations/Dispatch Interface

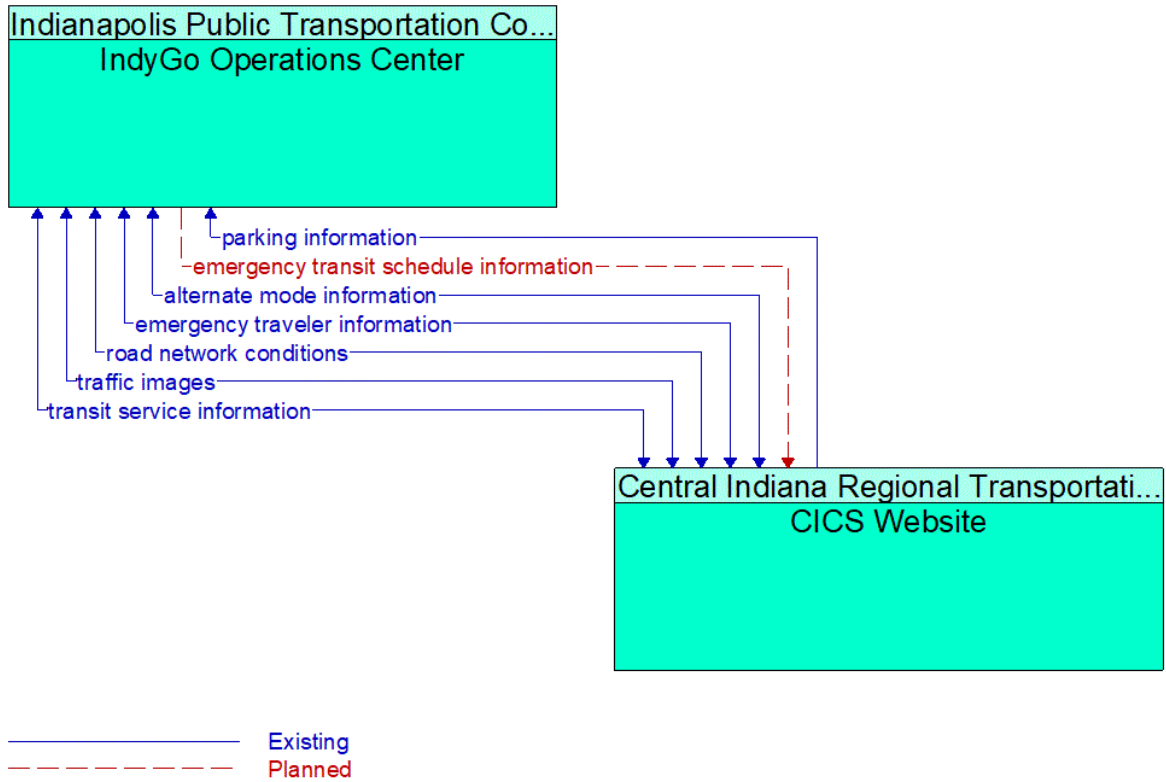


Figure 85: CICS Website - IndyGo Operations Center Interface

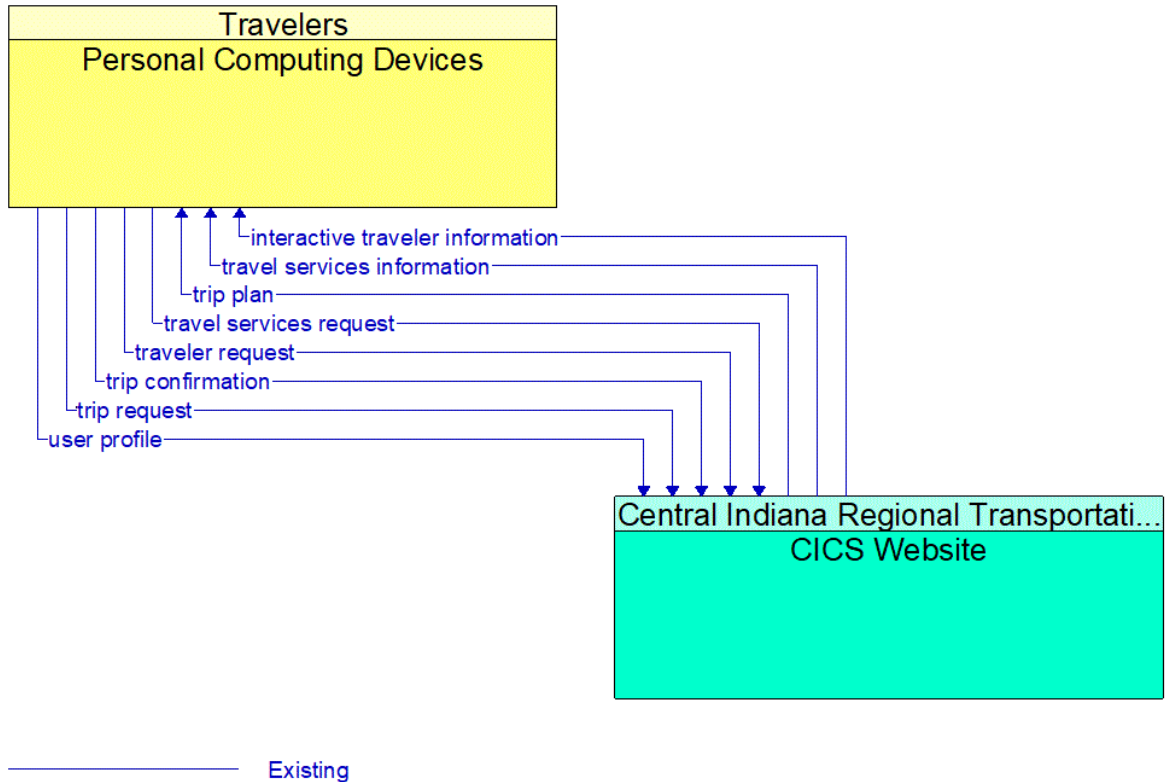


Figure 86: CICS Website - Personal Computing Devices Interface

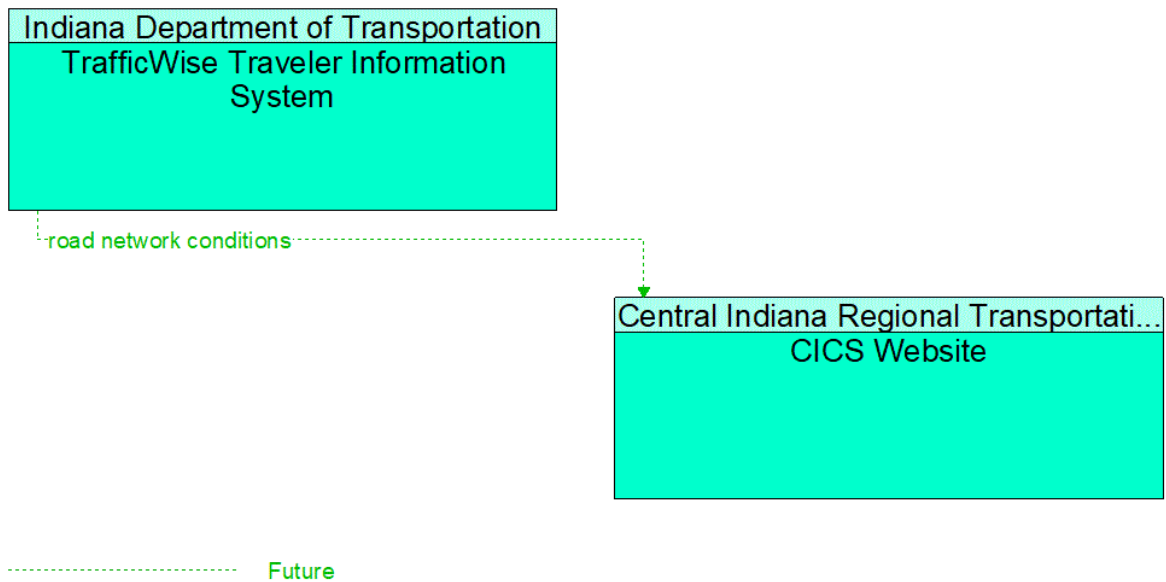


Figure 87: CICS Website - TrafficWise Traveler Information System Interface

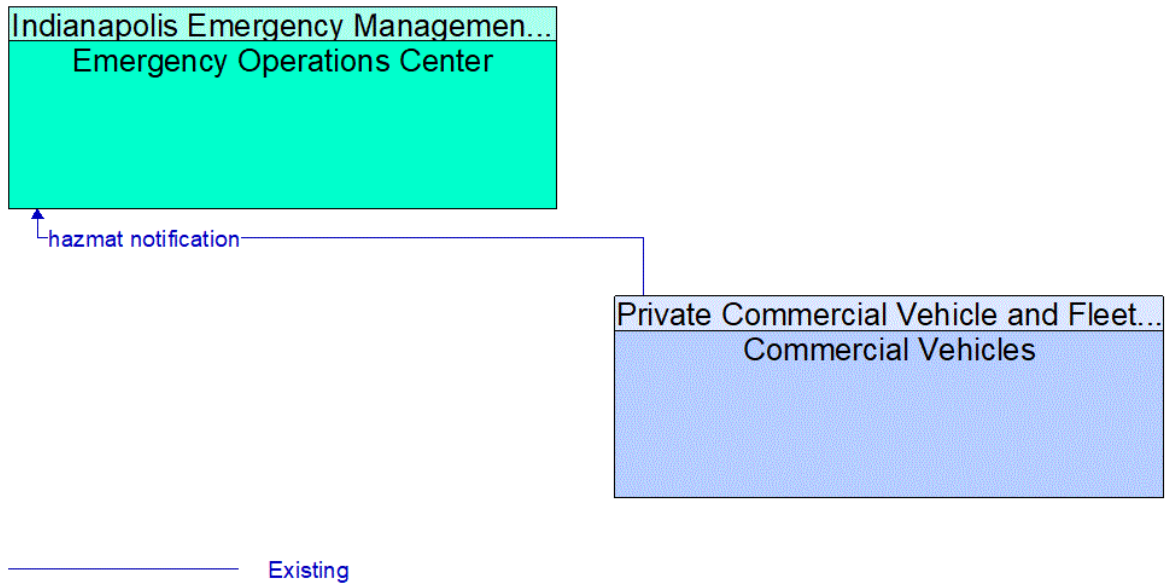


Figure 88: Commercial Vehicles - Emergency Operations Center Interface

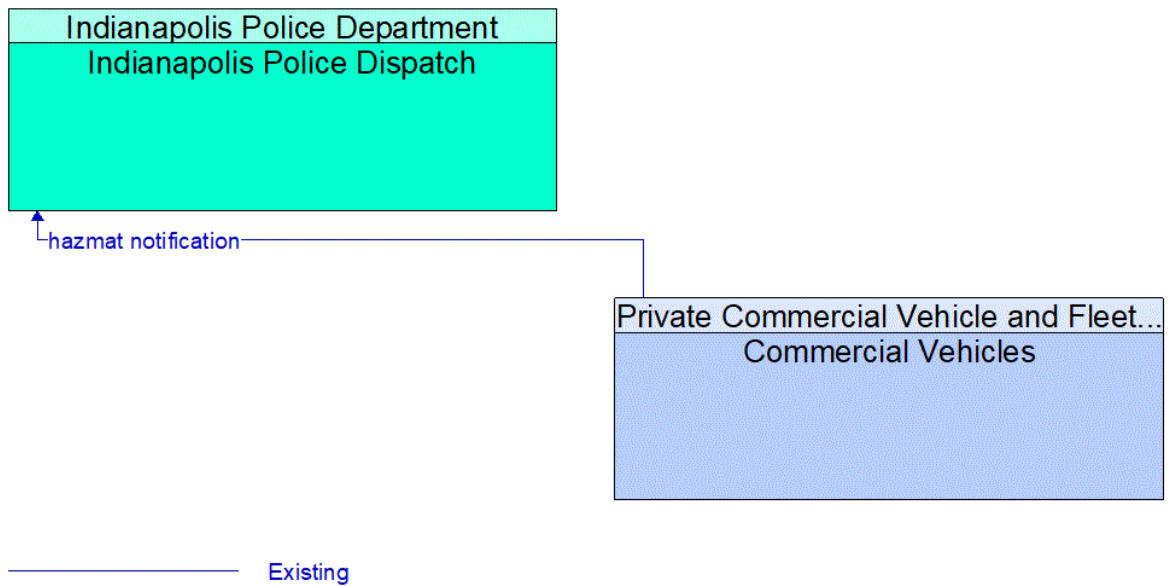


Figure 89: Commercial Vehicles - Indianapolis Police Dispatch Interface

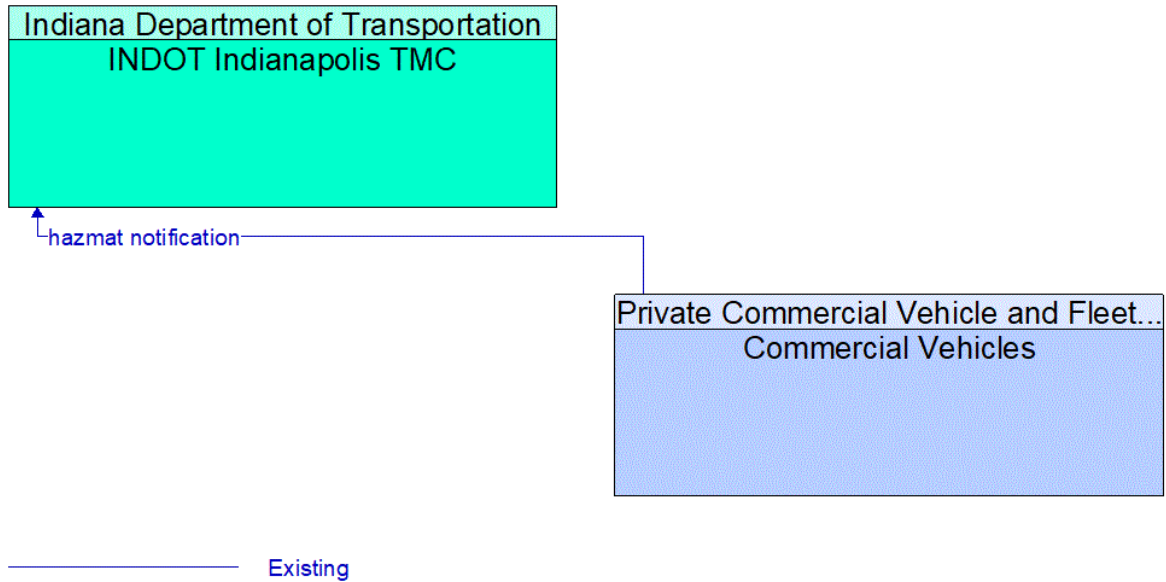


Figure 90: Commercial Vehicles - INDOT Indianapolis TMC Interface

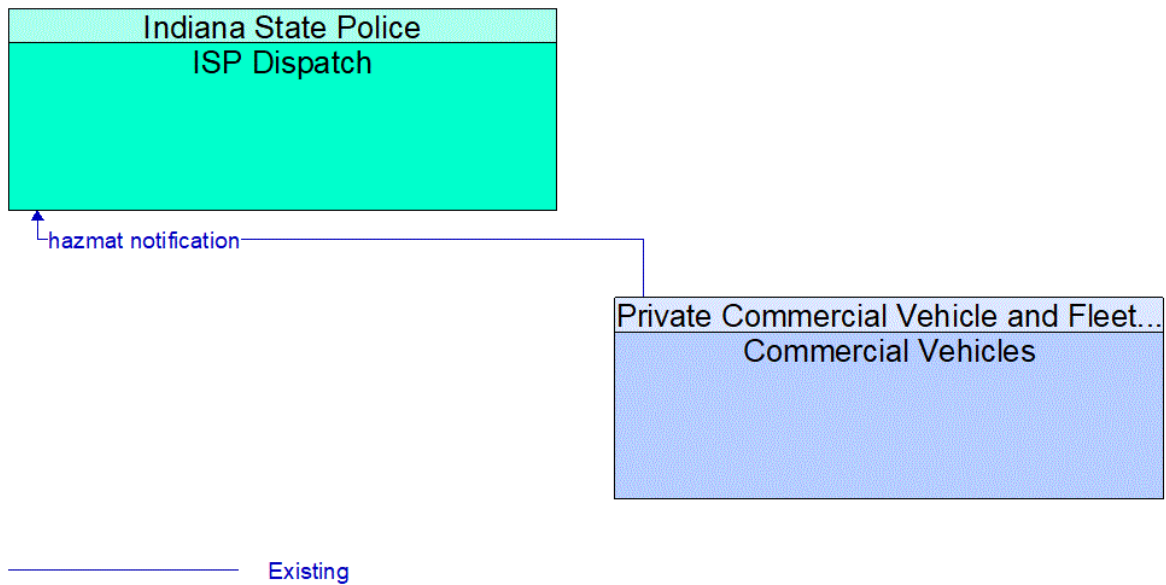


Figure 91: Commercial Vehicles - ISP Dispatch Interface

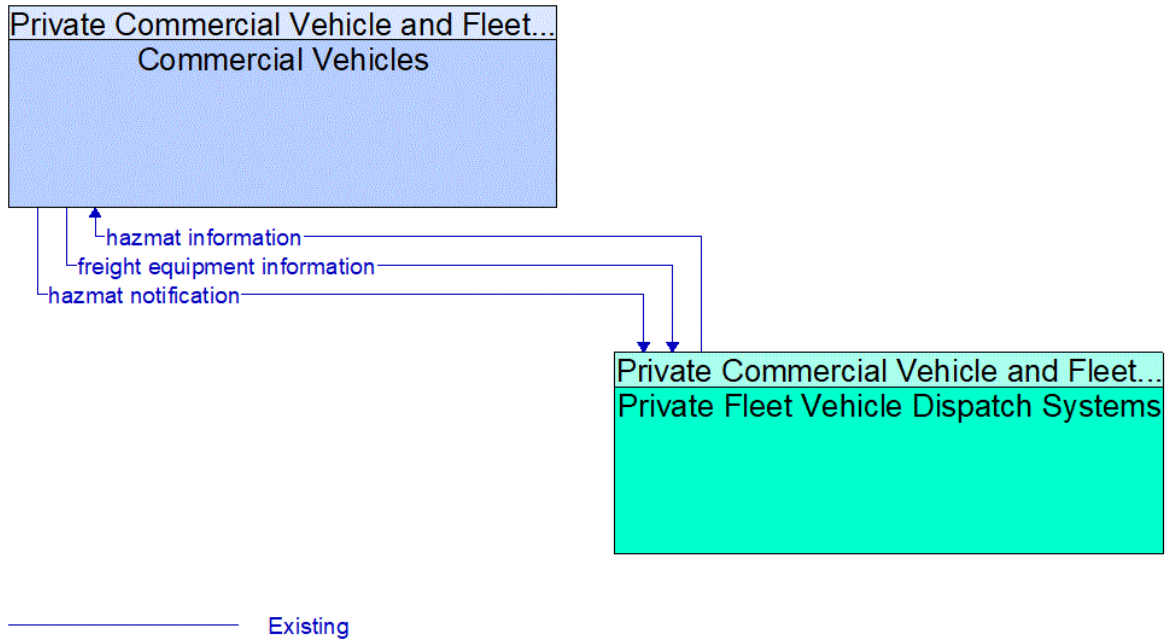


Figure 92: Commercial Vehicles - Private Fleet Vehicle Dispatch Systems Interface

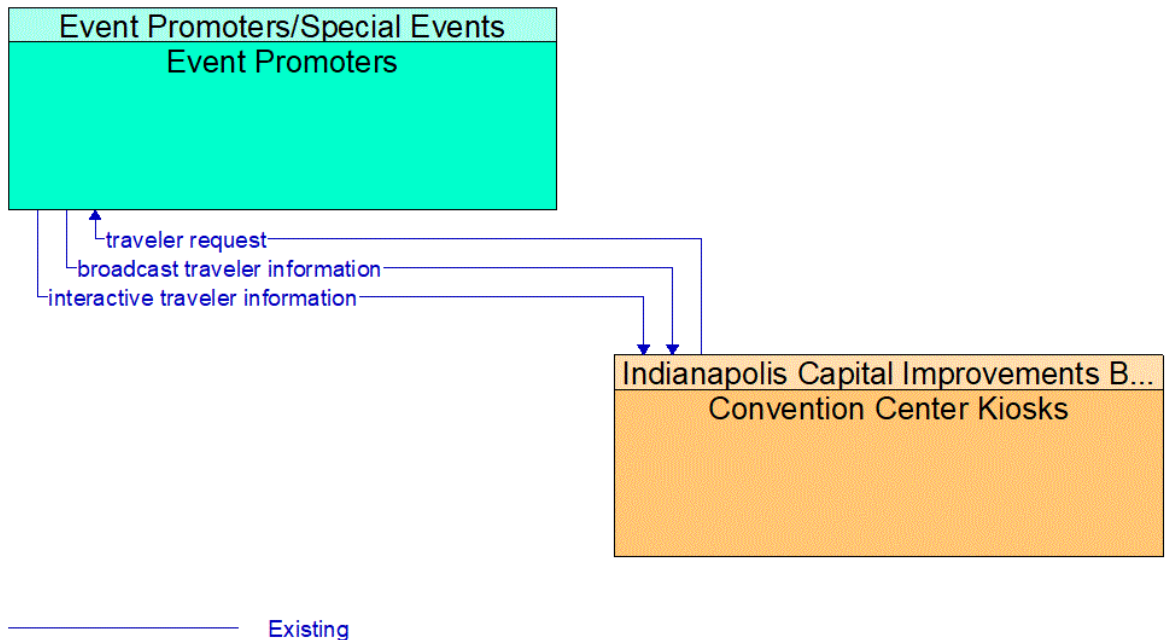


Figure 93: Convention Center Kiosks - Event Promoters Interface

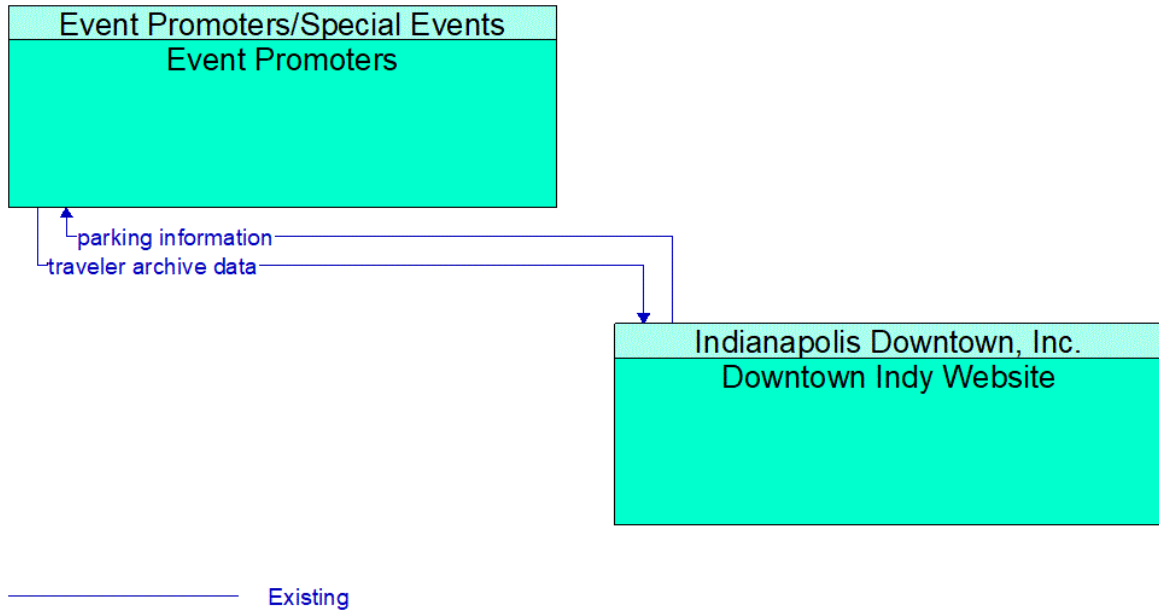


Figure 94: Downtown Indy Website - Event Promoters Interface

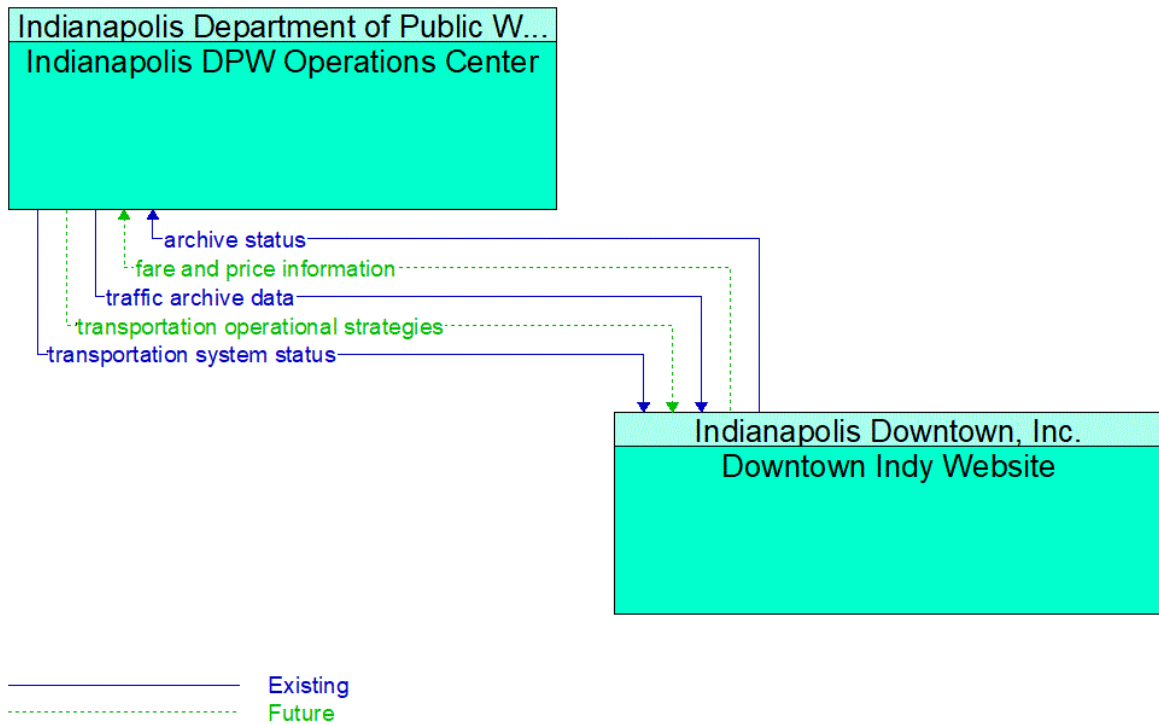


Figure 95: Downtown Indy Website - Indianapolis DPW Operations Center Interface

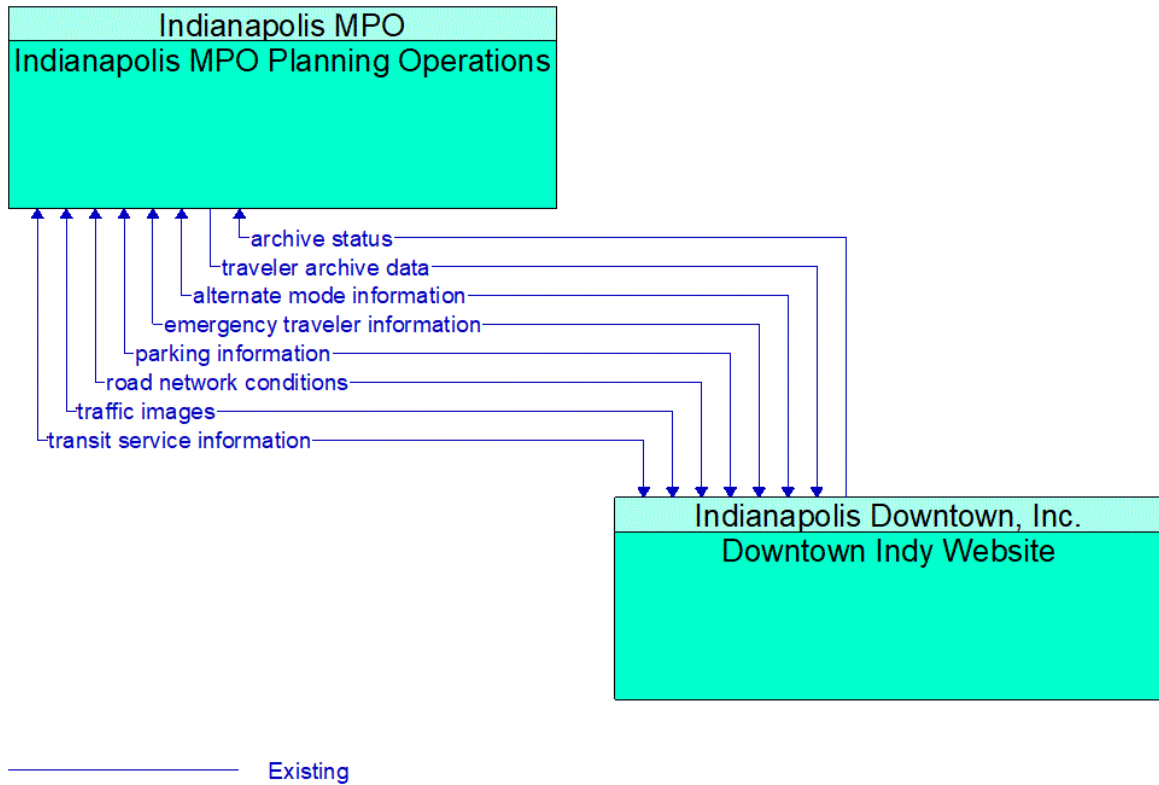


Figure 96: Downtown Indy Website - Indianapolis MPO Planning Operations Interface

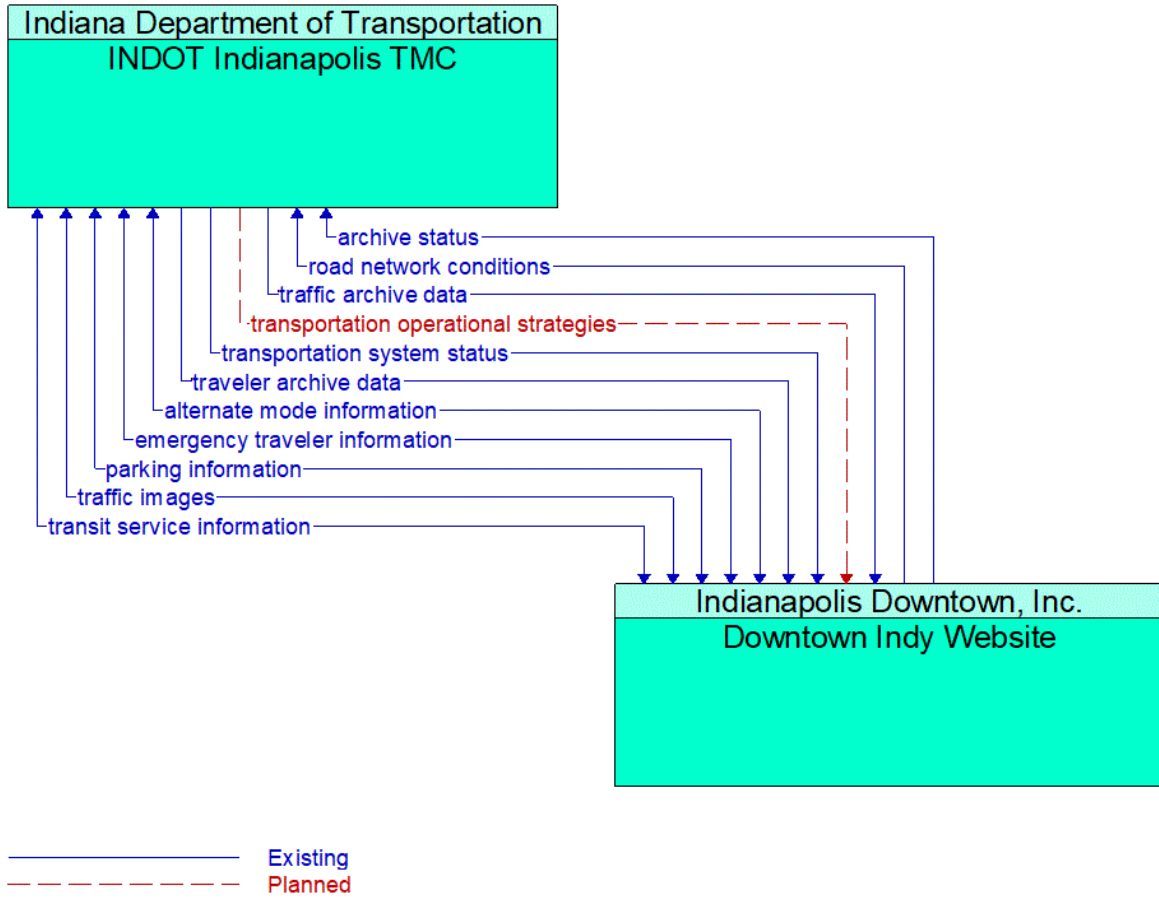


Figure 97: Downtown Indy Website - INDOT Indianapolis TMC Interface

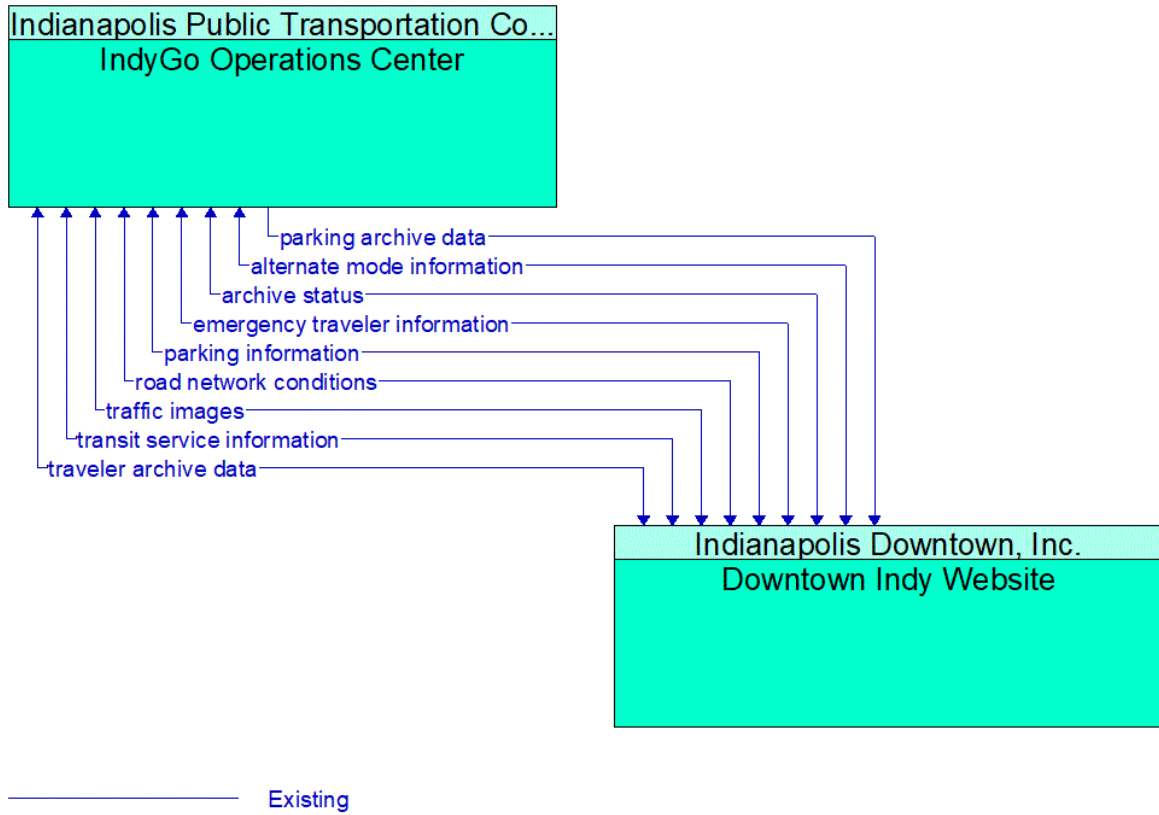


Figure 98: Downtown Indy Website - IndyGo Operations Center Interface

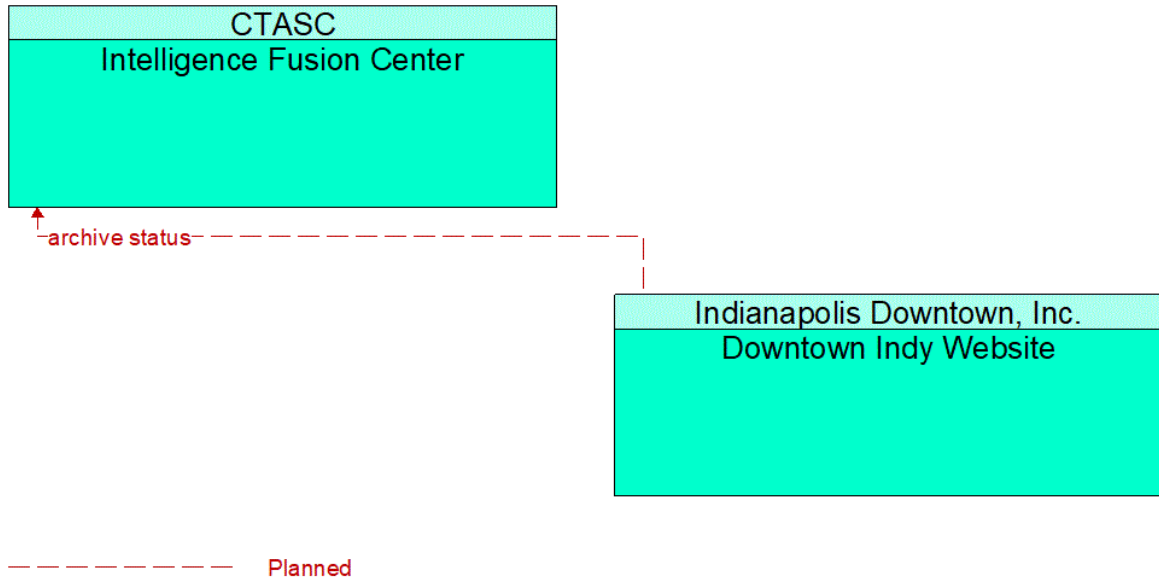


Figure 99: Downtown Indy Website - Intelligence Fusion Center Interface

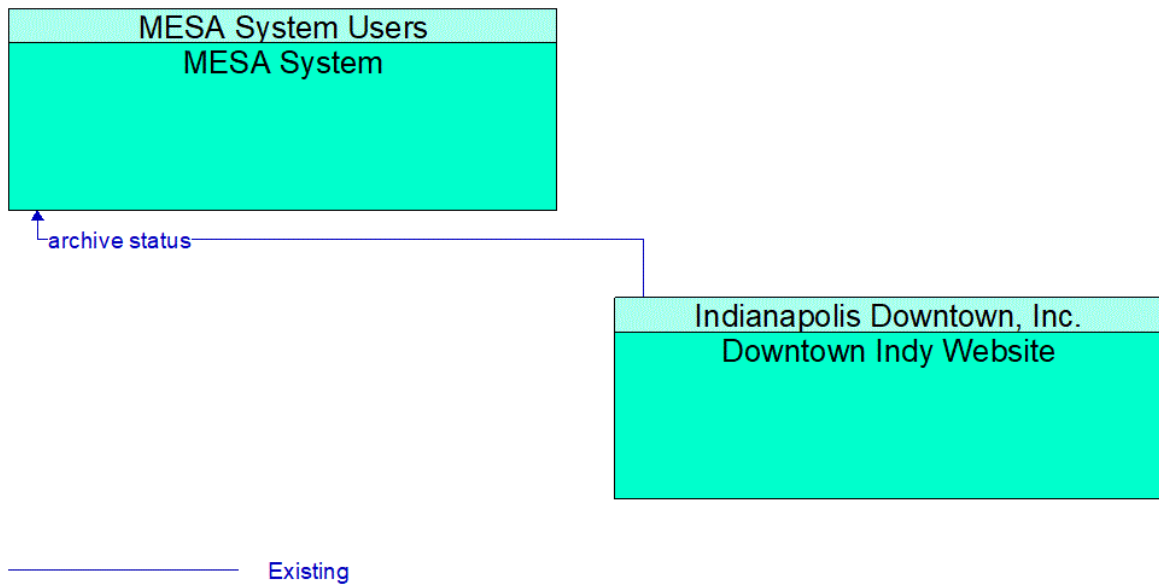


Figure 100: Downtown Indy Website - MESA System Interface

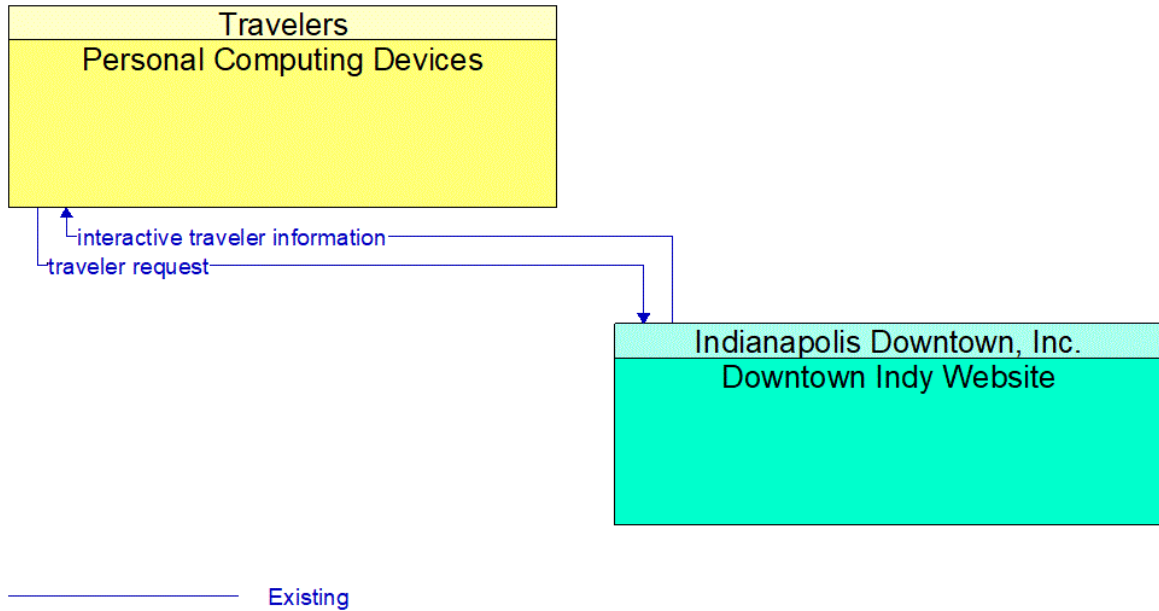


Figure 101: Downtown Indy Website - Personal Computing Devices Interface

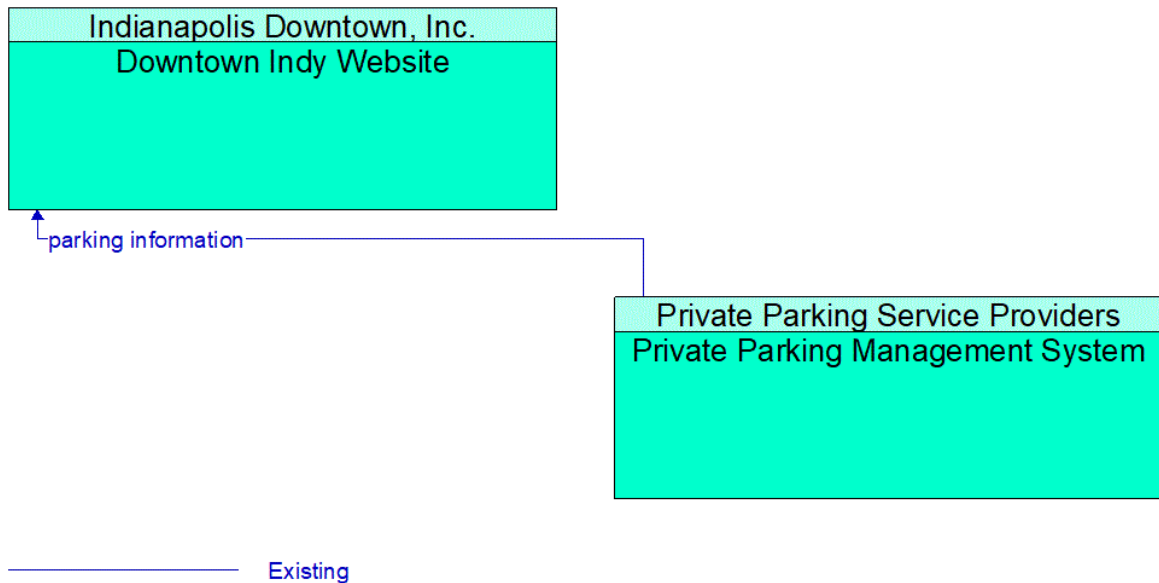


Figure 102: Downtown Indy Website - Private Parking Management System Interface

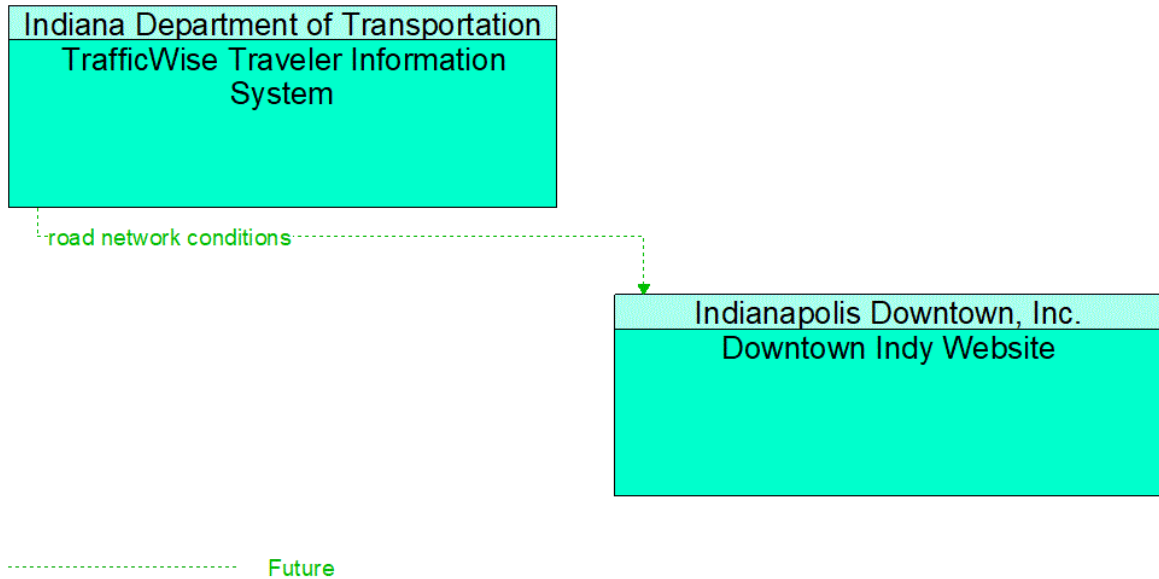


Figure 103: Downtown Indy Website - TrafficWise Traveler Information System Interface

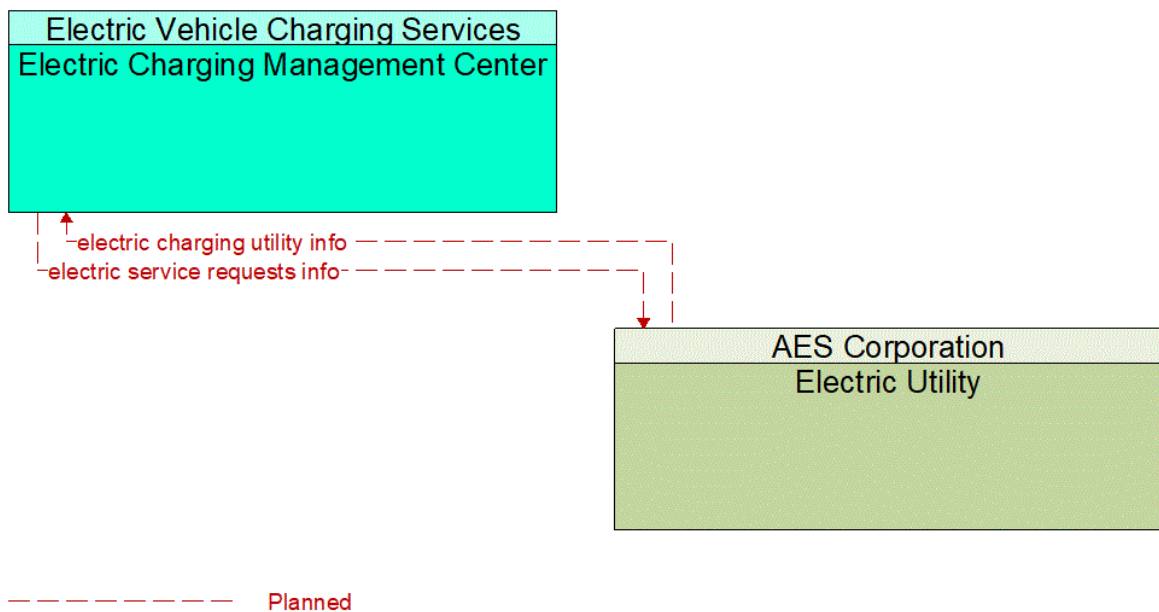


Figure 104: Electric Charging Management Center - Electric Utility Interface

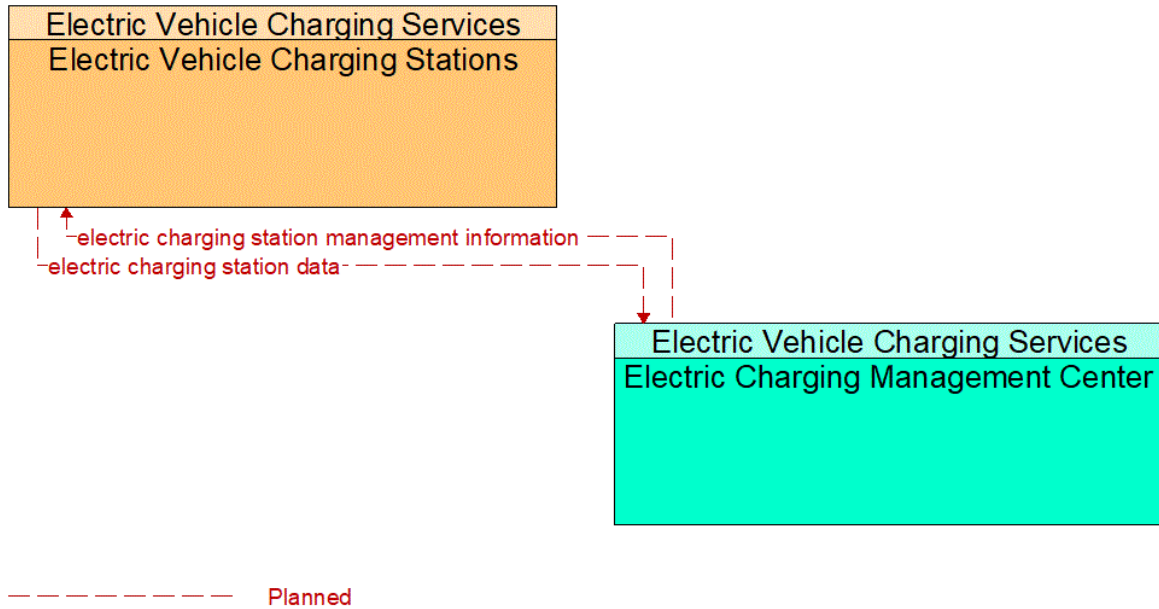


Figure 105: Electric Charging Management Center - Electric Vehicle Charging Stations Interface

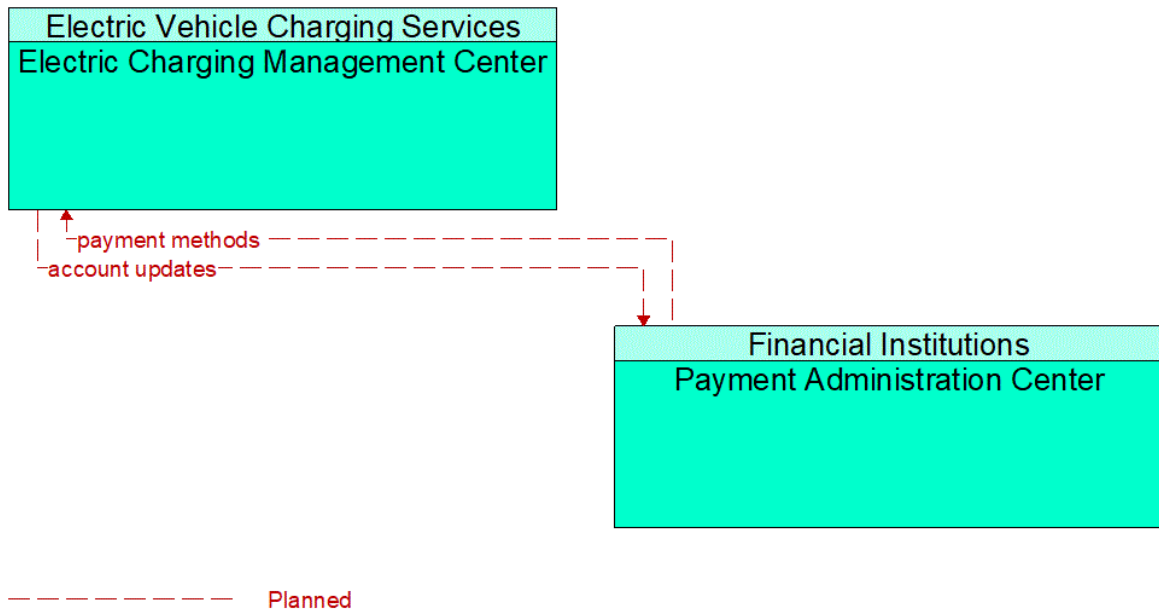


Figure 106: Electric Charging Management Center - Payment Administration Center Interface

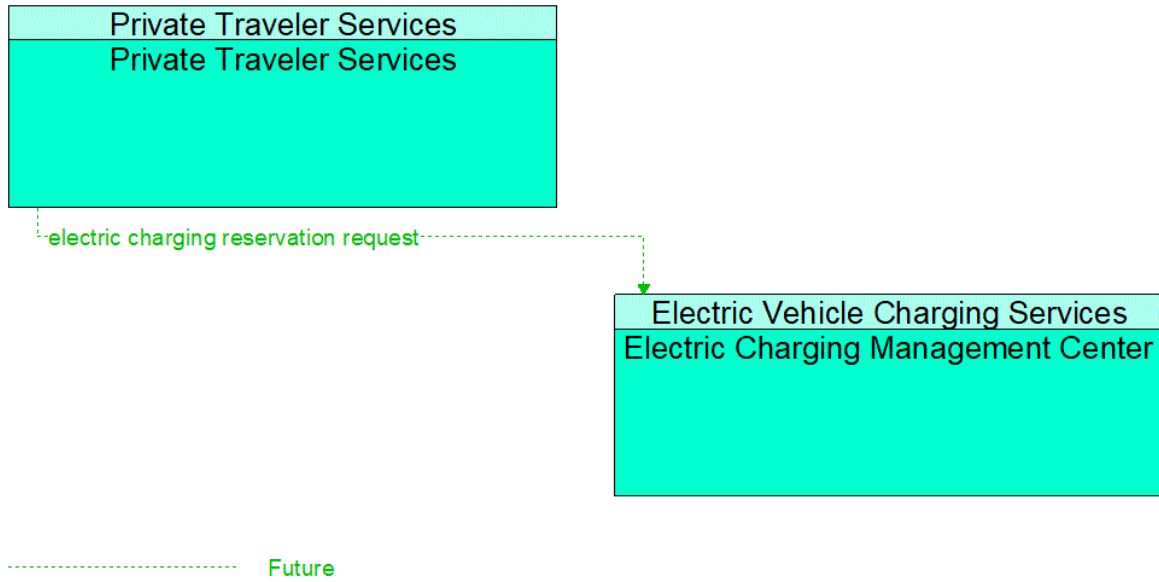


Figure 107: Electric Charging Management Center - Private Traveler Services Interface

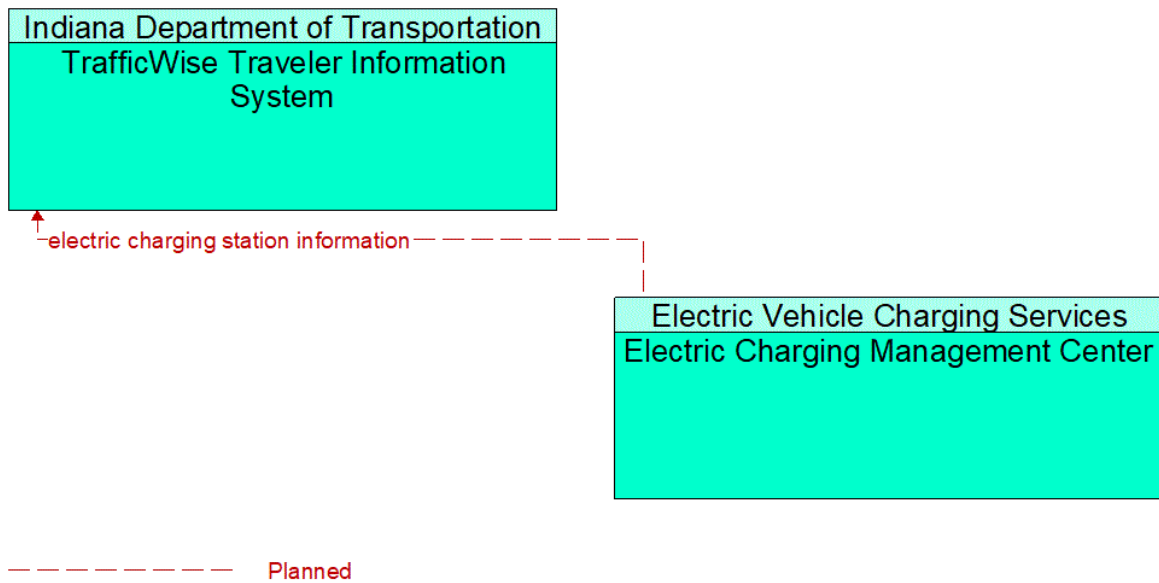


Figure 108: Electric Charging Management Center - TrafficWise Traveler Information System Interface

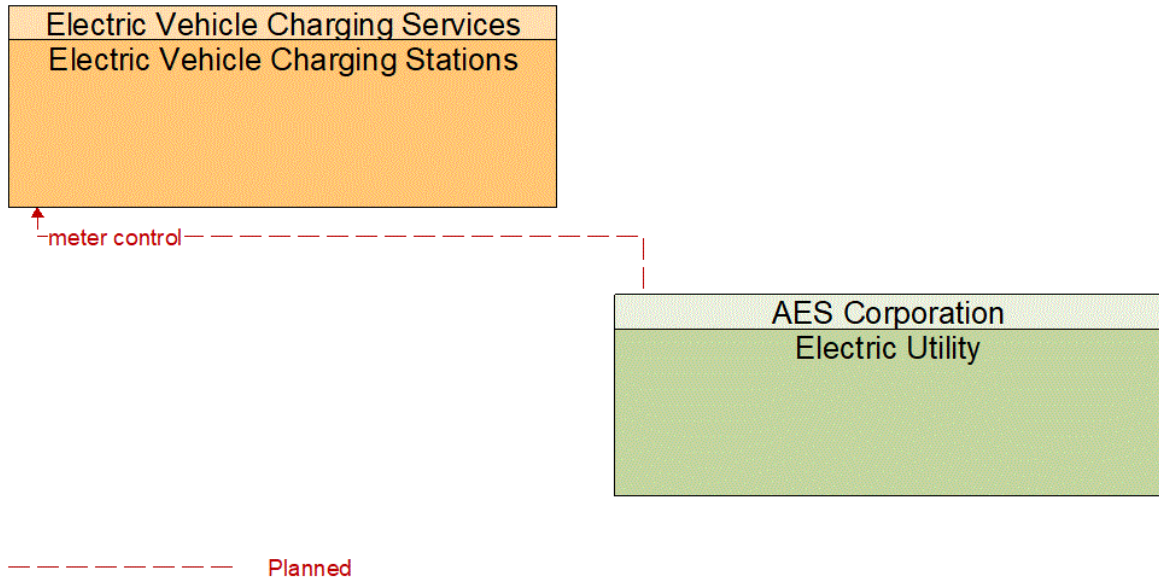


Figure 109: Electric Utility - Electric Vehicle Charging Stations Interface

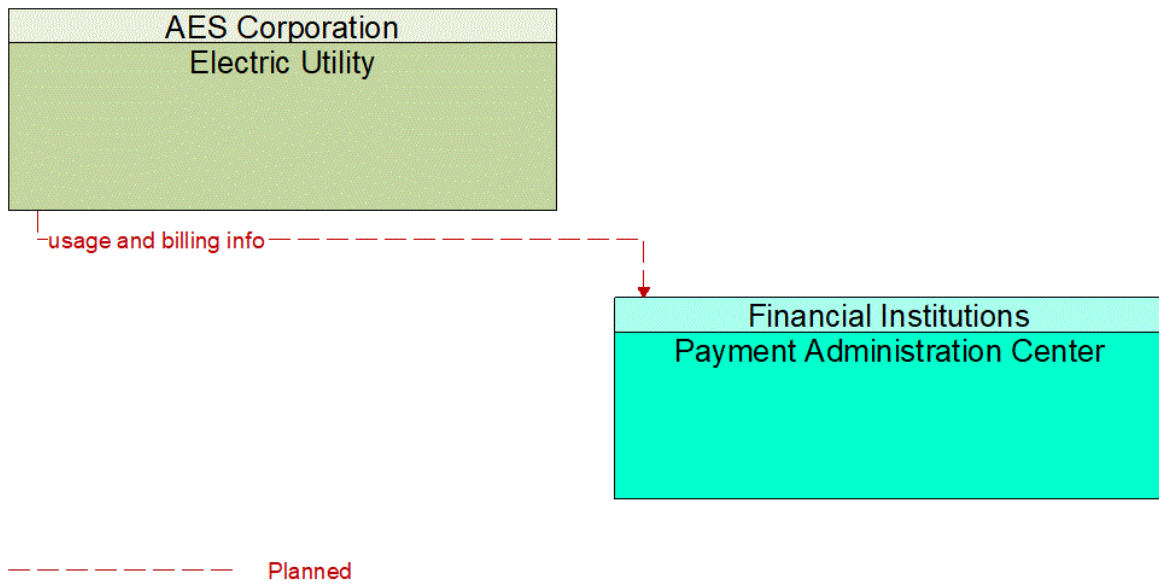


Figure 110: Electric Utility - Payment Administration Center Interface

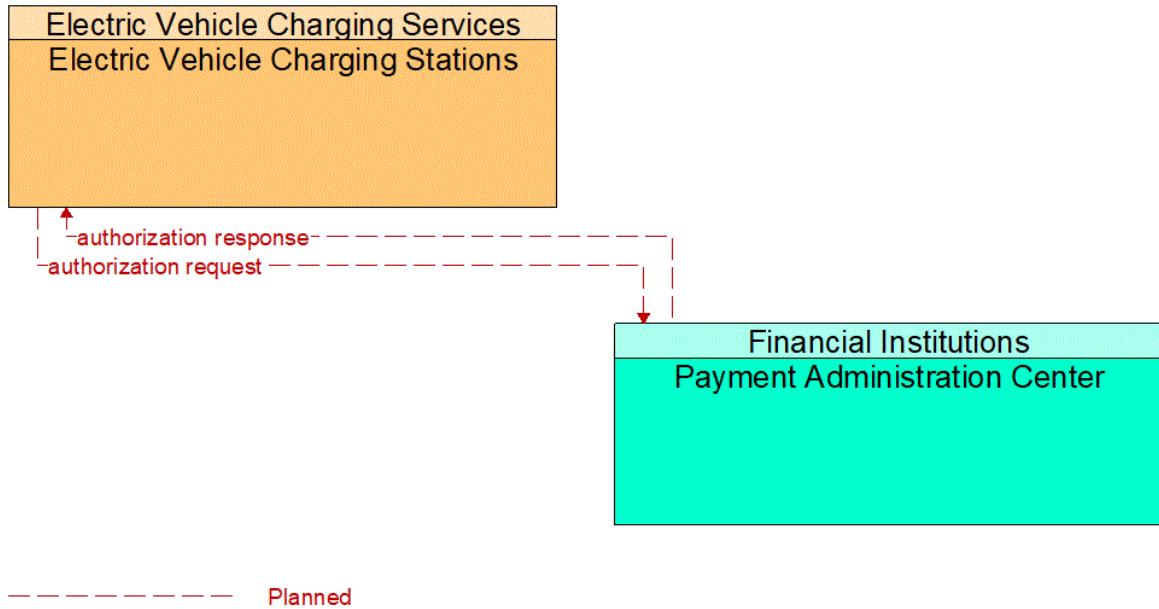


Figure 111: Electric Vehicle Charging Stations - Payment Administration Center Interface

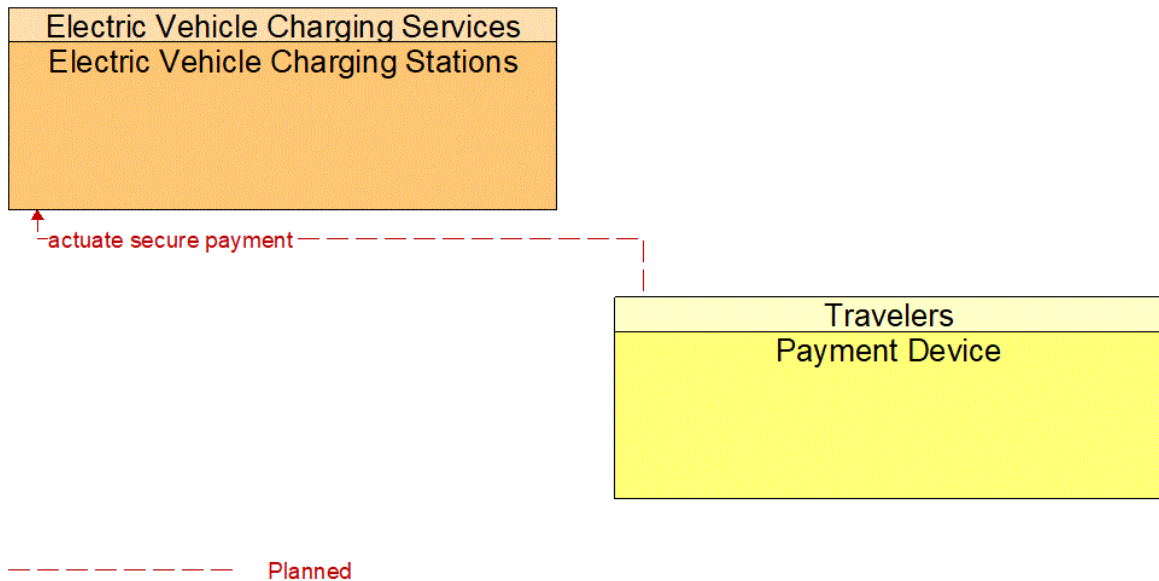


Figure 112: Electric Vehicle Charging Stations - Payment Device Interface

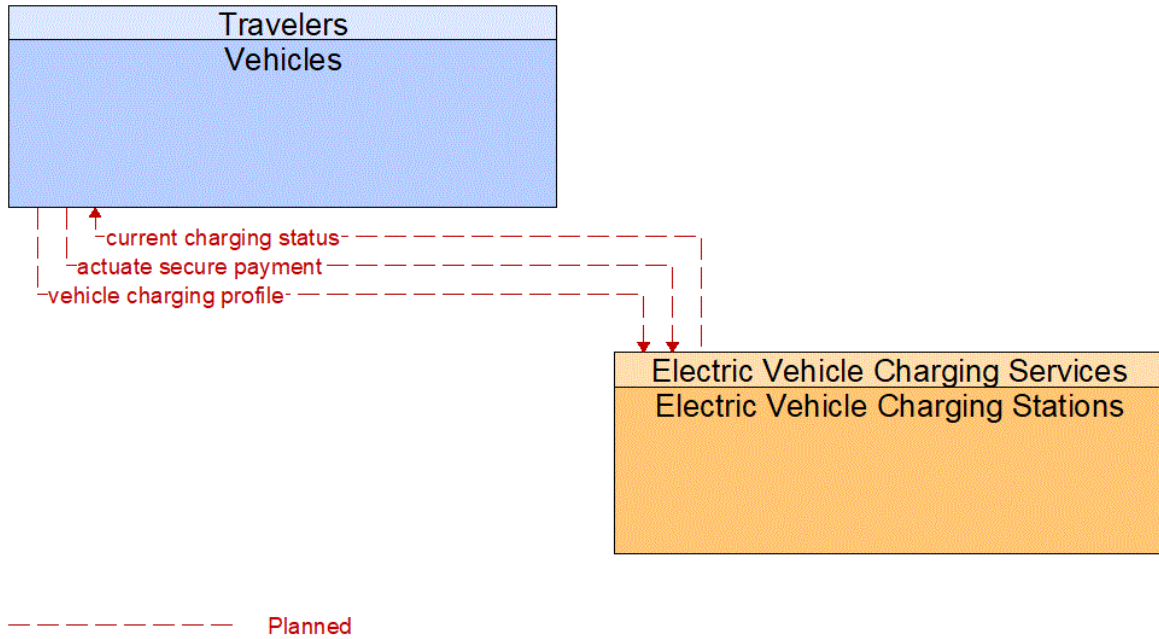


Figure 113: Electric Vehicle Charging Stations - Vehicles Interface

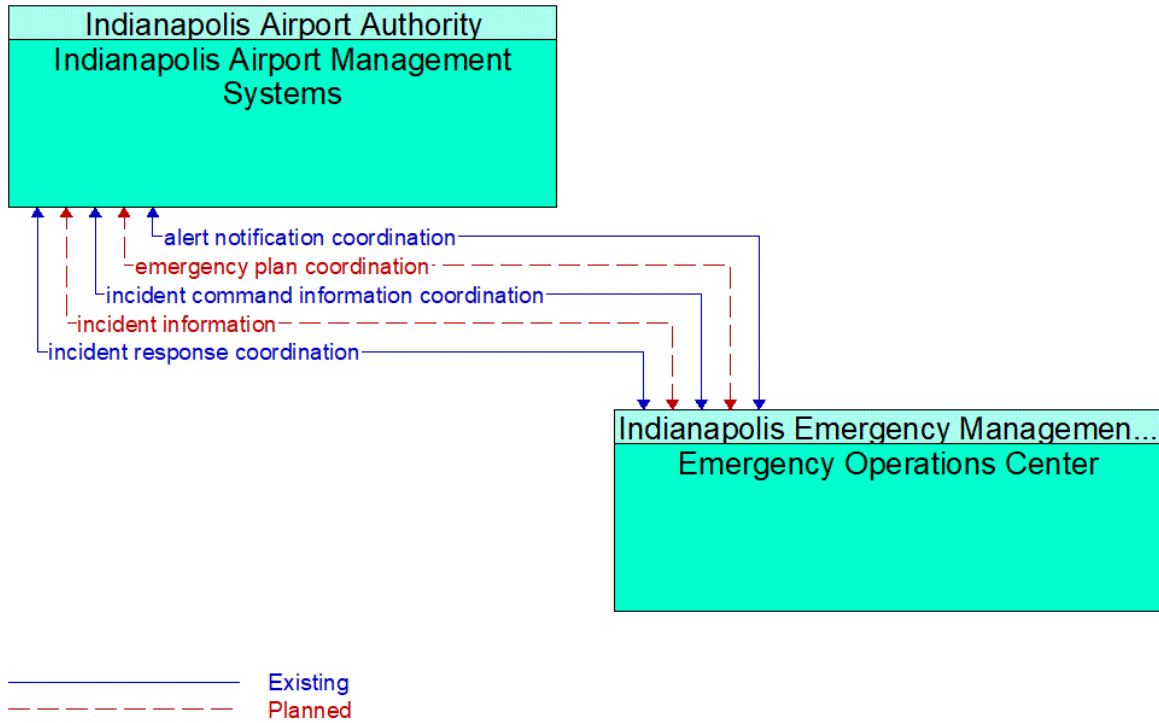


Figure 114: Emergency Operations Center - Indianapolis Airport Management Systems Interface

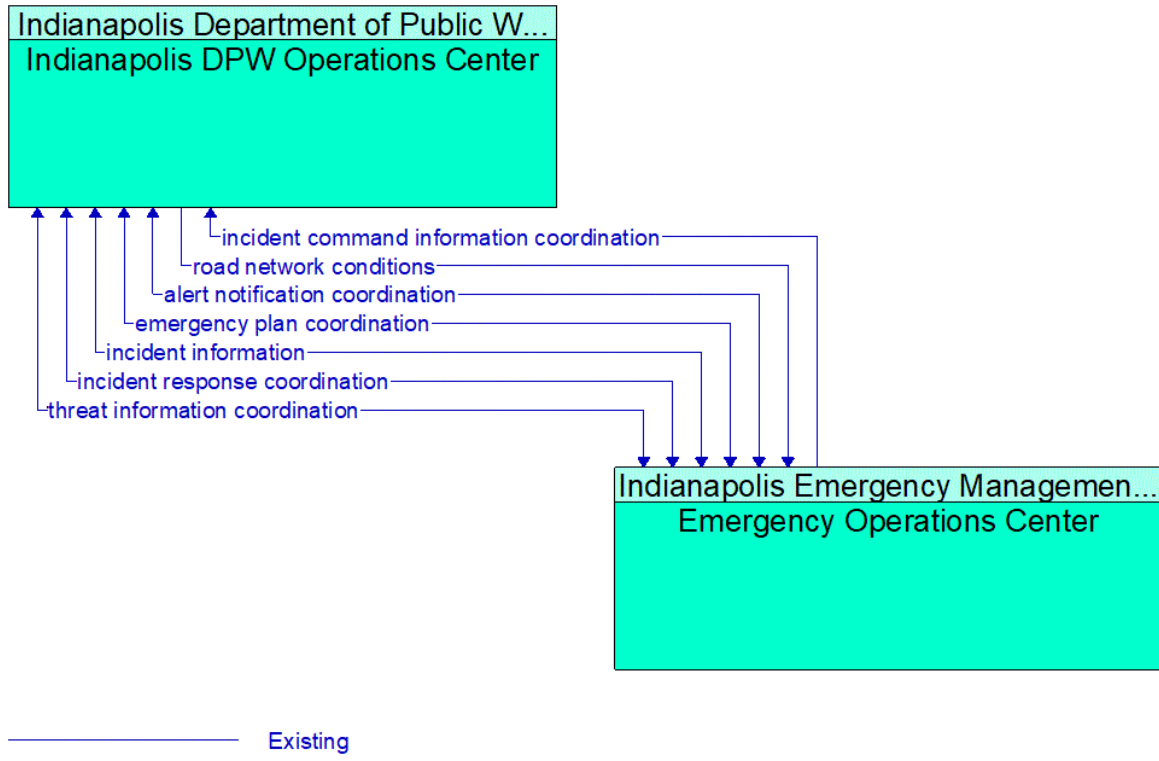
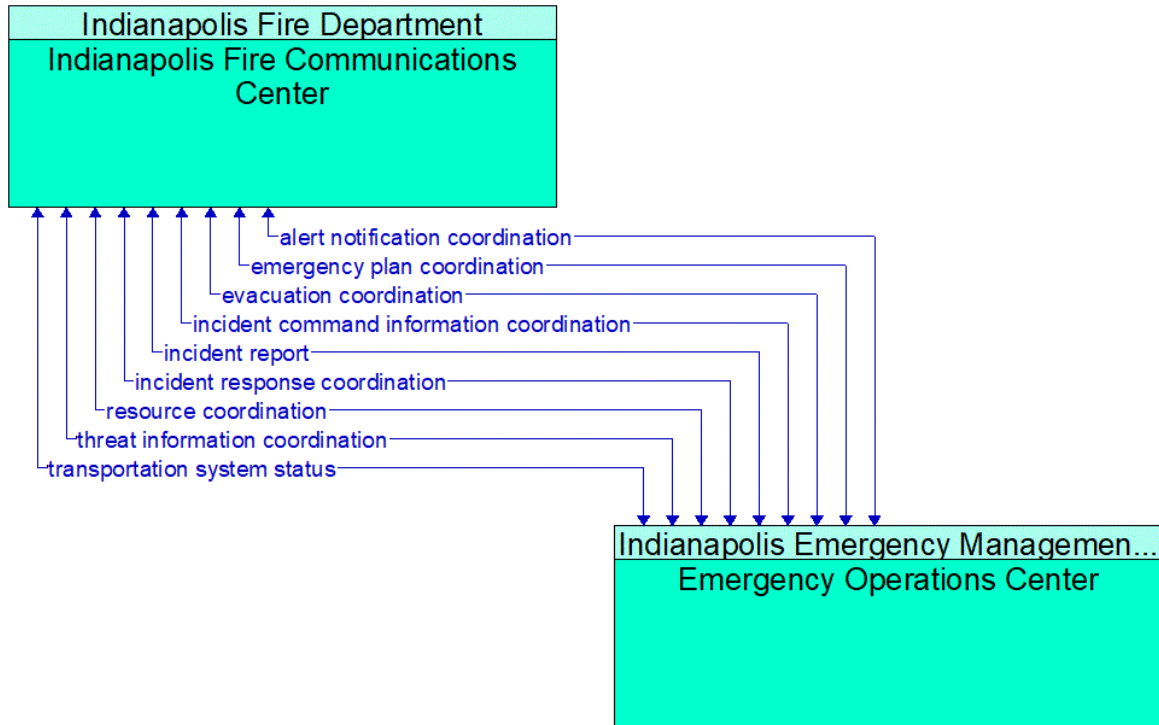


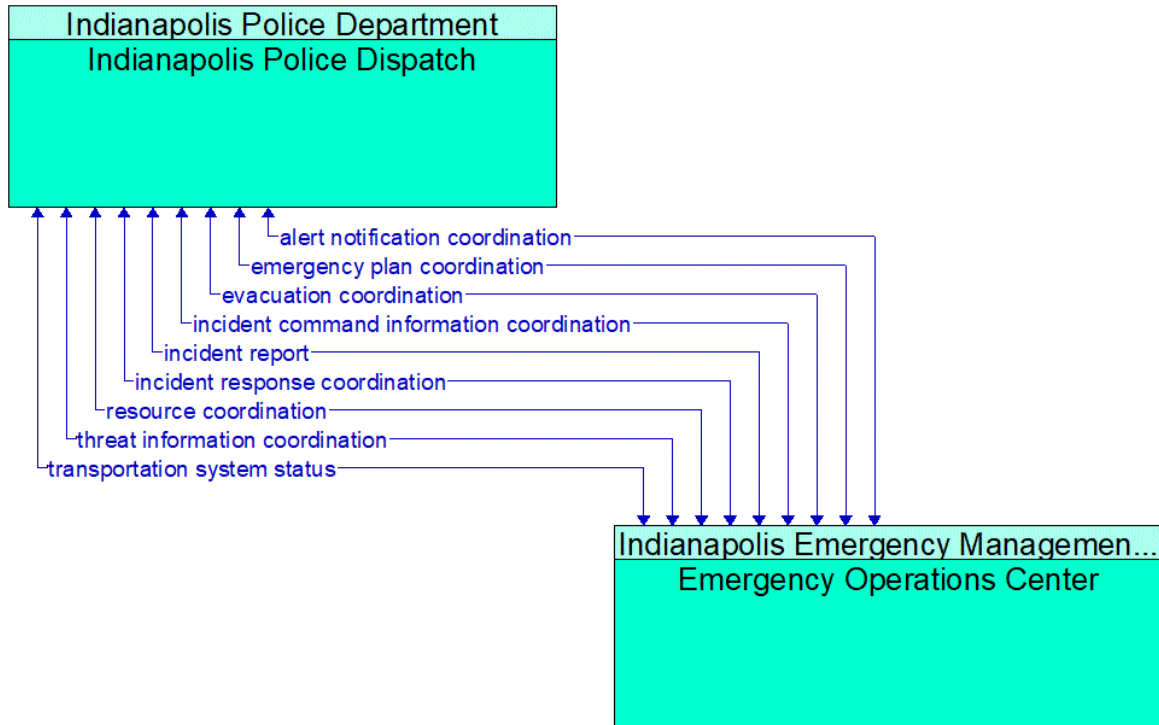
Figure 115: Emergency Operations Center - Indianapolis DPW Operations Center Interface





Existing

Figure 116: Emergency Operations Center - Indianapolis Fire Communications Center Interface



Existing

Figure 117: Emergency Operations Center - Indianapolis Police Dispatch Interface

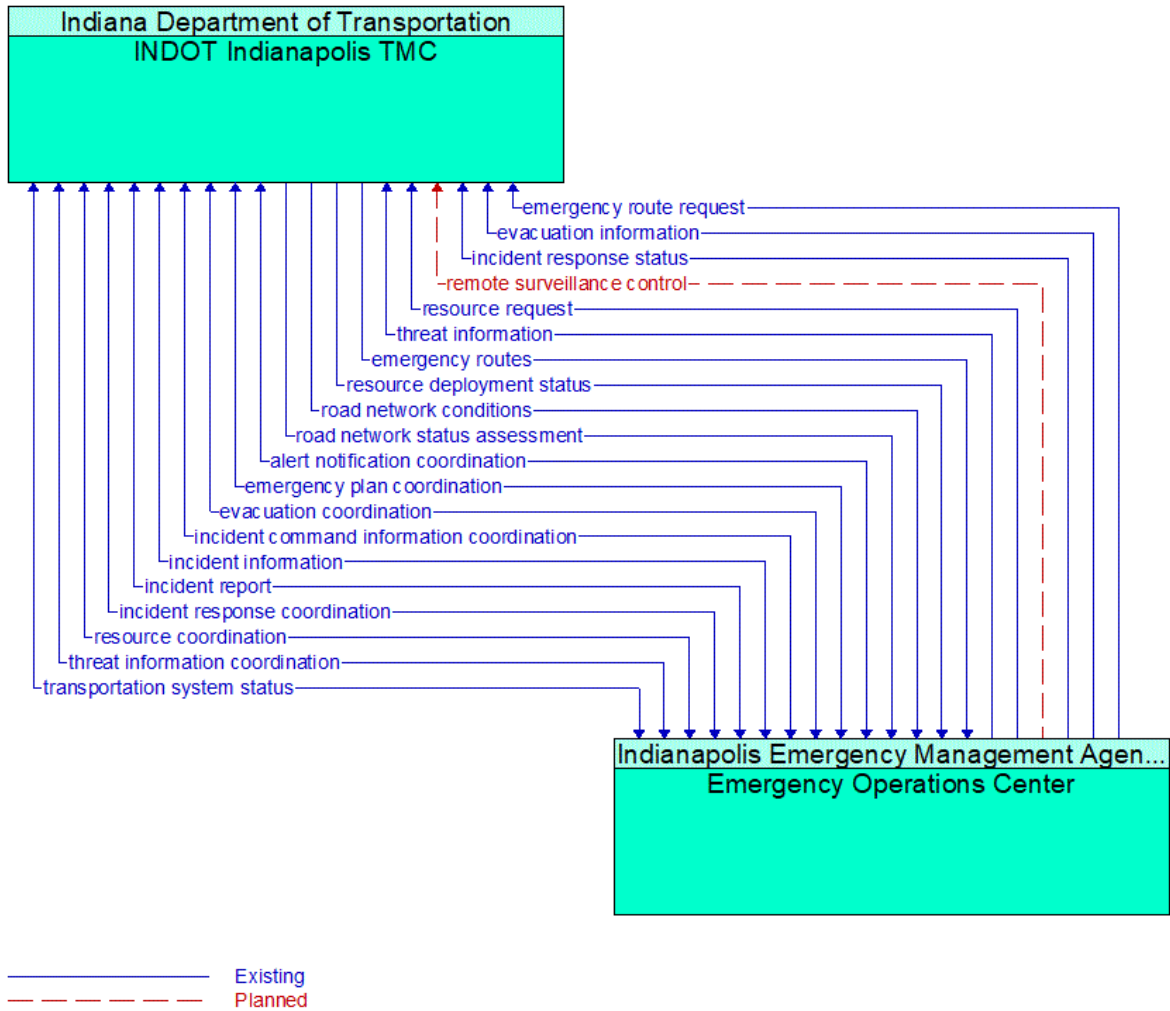


Figure 118: Emergency Operations Center - INDOT Indianapolis TMC Interface

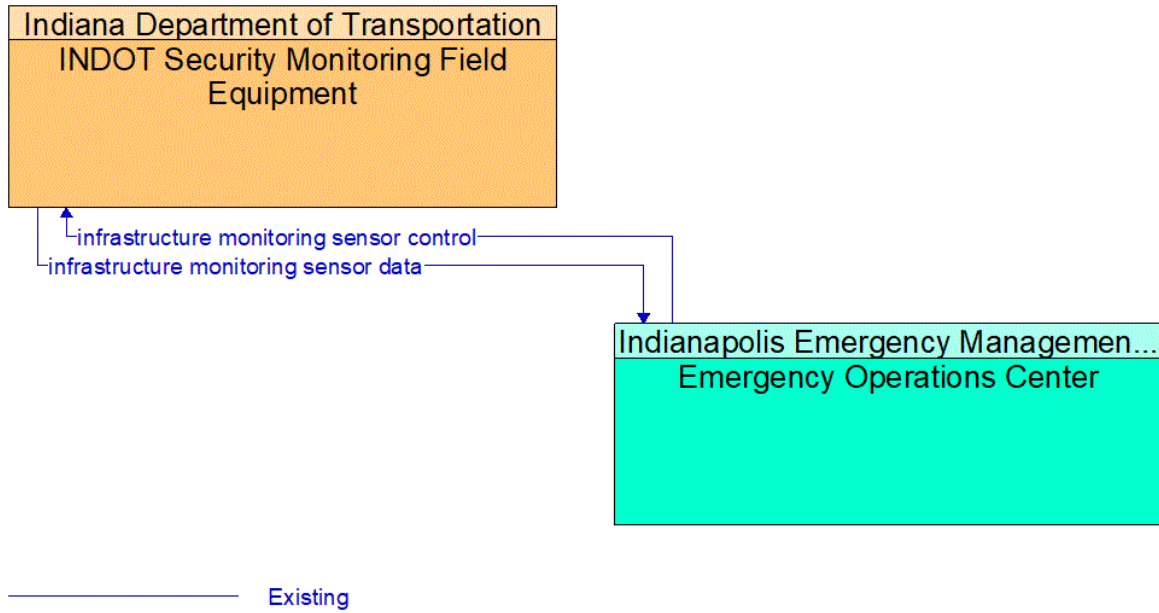
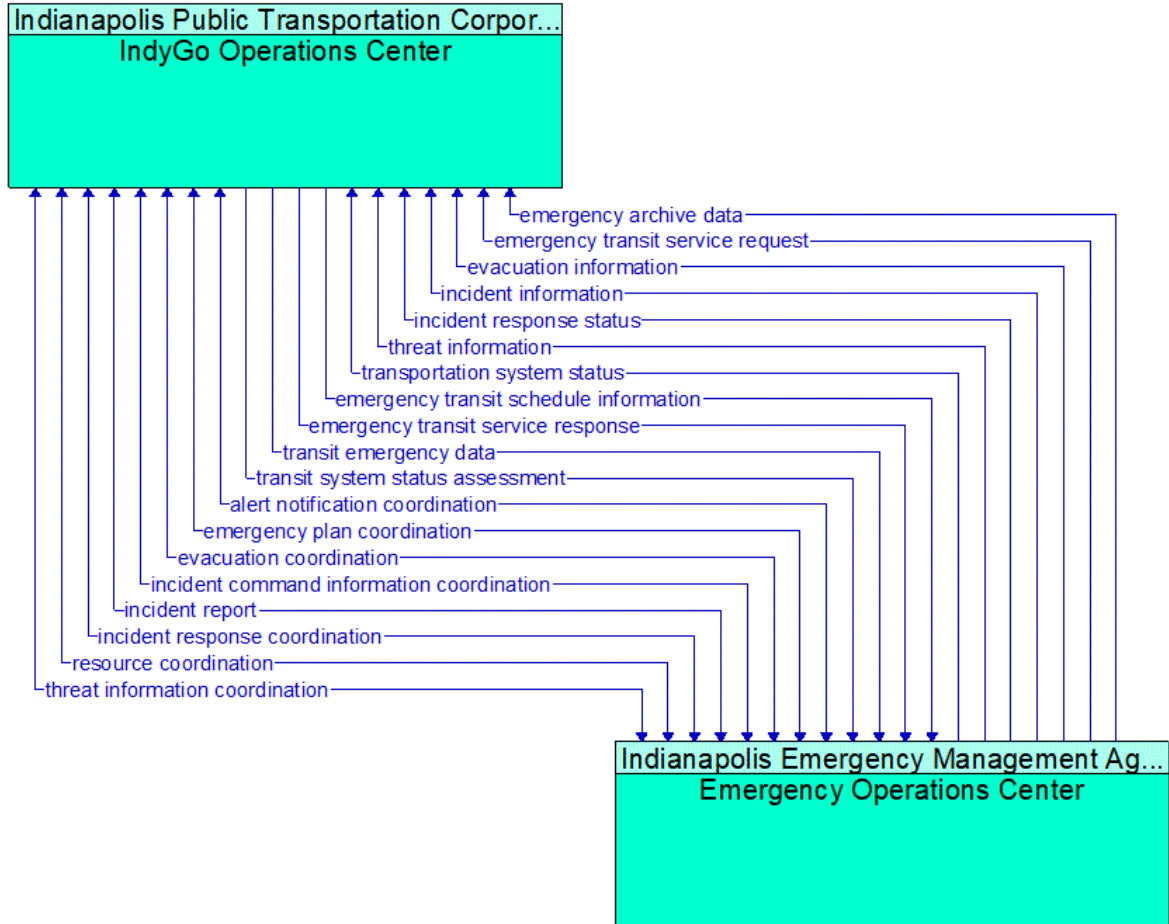


Figure 119: Emergency Operations Center - INDOT Security Monitoring Field Equipment Interface



Existing

Figure 120: Emergency Operations Center - IndyGo Operations Center Interface

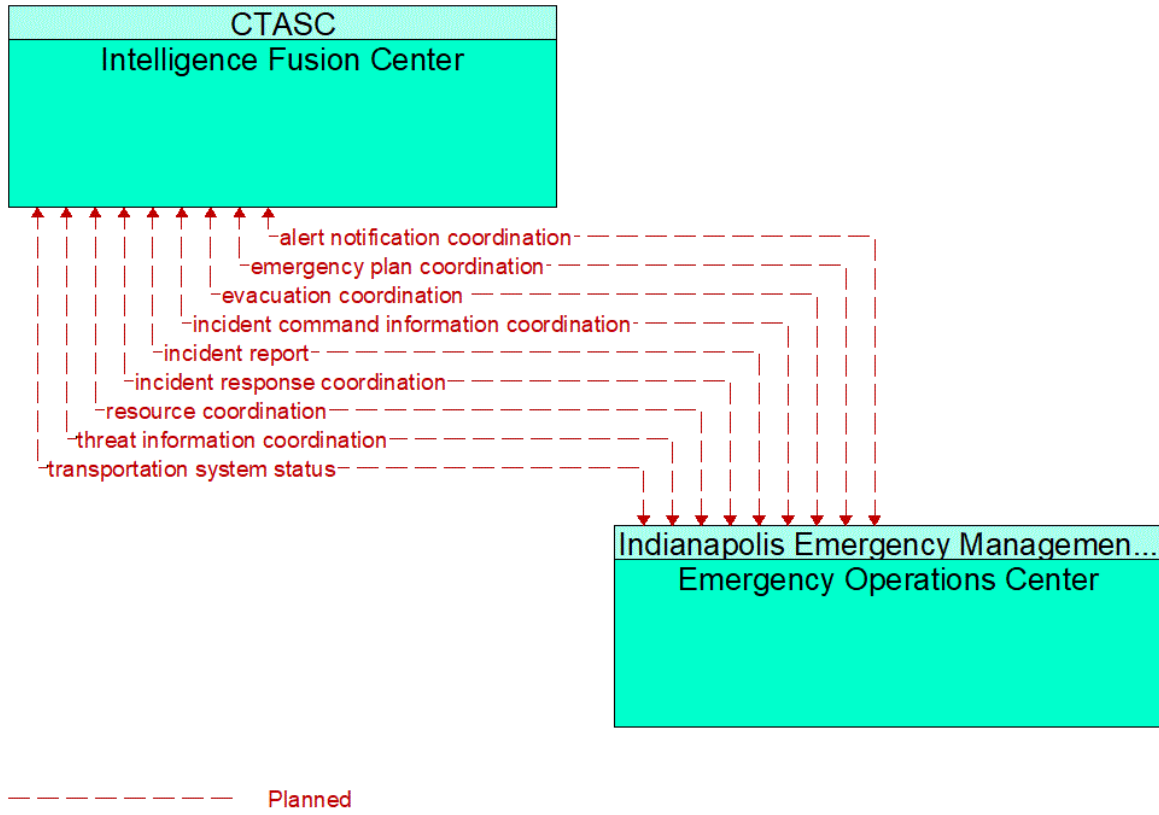


Figure 121: Emergency Operations Center - Intelligence Fusion Center Interface

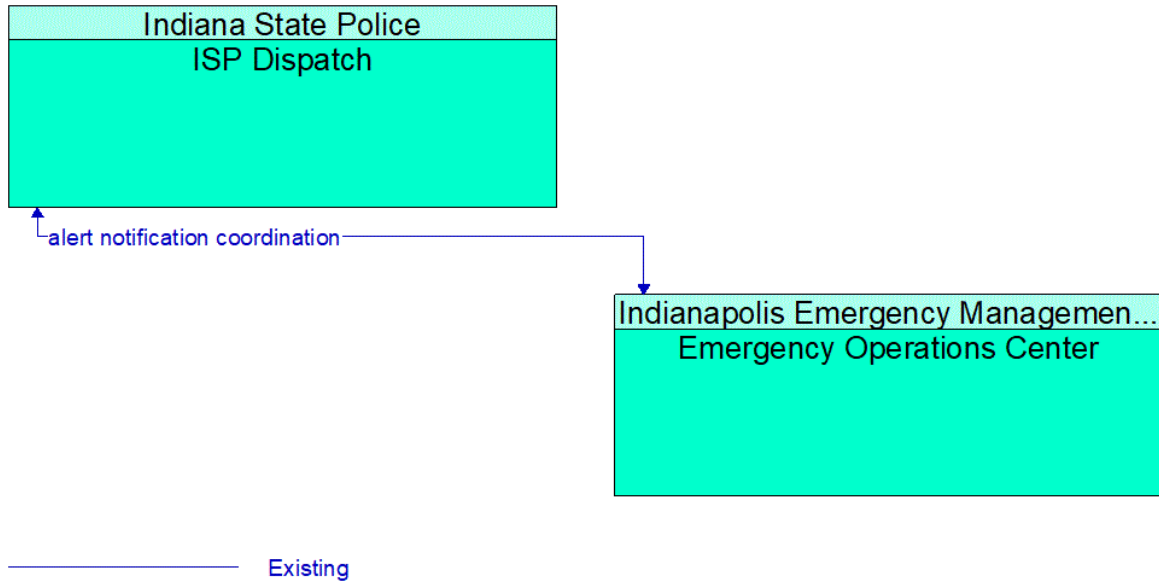


Figure 122: Emergency Operations Center - ISP Dispatch Interface

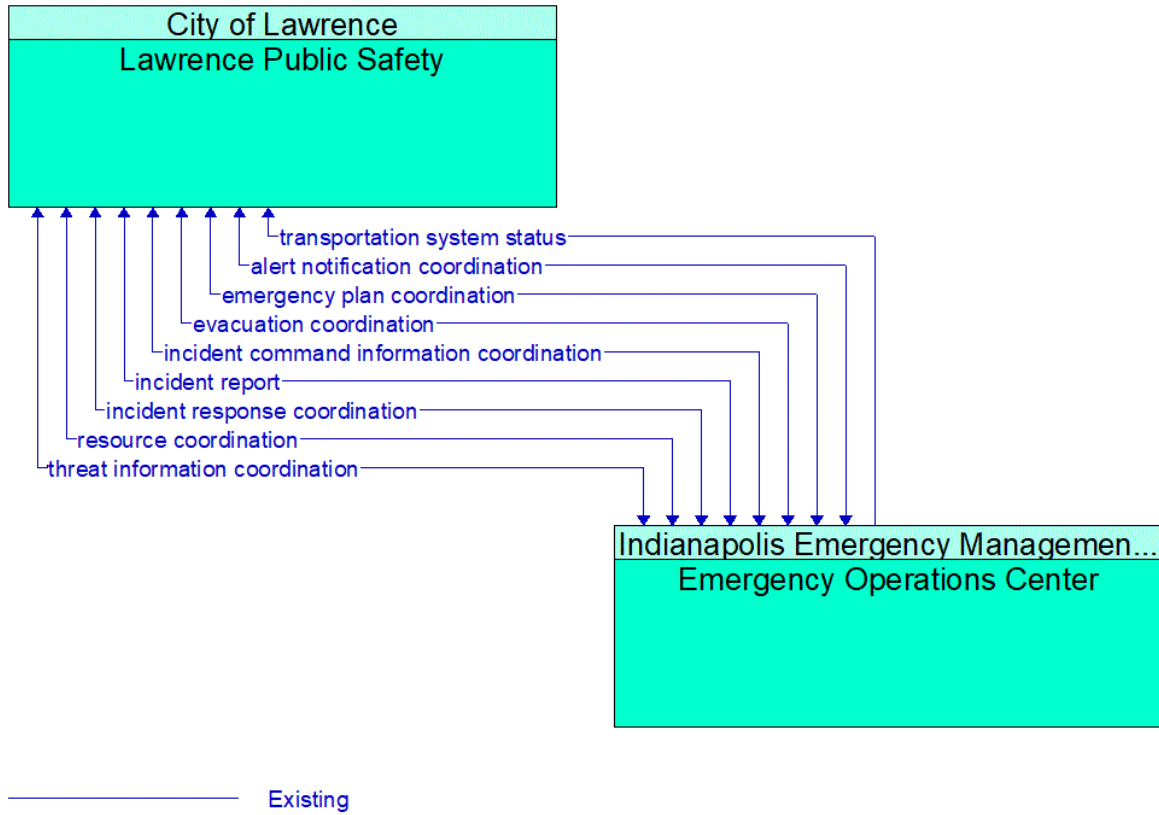


Figure 123: Emergency Operations Center - Lawrence Public Safety Interface

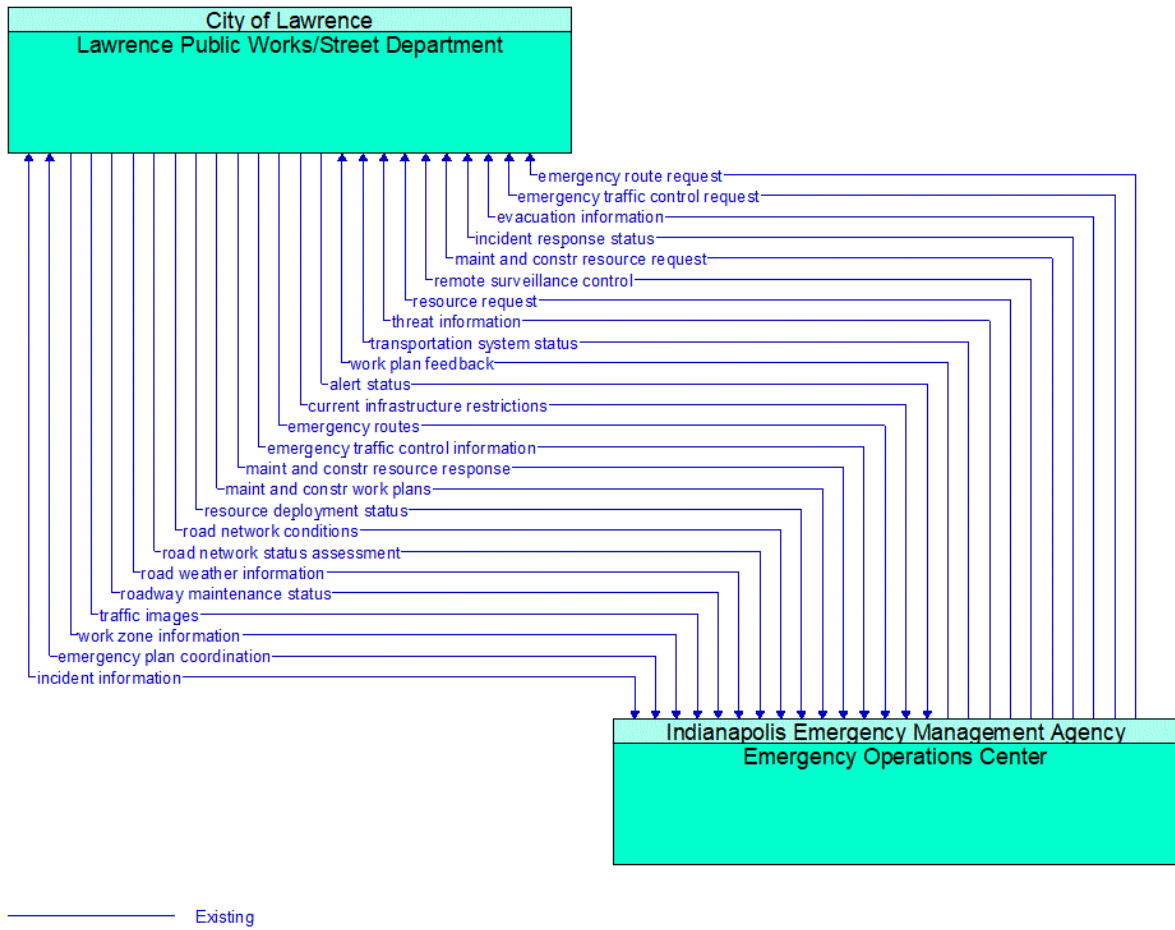


Figure 124: Emergency Operations Center - Lawrence Public Works/Street Department Interface

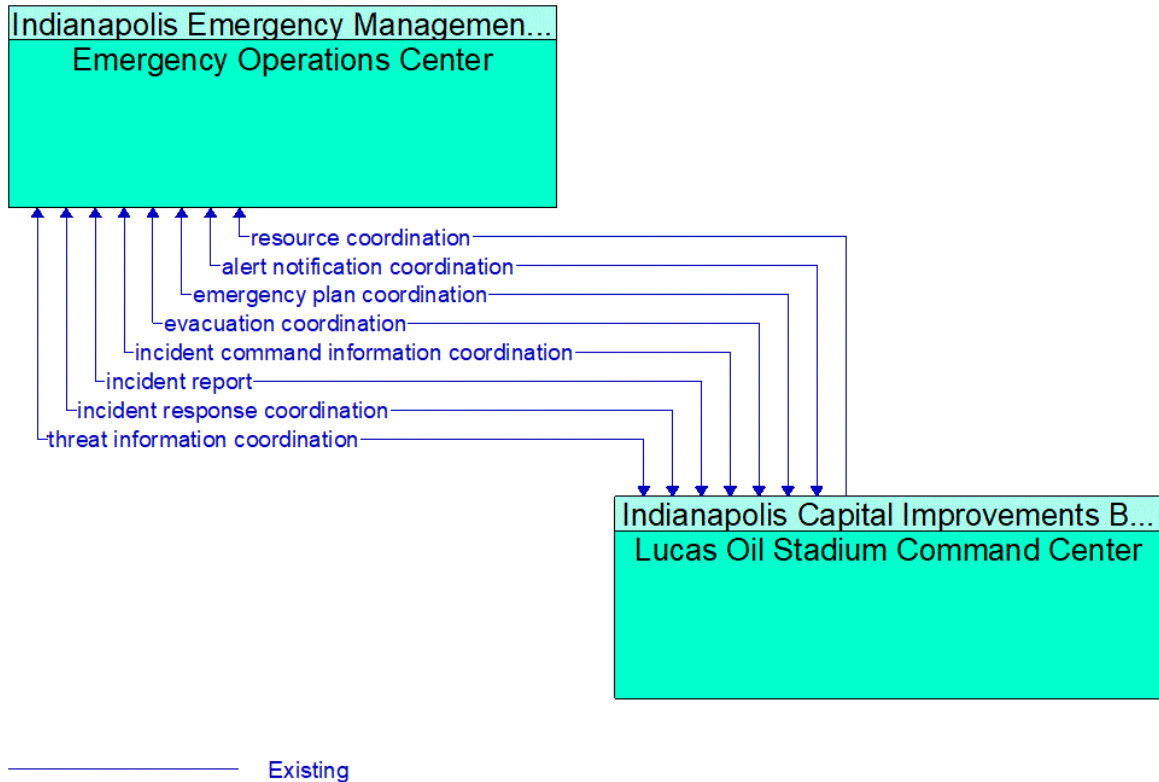
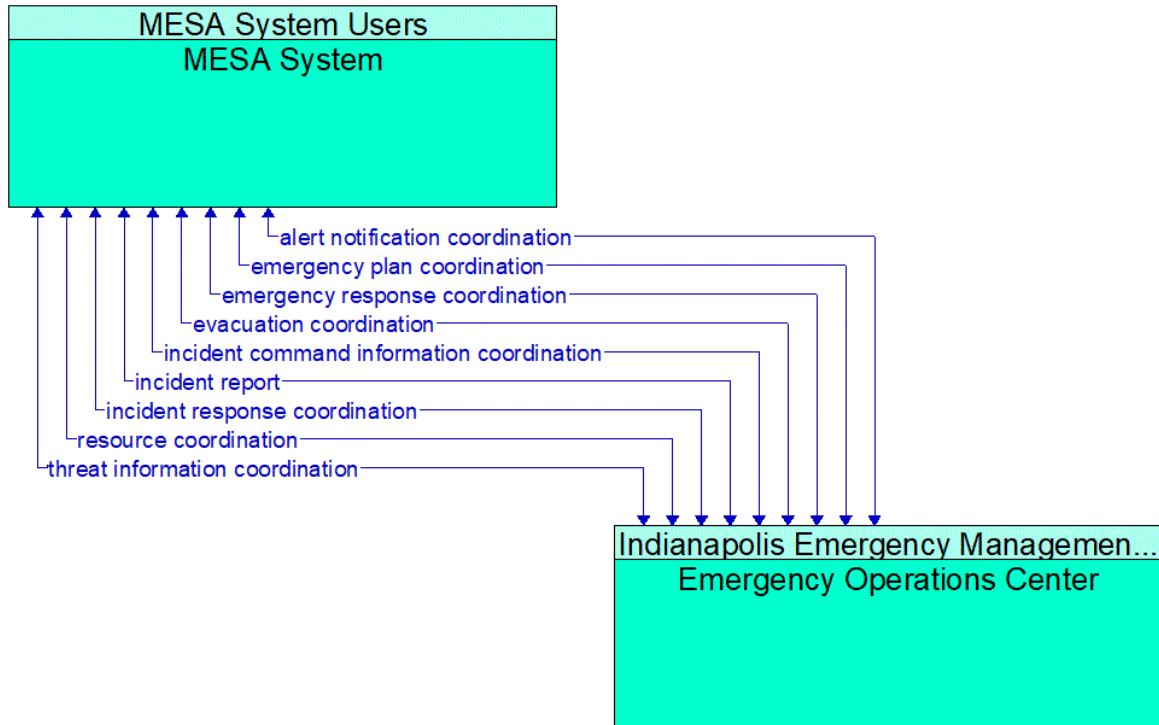


Figure 125: Emergency Operations Center - Lucas Oil Stadium Command Center Interface



Existing

Figure 126: Emergency Operations Center - MESA System Interface

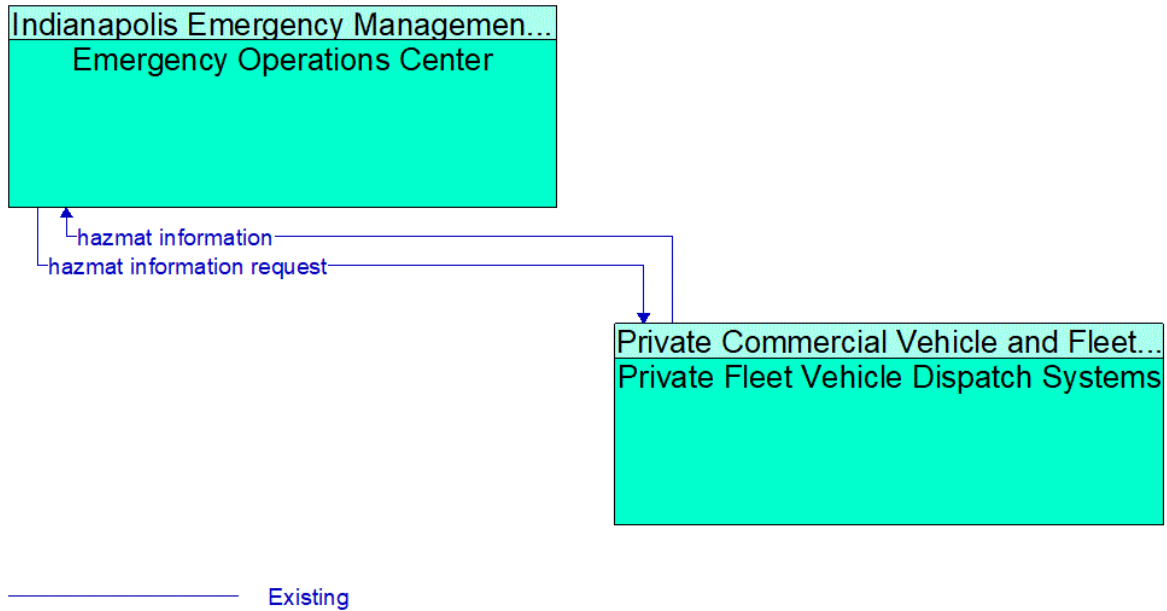


Figure 127: Emergency Operations Center - Private Fleet Vehicle Dispatch Systems Interface

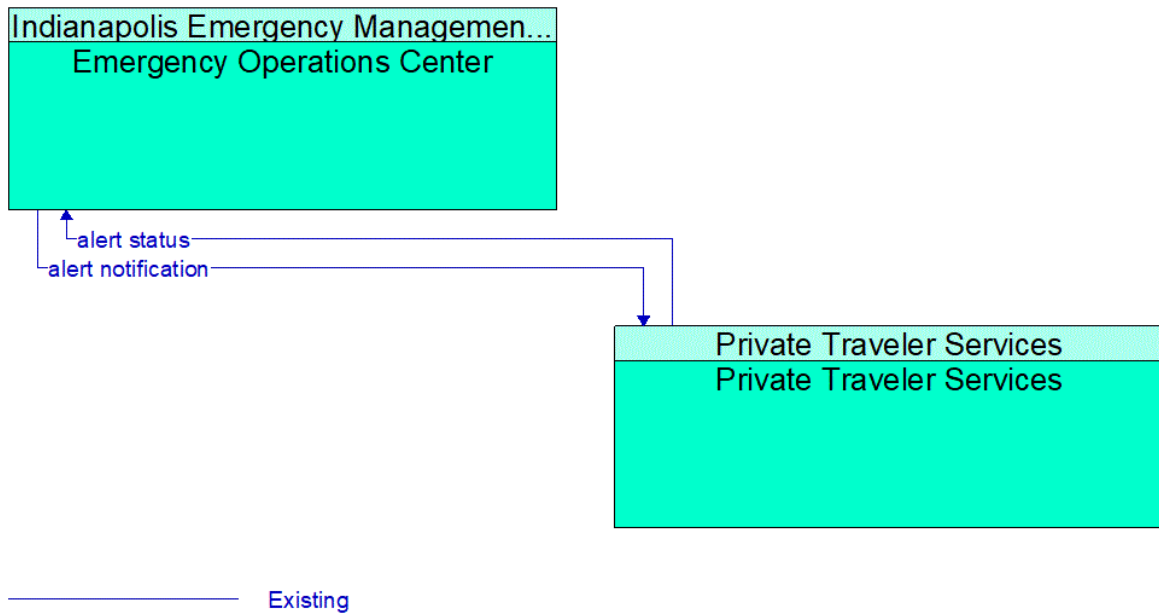
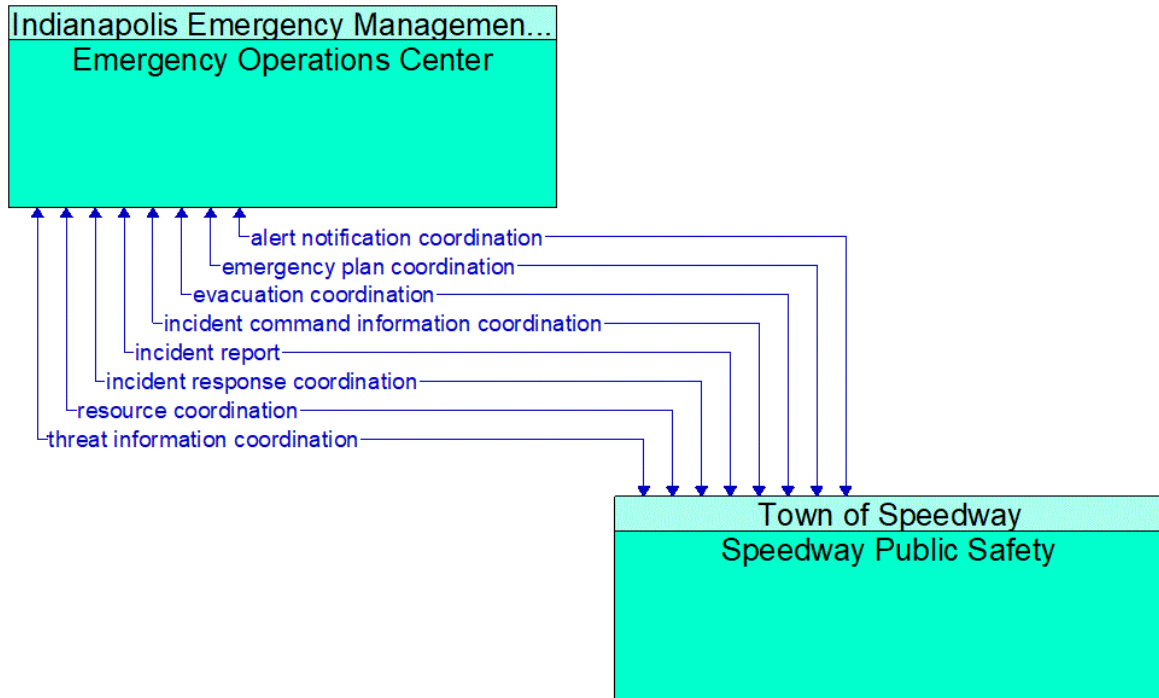


Figure 128: Emergency Operations Center - Private Traveler Services Interface



Existing

Figure 129: Emergency Operations Center - Speedway Public Safety Interface

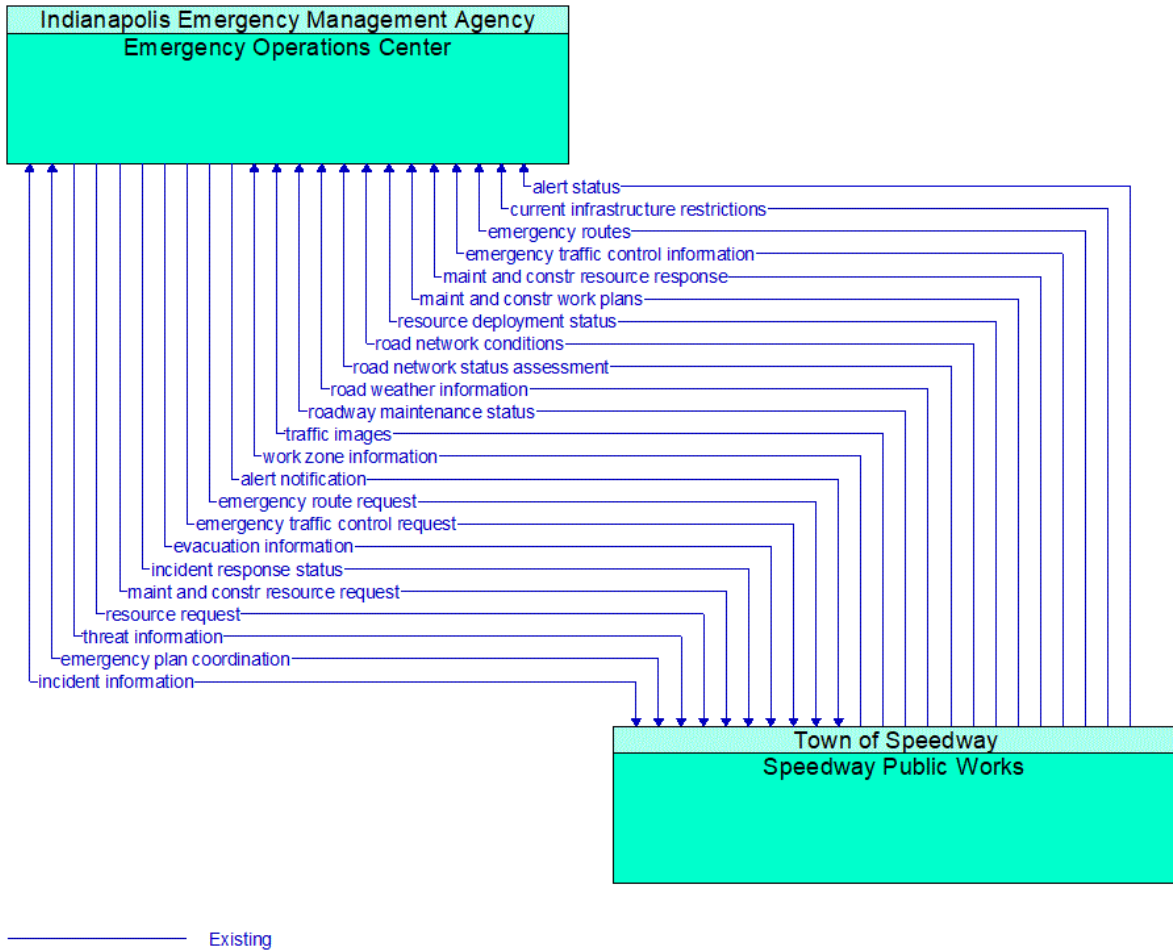


Figure 130: Emergency Operations Center - Speedway Public Works Interface

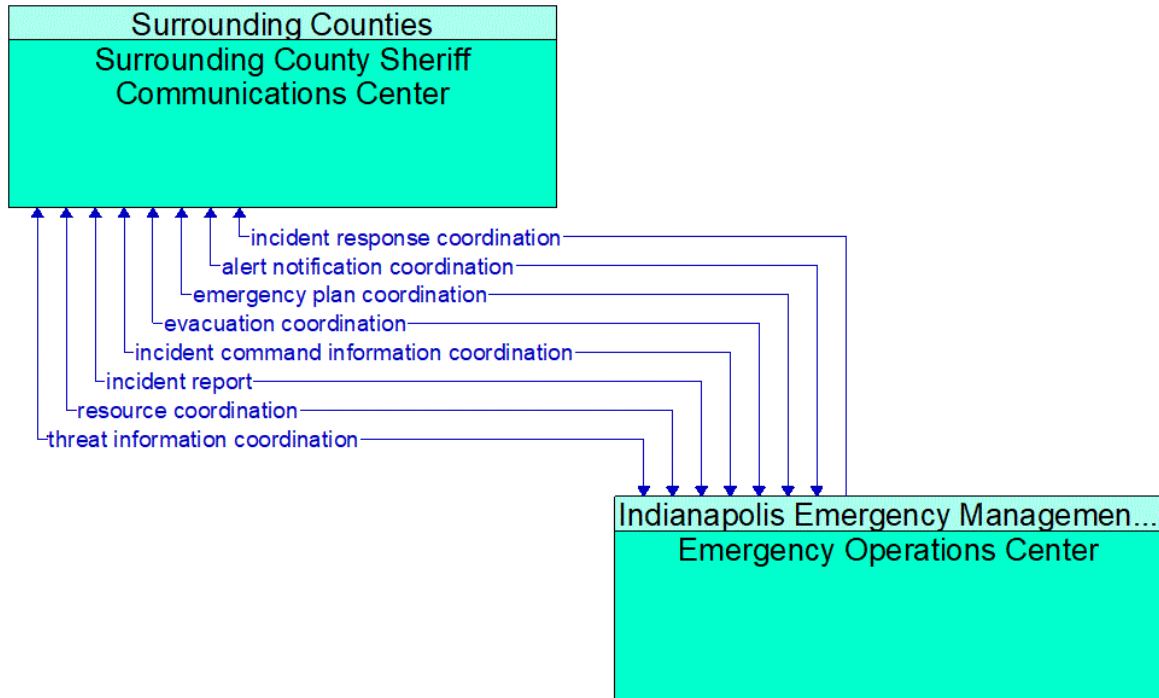


Figure 131: Emergency Operations Center - Surrounding County Sheriff Communications Center Interface

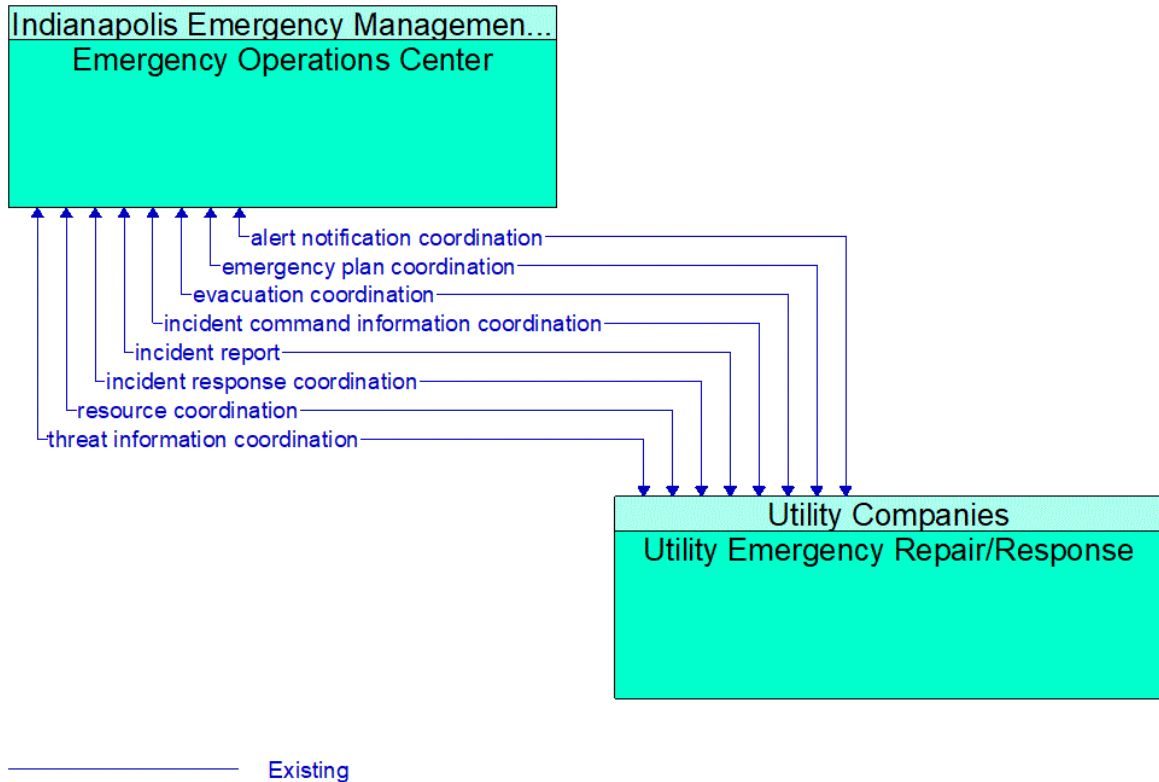


Figure 132: Emergency Operations Center - Utility Emergency Repair/Response Interface

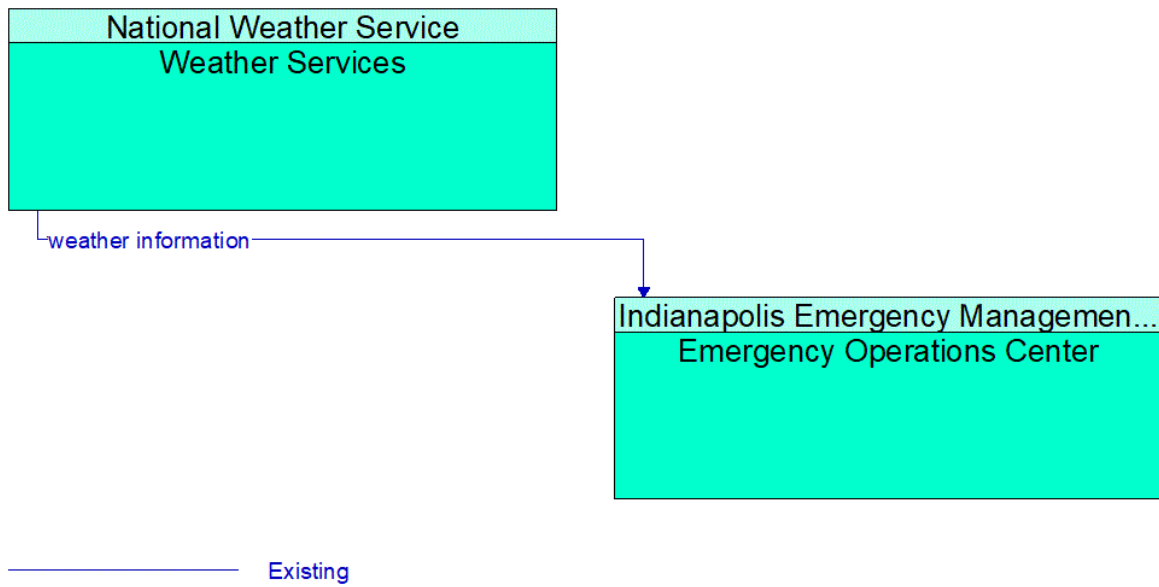


Figure 133: Emergency Operations Center - Weather Services Interface

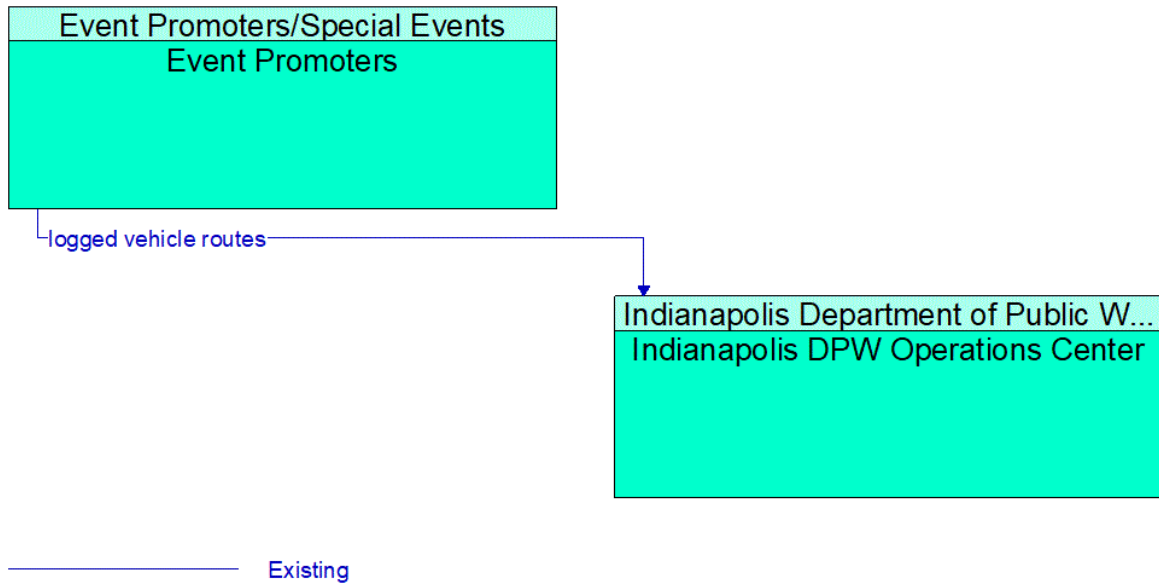


Figure 134: Event Promoters - Indianapolis DPW Operations Center Interface

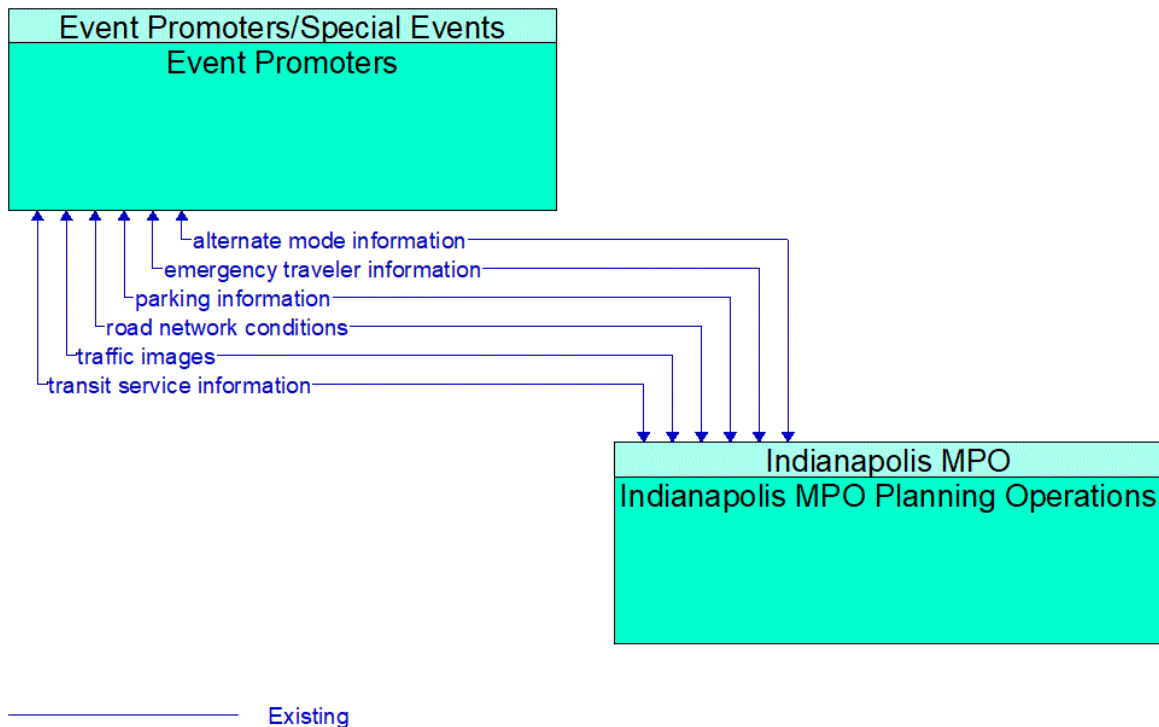


Figure 135: Event Promoters - Indianapolis MPO Planning Operations Interface

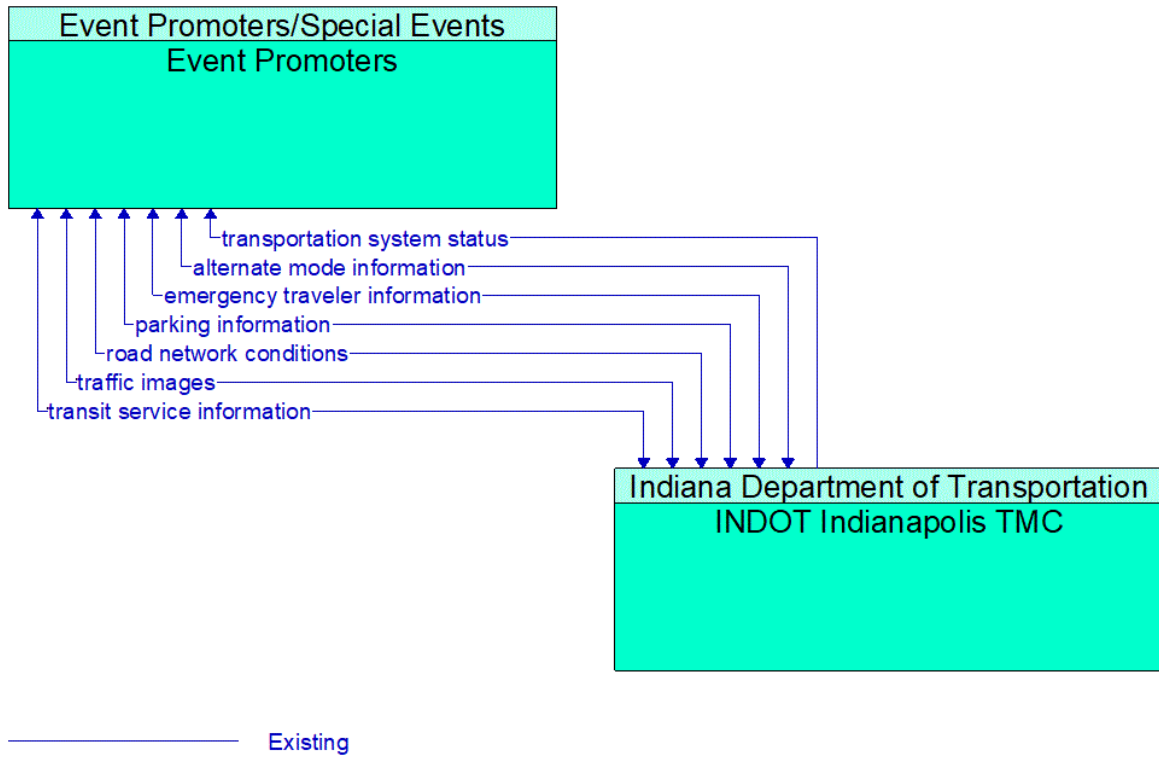


Figure 136: Event Promoters - INDOT Indianapolis TMC Interface

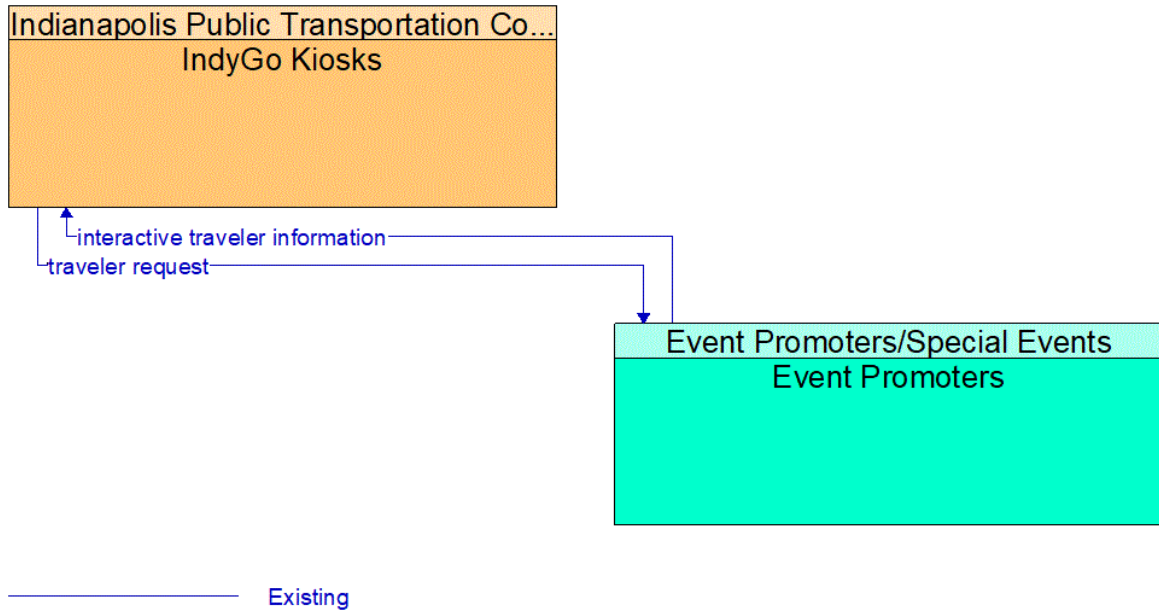


Figure 137: Event Promoters - IndyGo Kiosks Interface

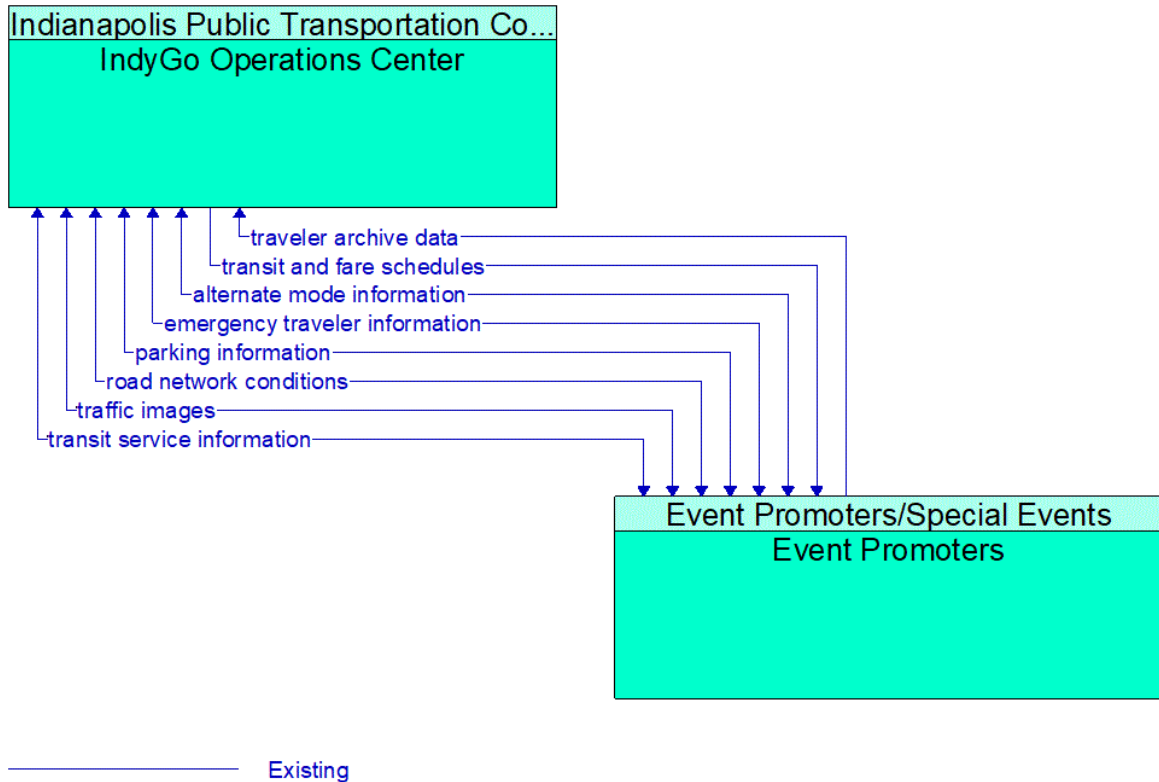


Figure 138: Event Promoters - IndyGo Operations Center Interface

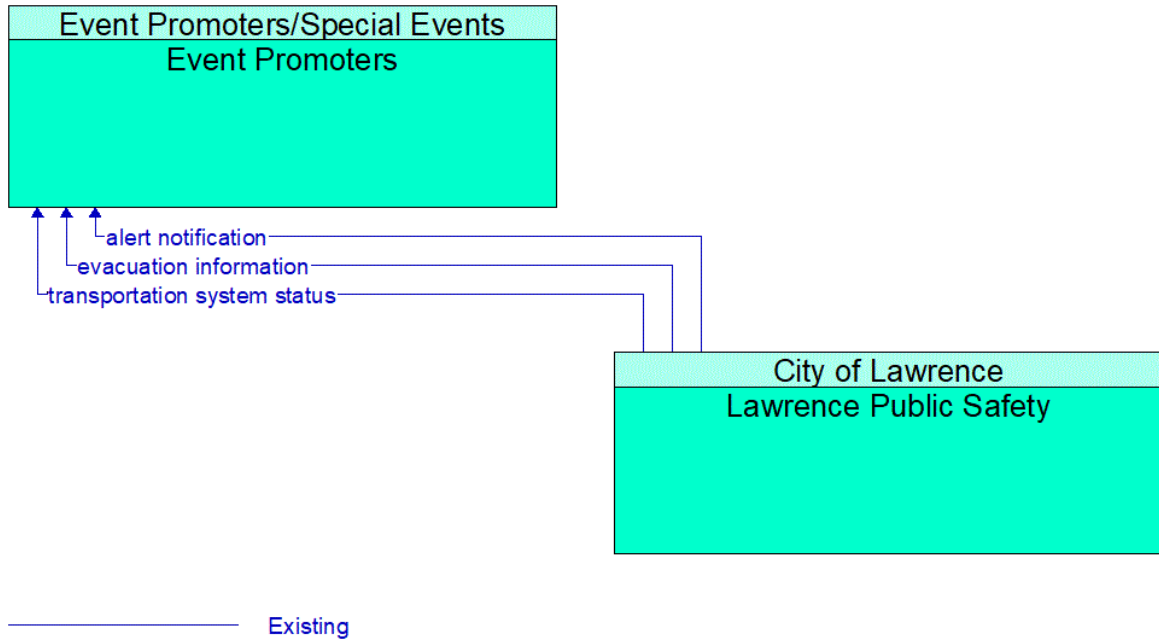


Figure 139: Event Promoters - Lawrence Public Safety Interface

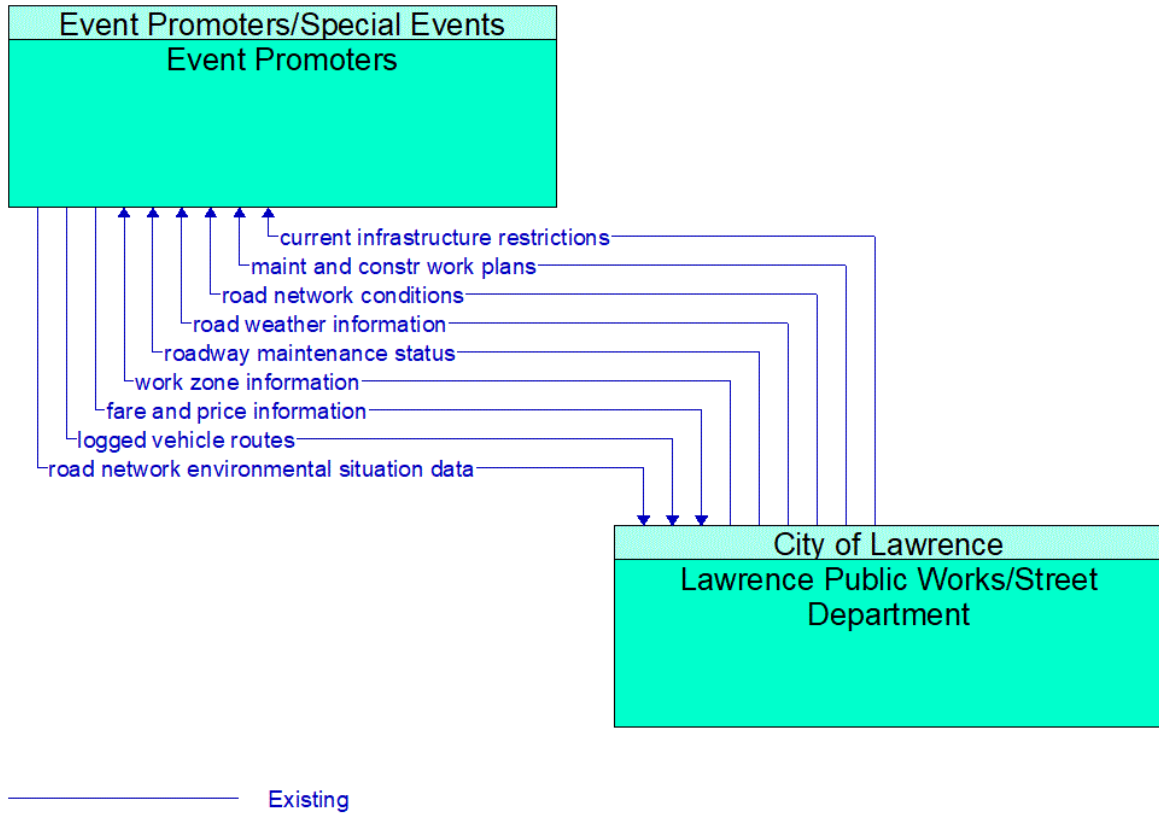


Figure 140: Event Promoters - Lawrence Public Works/Street Department Interface

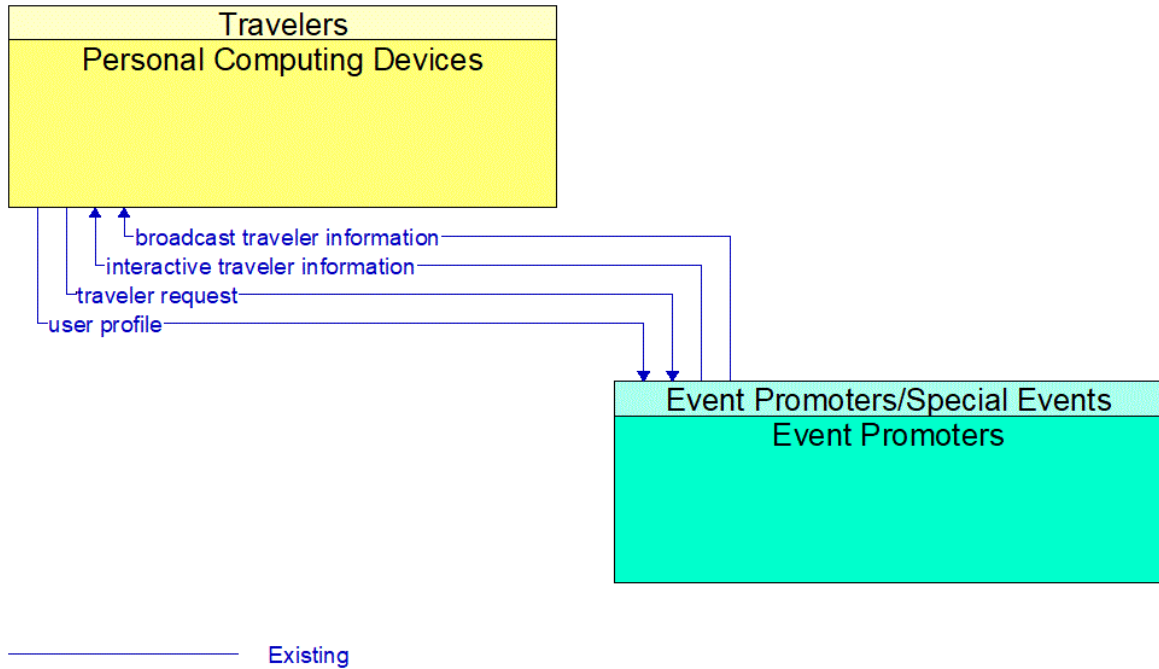


Figure 141: Event Promoters - Personal Computing Devices Interface

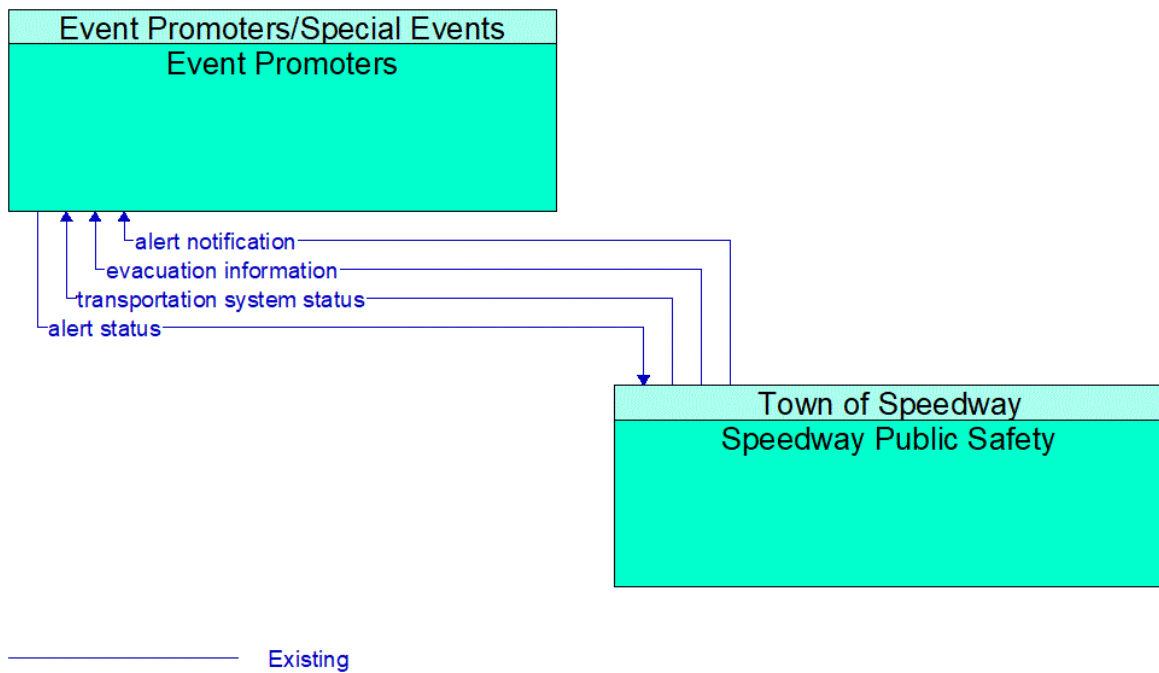


Figure 142: Event Promoters - Speedway Public Safety Interface

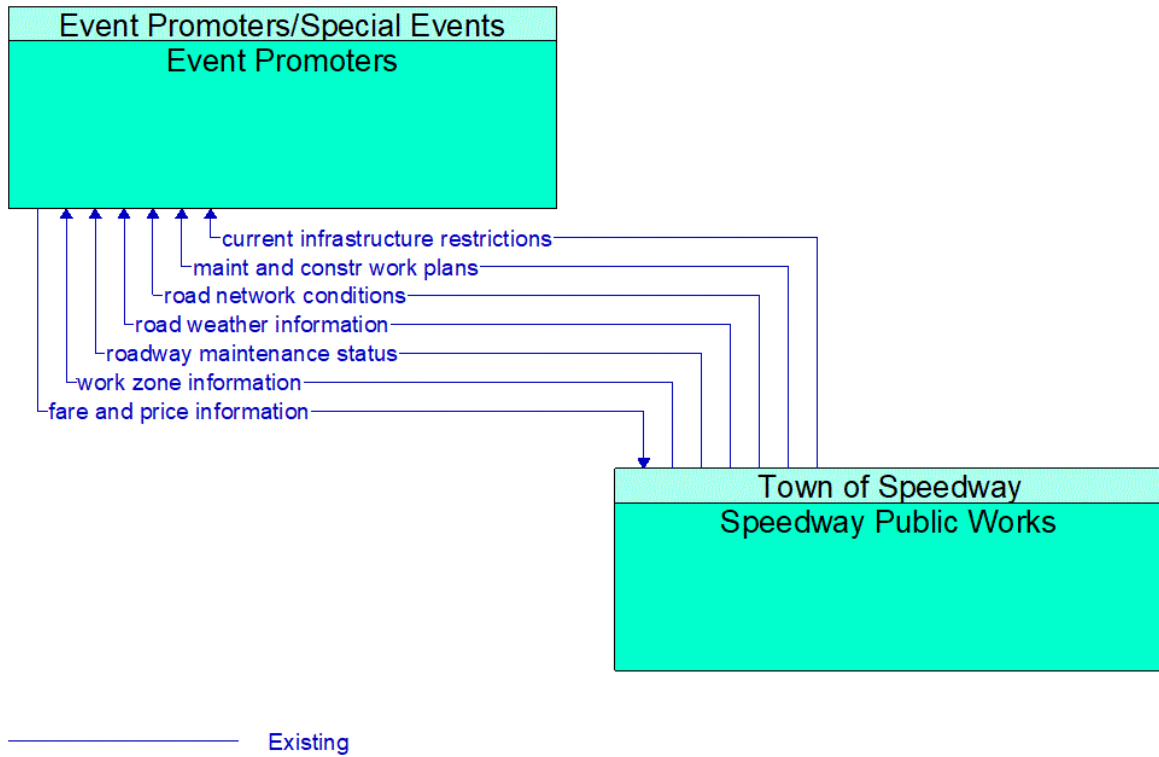


Figure 143: Event Promoters - Speedway Public Works Interface

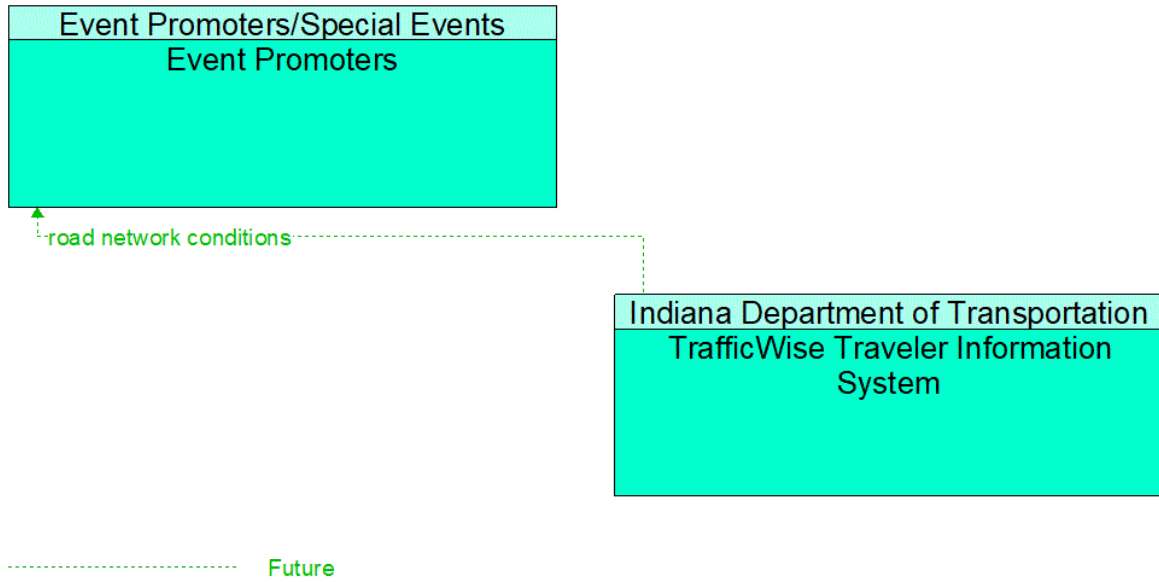


Figure 144: Event Promoters - TrafficWise Traveler Information System Interface

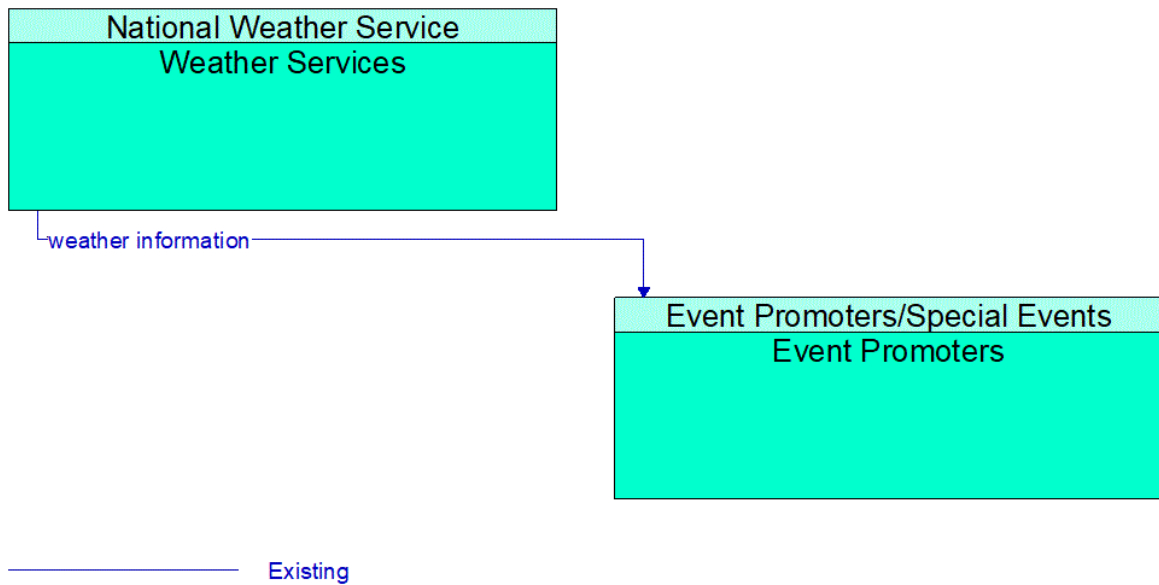


Figure 145: Event Promoters - Weather Services Interface

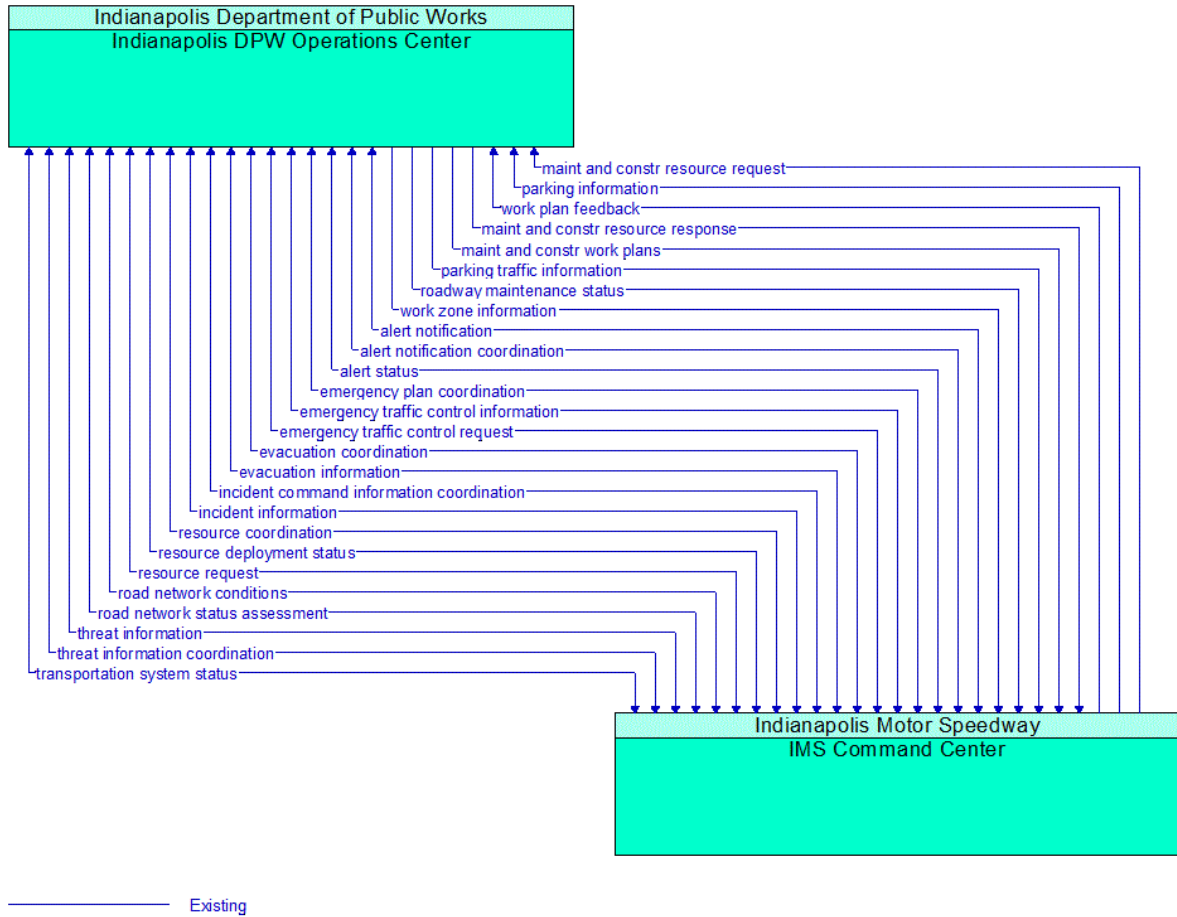
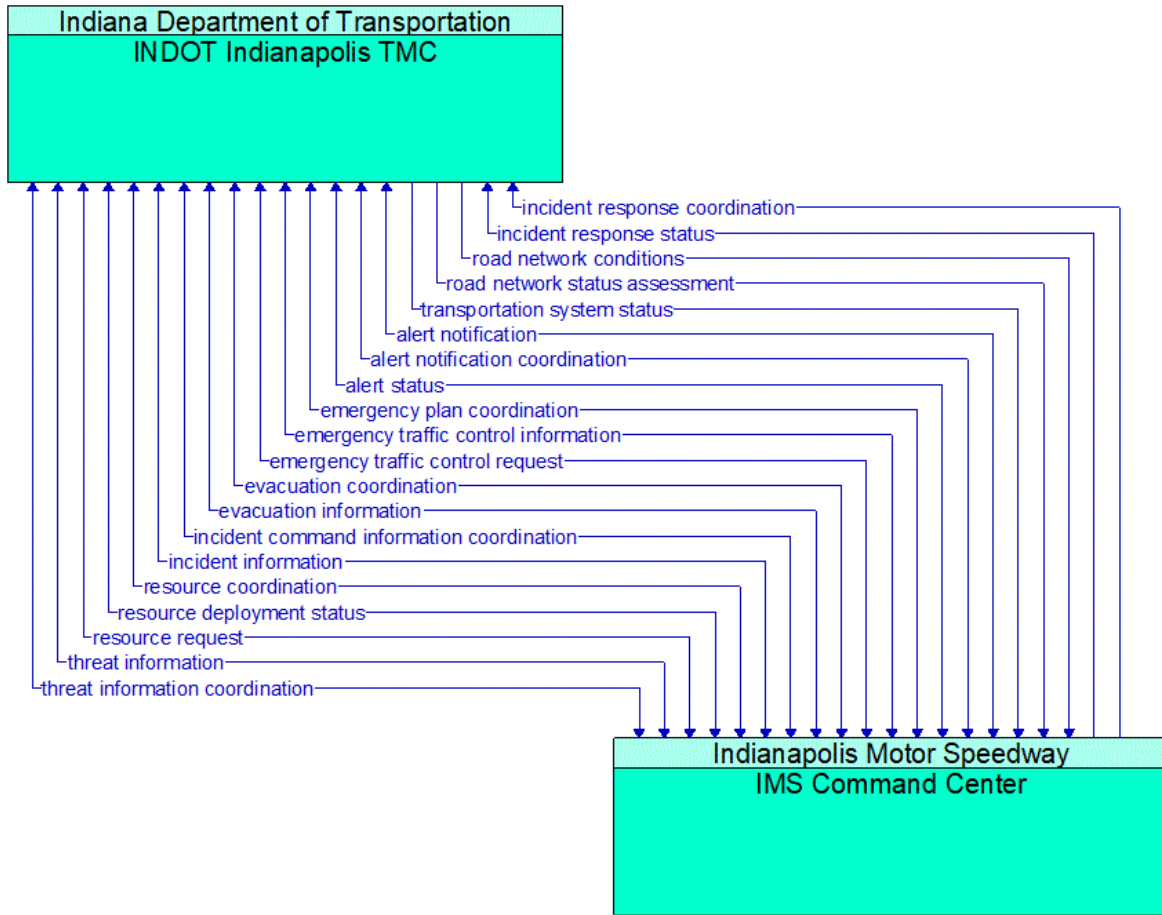
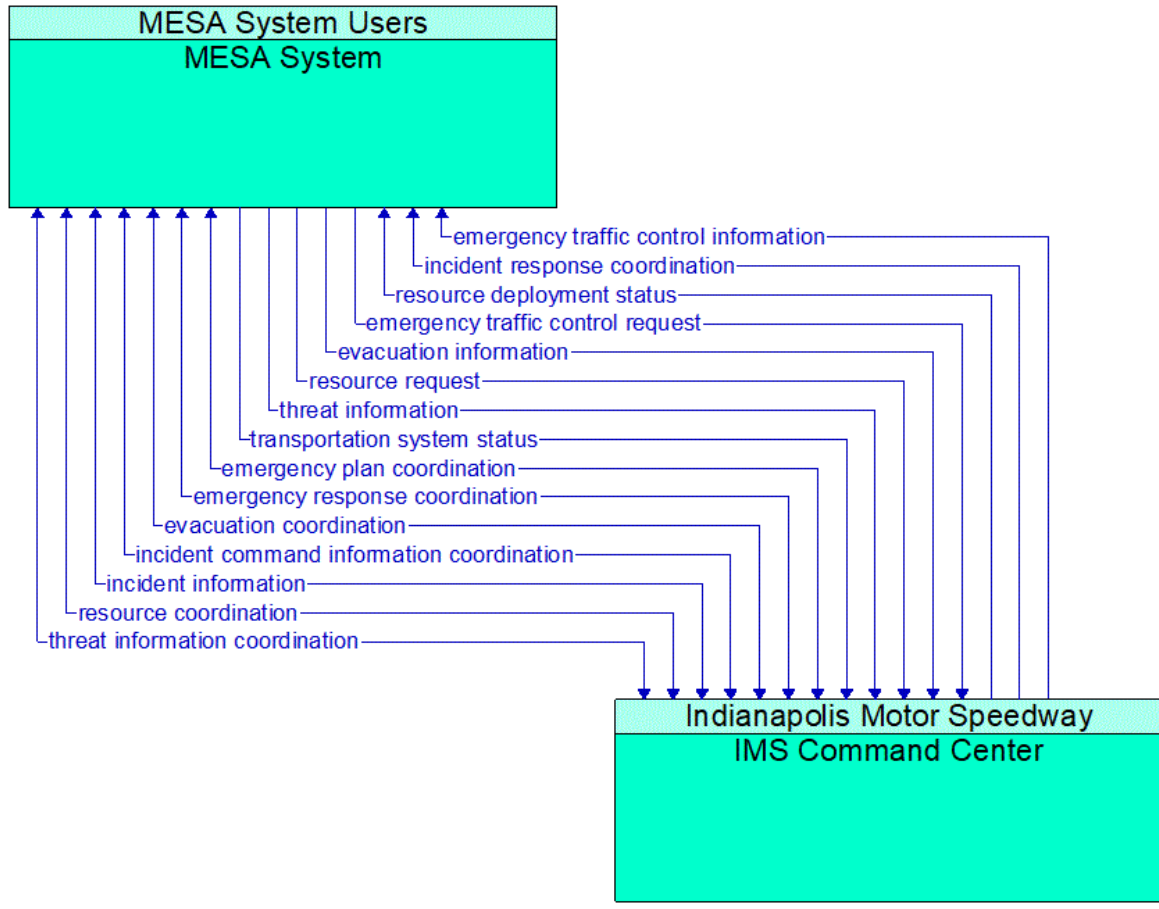


Figure 146: IMS Command Center - Indianapolis DPW Operations Center Interface



Existing

Figure 147: IMS Command Center - INDOT Indianapolis TMC Interface



Existing

Figure 148: IMS Command Center - MESA System Interface

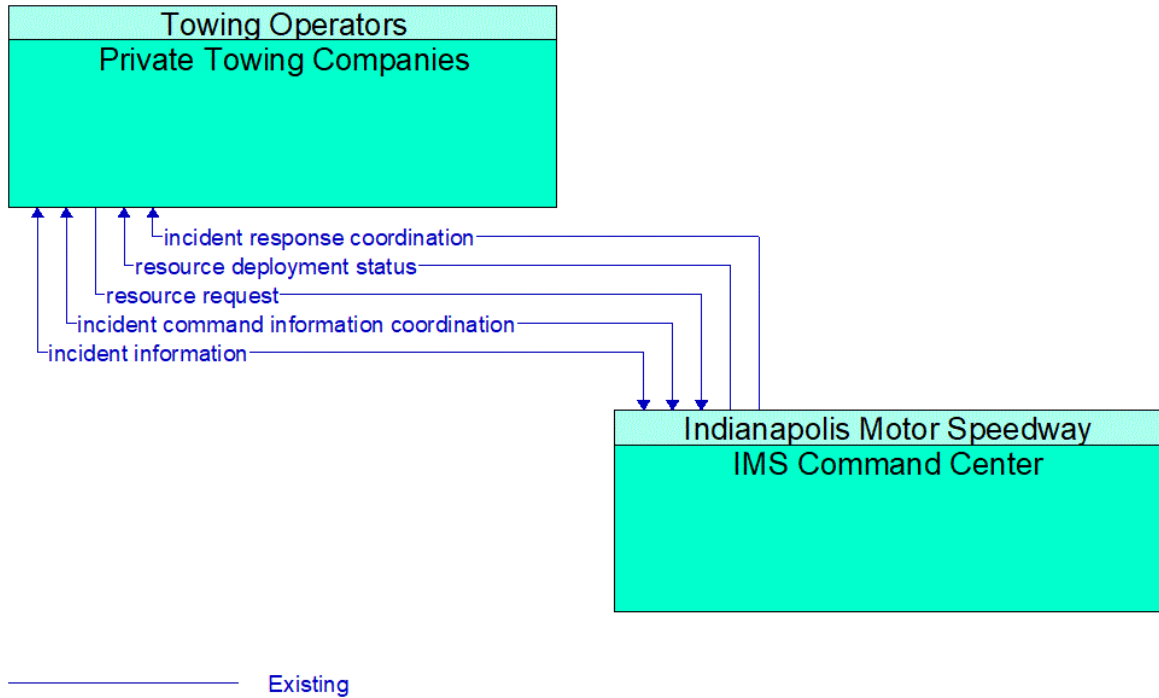
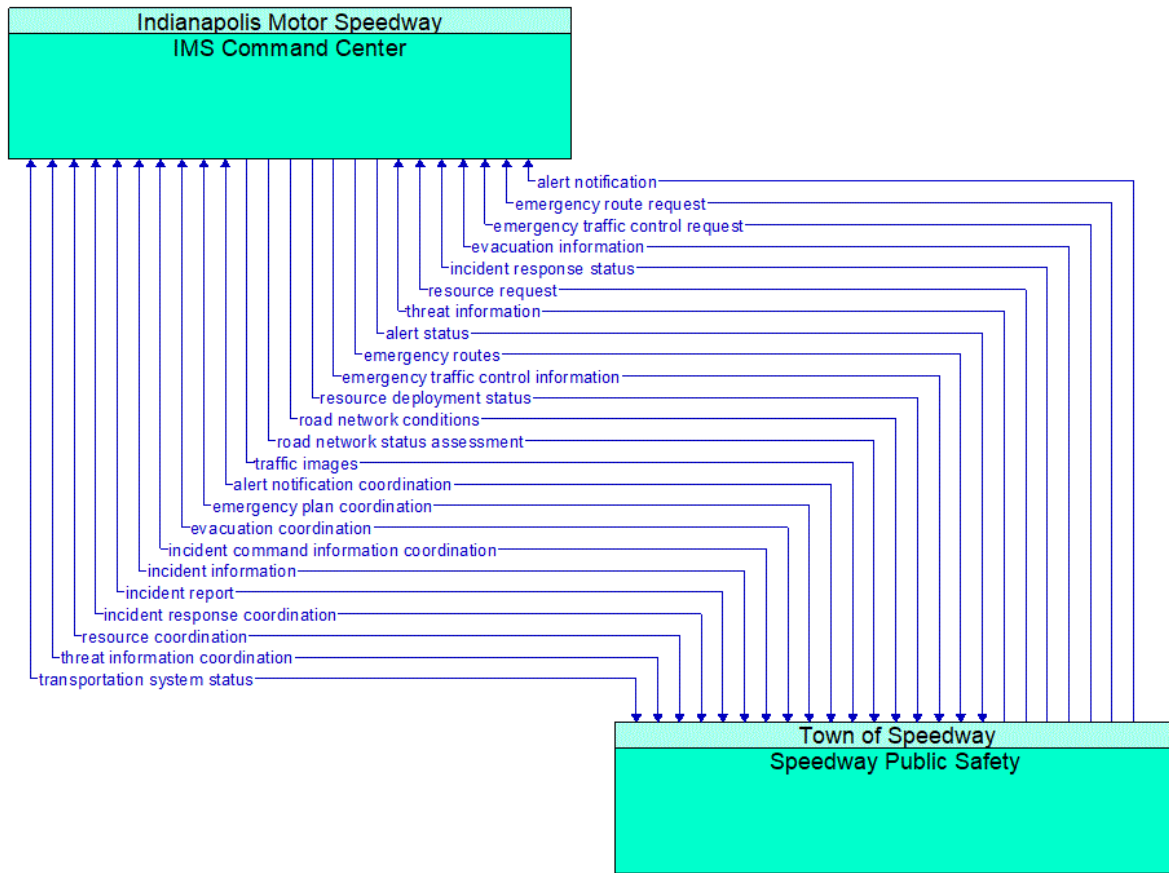


Figure 149: IMS Command Center - Private Towing Companies Interface



Existing

Figure 150: IMS Command Center - Speedway Public Safety Interface

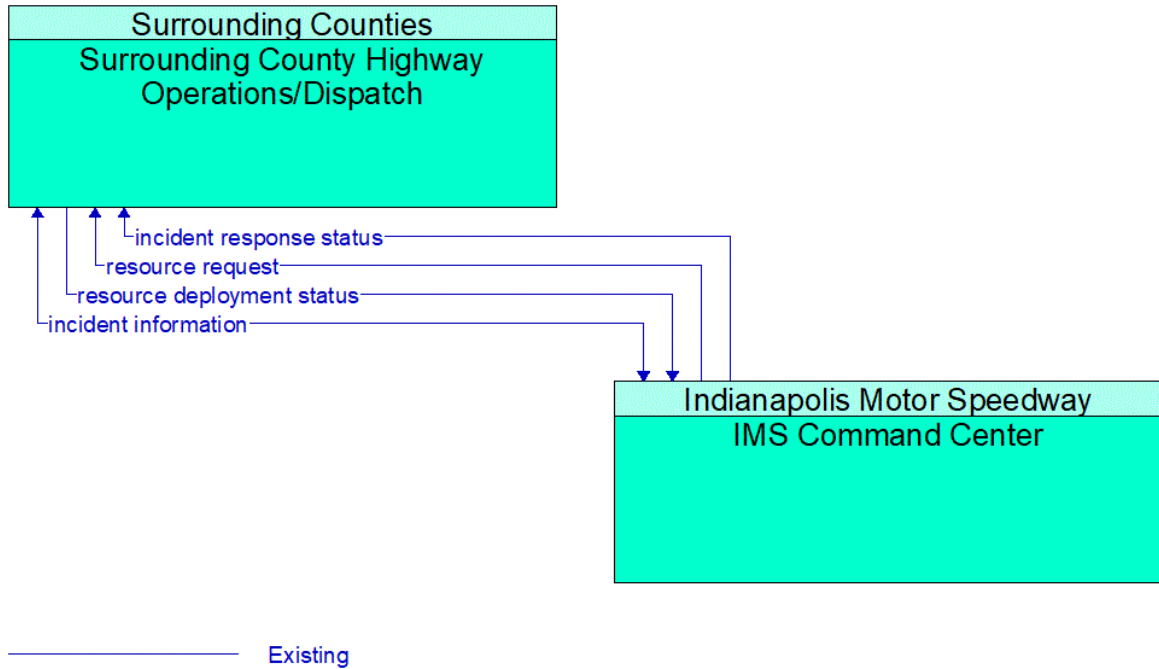
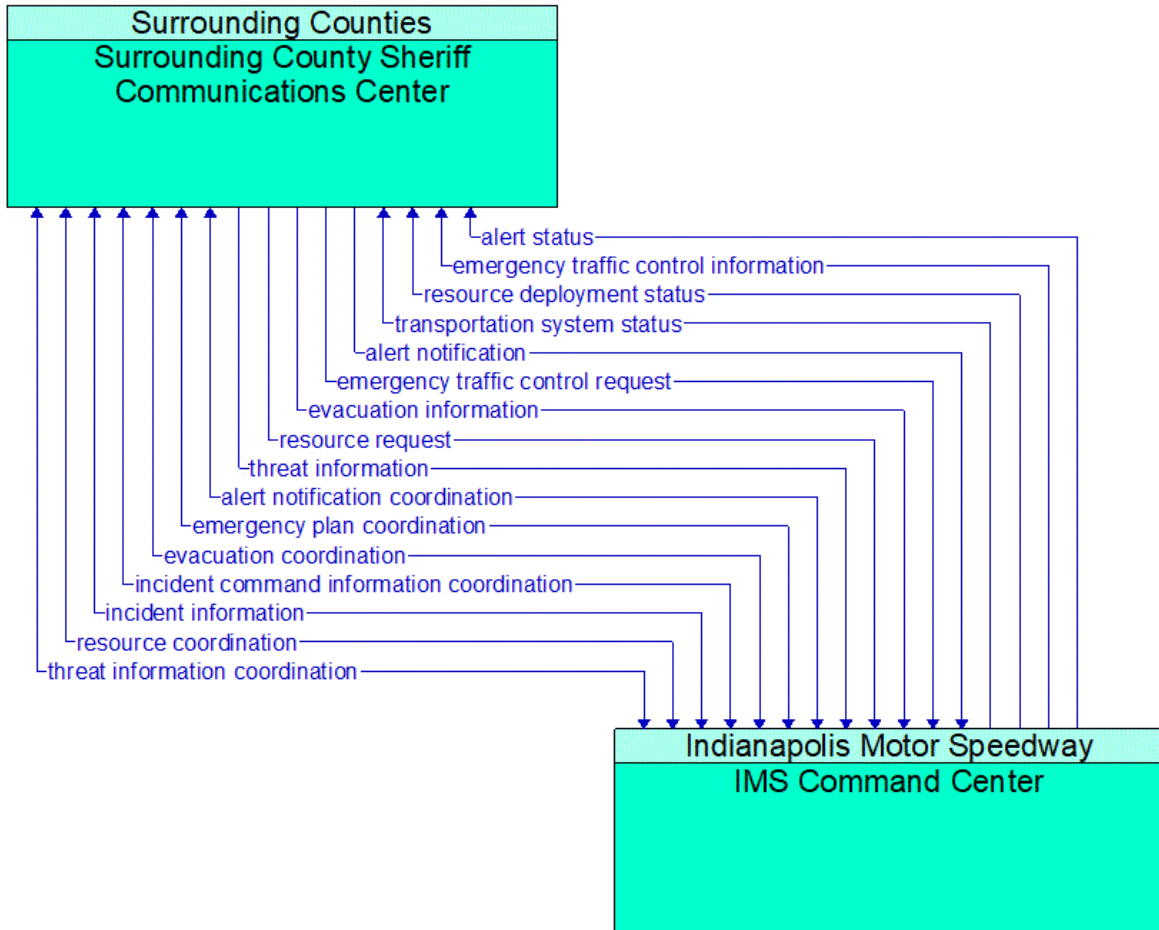


Figure 151: IMS Command Center - Surrounding County Highway Operations/Dispatch Interface



Existing

Figure 152: IMS Command Center - Surrounding County Sheriff Communications Center Interface

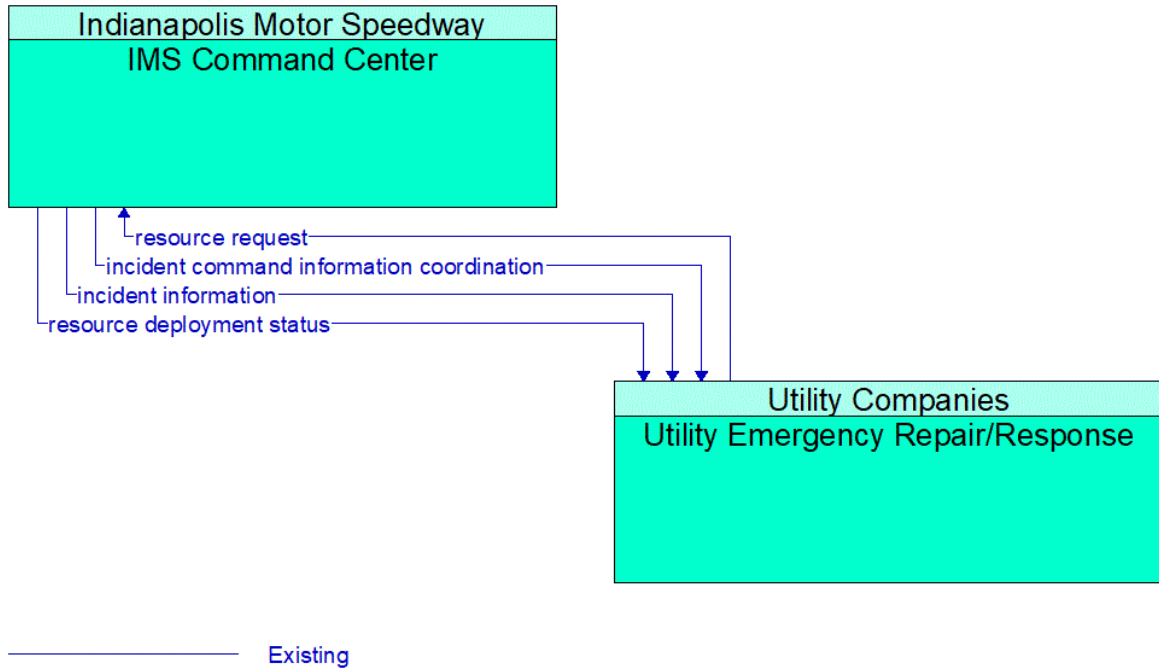


Figure 153: IMS Command Center - Utility Emergency Repair/Response Interface

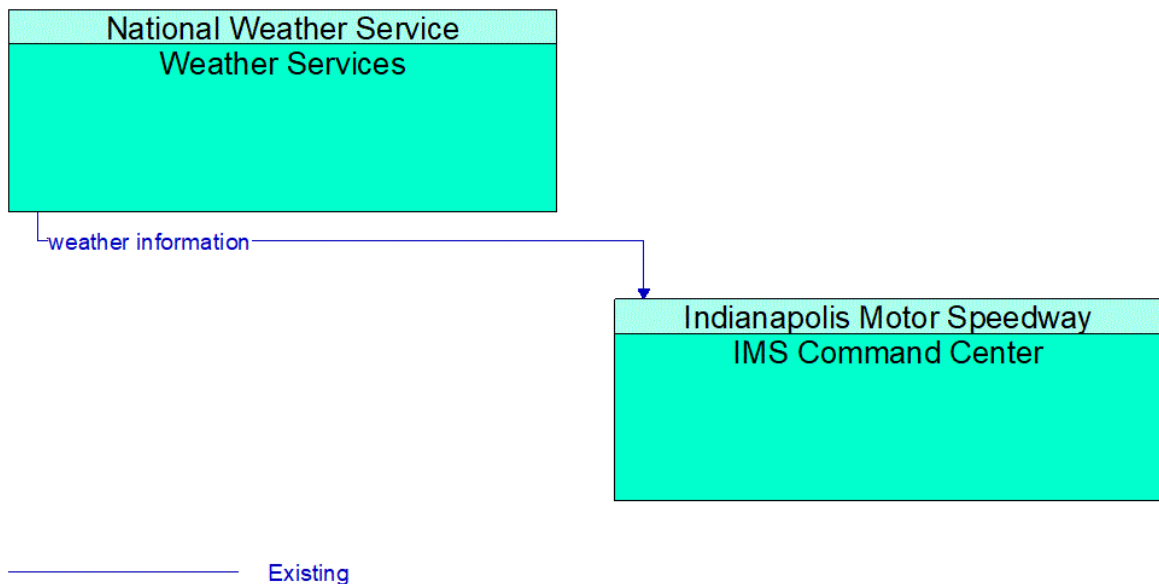


Figure 154: IMS Command Center - Weather Services Interface

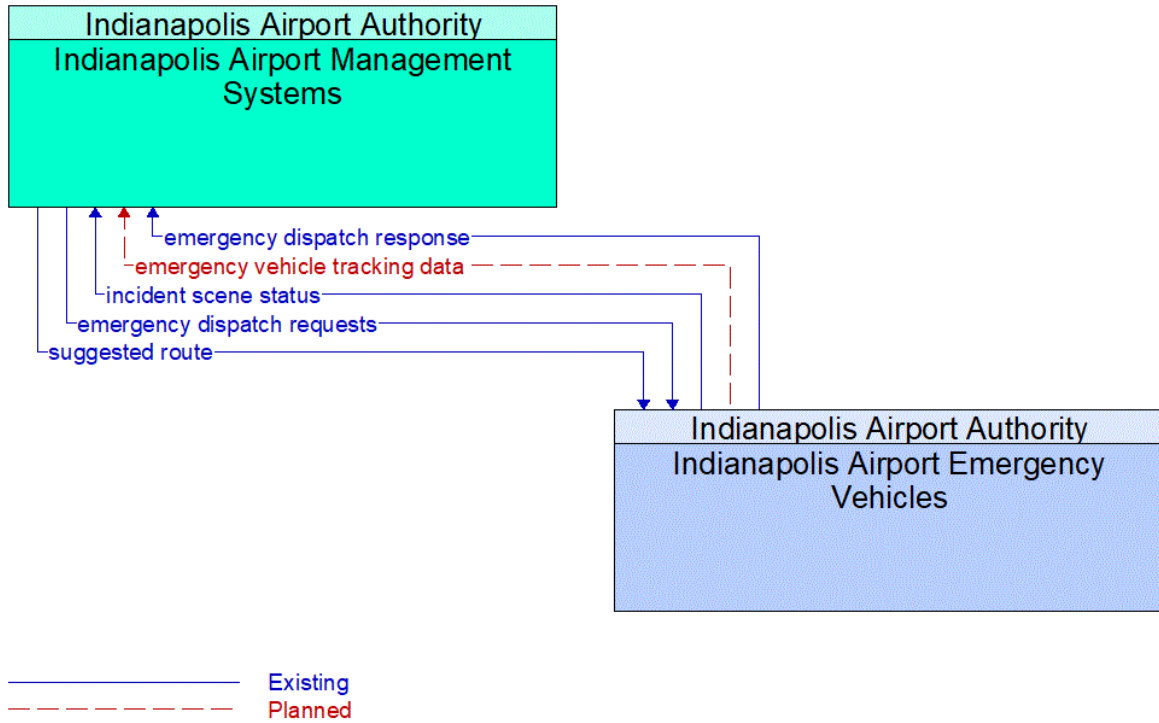
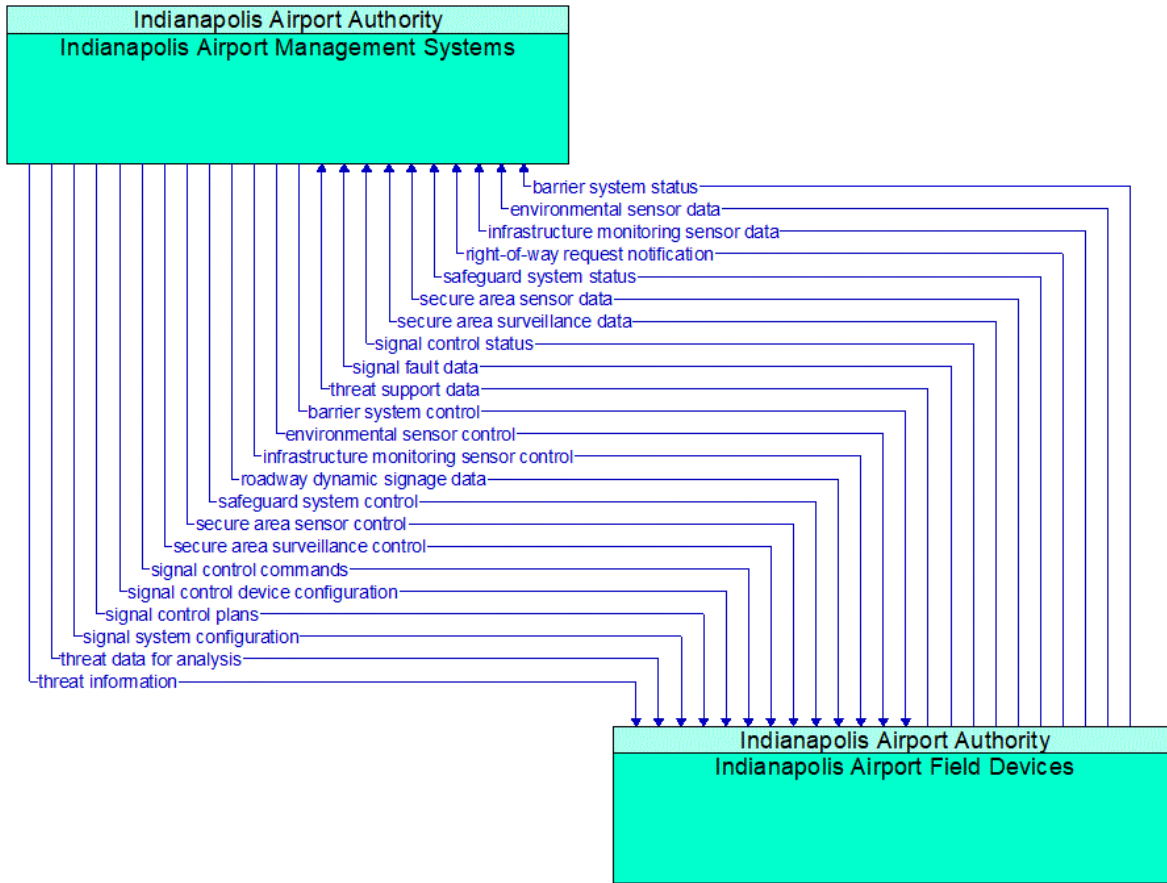


Figure 155: Indianapolis Airport Emergency Vehicles - Indianapolis Airport Management Systems Interface



Existing

Figure 156: Indianapolis Airport Field Devices - Indianapolis Airport Management Systems Interface

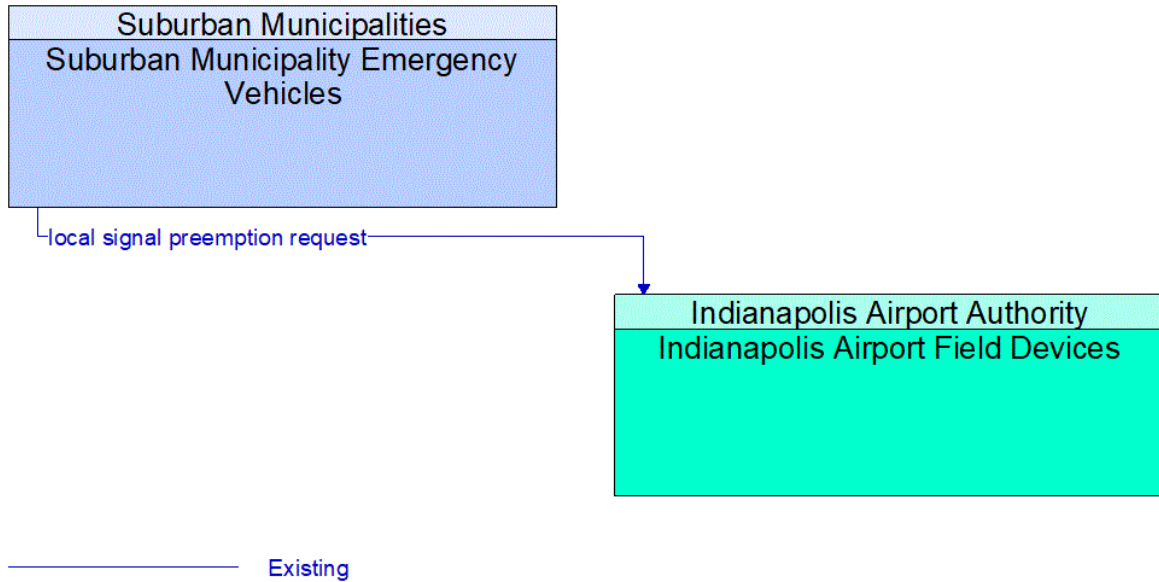


Figure 157: Indianapolis Airport Field Devices - Suburban Municipality Emergency Vehicles Interface

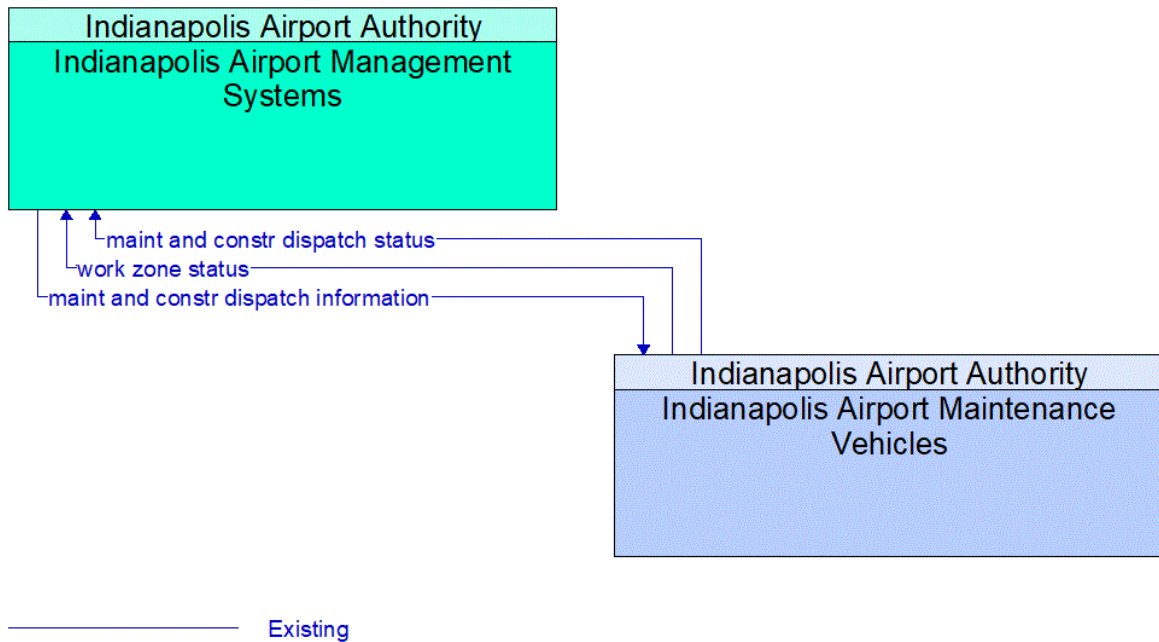


Figure 158: Indianapolis Airport Maintenance Vehicles - Indianapolis Airport Management Systems Interface

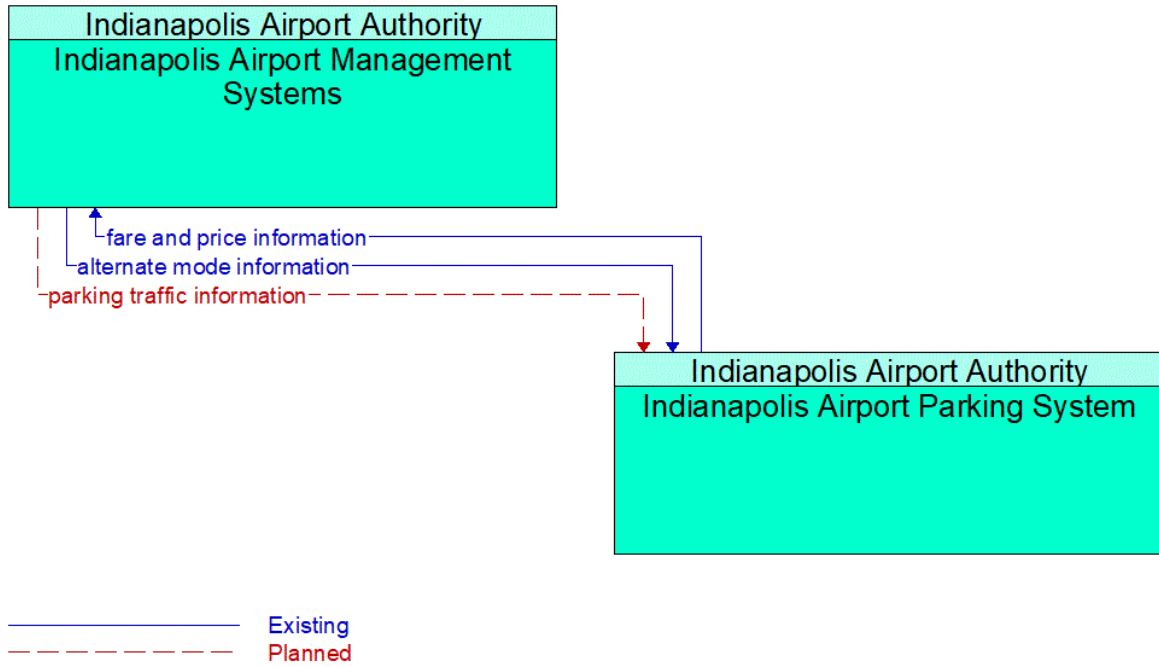


Figure 159: Indianapolis Airport Management Systems - Indianapolis Airport Parking System Interface

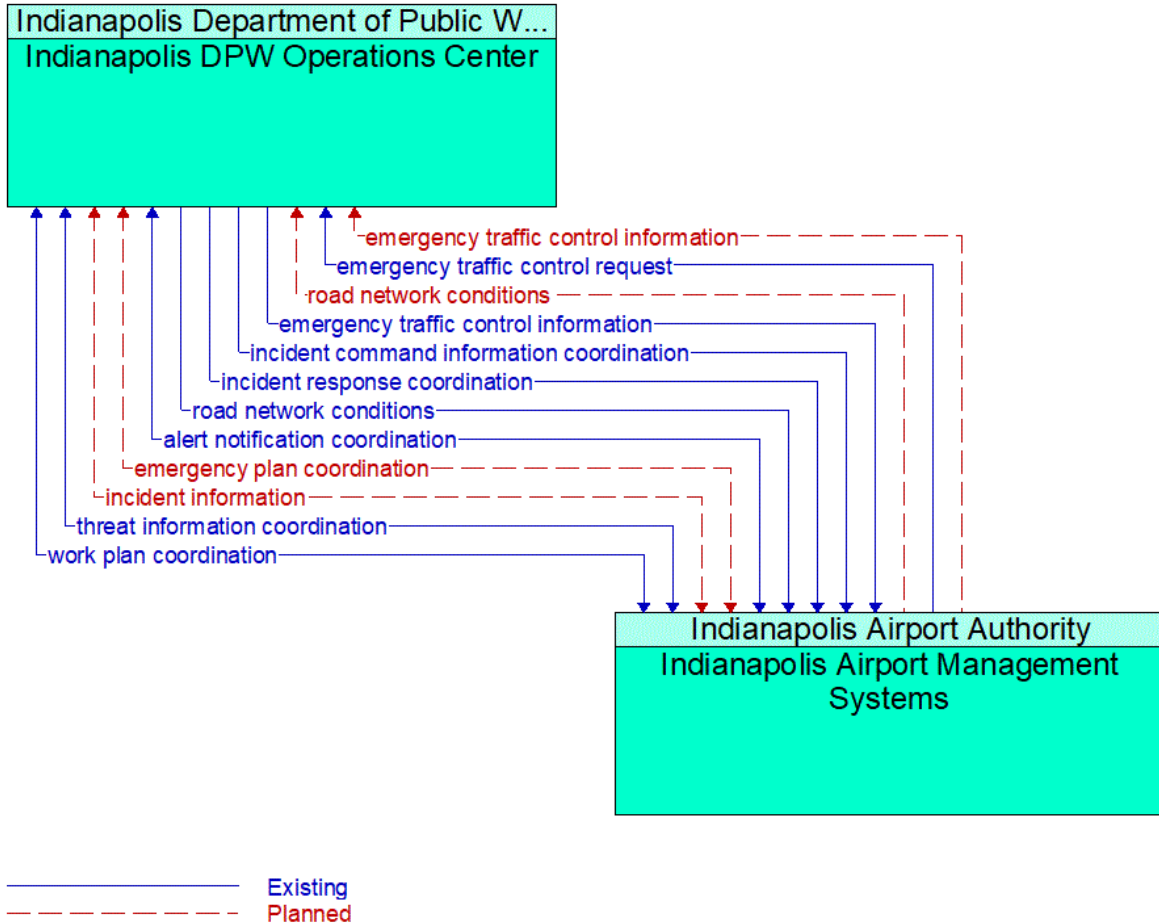


Figure 160: Indianapolis Airport Management Systems - Indianapolis DPW Operations Center Interface

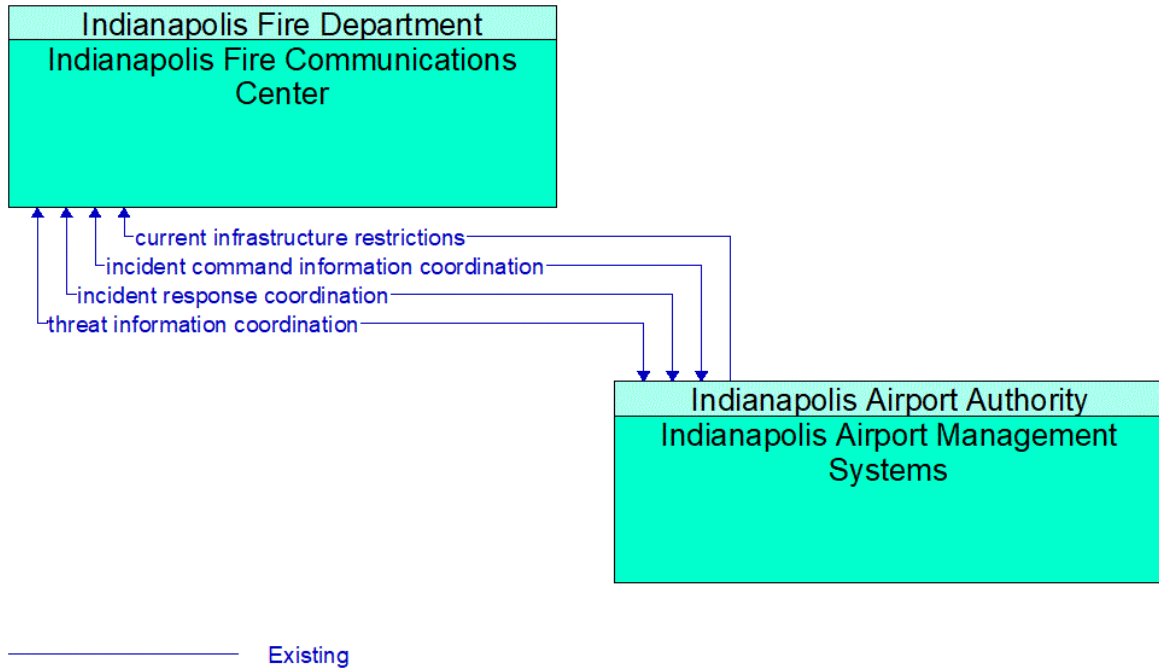


Figure 161: Indianapolis Airport Management Systems - Indianapolis Fire Communications Center Interface

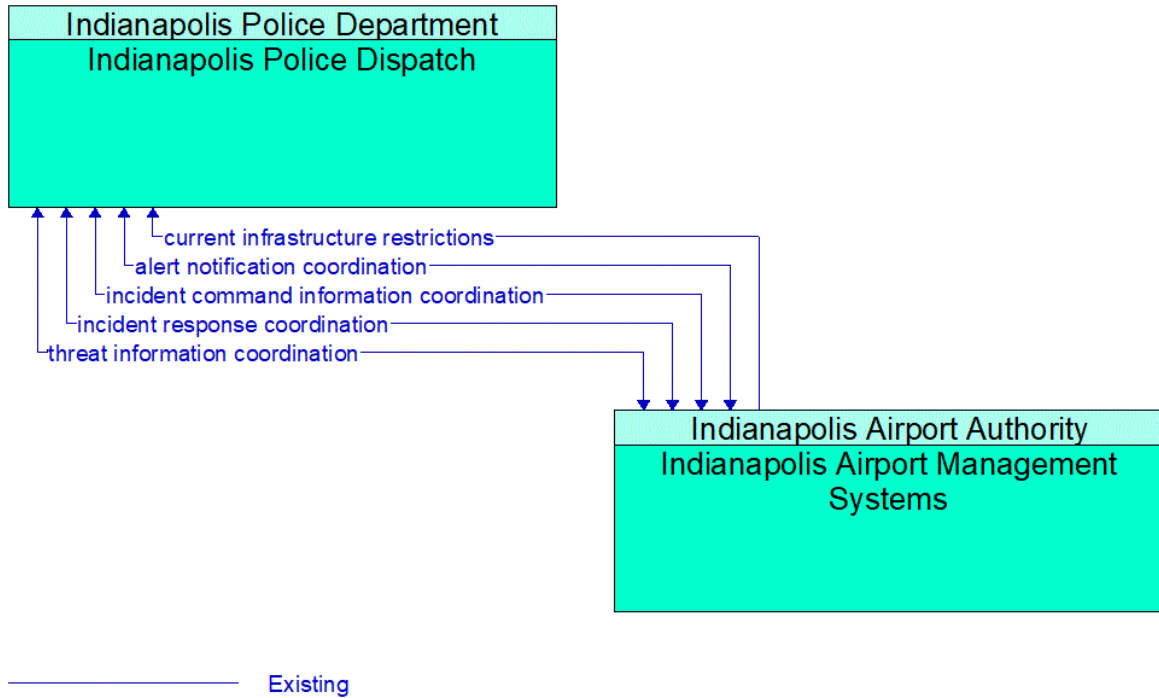


Figure 162: Indianapolis Airport Management Systems - Indianapolis Police Dispatch Interface

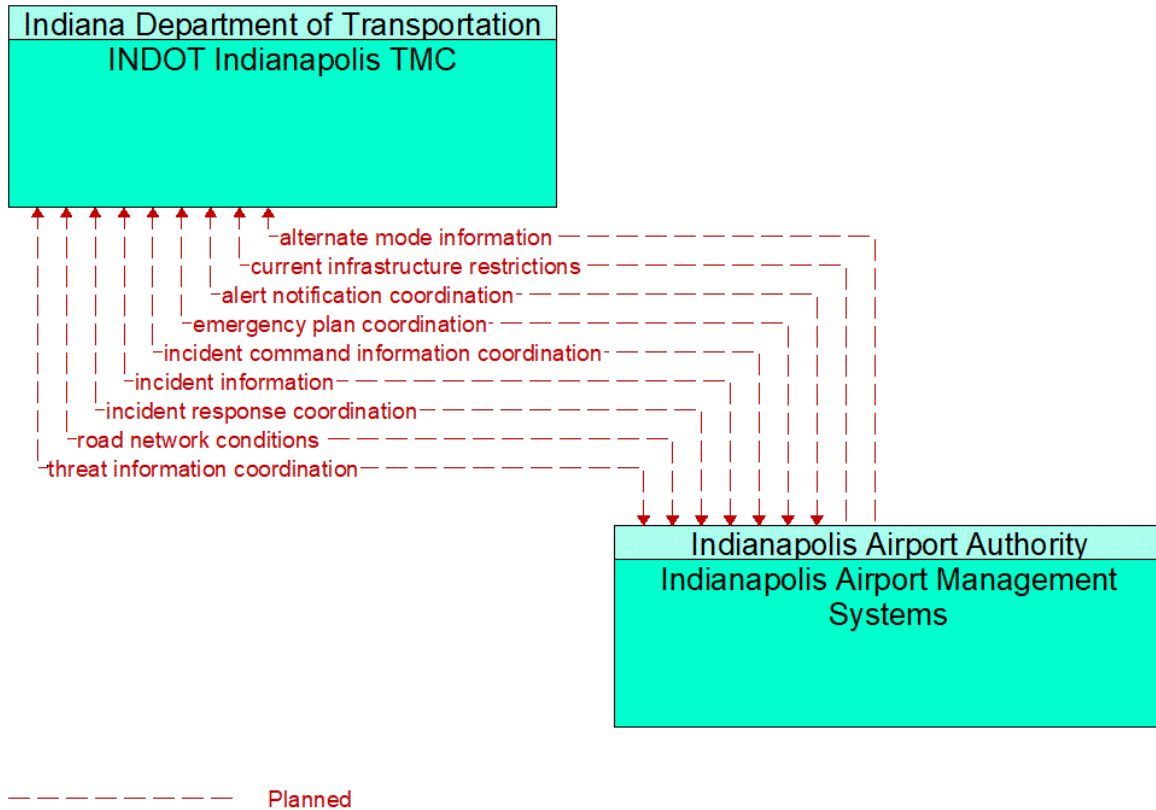


Figure 163: Indianapolis Airport Management Systems - INDOT Indianapolis TMC Interface

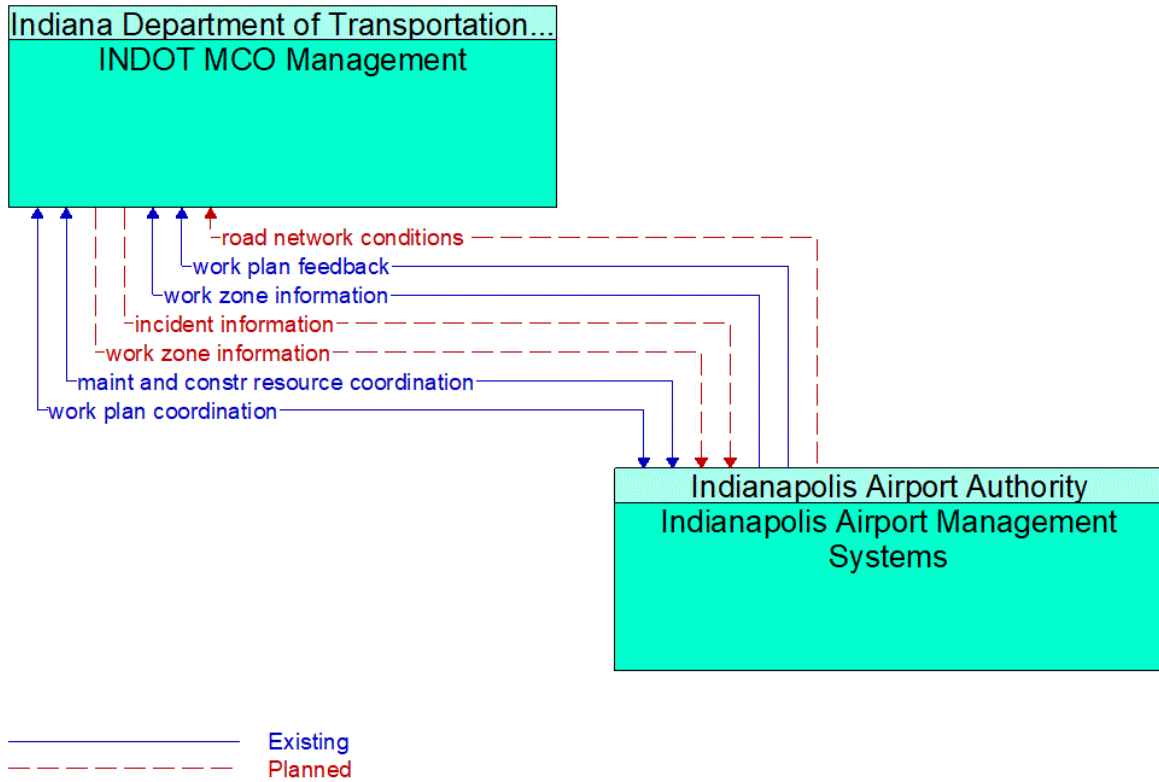


Figure 164: Indianapolis Airport Management Systems - INDOT MCO Management Interface

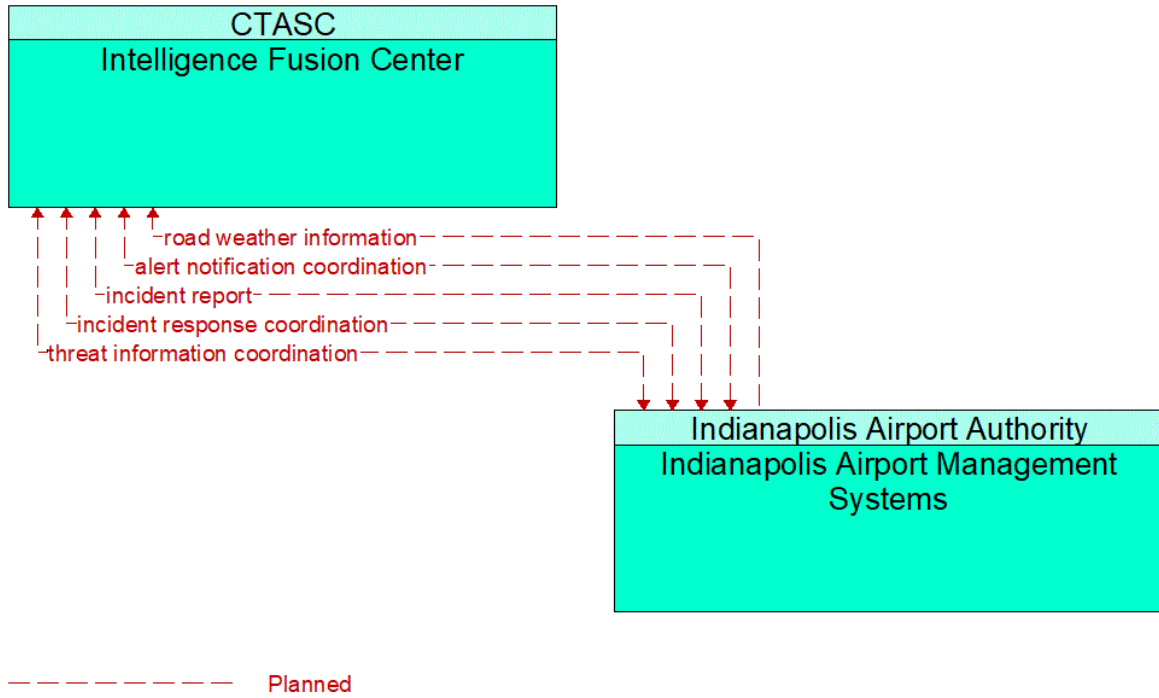


Figure 165: Indianapolis Airport Management Systems - Intelligence Fusion Center Interface

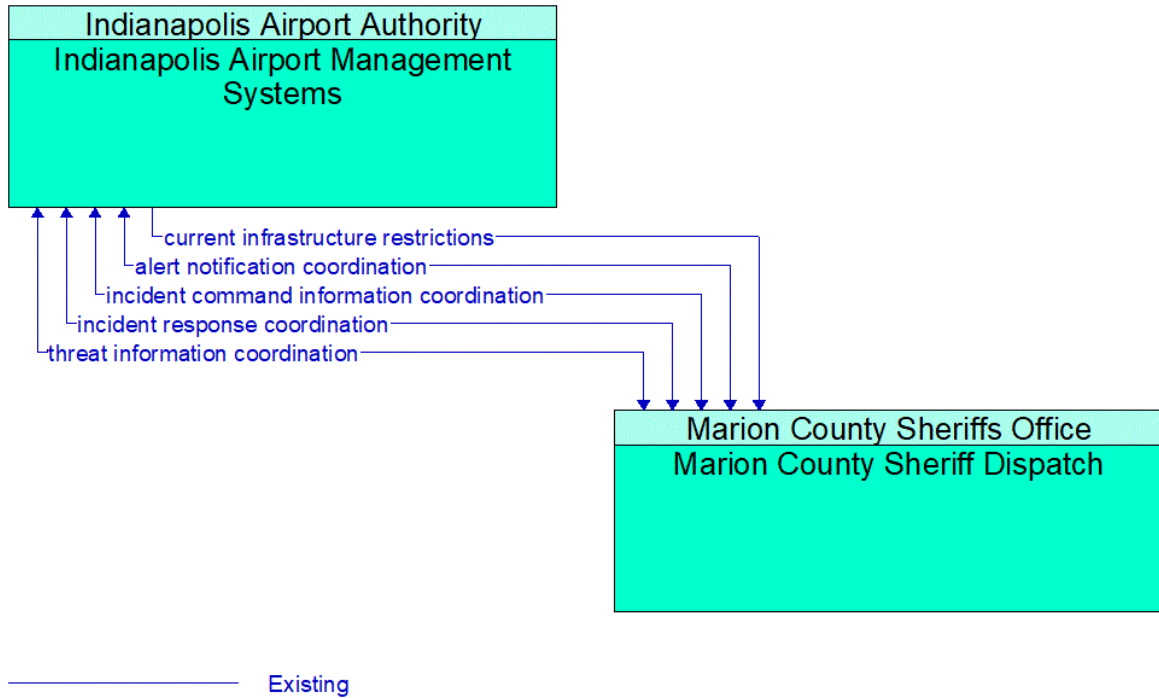


Figure 166: Indianapolis Airport Management Systems - Marion County Sheriff Dispatch Interface

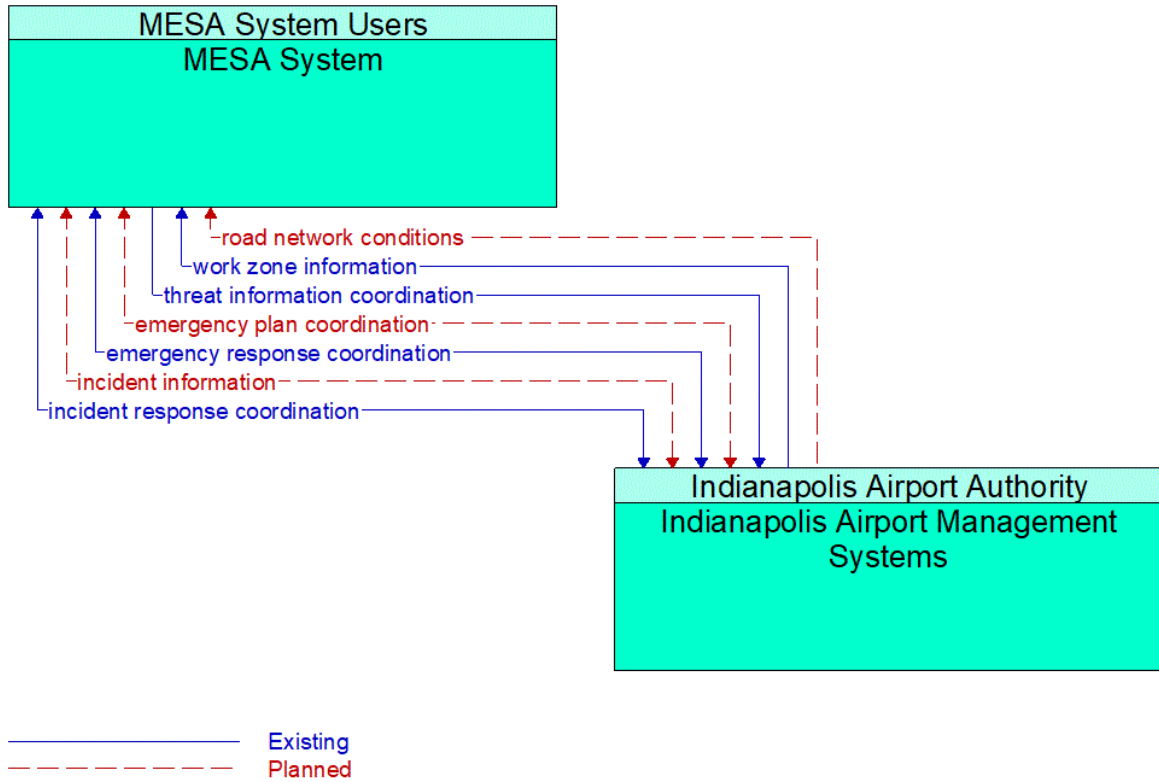


Figure 167: Indianapolis Airport Management Systems - MESA System Interface

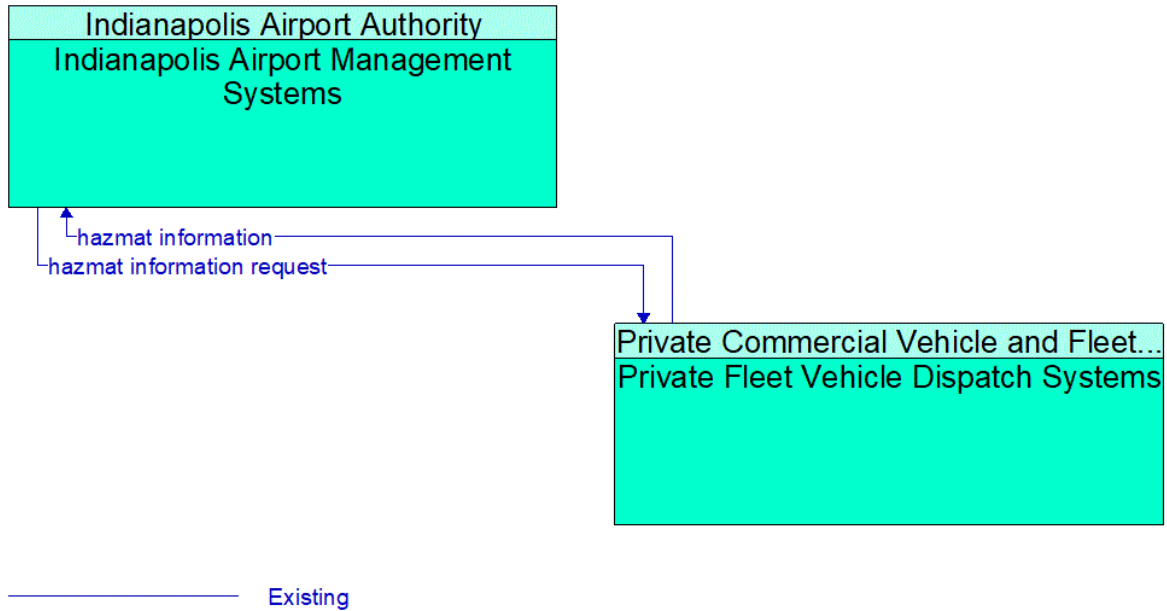


Figure 168: Indianapolis Airport Management Systems - Private Fleet Vehicle Dispatch Systems Interface

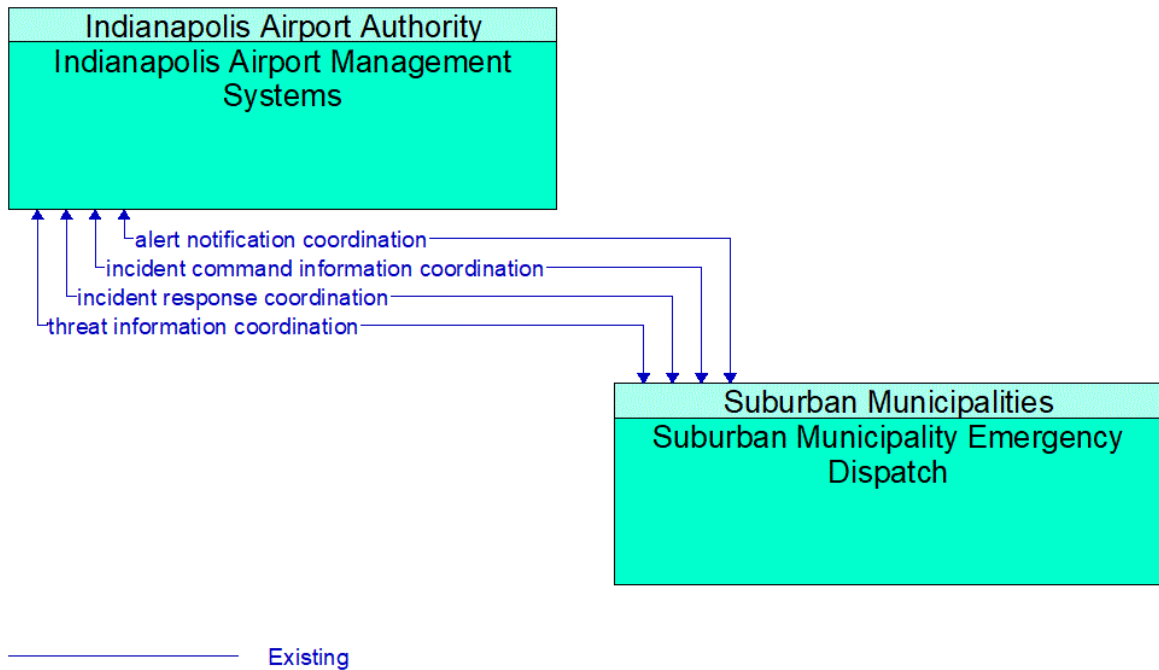


Figure 169: Indianapolis Airport Management Systems - Suburban Municipality Emergency Dispatch Interface

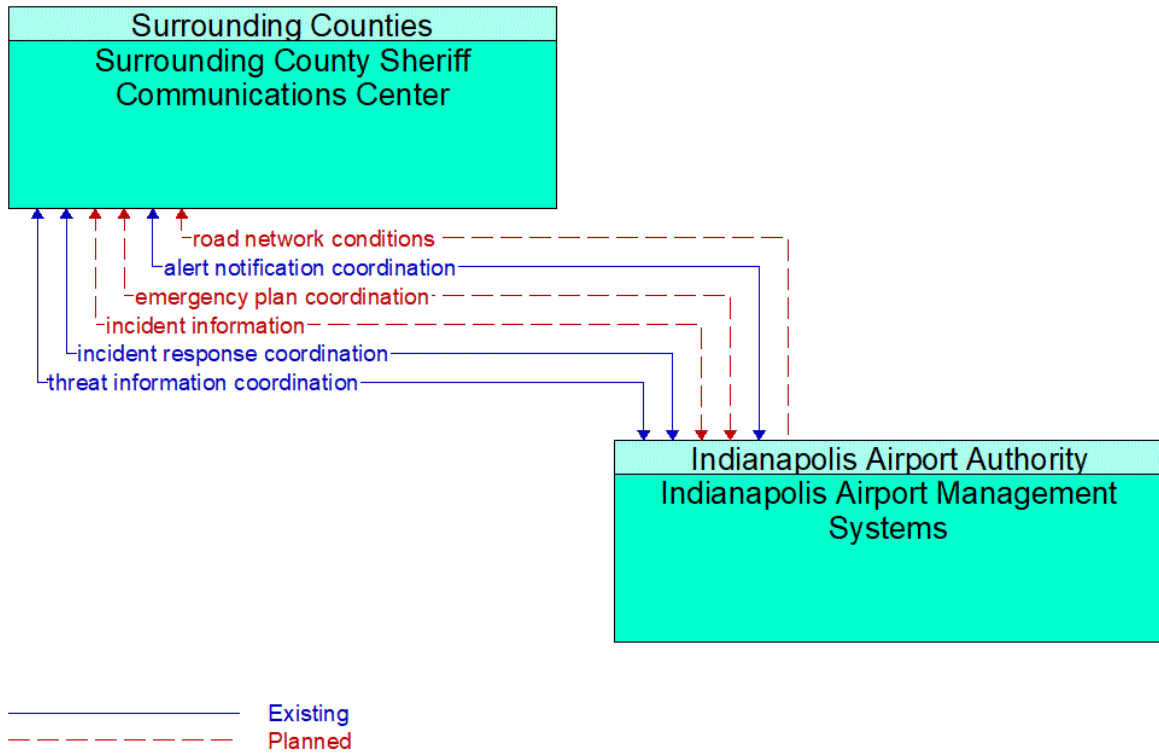


Figure 170: Indianapolis Airport Management Systems - Surrounding County Sheriff Communications Center Interface

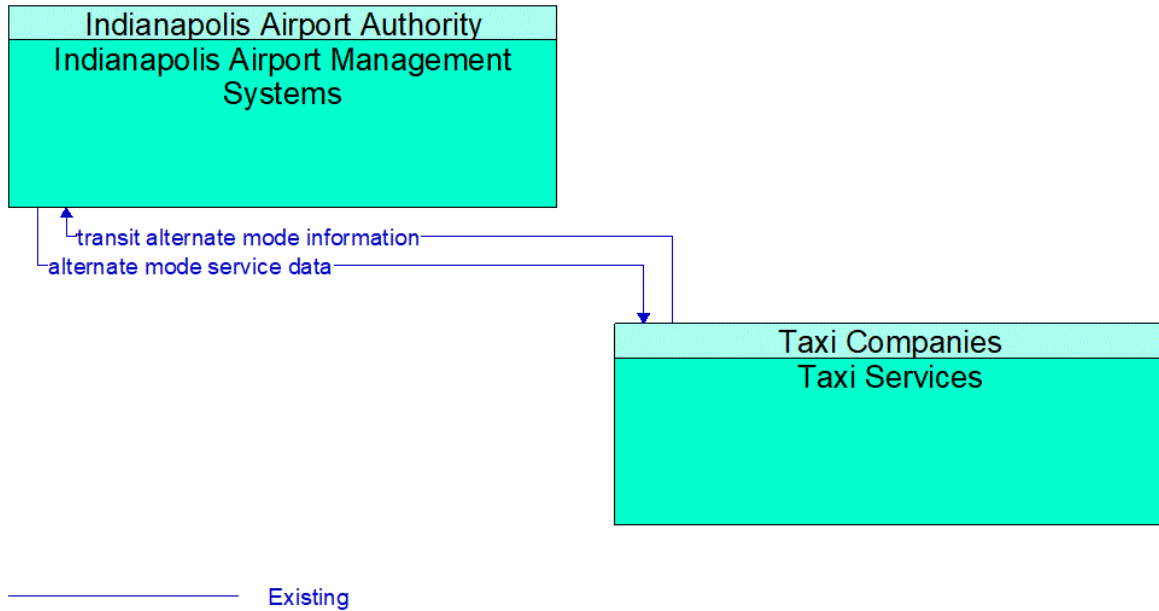


Figure 171: Indianapolis Airport Management Systems - Taxi Services Interface

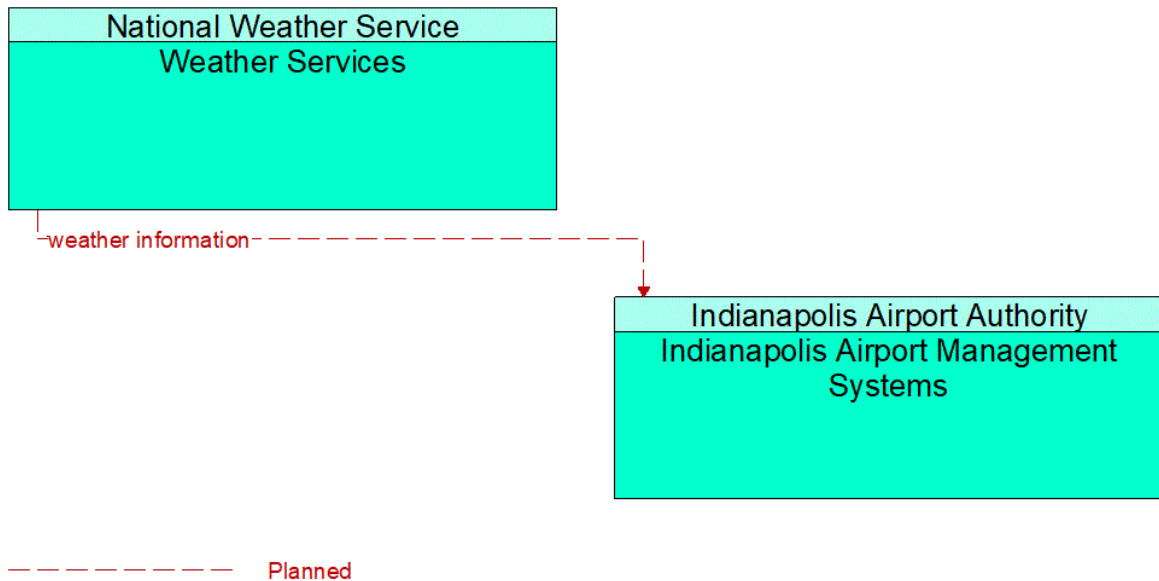


Figure 172: Indianapolis Airport Management Systems - Weather Services Interface

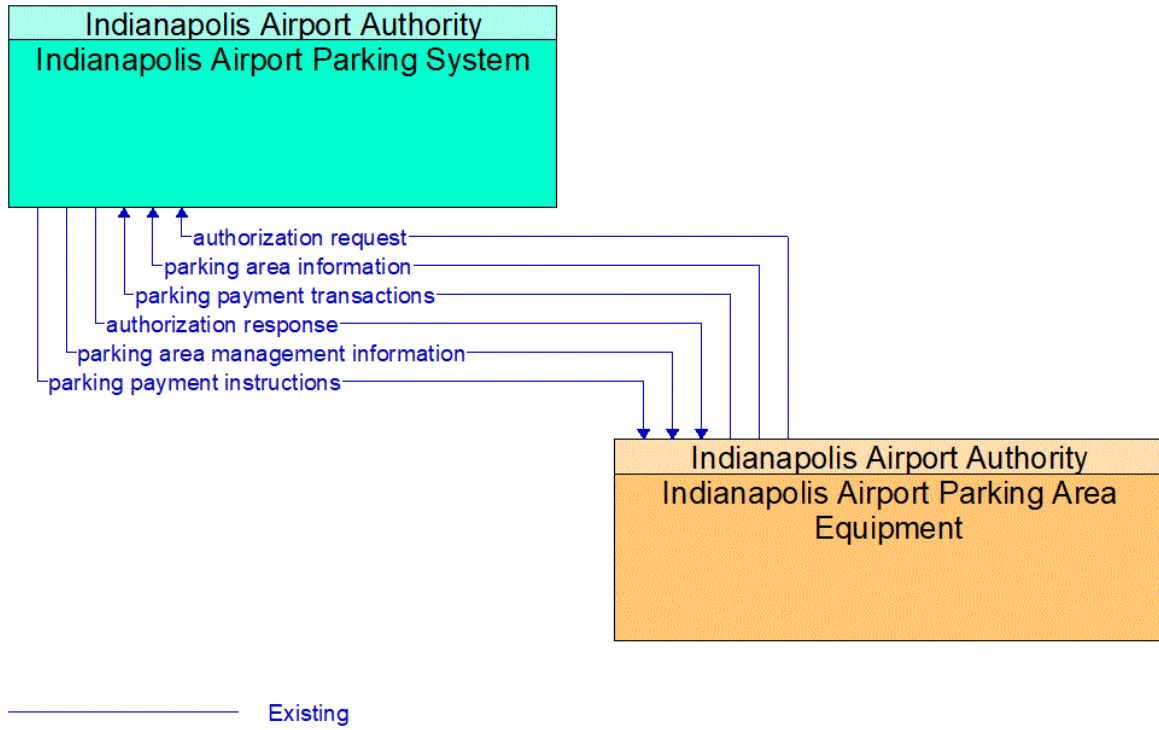
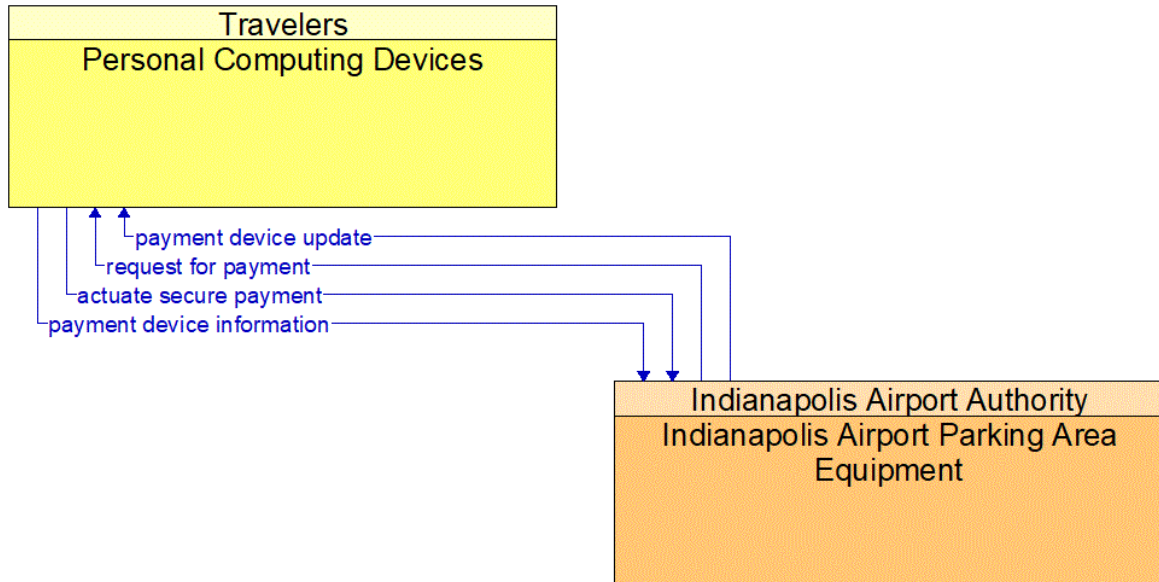
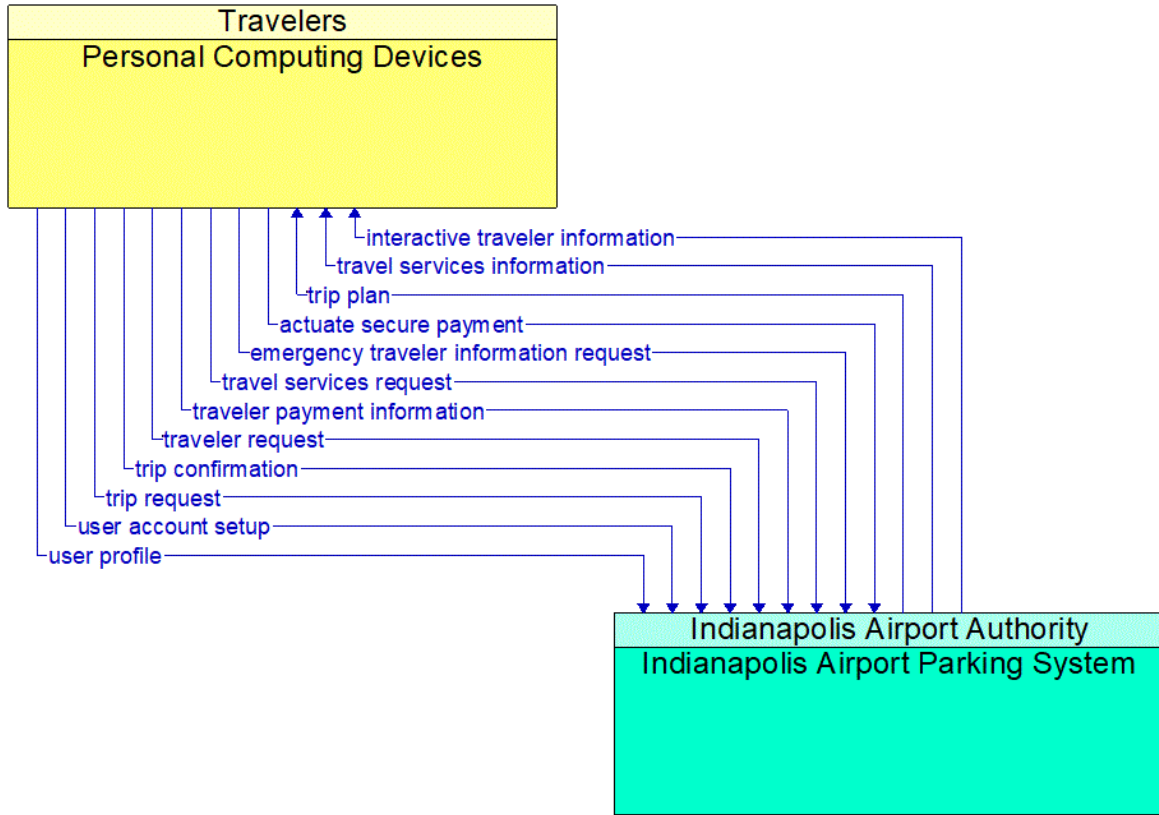


Figure 173: Indianapolis Airport Parking Area Equipment - Indianapolis Airport Parking System Interface



Existing

Figure 174: Indianapolis Airport Parking Area Equipment - Personal Computing Devices Interface



Existing

Figure 175: Indianapolis Airport Parking System - Personal Computing Devices Interface



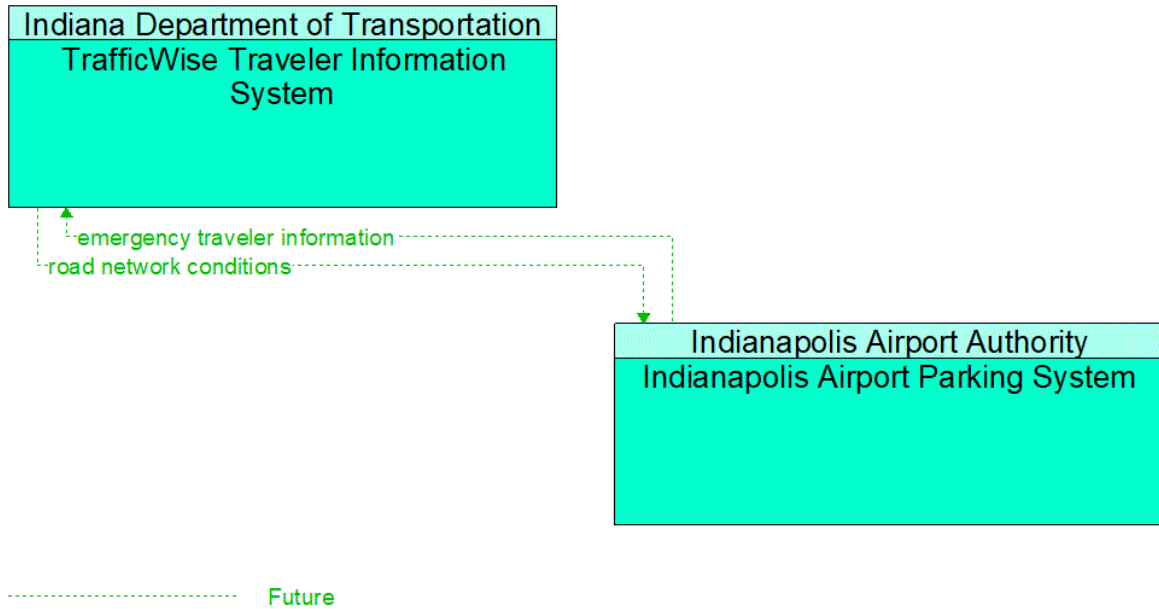


Figure 176: Indianapolis Airport Parking System - TrafficWise Traveler Information System Interface

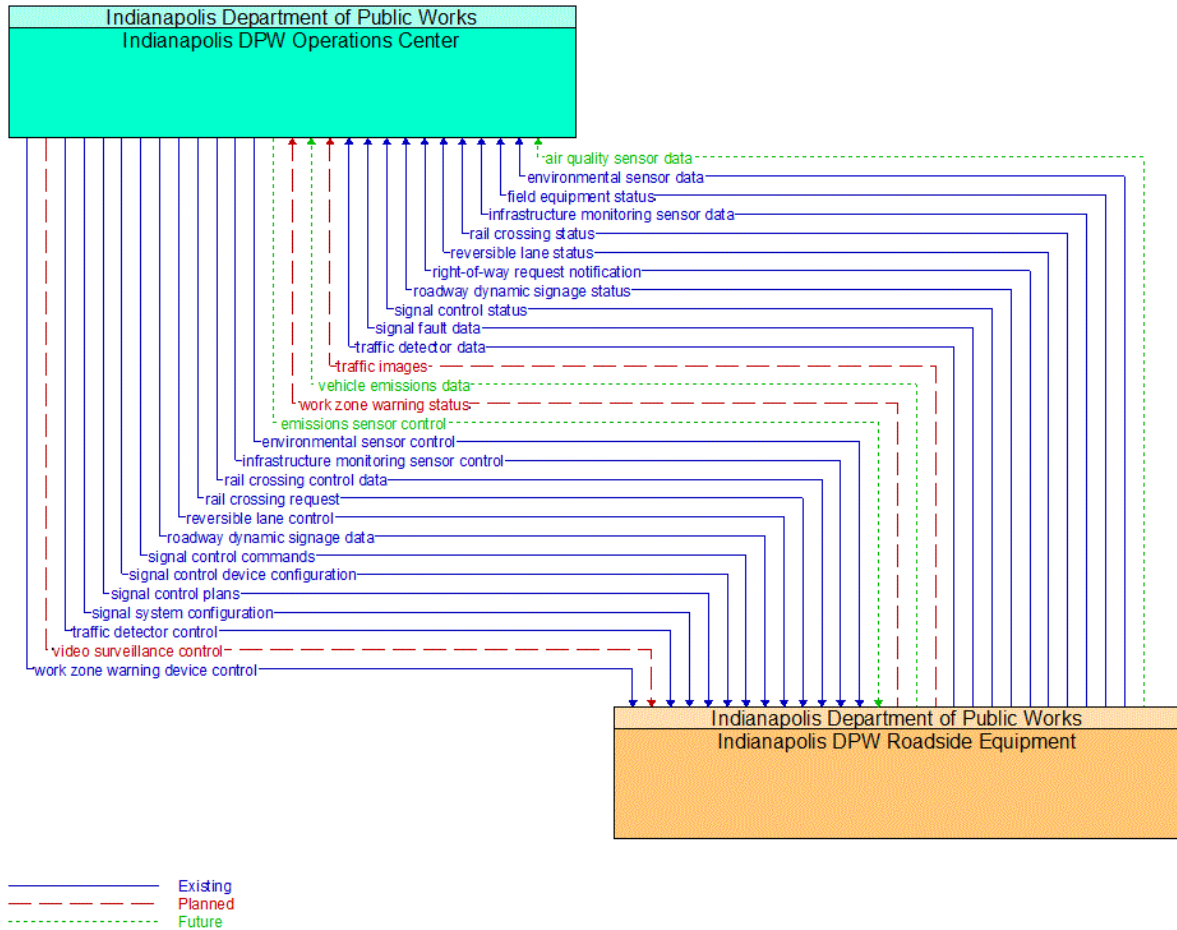


Figure 177: Indianapolis DPW Operations Center - Indianapolis DPW Roadside Equipment Interface

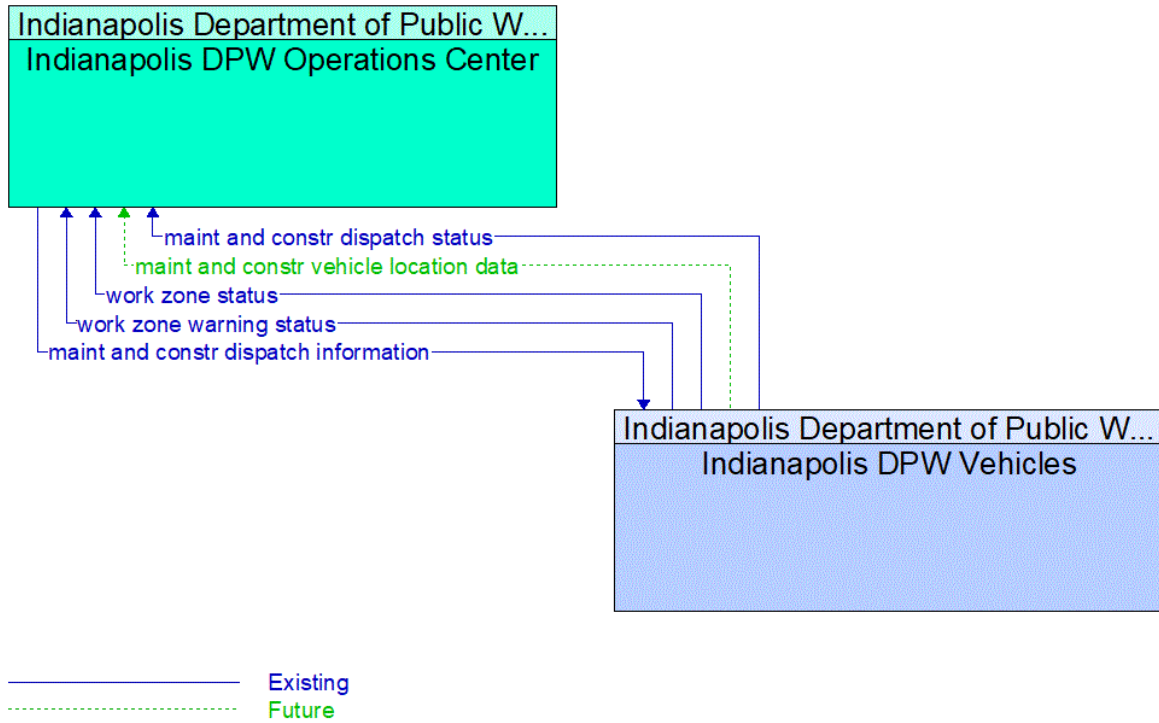


Figure 178: Indianapolis DPW Operations Center - Indianapolis DPW Vehicles Interface

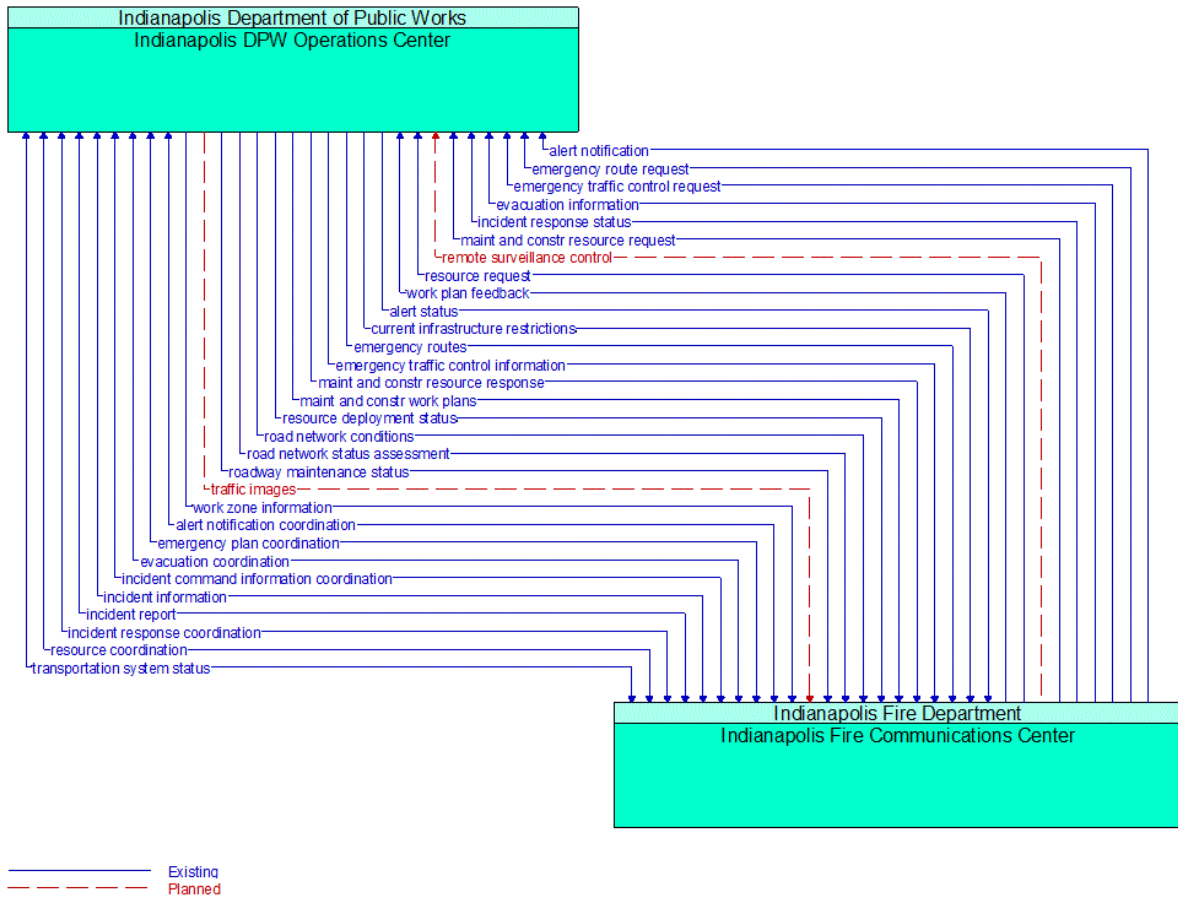


Figure 179: Indianapolis DPW Operations Center - Indianapolis Fire Communications Center Interface

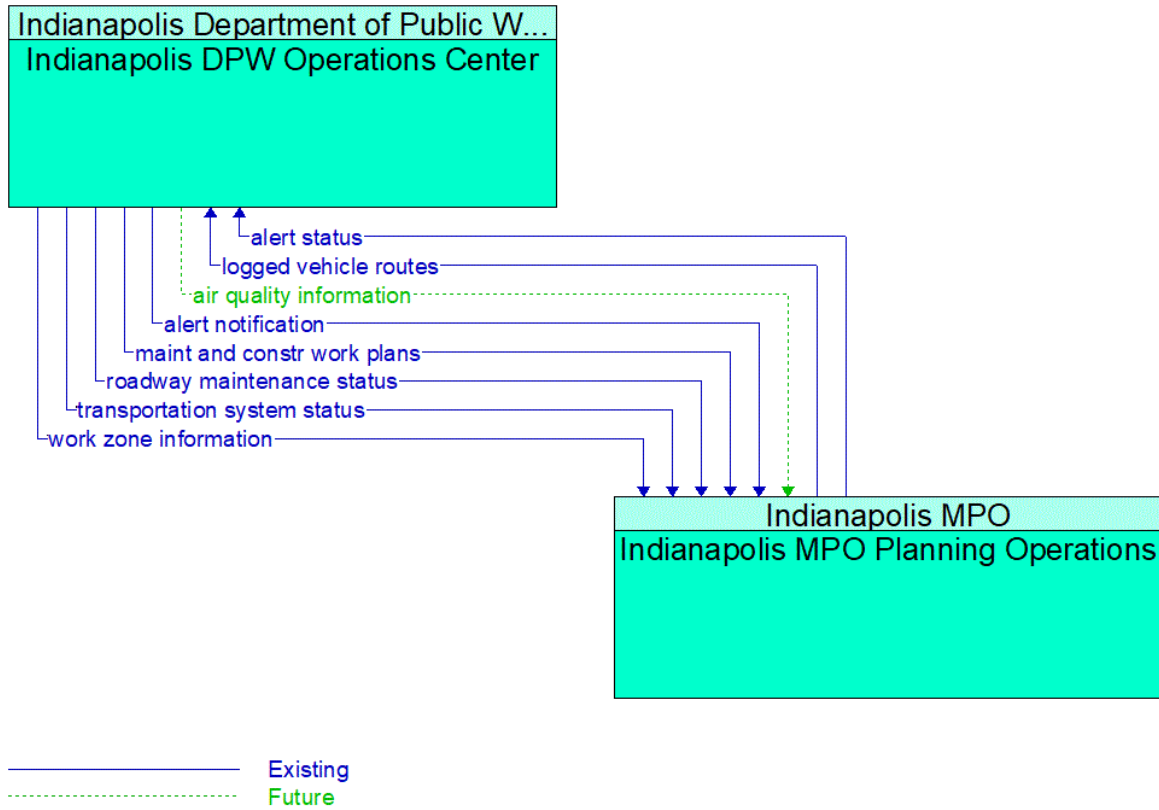


Figure 180: Indianapolis DPW Operations Center - Indianapolis MPO Planning Operations Interface

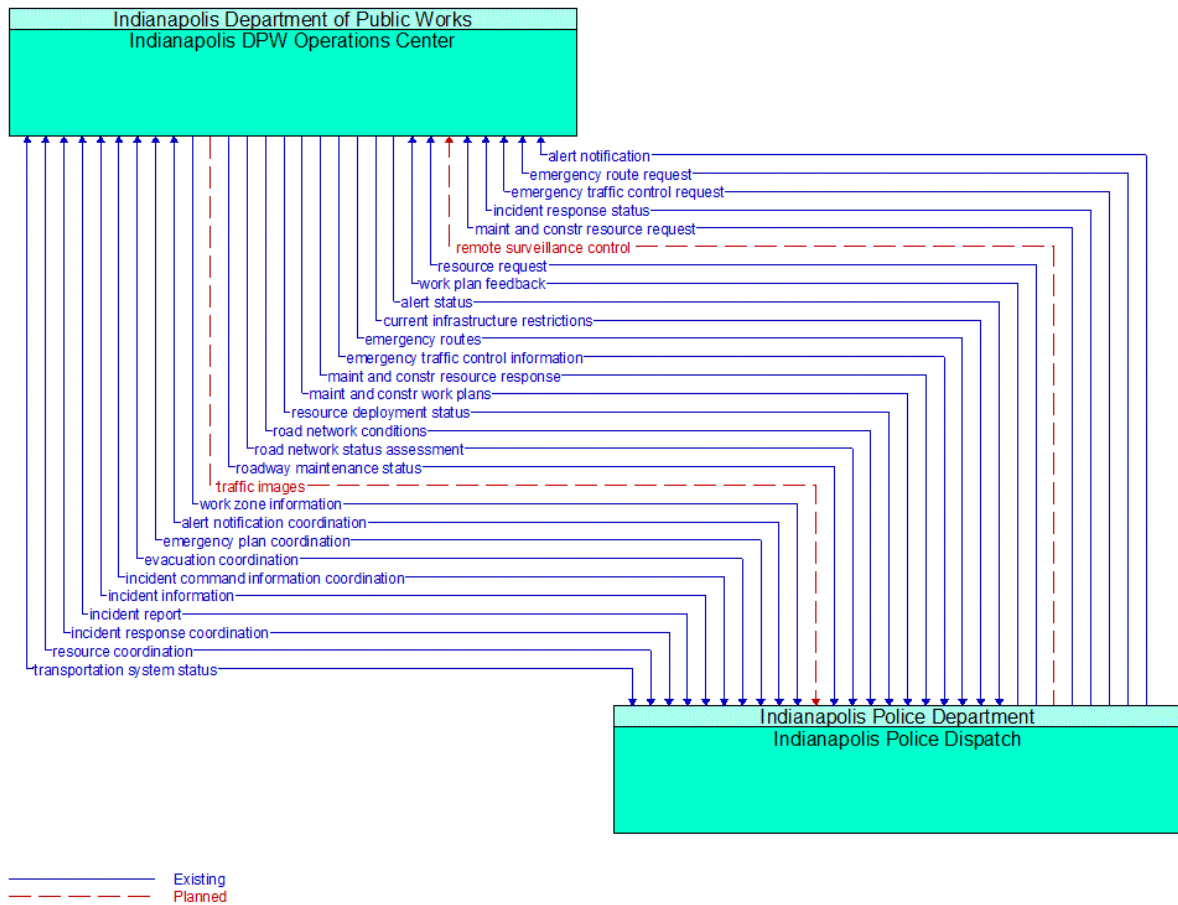


Figure 181: Indianapolis DPW Operations Center - Indianapolis Police Dispatch Interface

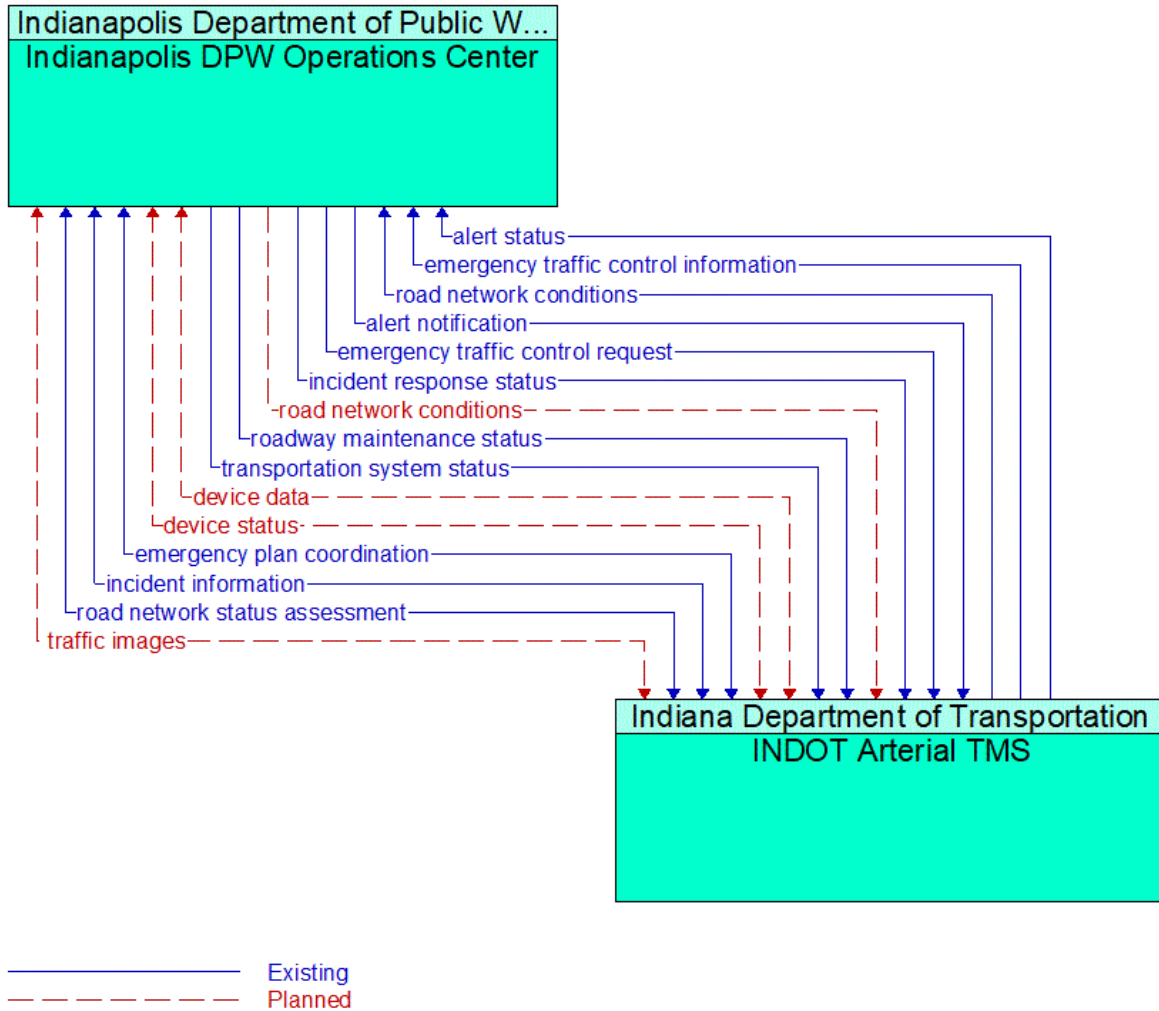


Figure 182: Indianapolis DPW Operations Center - INDOT Arterial TMS Interface

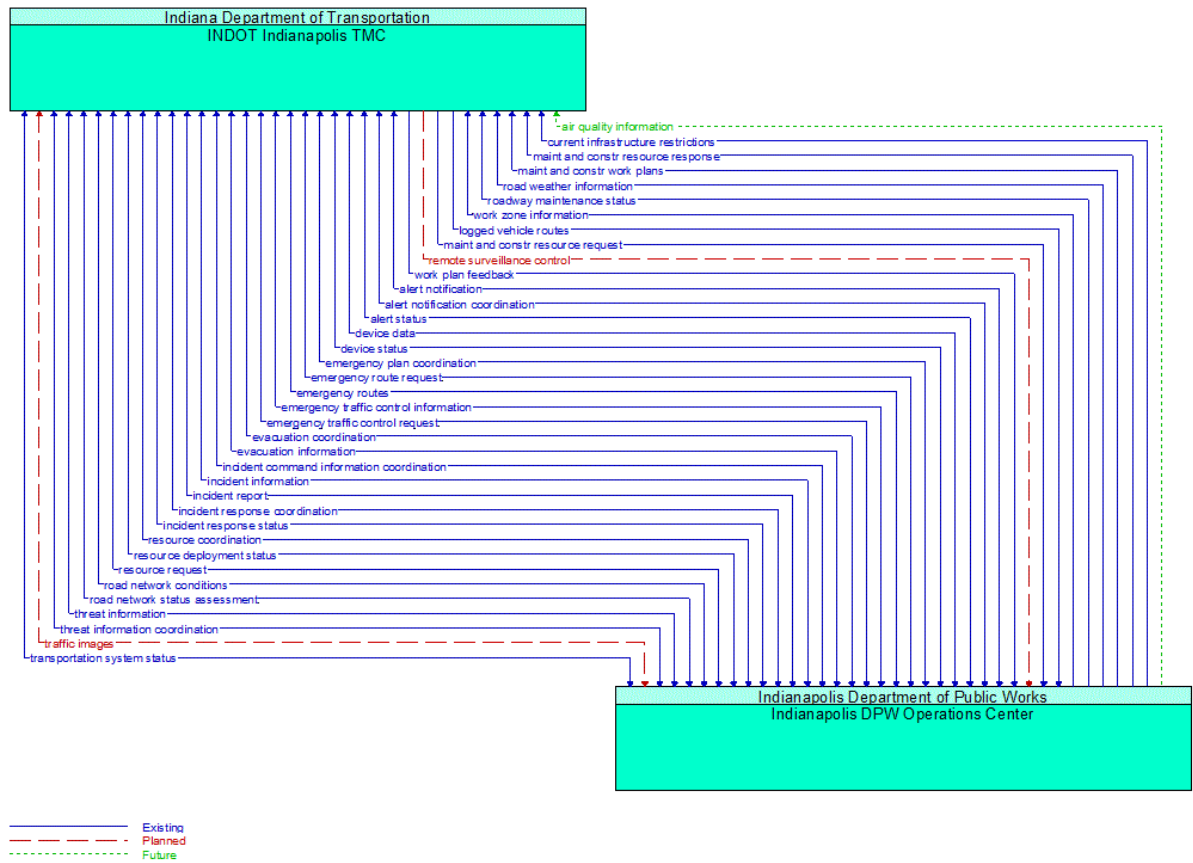
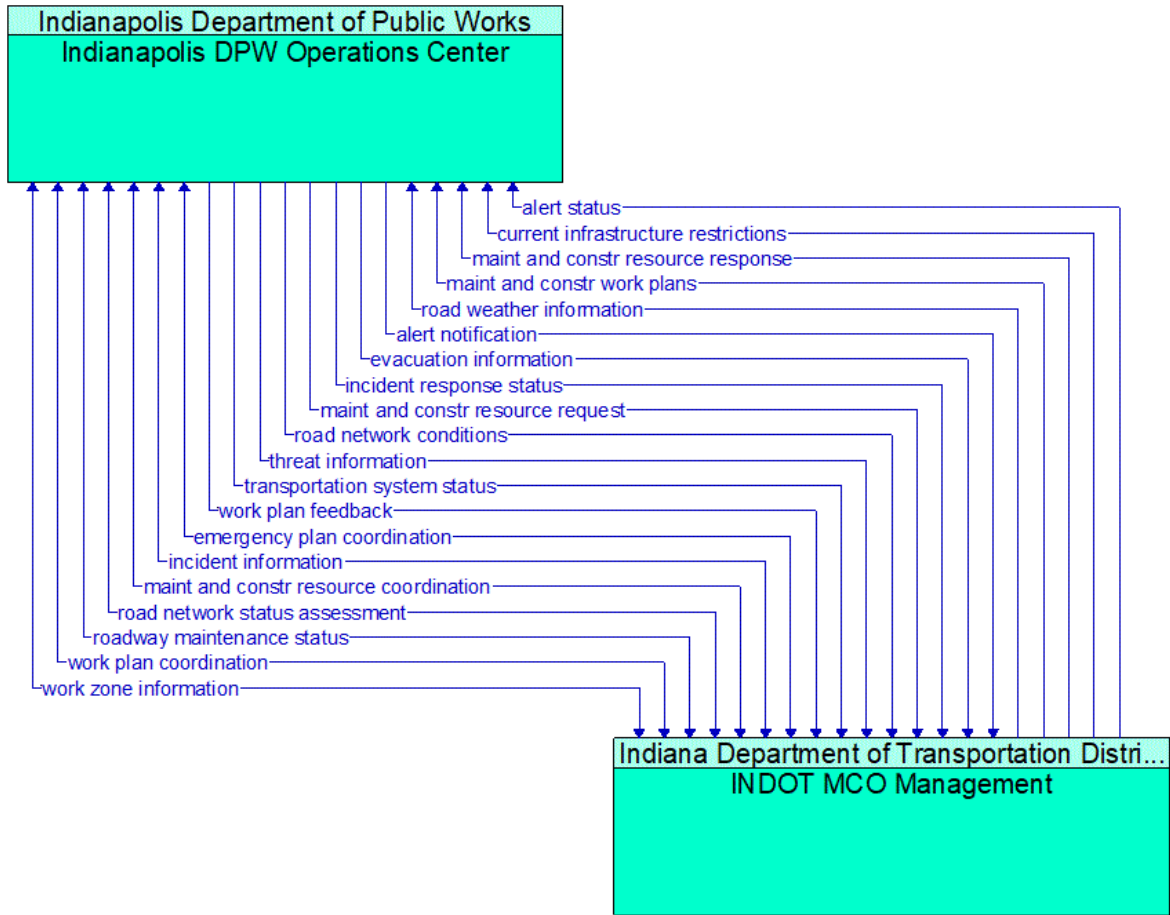


Figure 183: Indianapolis DPW Operations Center - INDOT Indianapolis TMC Interface



Existing

Figure 184: Indianapolis DPW Operations Center - INDOT MCO Management Interface

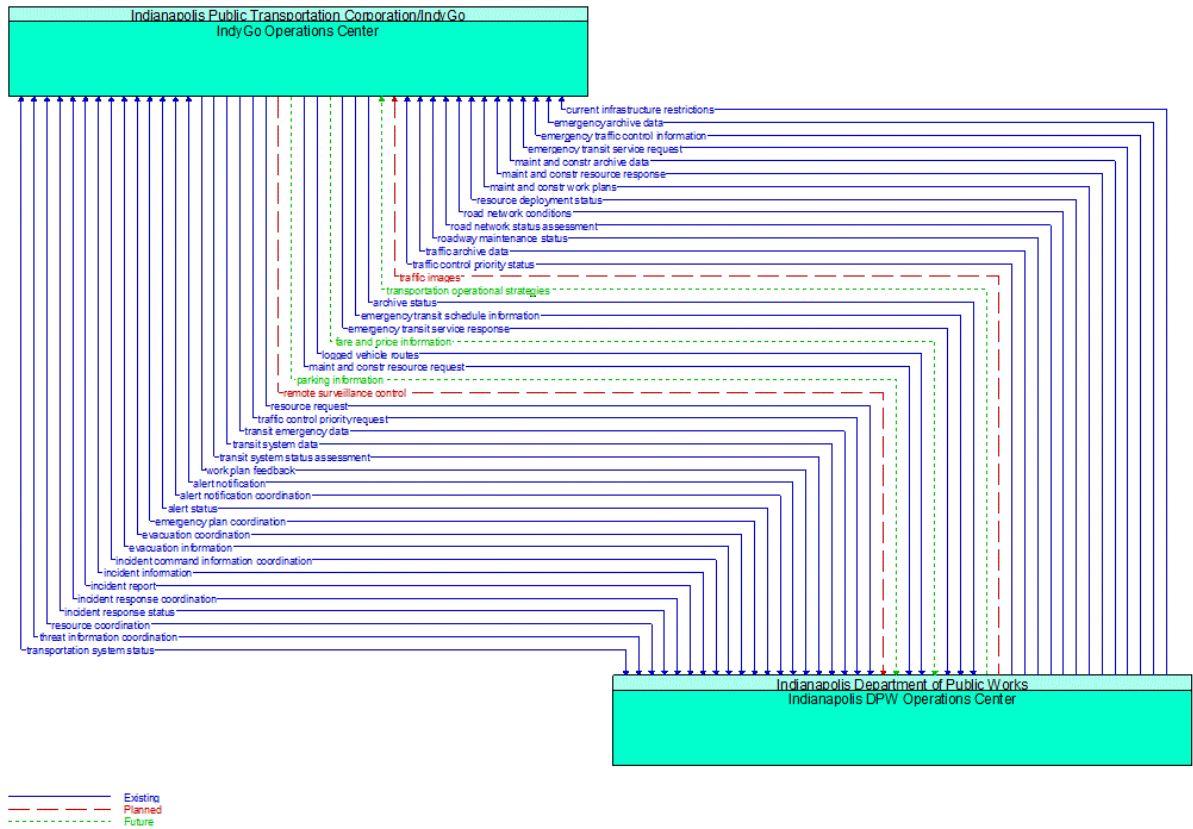


Figure 185: Indianapolis DPW Operations Center - IndyGo Operations Center Interface

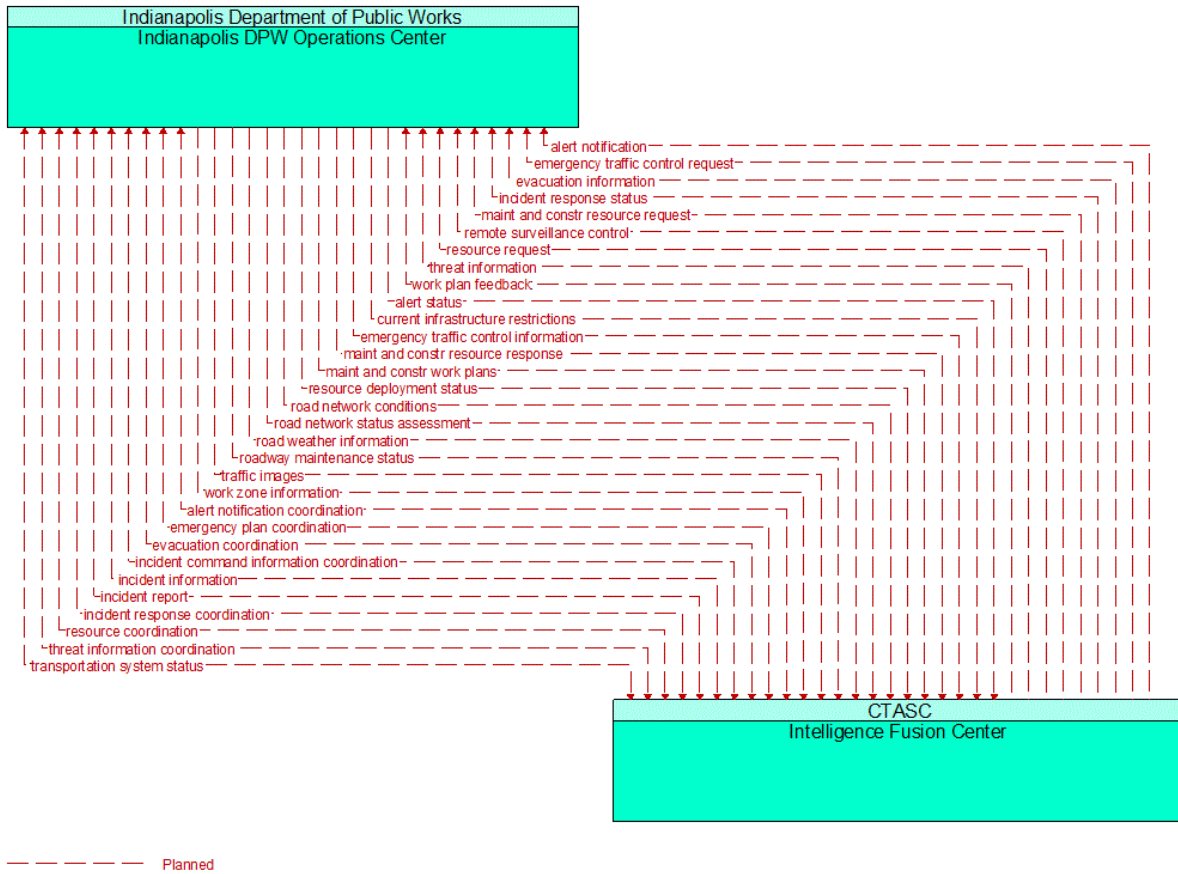
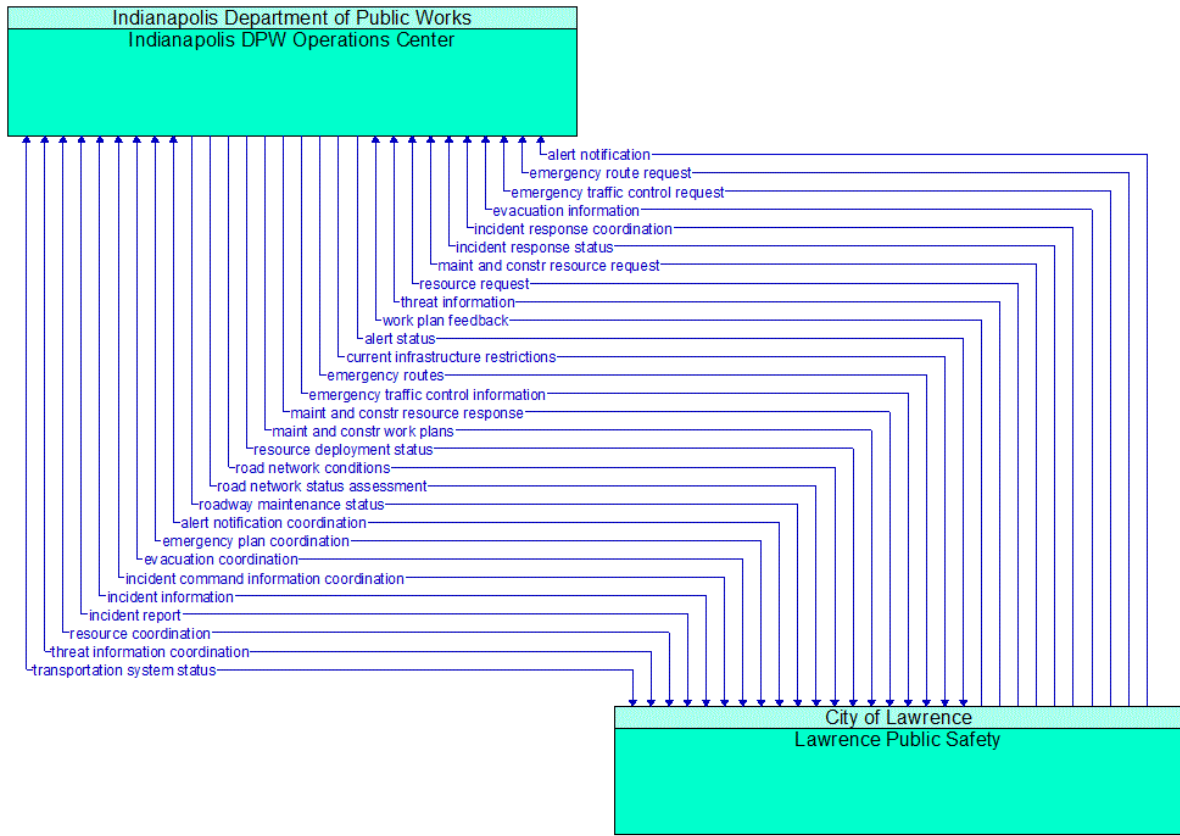


Figure 186: Indianapolis DPW Operations Center - Intelligence Fusion Center Interface



Existing

Figure 187: Indianapolis DPW Operations Center - Lawrence Public Safety Interface

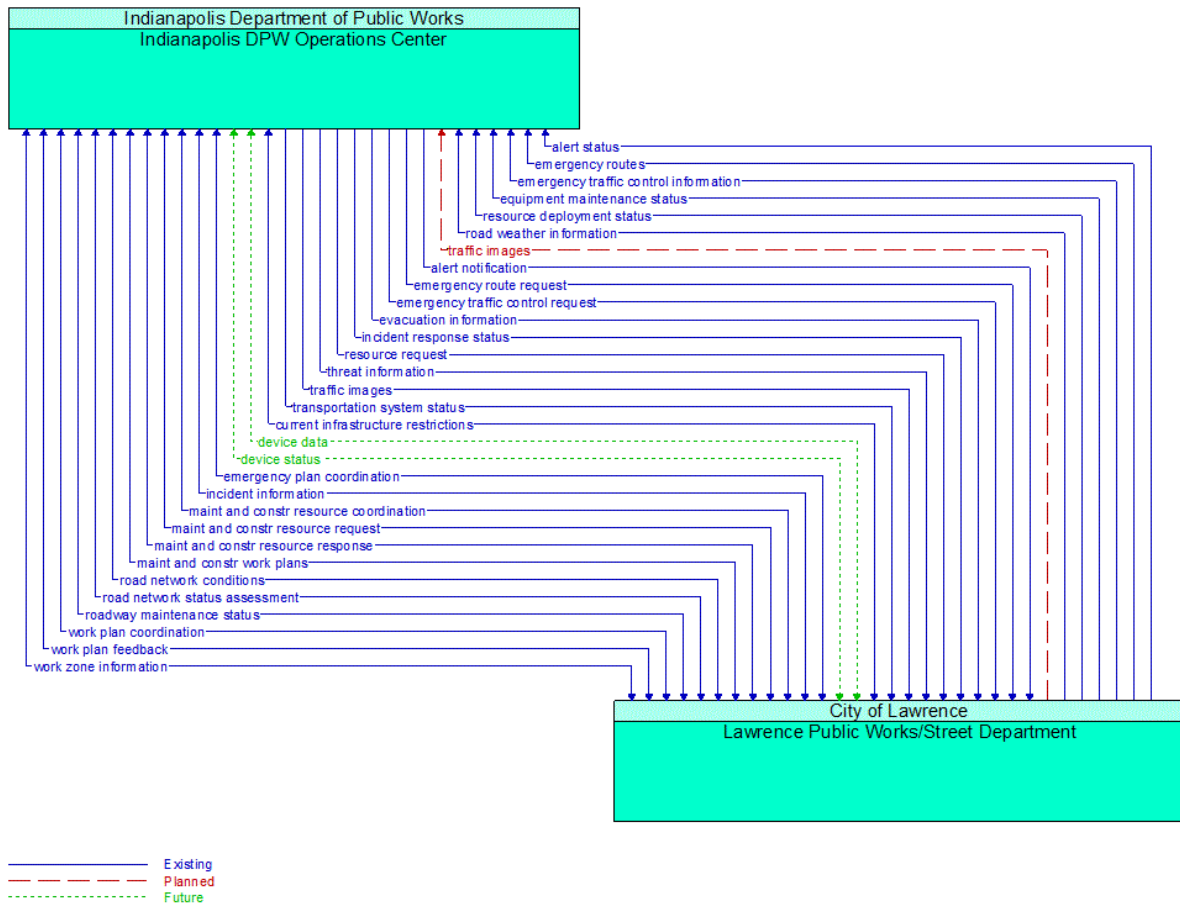


Figure 188: Indianapolis DPW Operations Center - Lawrence Public Works/Street Department Interface

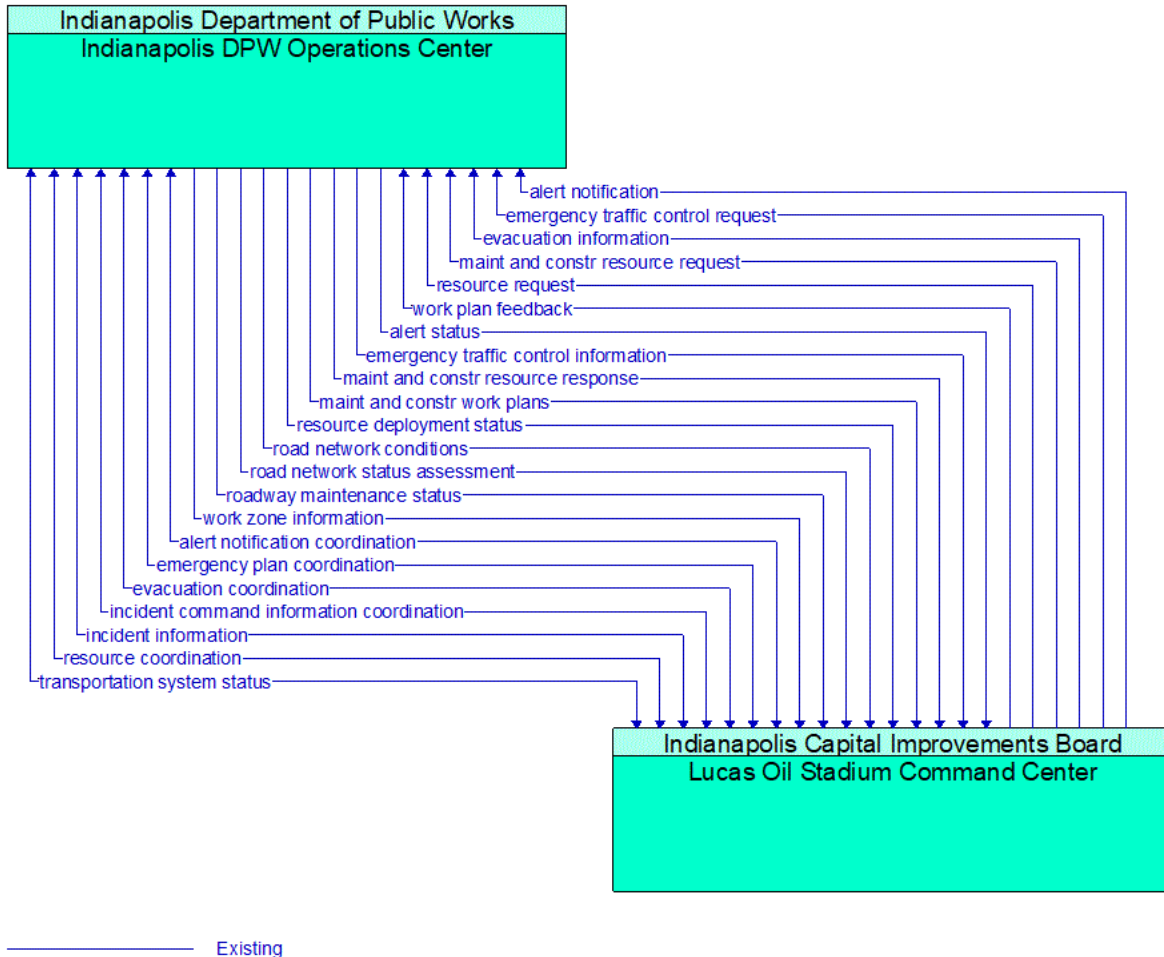


Figure 189: Indianapolis DPW Operations Center - Lucas Oil Stadium Command Center Interface

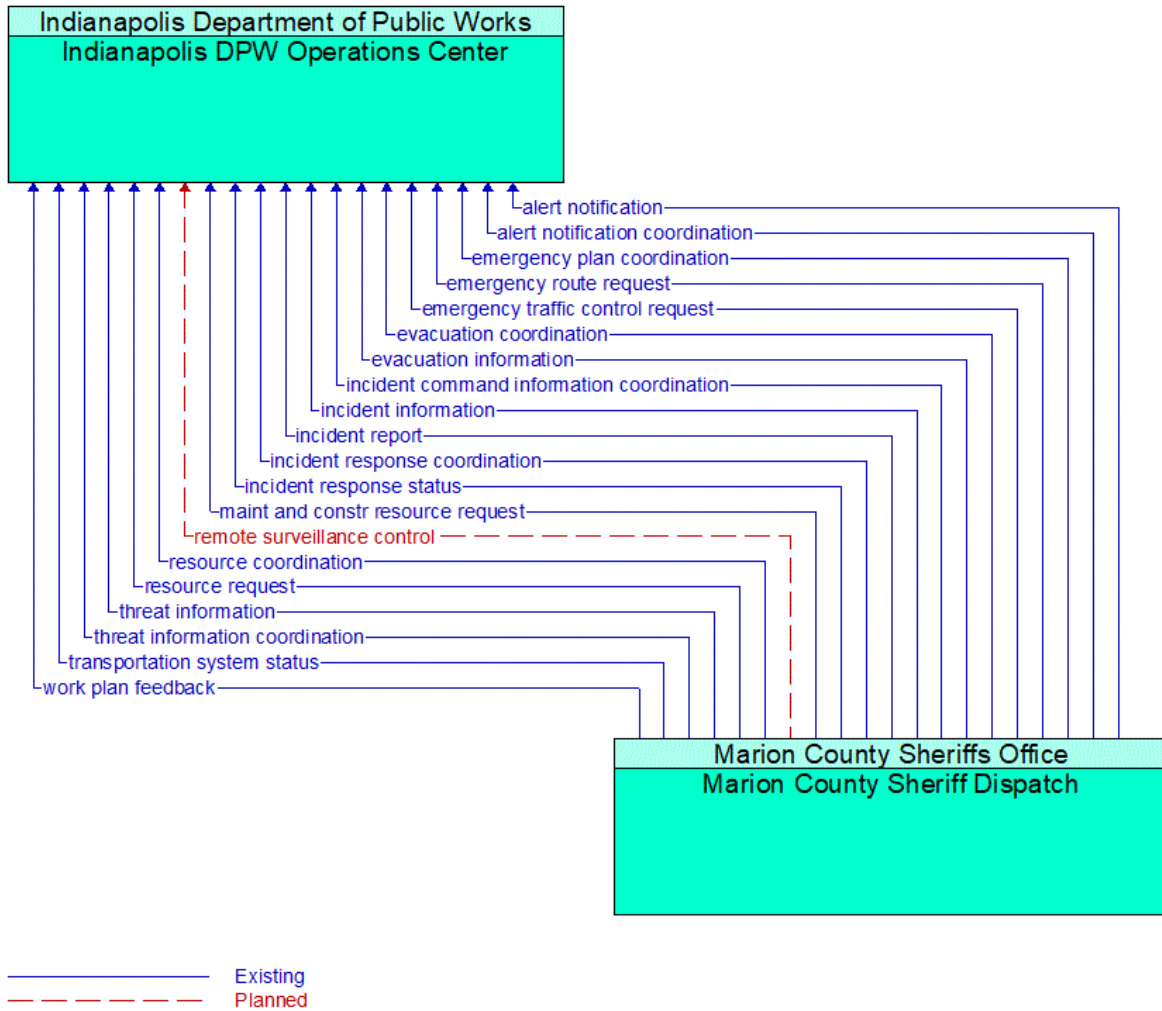


Figure 190: Indianapolis DPW Operations Center - Marion County Sheriff Dispatch Interface

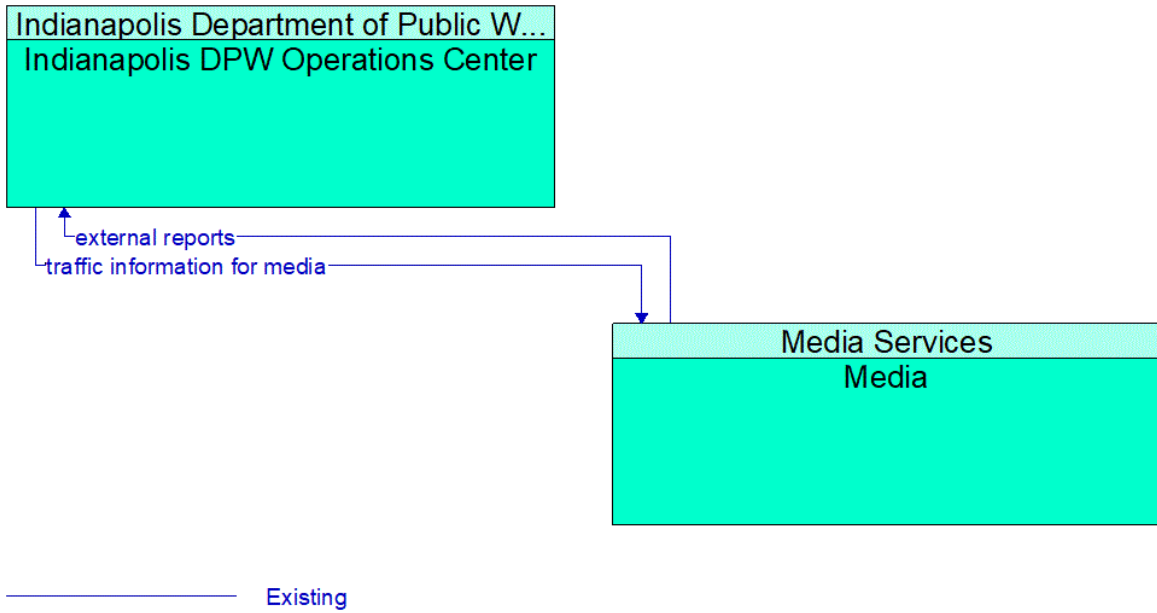


Figure 191: Indianapolis DPW Operations Center - Media Interface

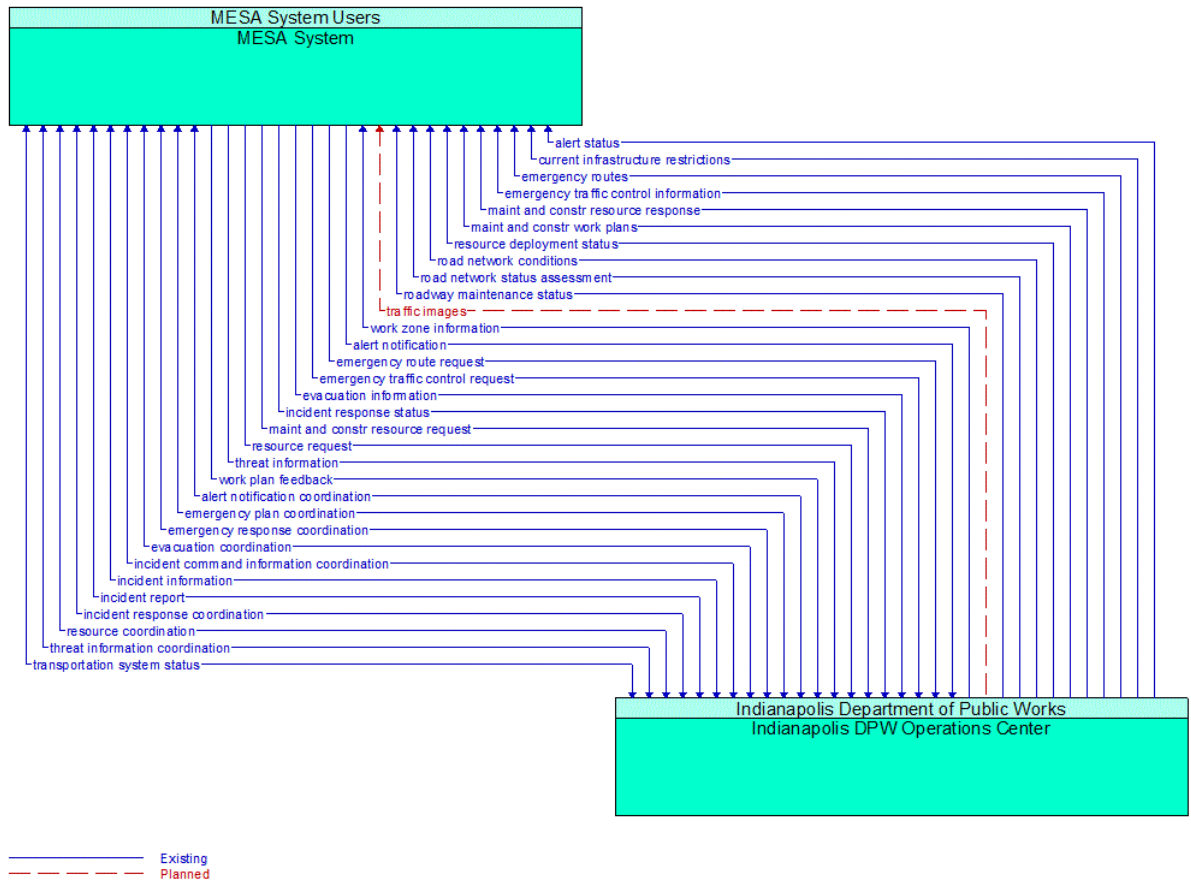


Figure 192: Indianapolis DPW Operations Center - MESA System Interface

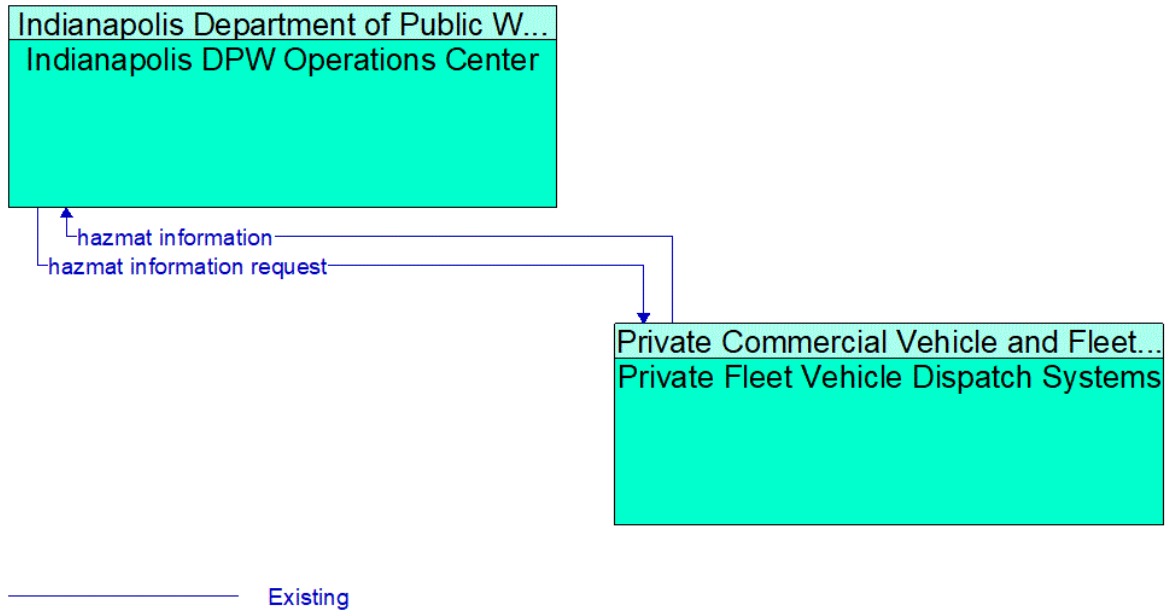


Figure 193: Indianapolis DPW Operations Center - Private Fleet Vehicle Dispatch Systems Interface

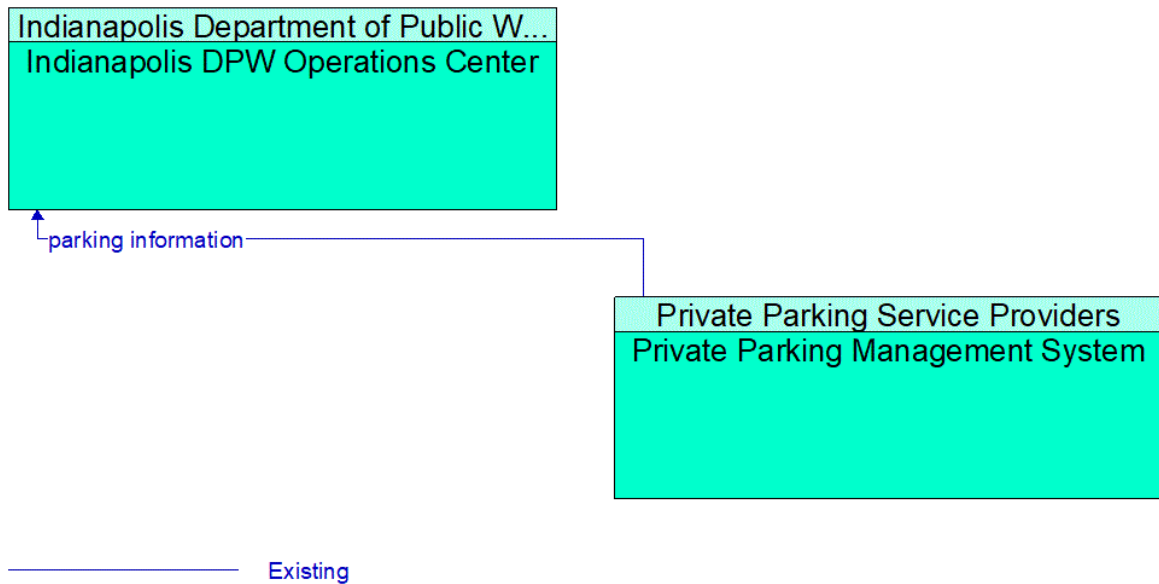


Figure 194: Indianapolis DPW Operations Center - Private Parking Management System Interface

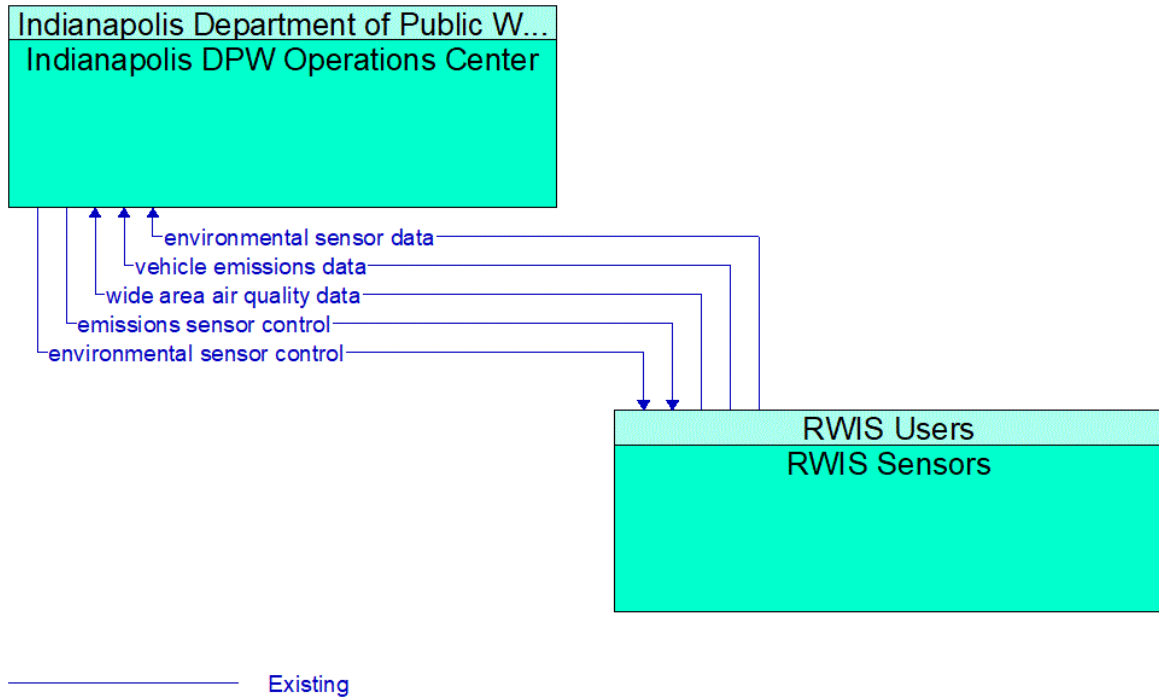


Figure 195: Indianapolis DPW Operations Center - RWIS Sensors Interface

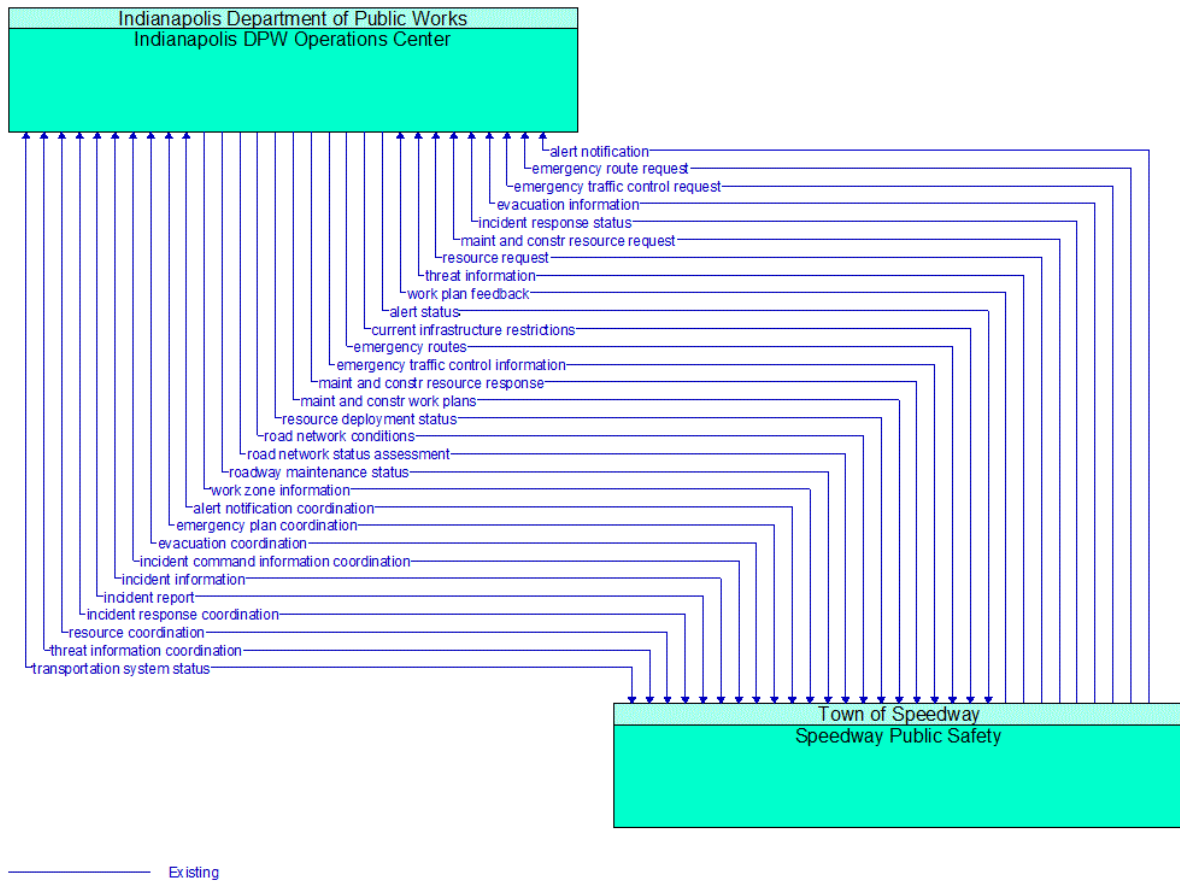


Figure 196: Indianapolis DPW Operations Center - Speedway Public Safety Interface

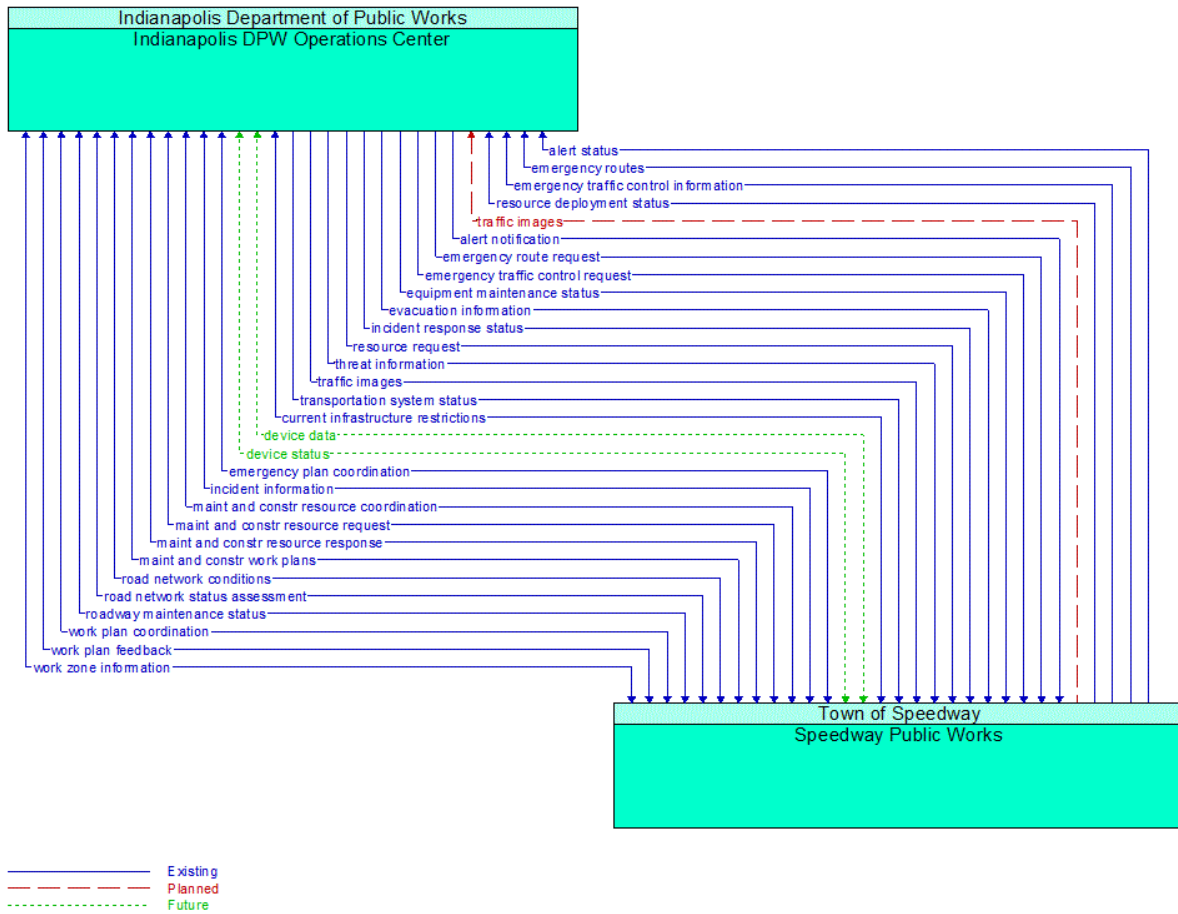


Figure 197: Indianapolis DPW Operations Center - Speedway Public Works Interface

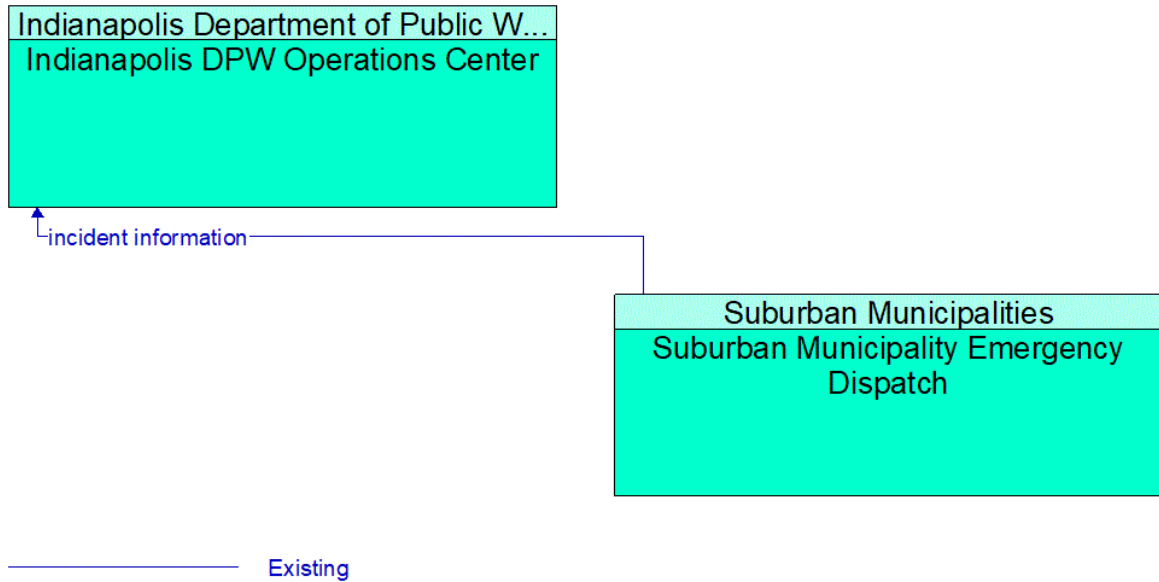


Figure 198: Indianapolis DPW Operations Center - Suburban Municipality Emergency Dispatch Interface

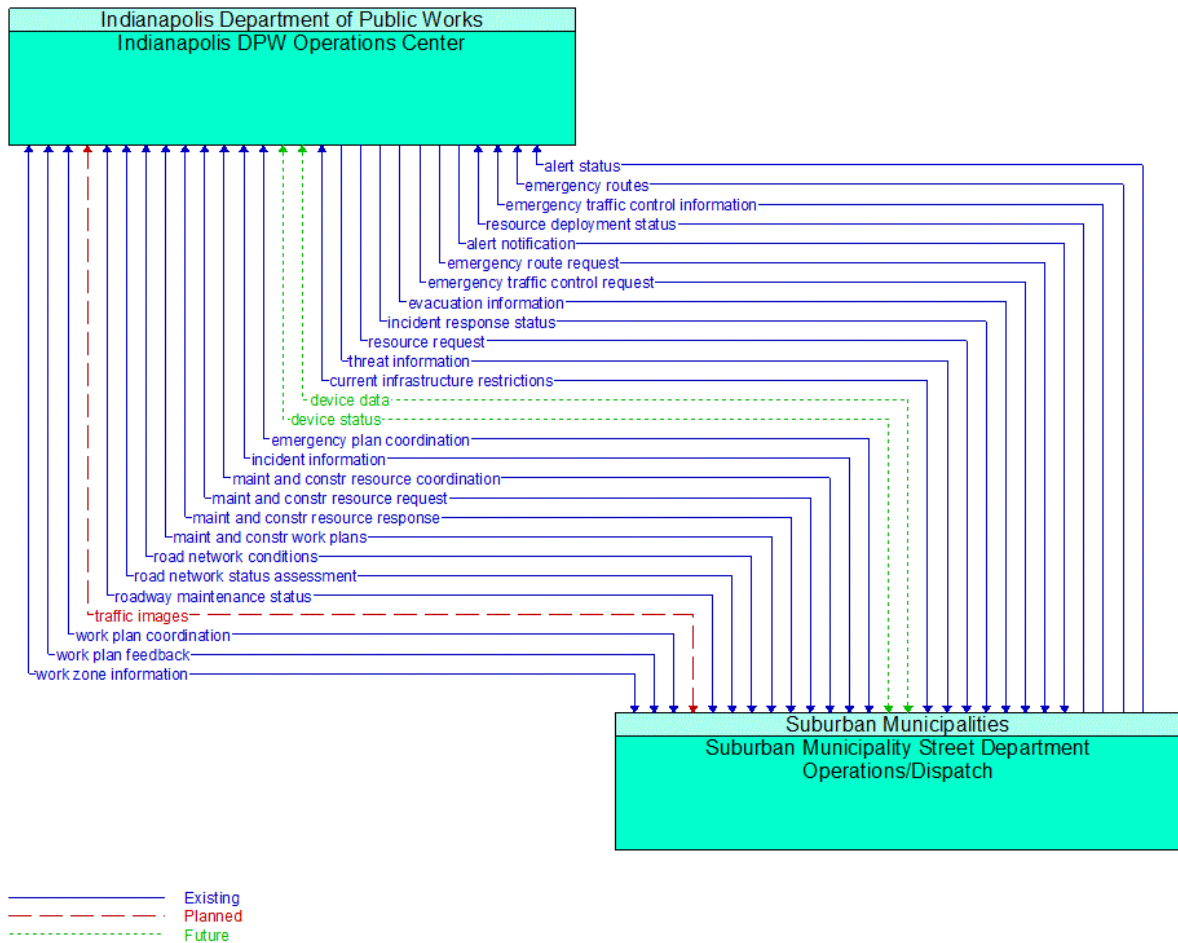


Figure 199: Indianapolis DPW Operations Center - Suburban Municipality Street Department Operations/Dispatch Interface

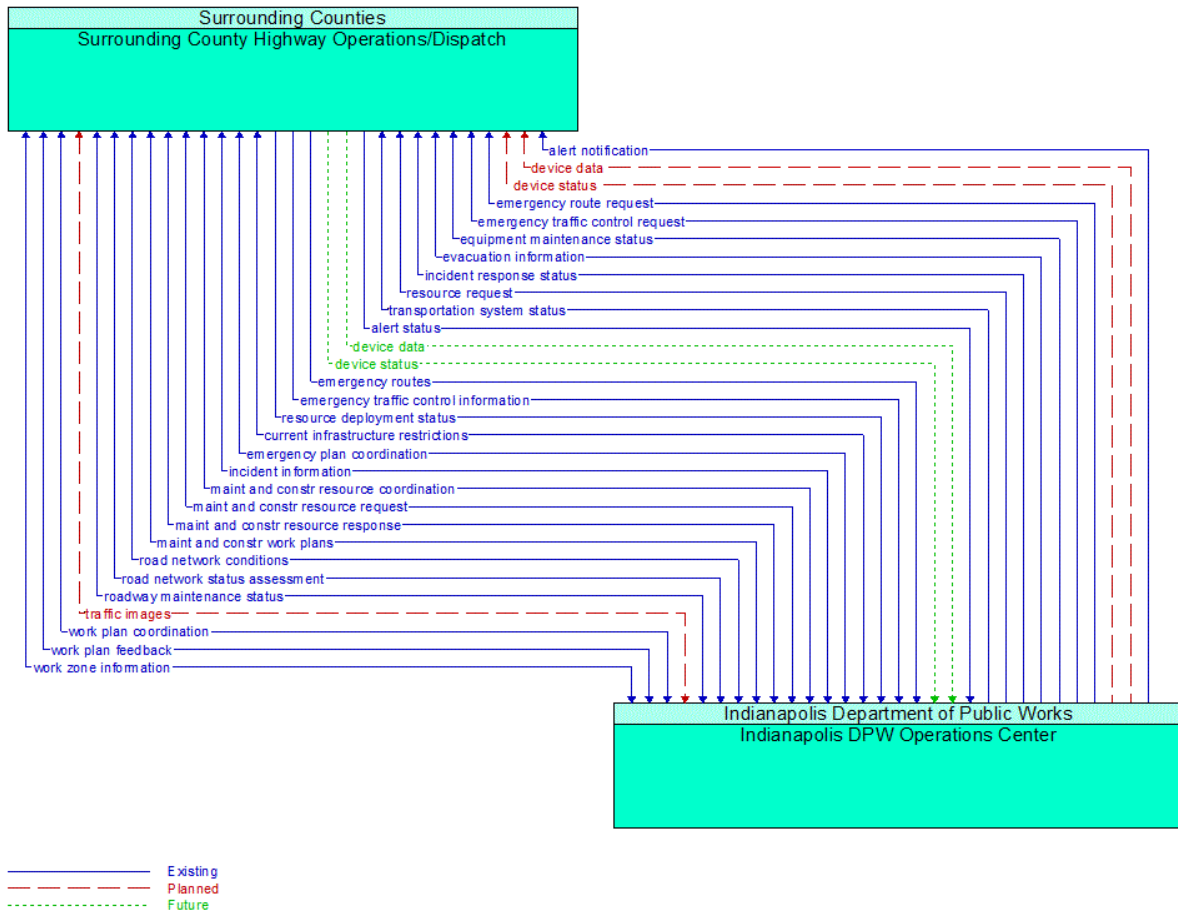


Figure 200: Indianapolis DPW Operations Center - Surrounding County Highway Operations/Dispatch Interface

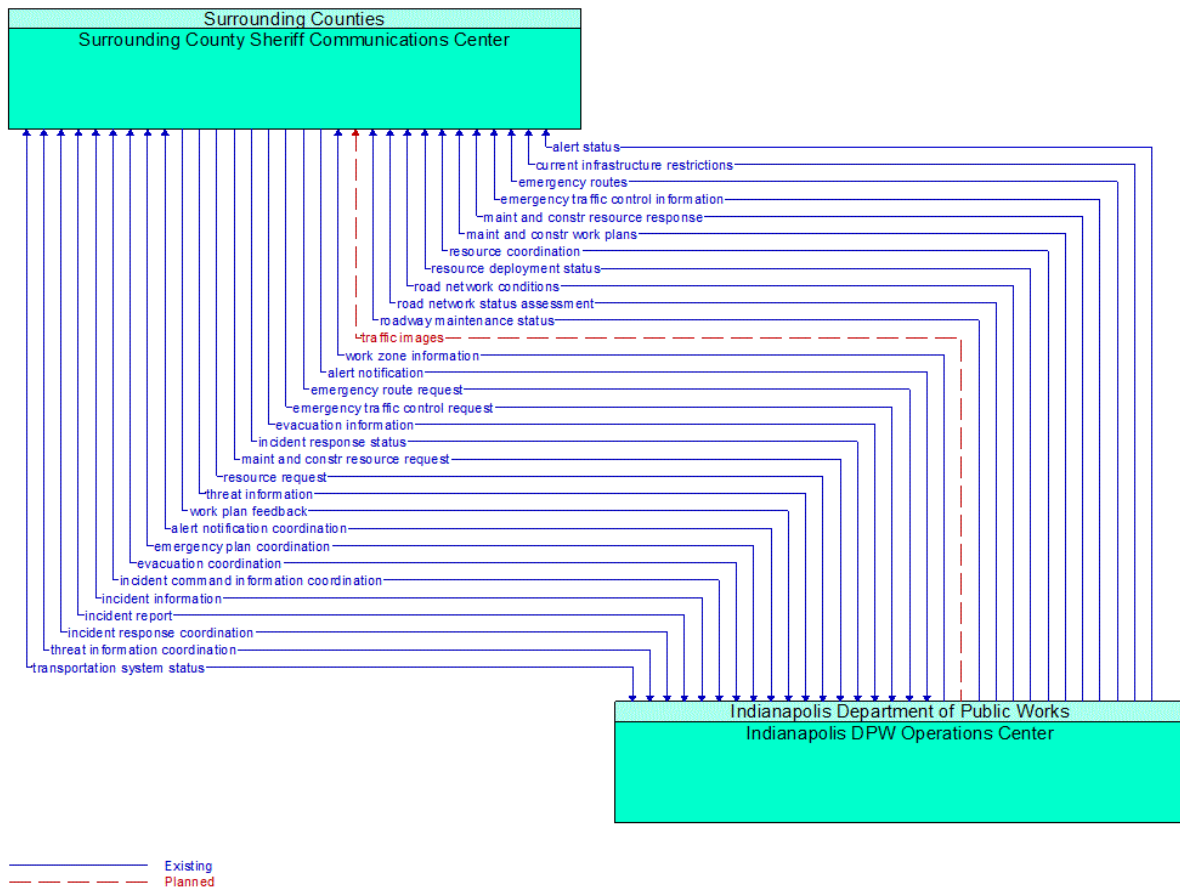


Figure 201: Indianapolis DPW Operations Center - Surrounding County Sheriff Communications Center Interface

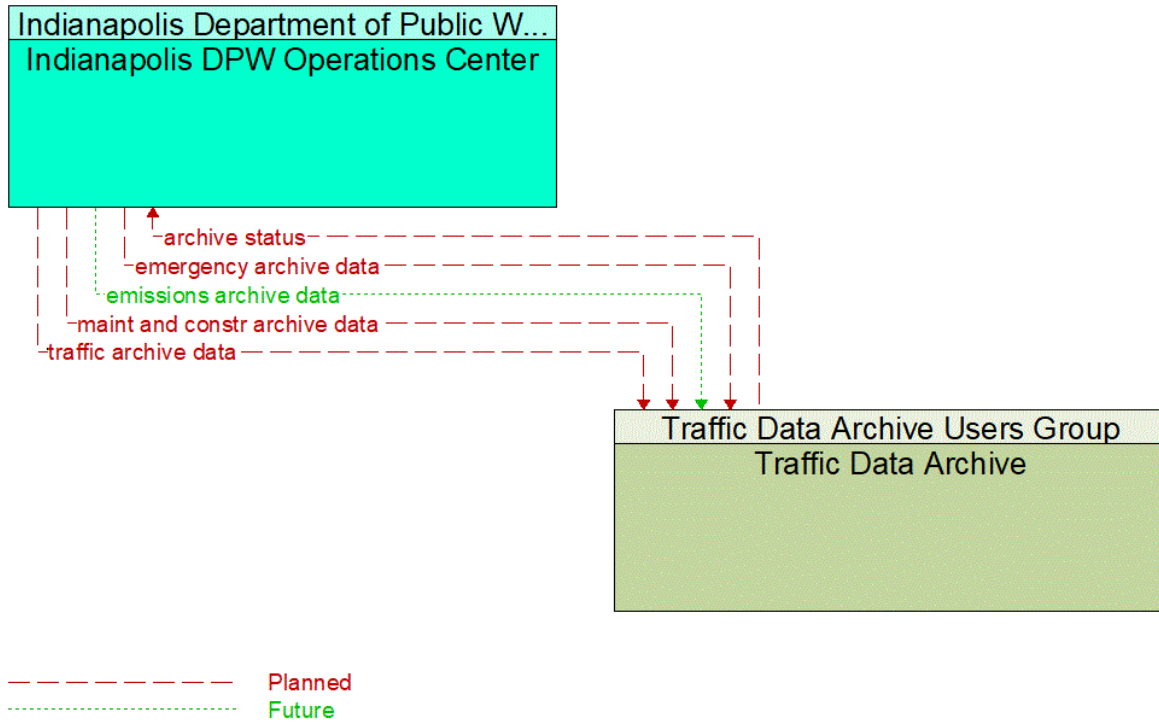


Figure 202: Indianapolis DPW Operations Center - Traffic Data Archive Interface

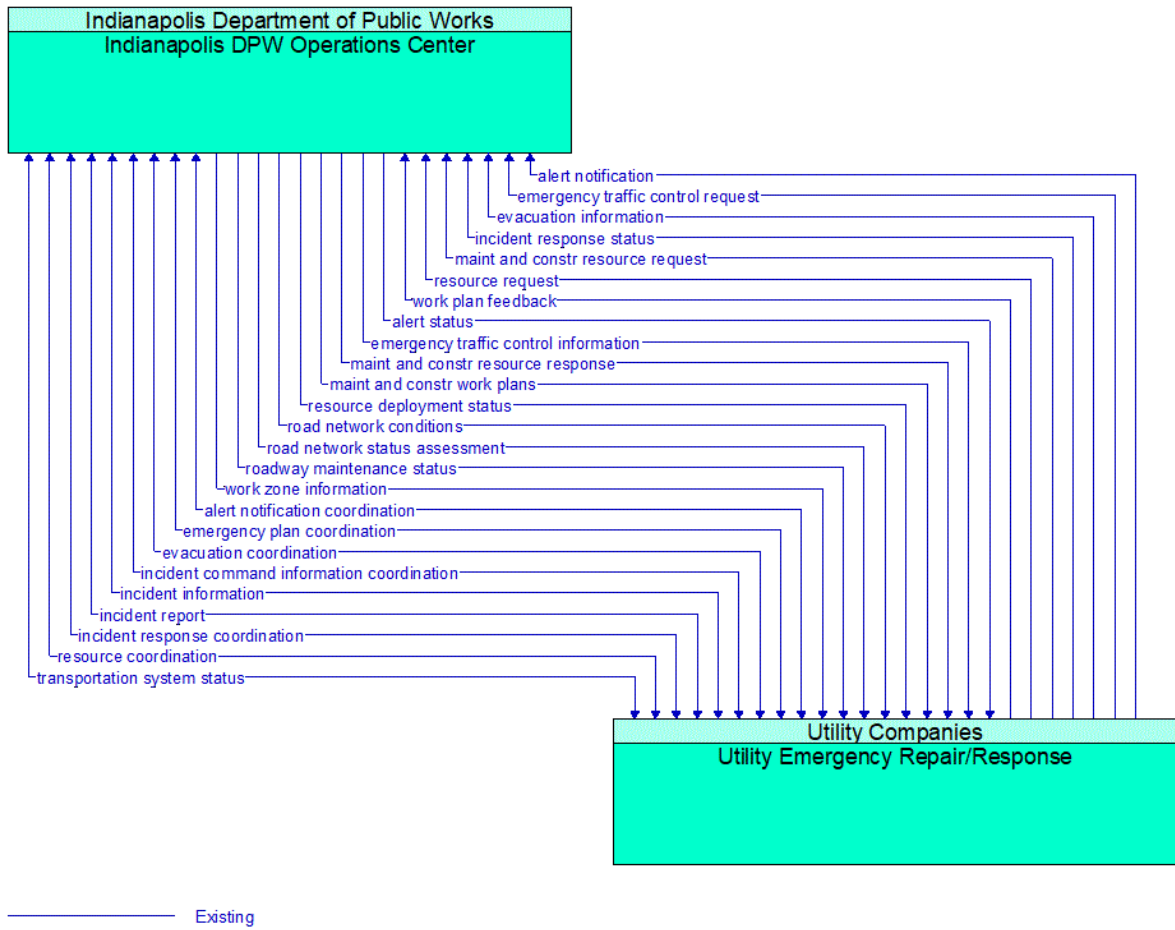


Figure 203: Indianapolis DPW Operations Center - Utility Emergency Repair/Response Interface

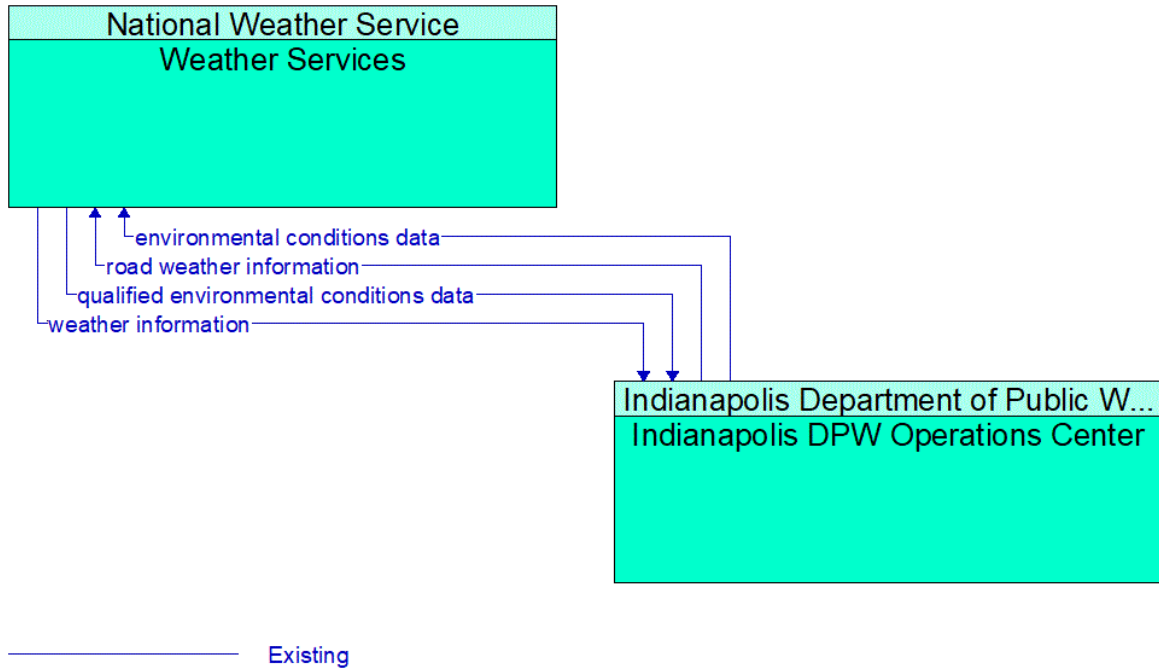


Figure 204: Indianapolis DPW Operations Center - Weather Services Interface

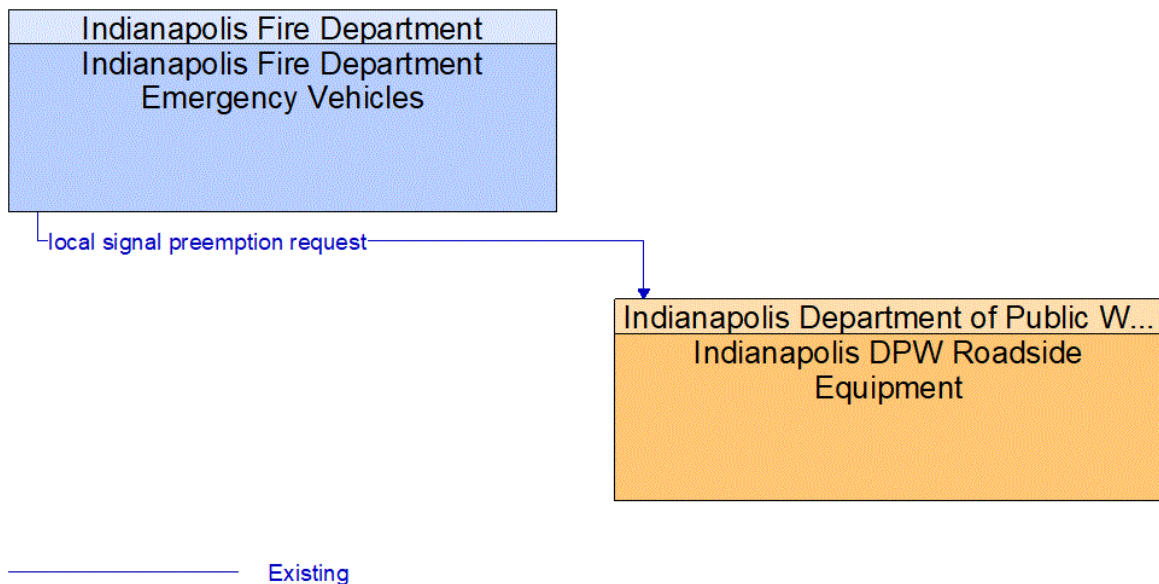


Figure 205: Indianapolis DPW Roadside Equipment - Indianapolis Fire Department Emergency Vehicles Interface

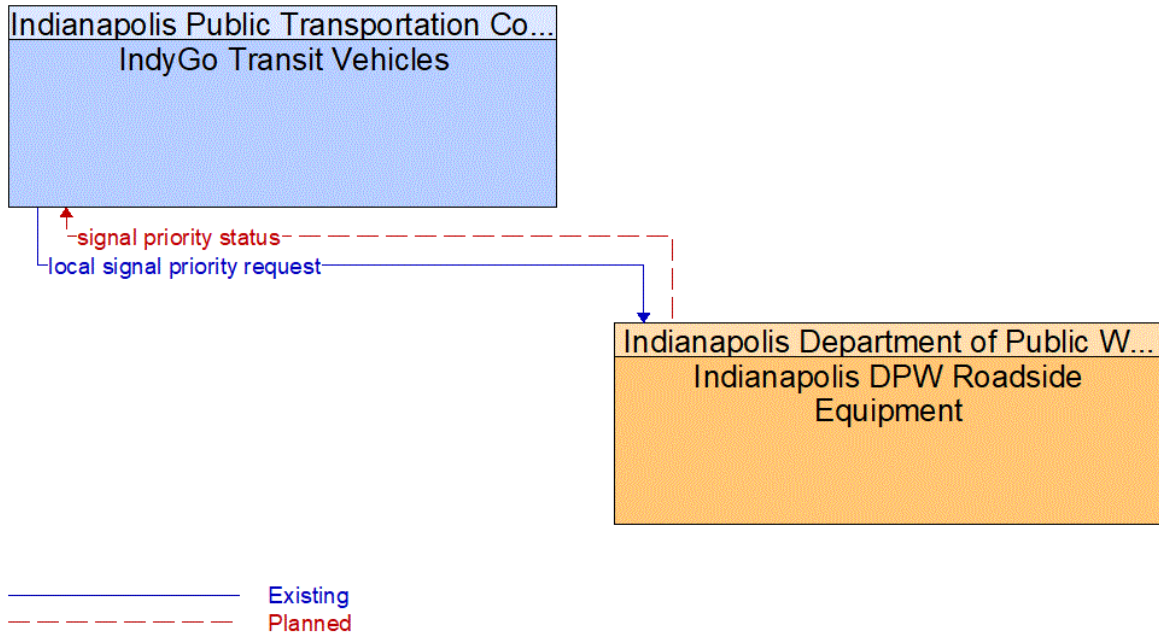


Figure 206: Indianapolis DPW Roadside Equipment - IndyGo Transit Vehicles Interface

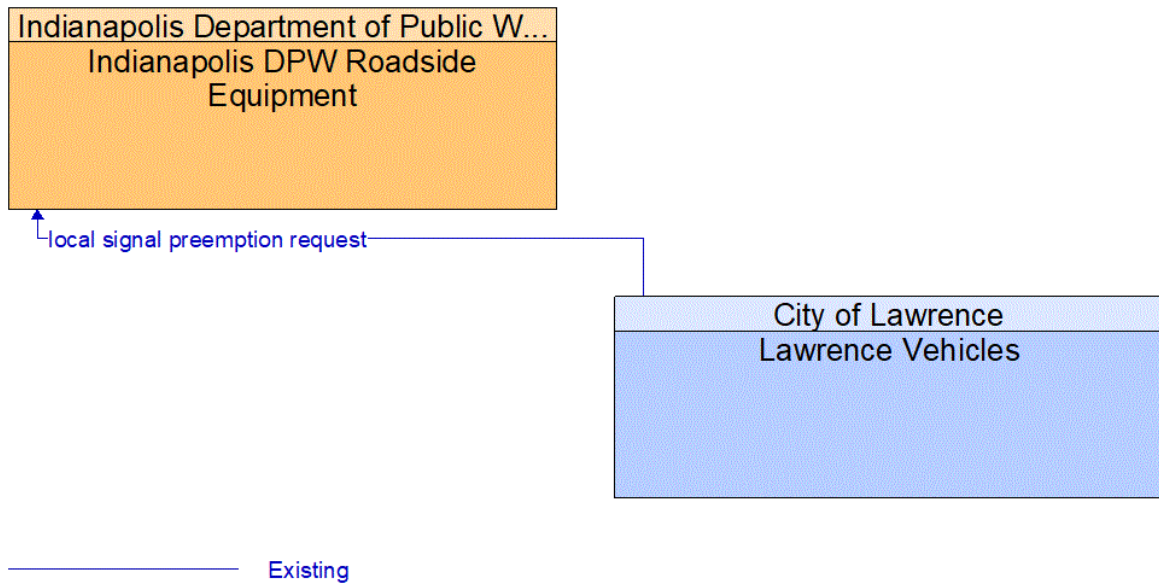


Figure 207: Indianapolis DPW Roadside Equipment - Lawrence Vehicles Interface

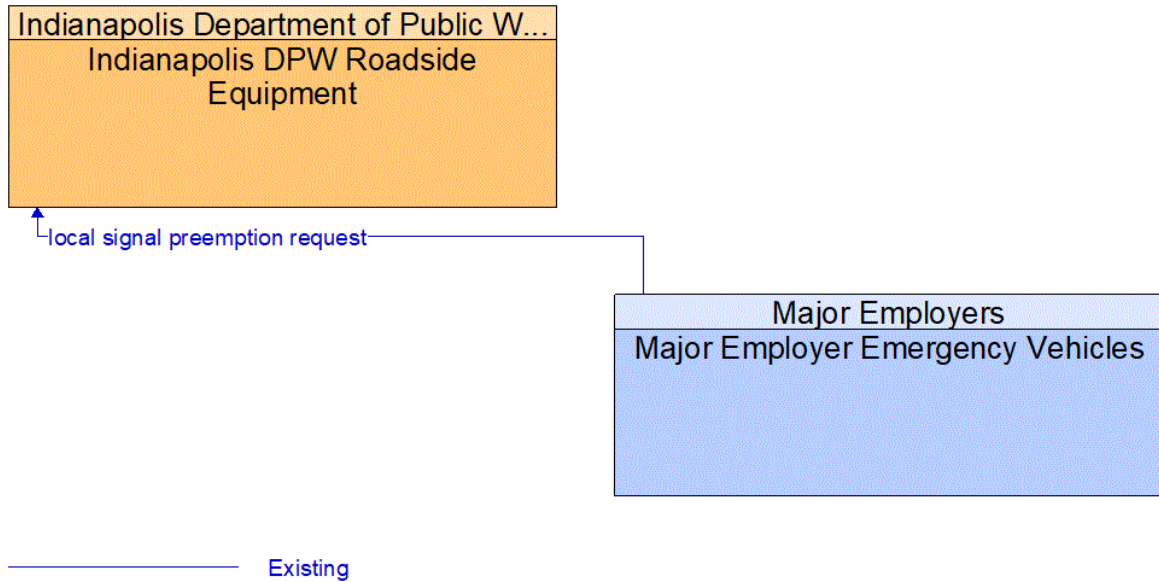


Figure 208: Indianapolis DPW Roadside Equipment - Major Employer Emergency Vehicles Interface

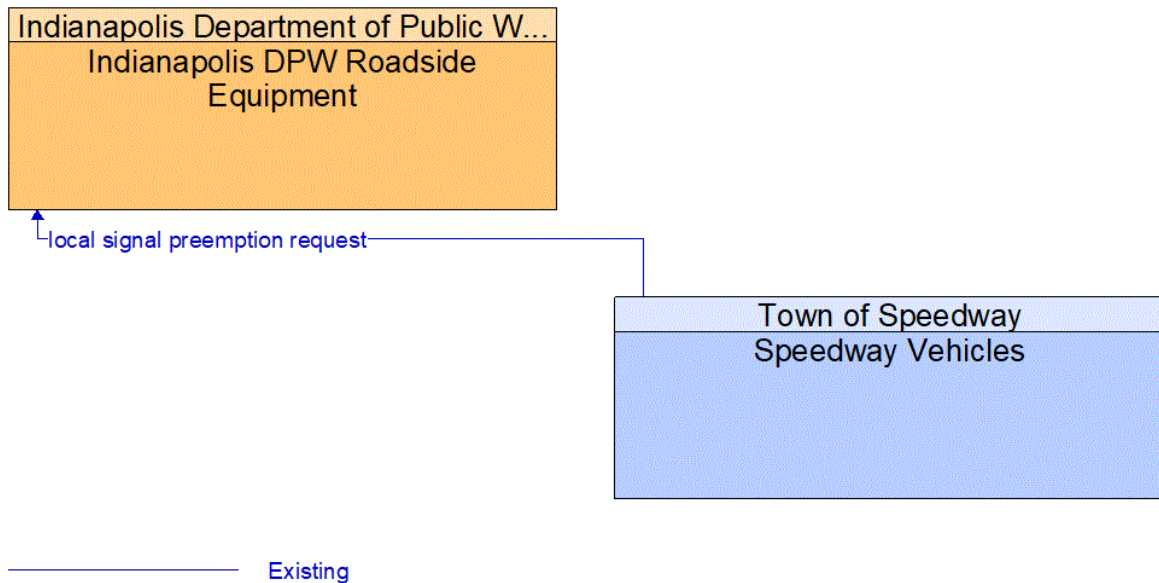


Figure 209: Indianapolis DPW Roadside Equipment - Speedway Vehicles Interface

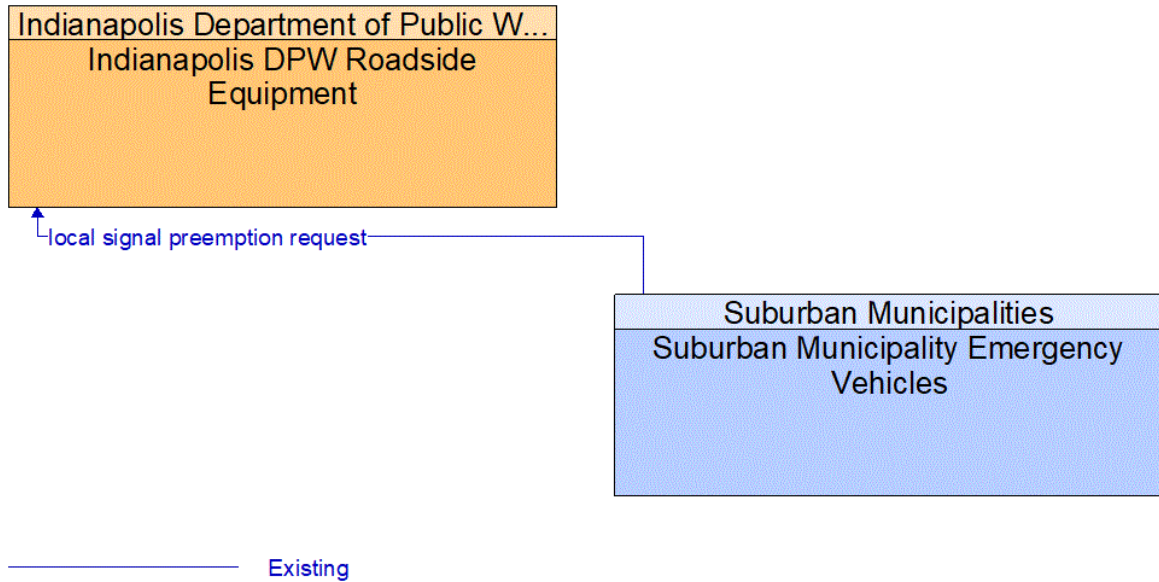


Figure 210: Indianapolis DPW Roadside Equipment - Suburban Municipality Emergency Vehicles Interface

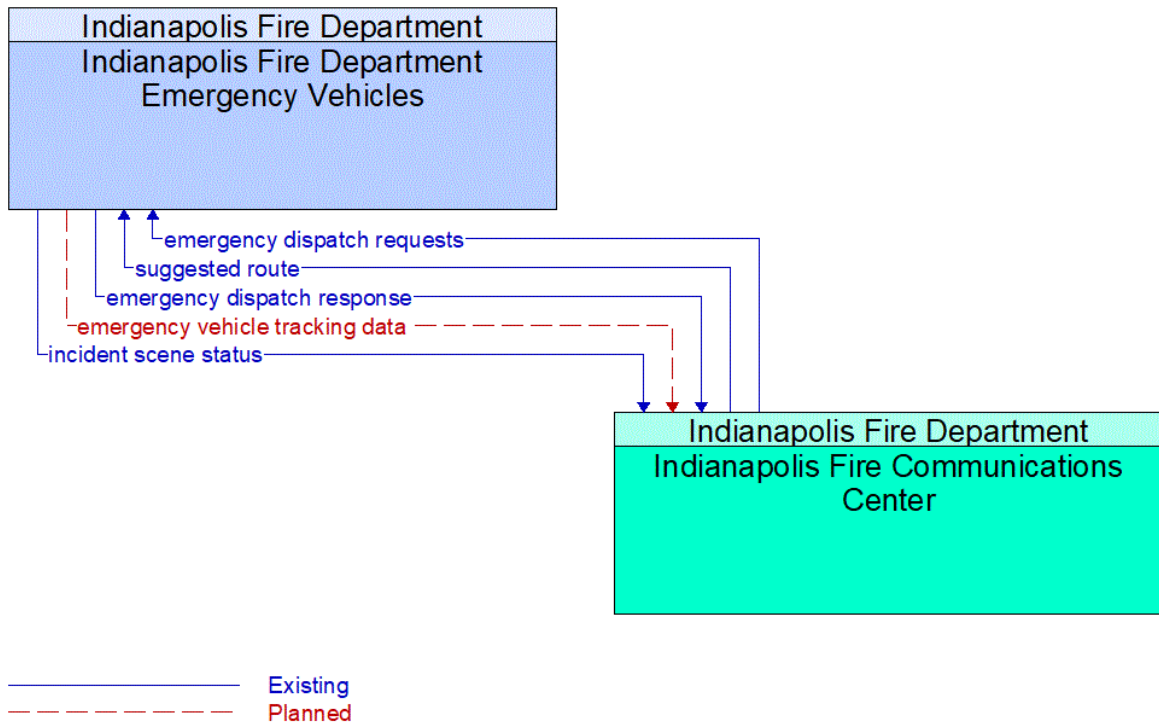


Figure 211: Indianapolis Fire Communications Center - Indianapolis Fire Department Emergency Vehicles Interface

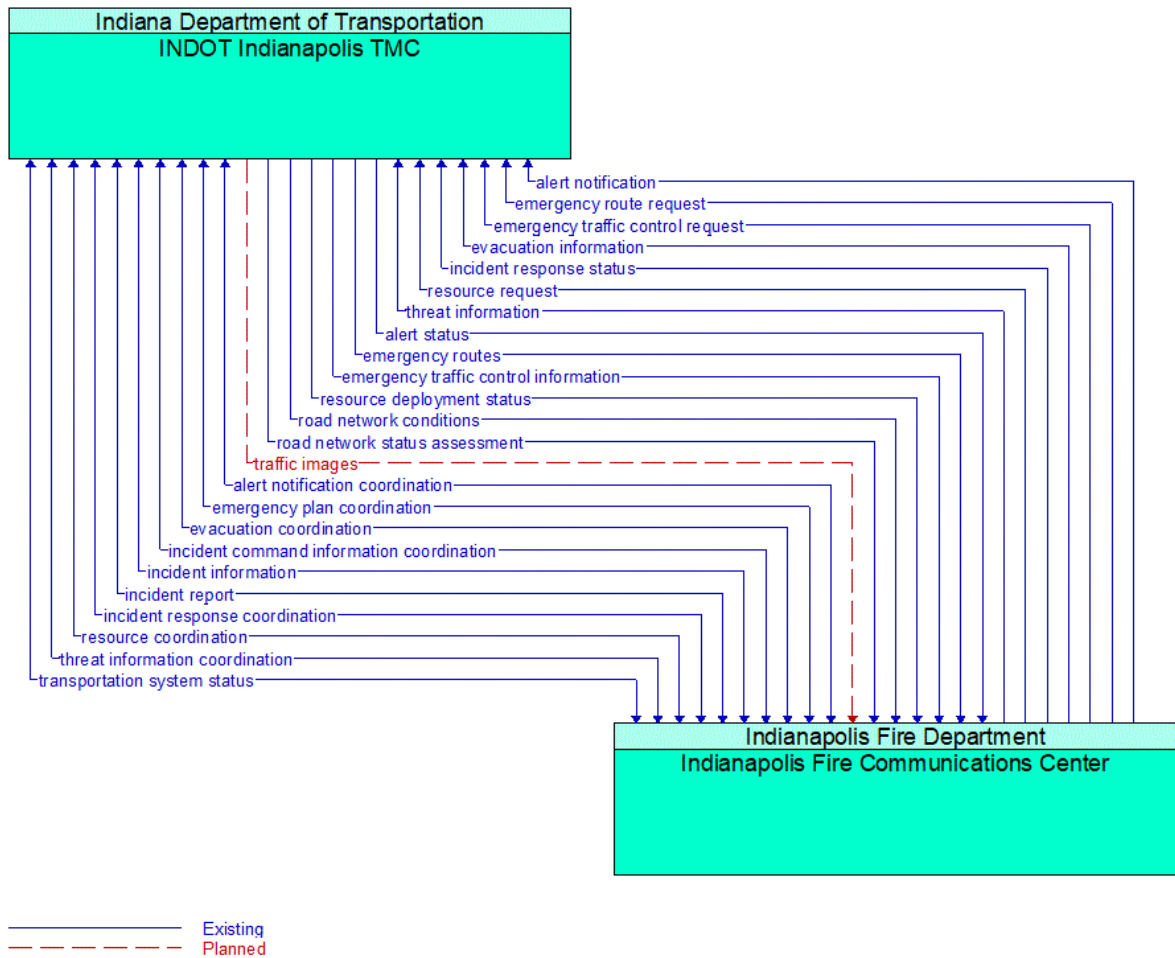


Figure 212: Indianapolis Fire Communications Center - INDOT Indianapolis TMC Interface

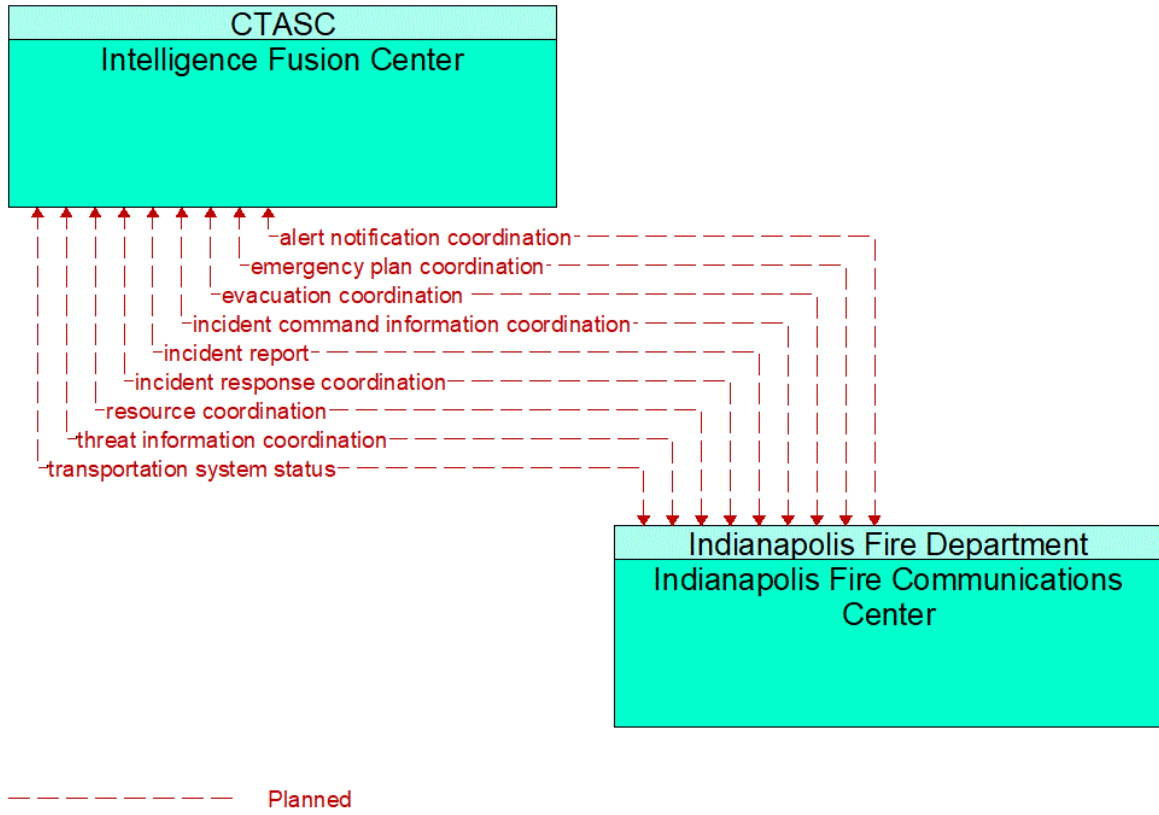


Figure 213: Indianapolis Fire Communications Center - Intelligence Fusion Center Interface

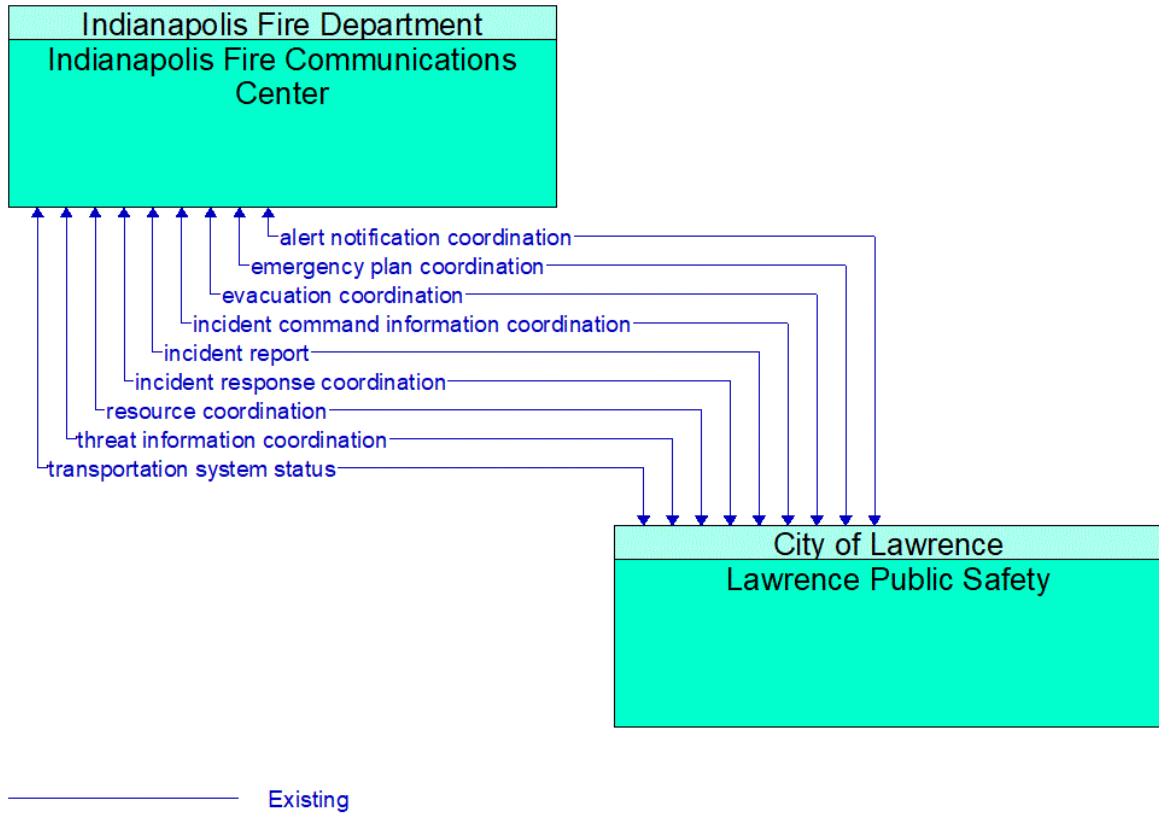


Figure 214: Indianapolis Fire Communications Center - Lawrence Public Safety Interface

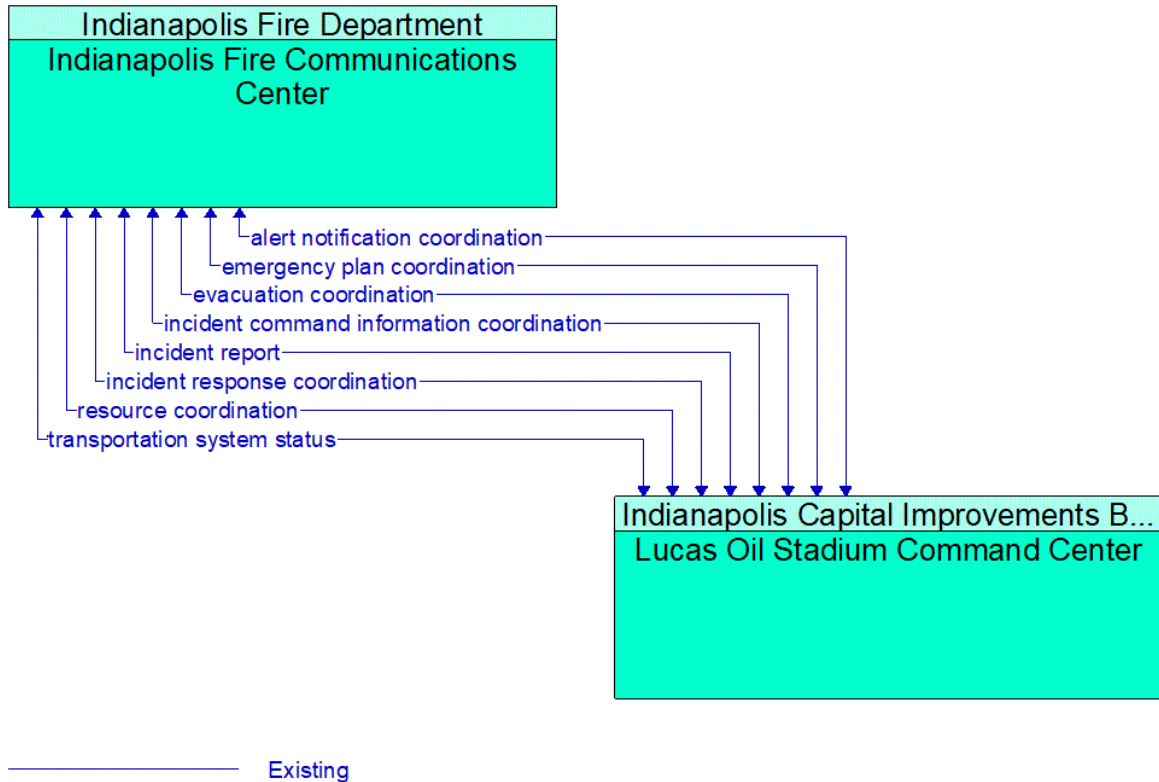


Figure 215: Indianapolis Fire Communications Center - Lucas Oil Stadium Command Center Interface

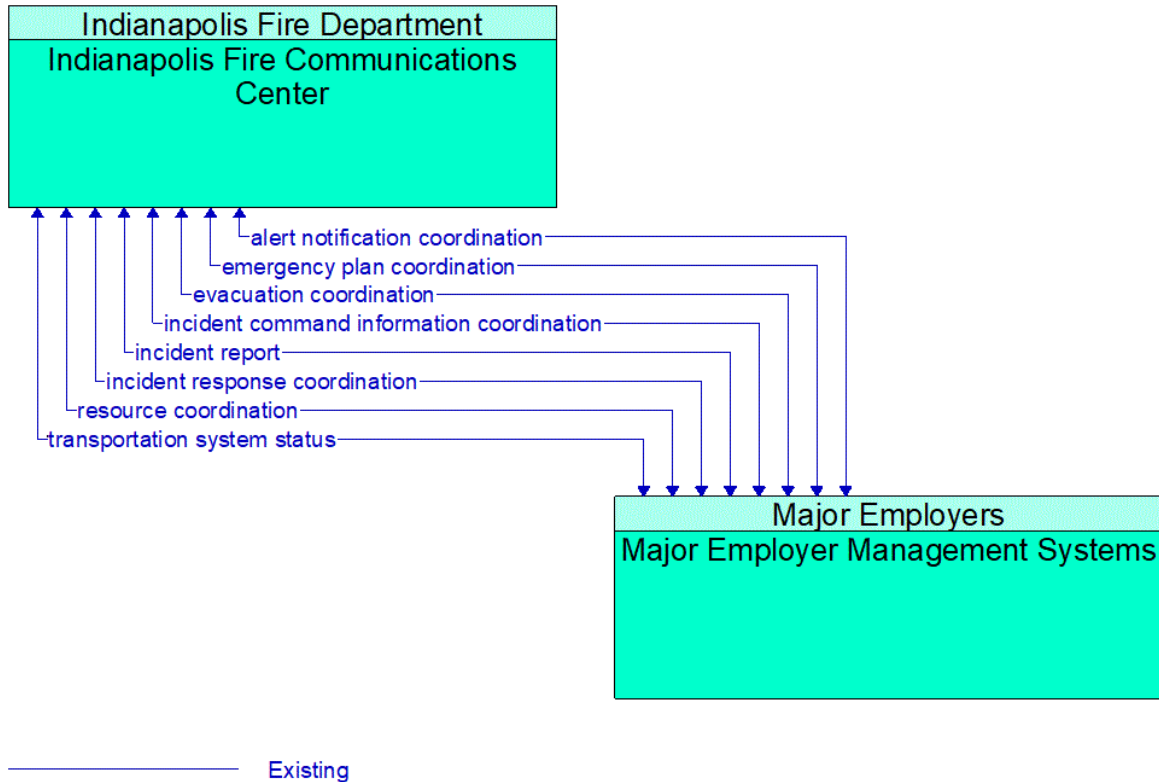


Figure 216: Indianapolis Fire Communications Center - Major Employer Management Systems Interface

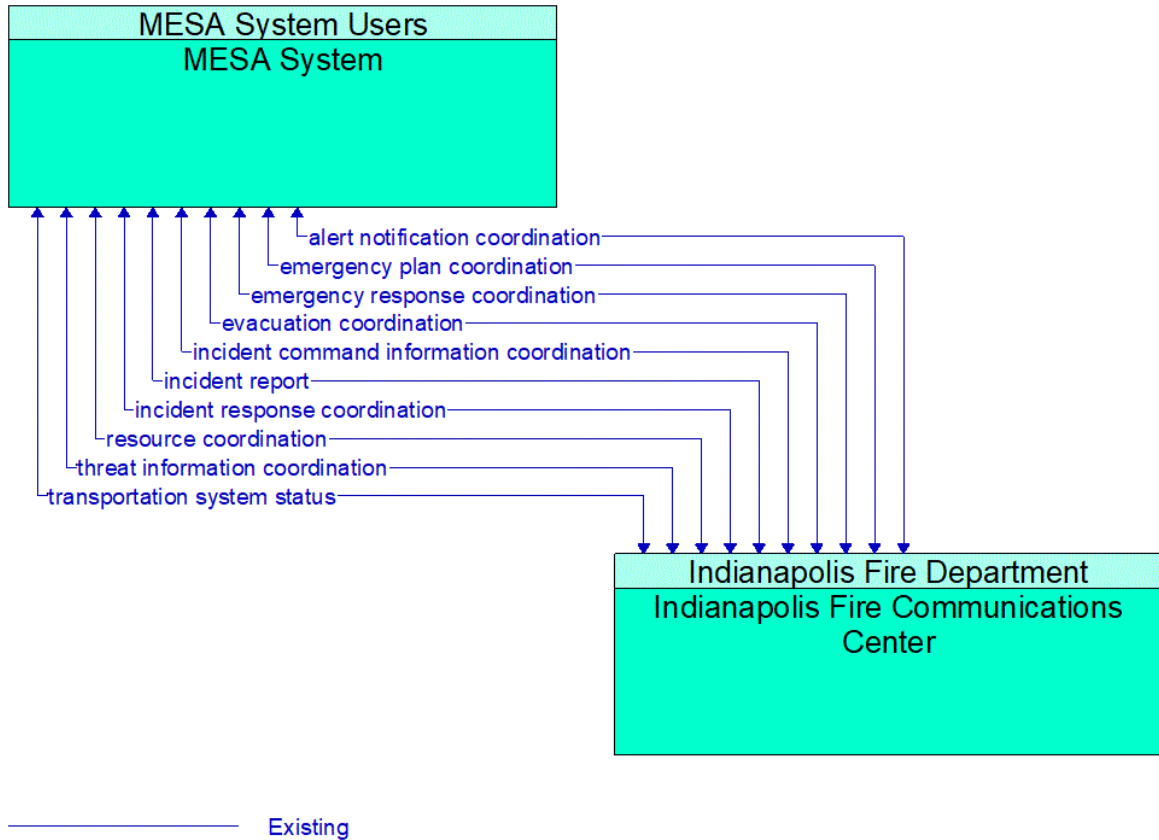


Figure 217: Indianapolis Fire Communications Center - MESA System Interface

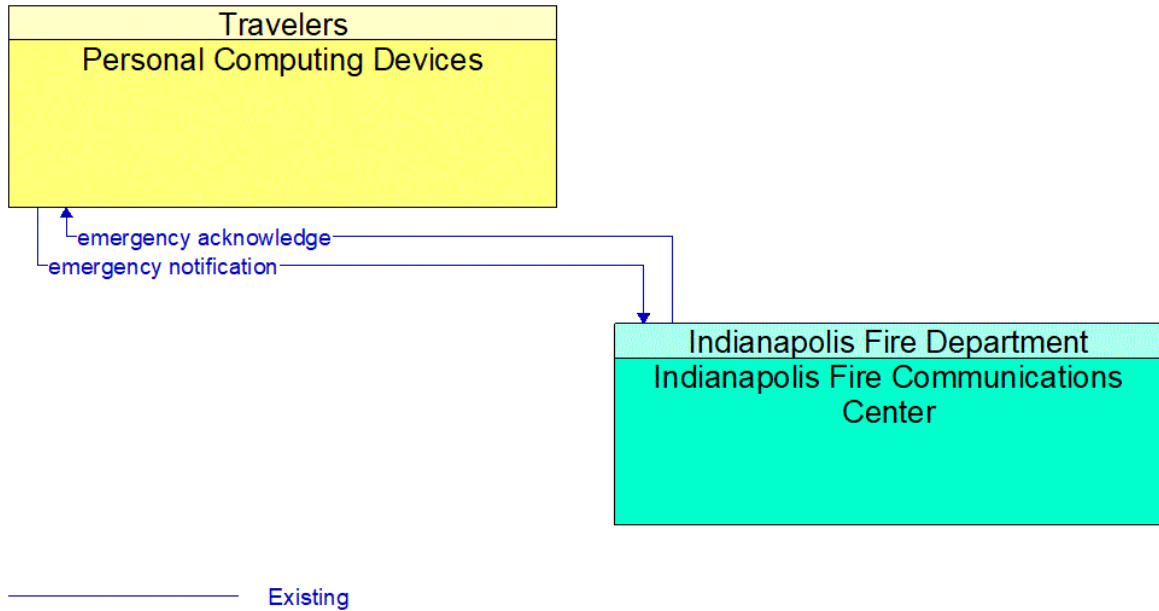


Figure 218: Indianapolis Fire Communications Center - Personal Computing Devices Interface

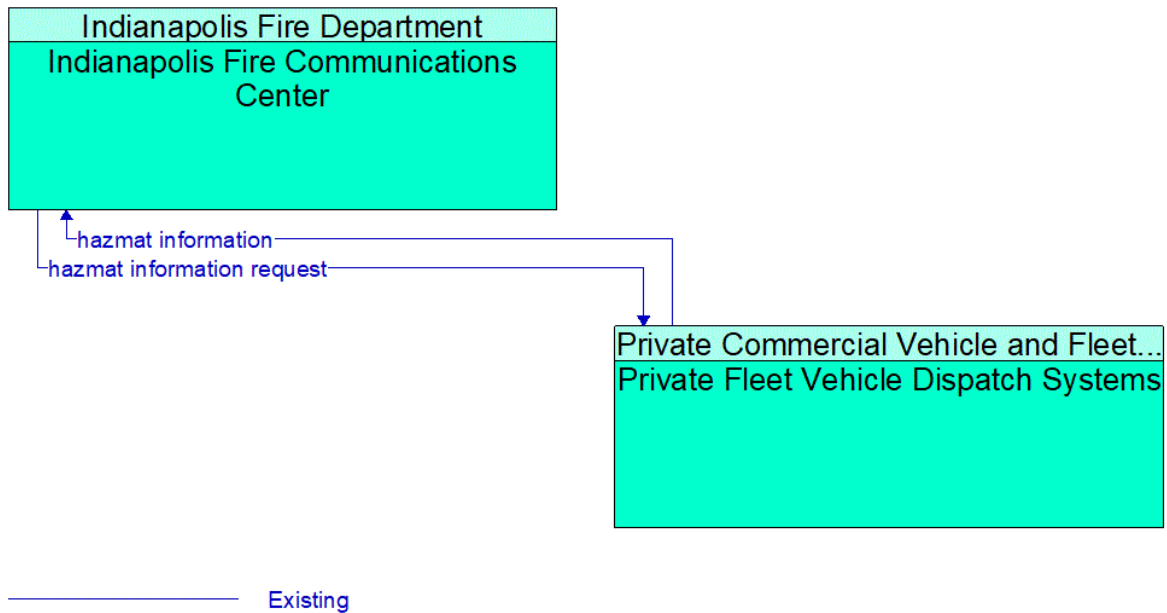


Figure 219: Indianapolis Fire Communications Center - Private Fleet Vehicle Dispatch Systems Interface

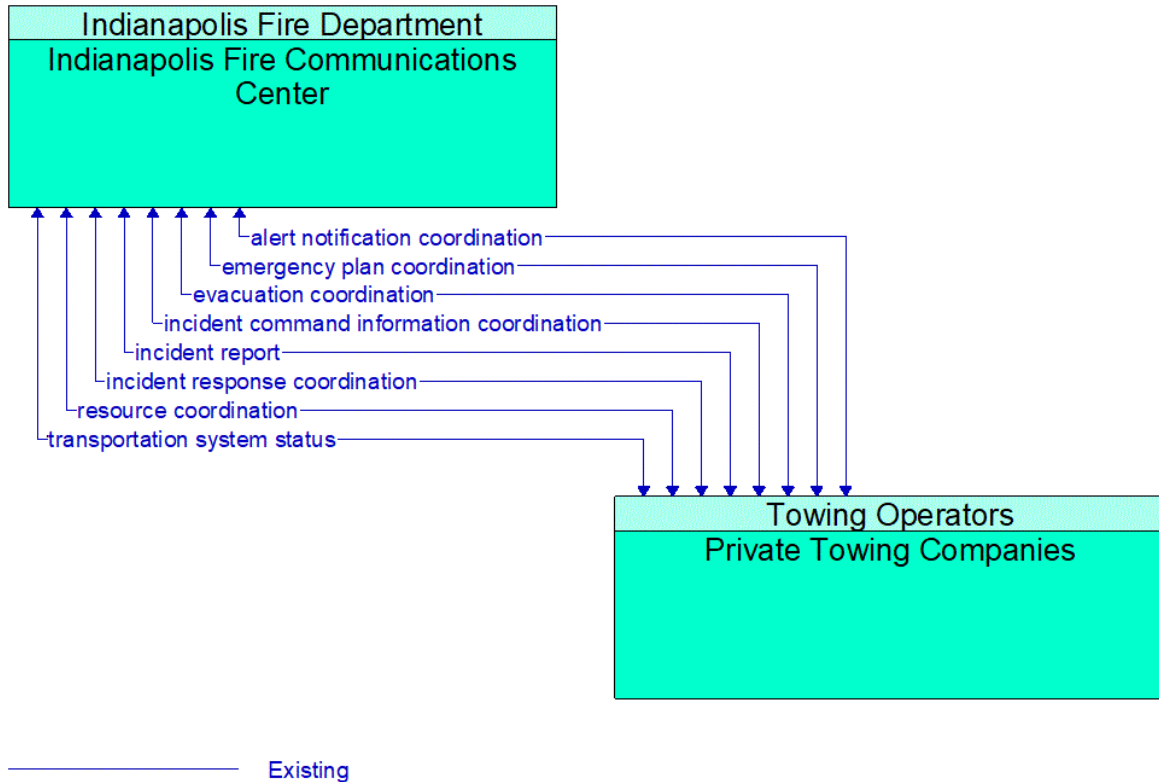


Figure 220: Indianapolis Fire Communications Center - Private Towing Companies Interface

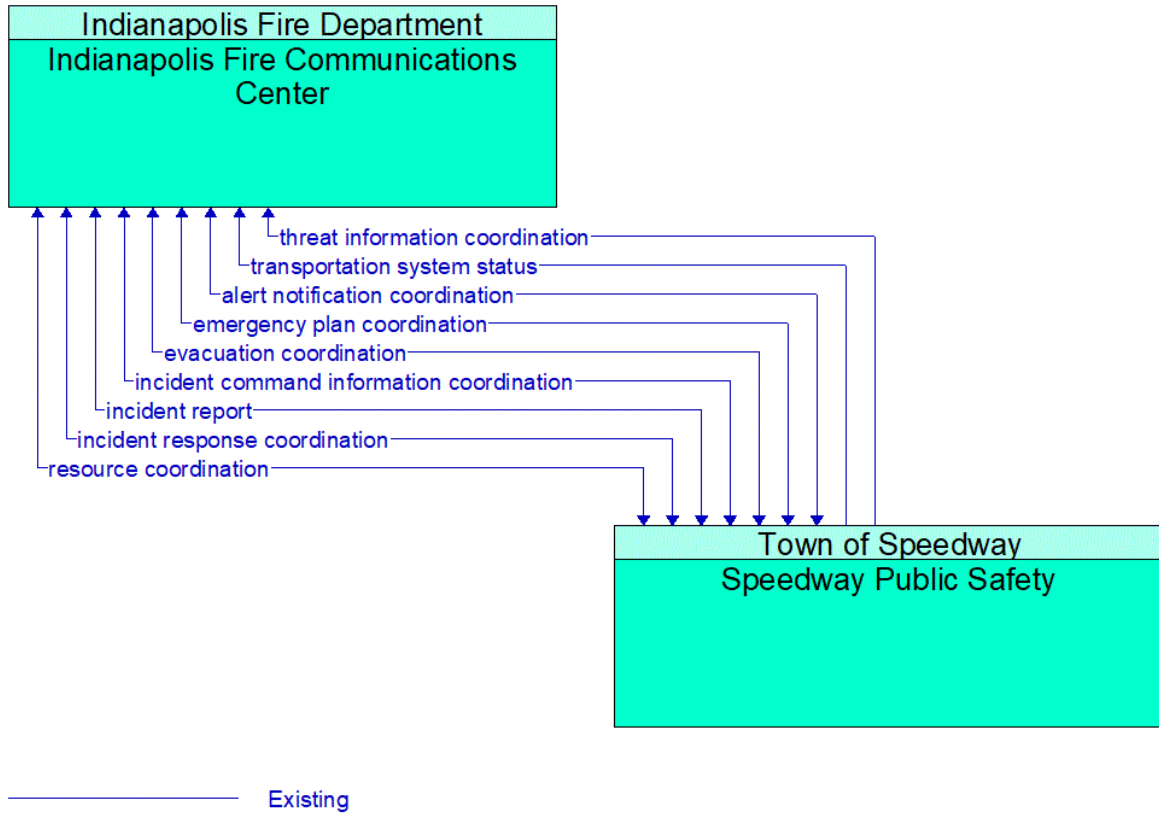
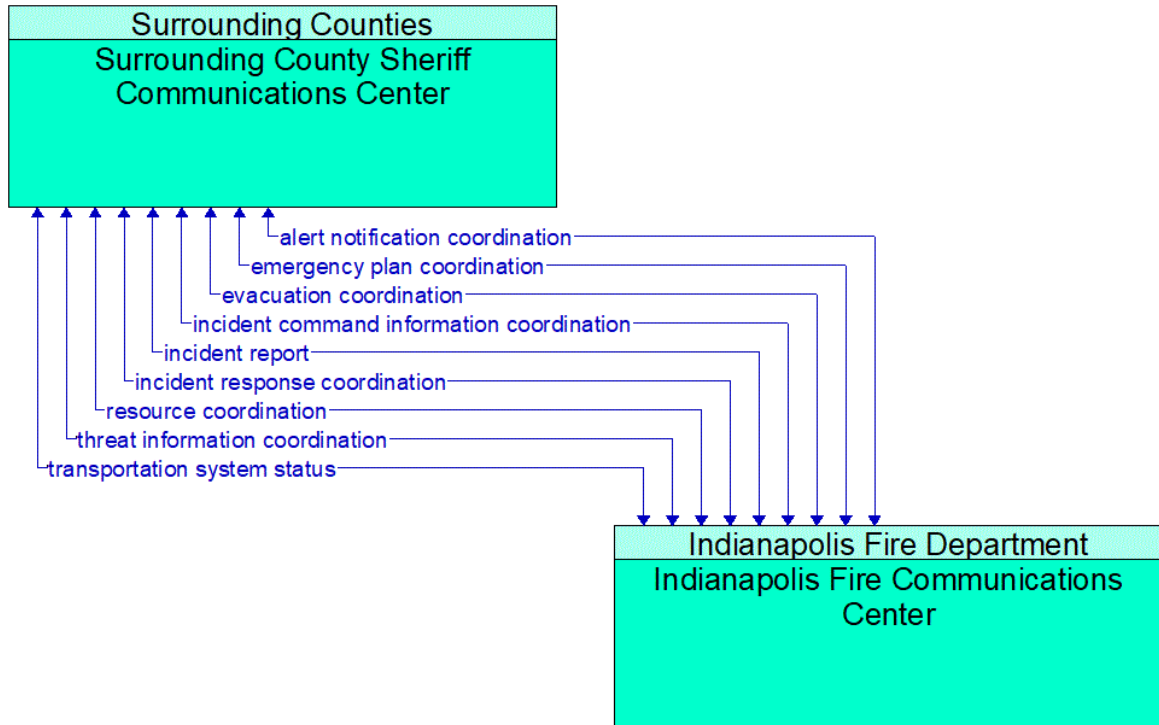


Figure 221: Indianapolis Fire Communications Center - Speedway Public Safety Interface



Existing

Figure 222: Indianapolis Fire Communications Center - Surrounding County Sheriff Communications Center Interface

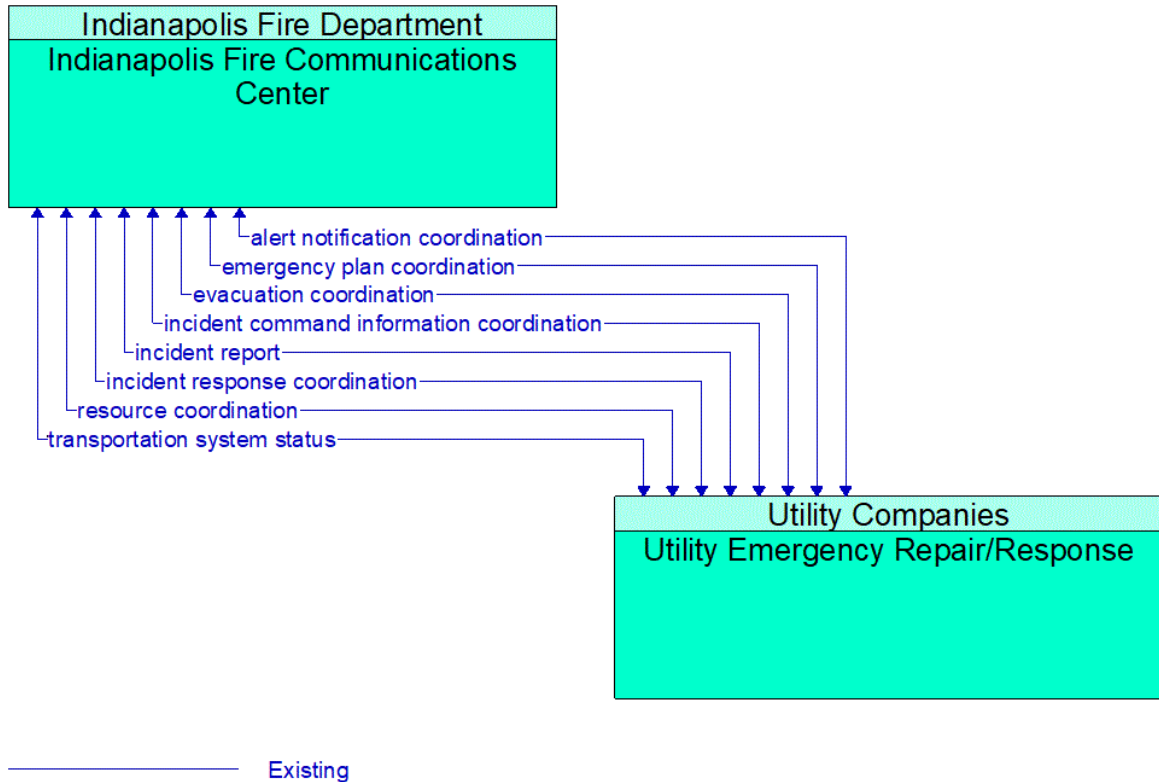


Figure 223: Indianapolis Fire Communications Center - Utility Emergency Repair/Response Interface

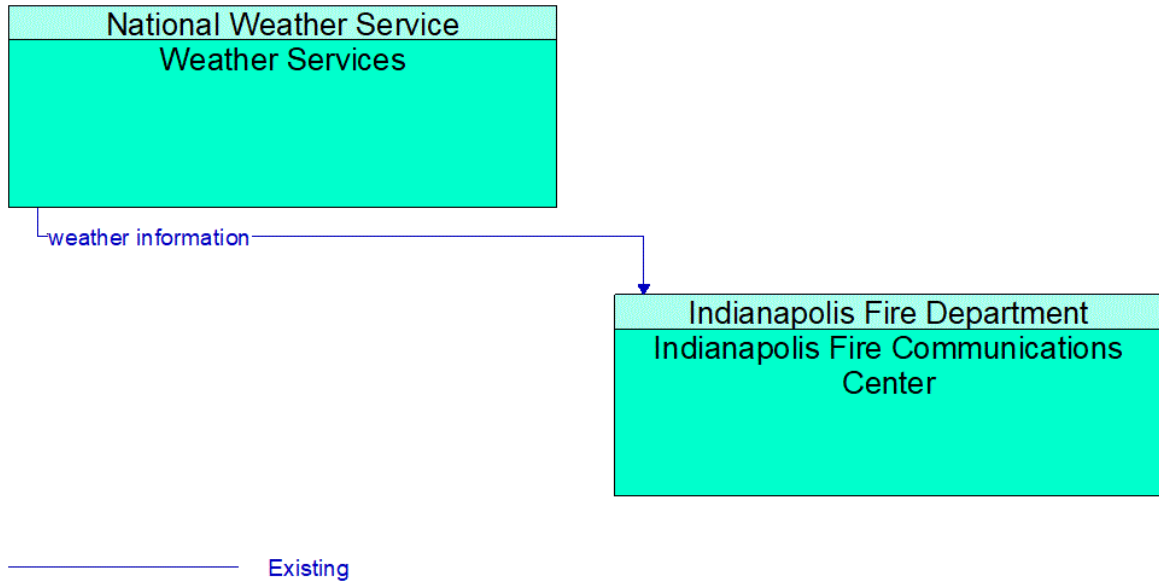


Figure 224: Indianapolis Fire Communications Center - Weather Services Interface

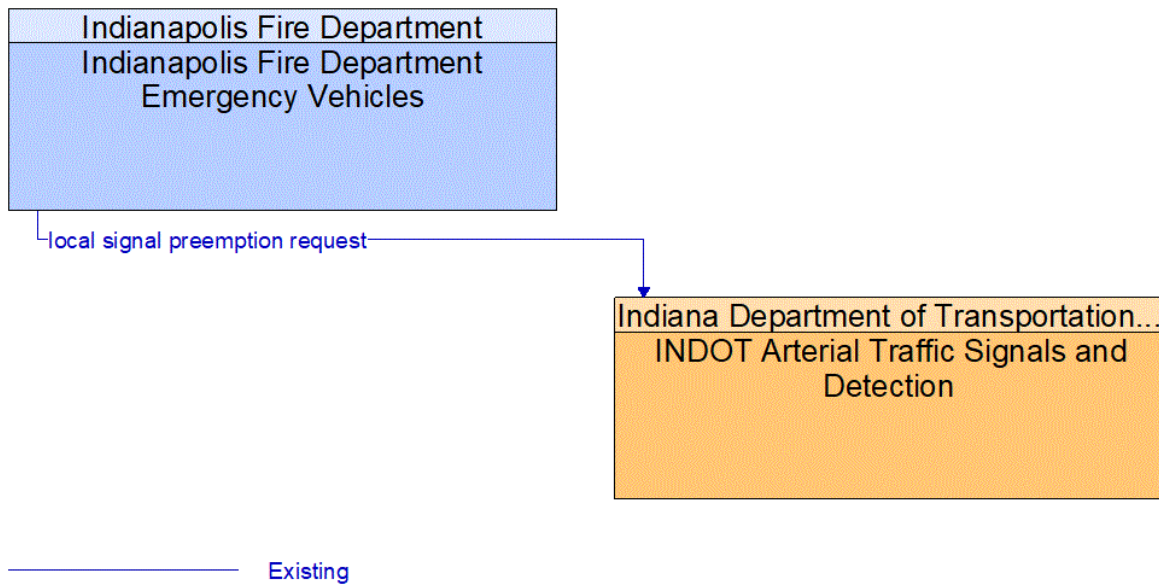


Figure 225: Indianapolis Fire Department Emergency Vehicles - INDOT Arterial Traffic Signals and Detection Interface

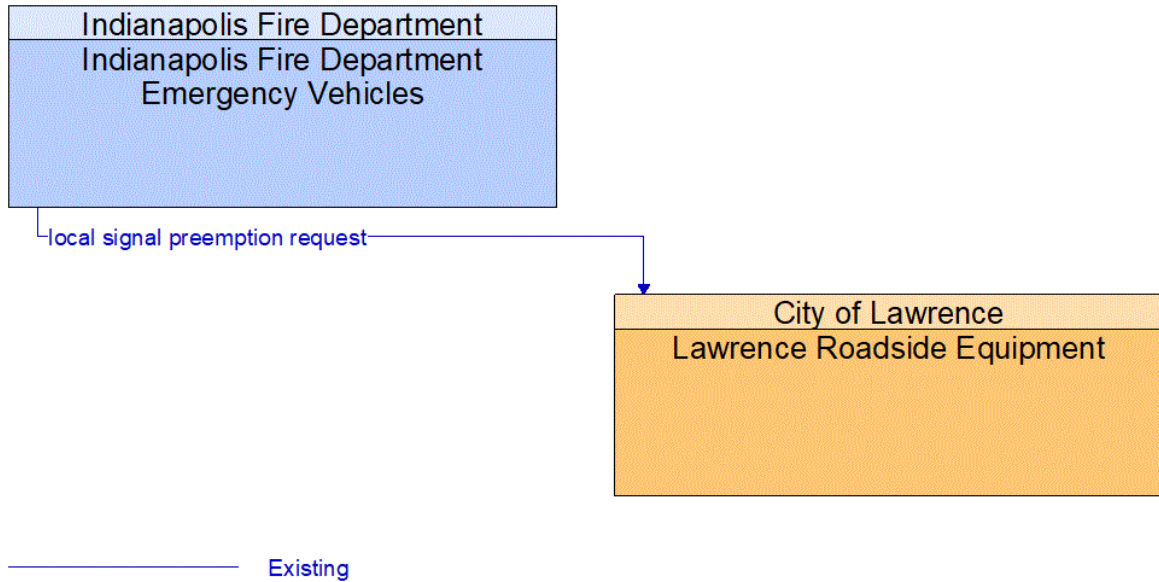


Figure 226: Indianapolis Fire Department Emergency Vehicles - Lawrence Roadside Equipment Interface

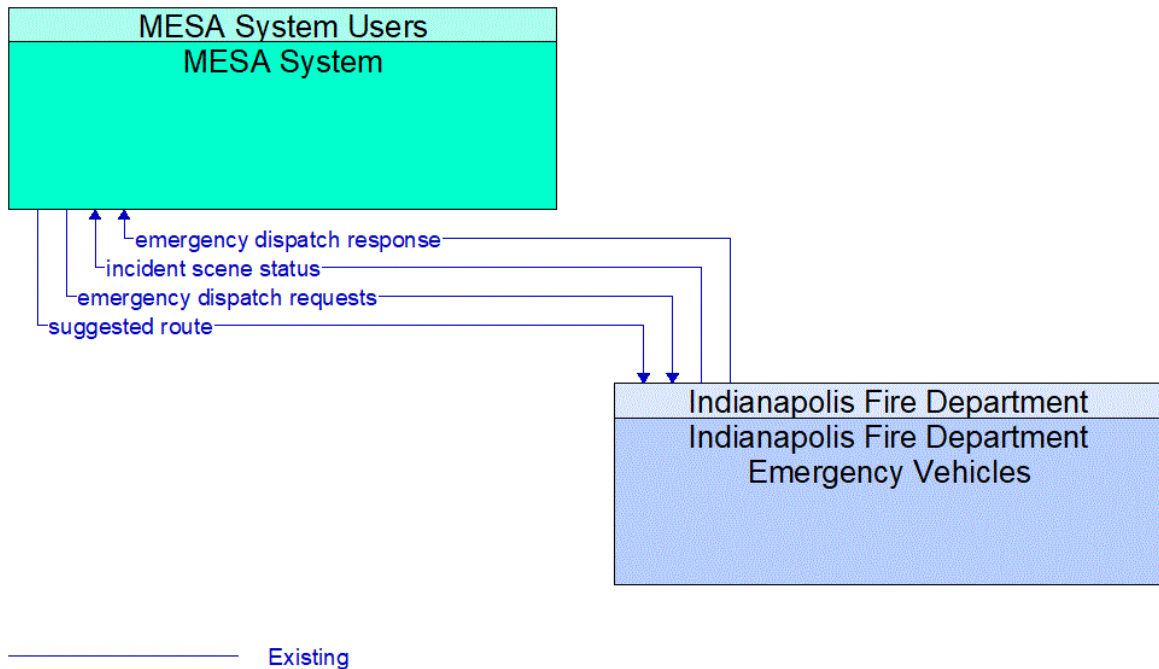


Figure 227: Indianapolis Fire Department Emergency Vehicles - MESA System Interface

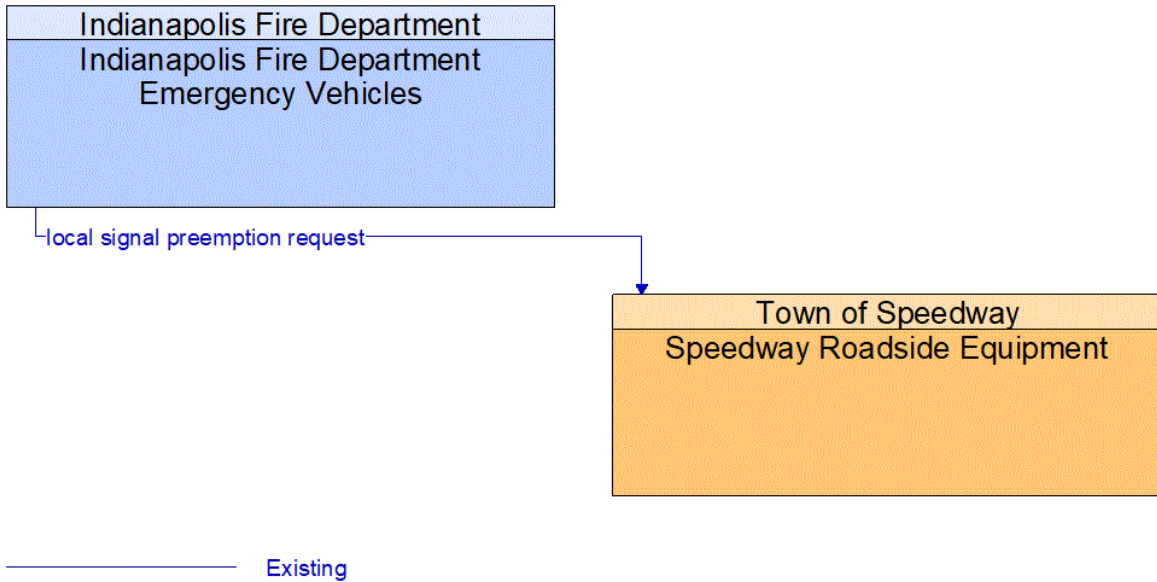


Figure 228: Indianapolis Fire Department Emergency Vehicles - Speedway Roadside Equipment Interface

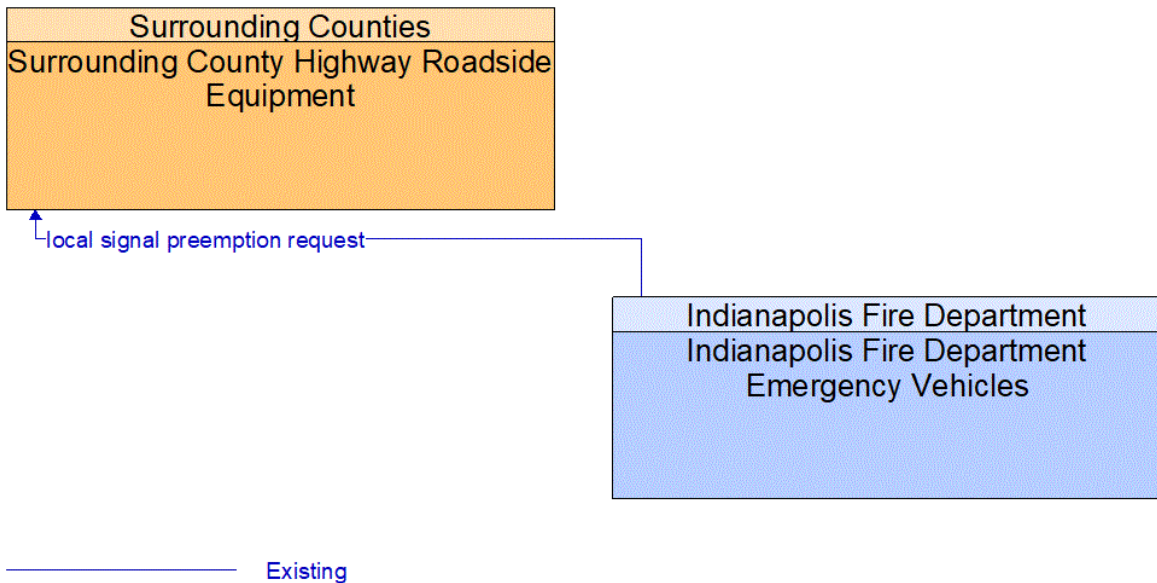


Figure 229: Indianapolis Fire Department Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface

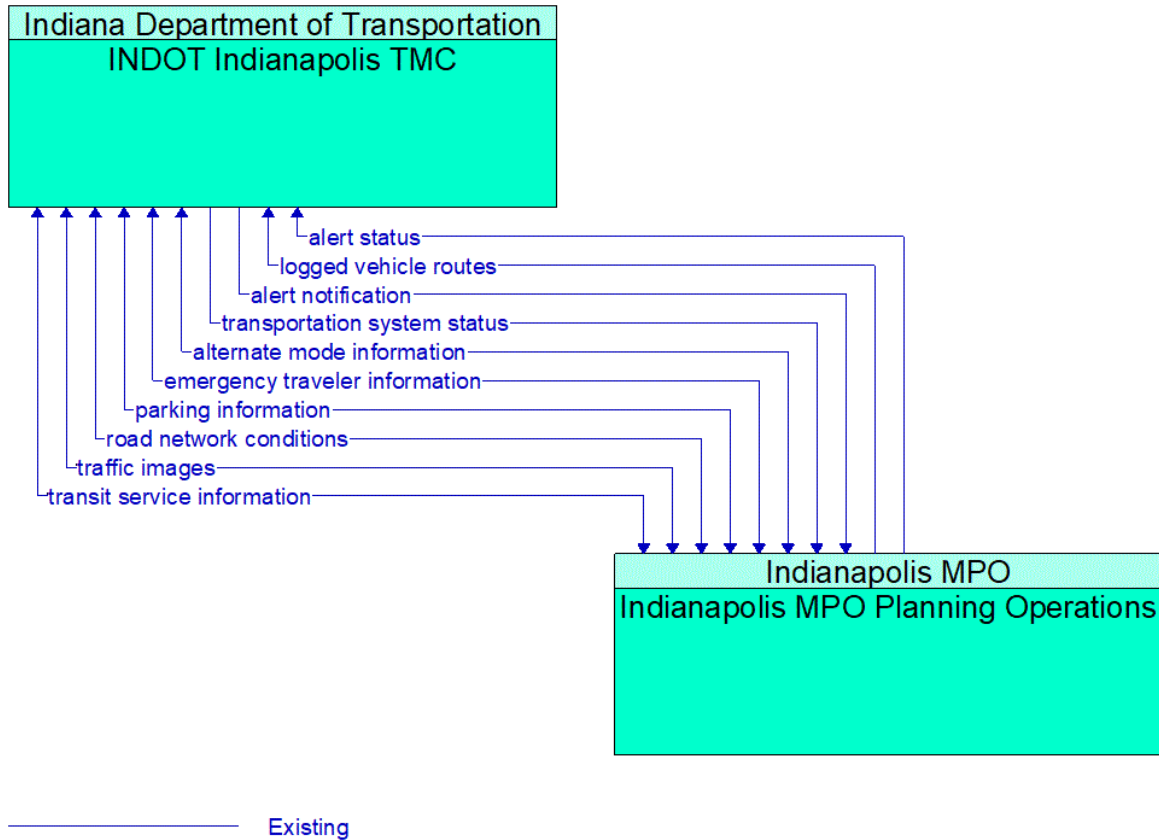


Figure 230: Indianapolis MPO Planning Operations - INDOT Indianapolis TMC Interface

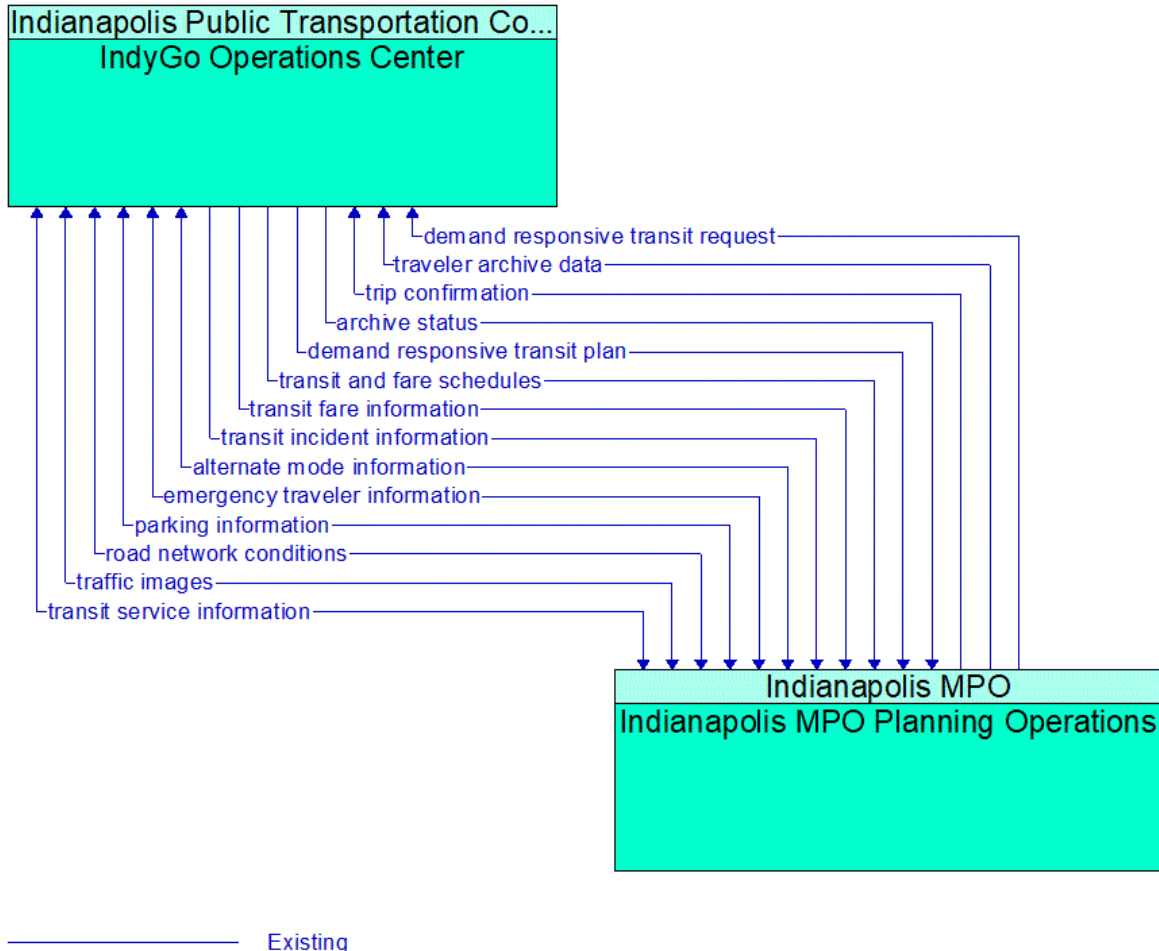


Figure 231: Indianapolis MPO Planning Operations - IndyGo Operations Center Interface

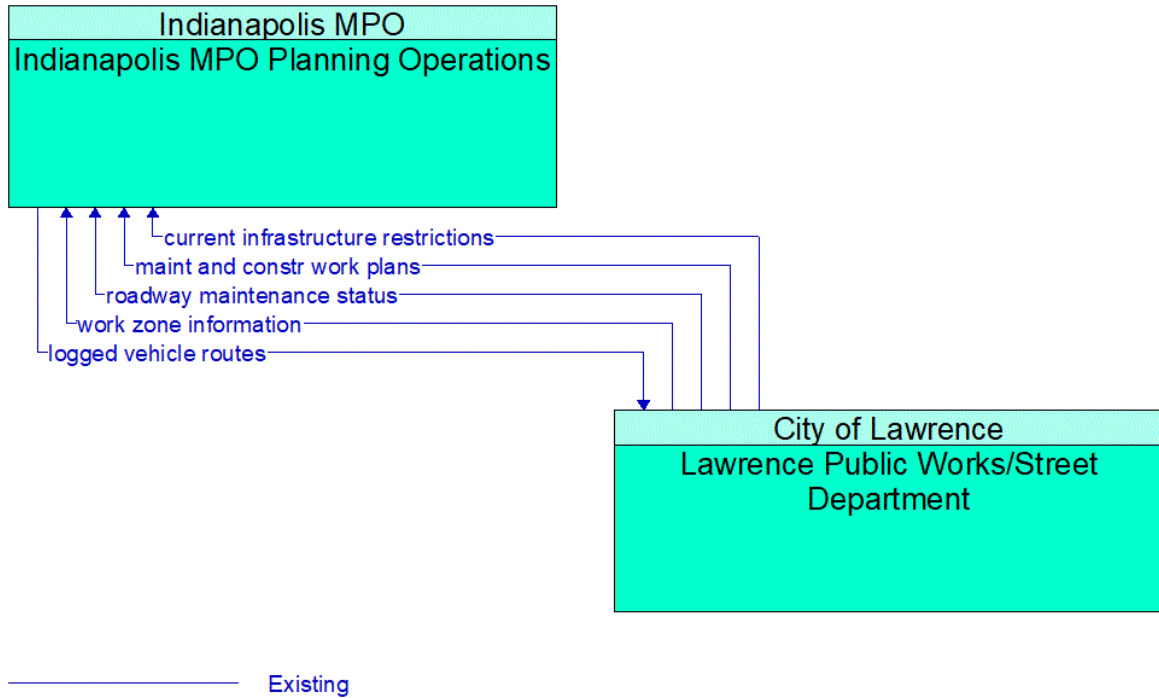


Figure 232: Indianapolis MPO Planning Operations - Lawrence Public Works/Street Department Interface

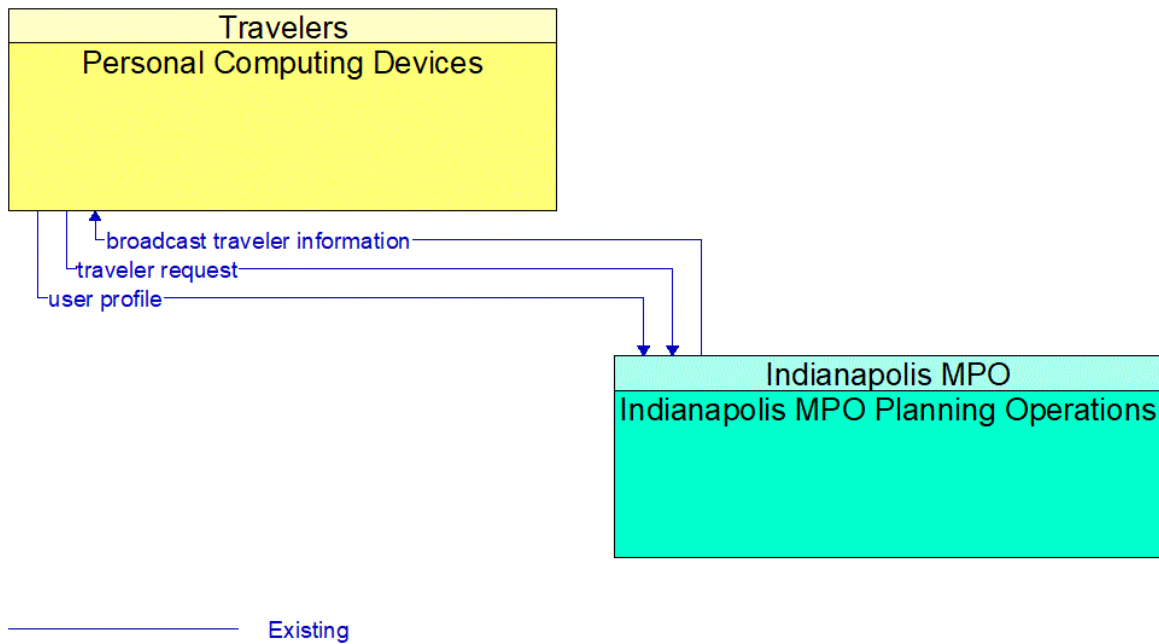


Figure 233: Indianapolis MPO Planning Operations - Personal Computing Devices Interface

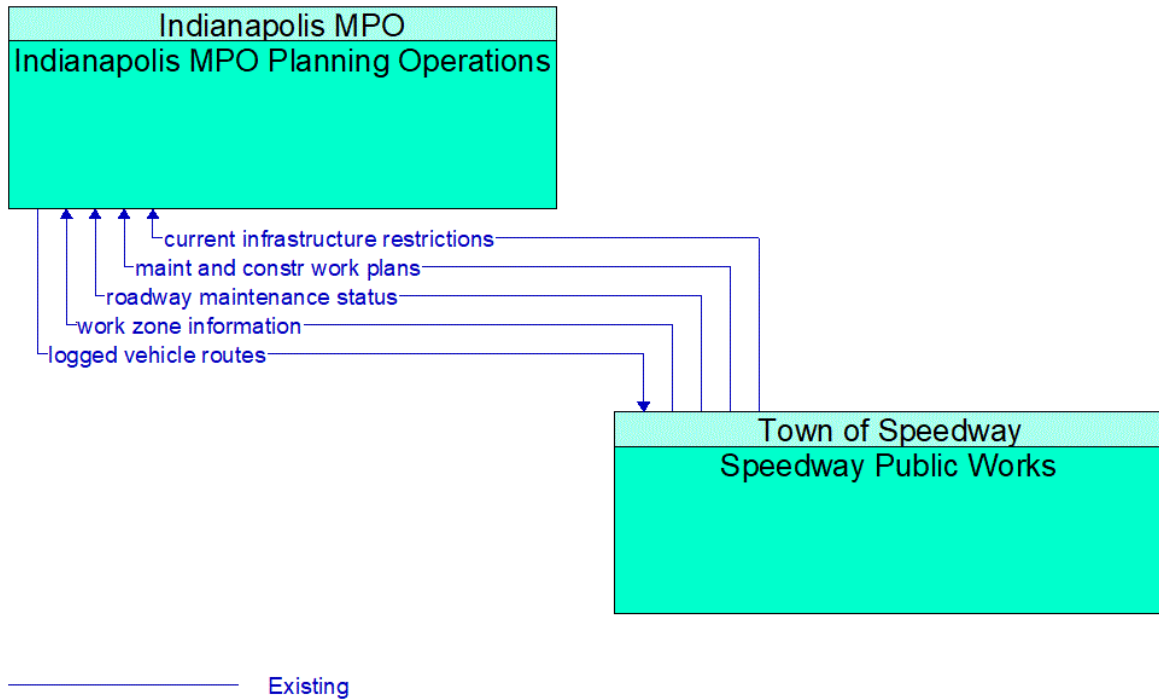


Figure 234: Indianapolis MPO Planning Operations - Speedway Public Works Interface

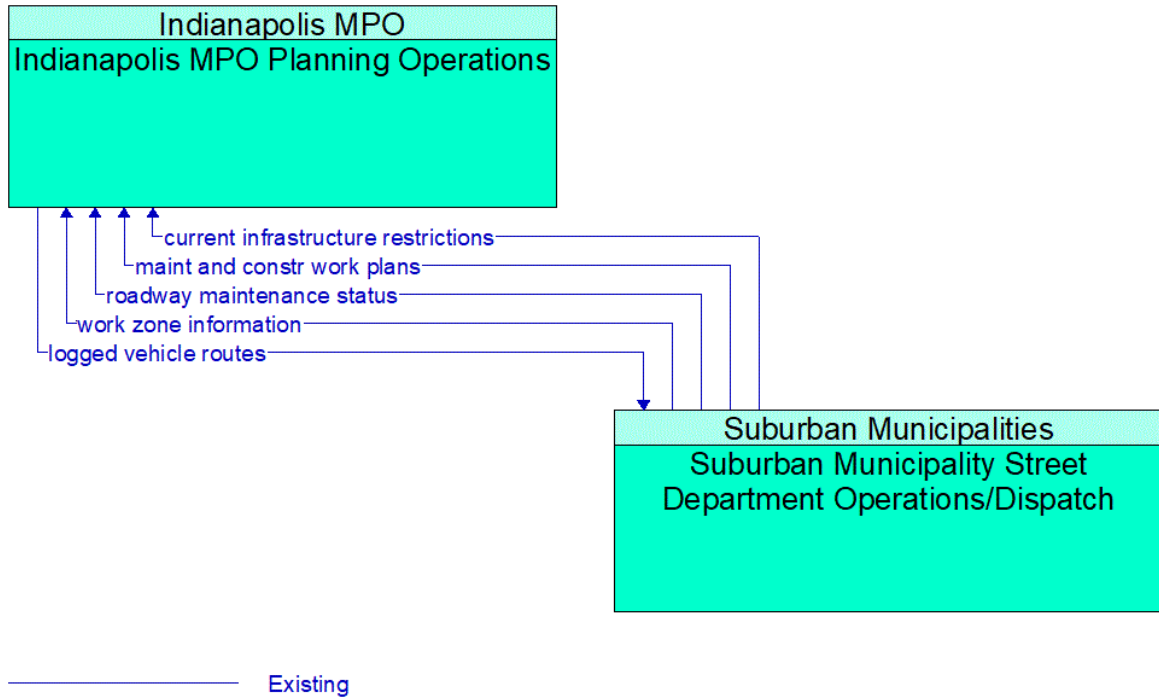


Figure 235: Indianapolis MPO Planning Operations - Suburban Municipality Street Department Operations/Dispatch Interface

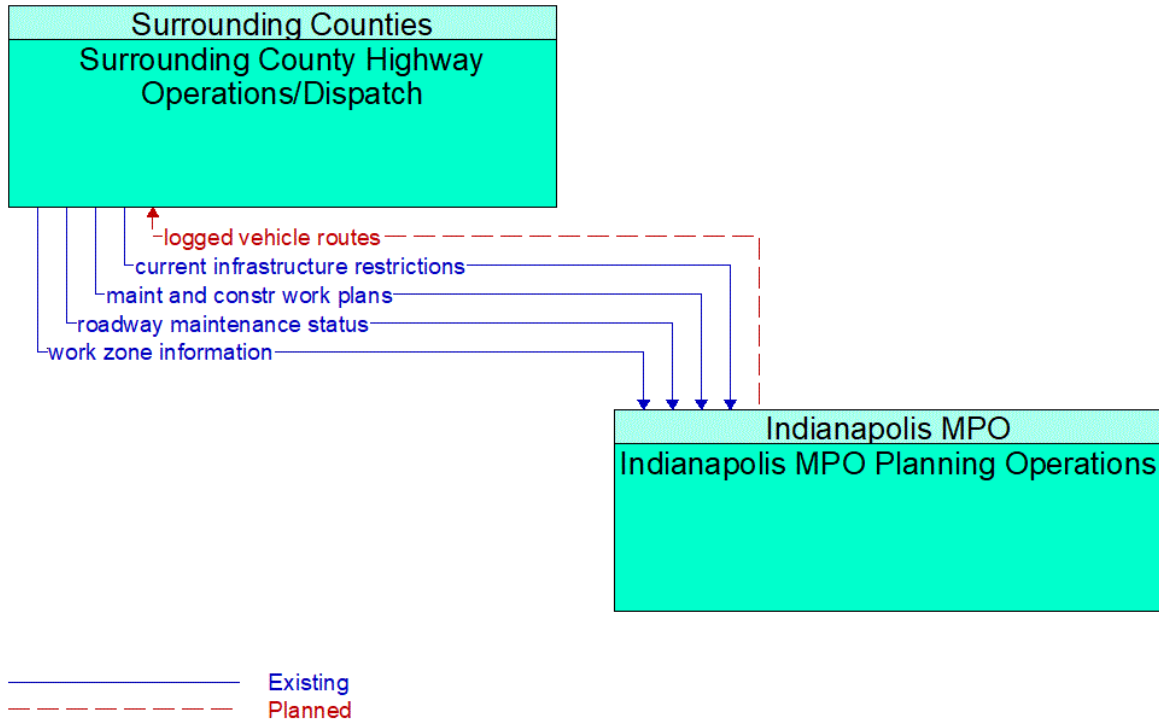


Figure 236: Indianapolis MPO Planning Operations - Surrounding County Highway Operations/Dispatch Interface

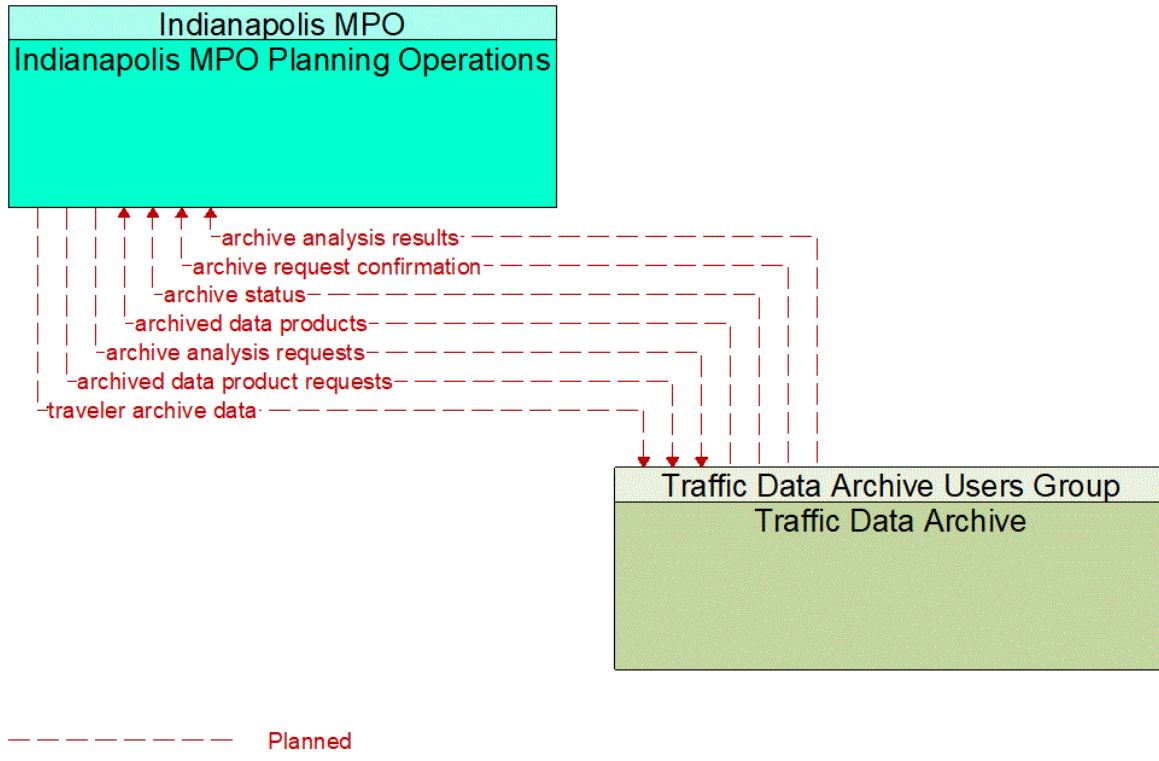


Figure 237: Indianapolis MPO Planning Operations - Traffic Data Archive Interface

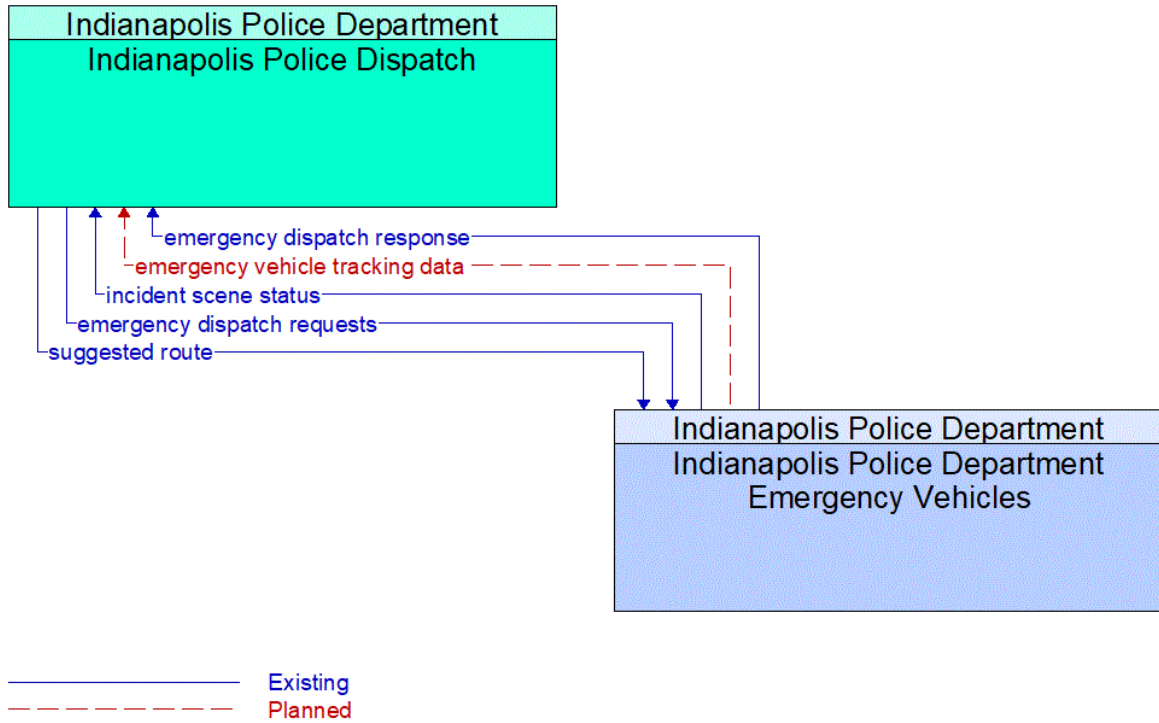


Figure 238: Indianapolis Police Department Emergency Vehicles - Indianapolis Police Dispatch Interface

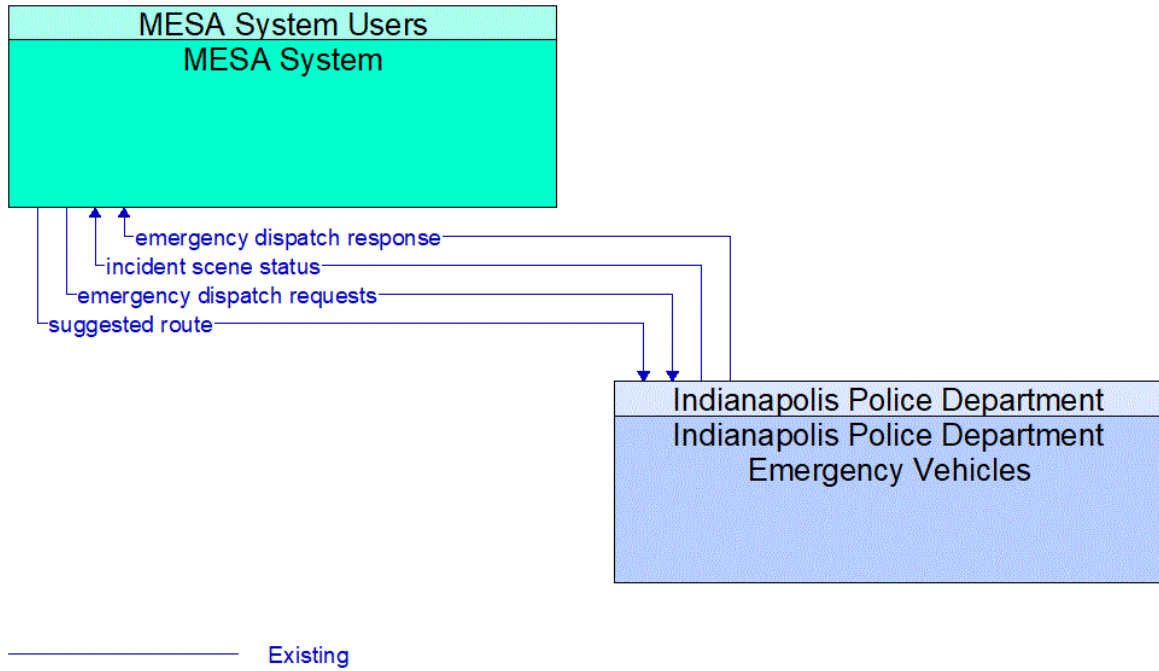


Figure 239: Indianapolis Police Department Emergency Vehicles - MESA System Interface

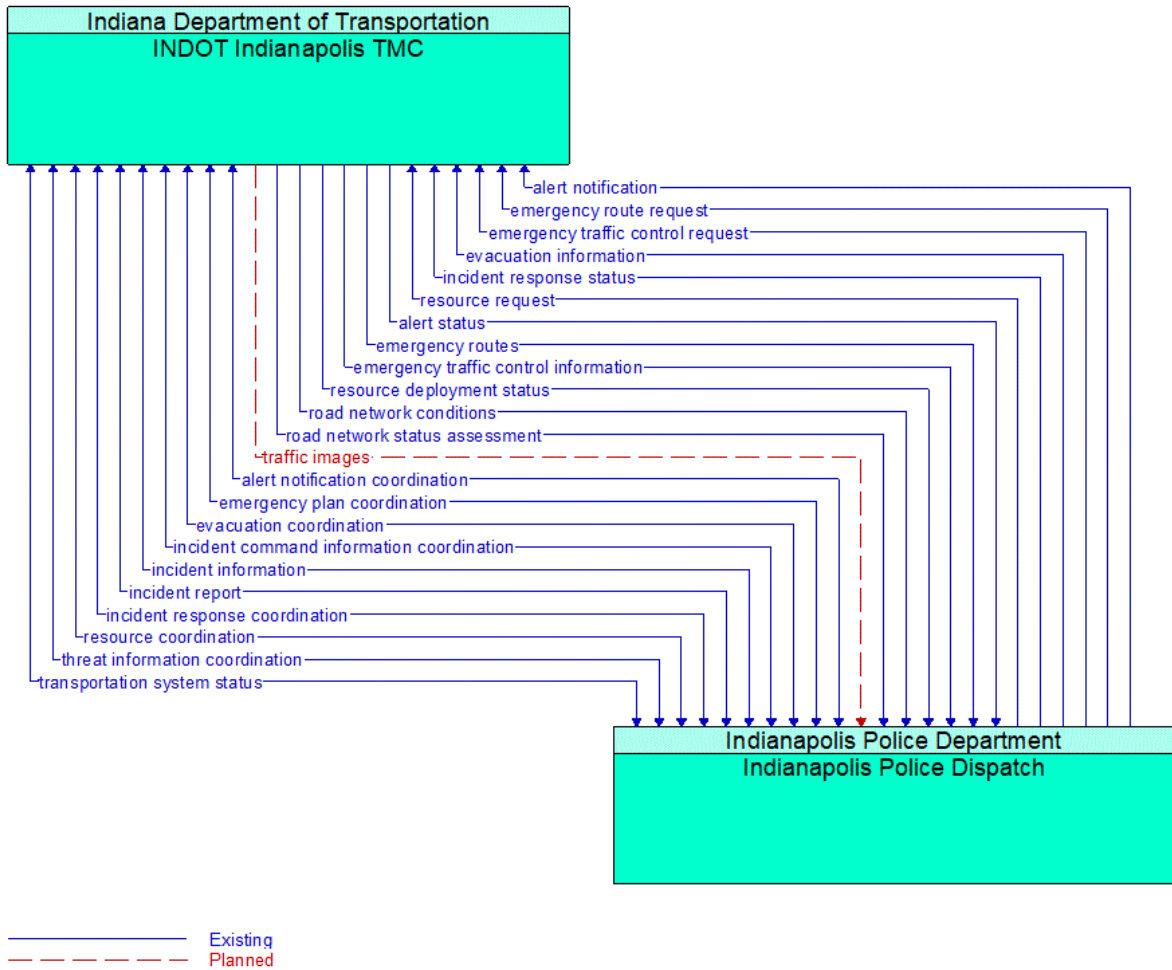


Figure 240: Indianapolis Police Dispatch - INDOT Indianapolis TMC Interface

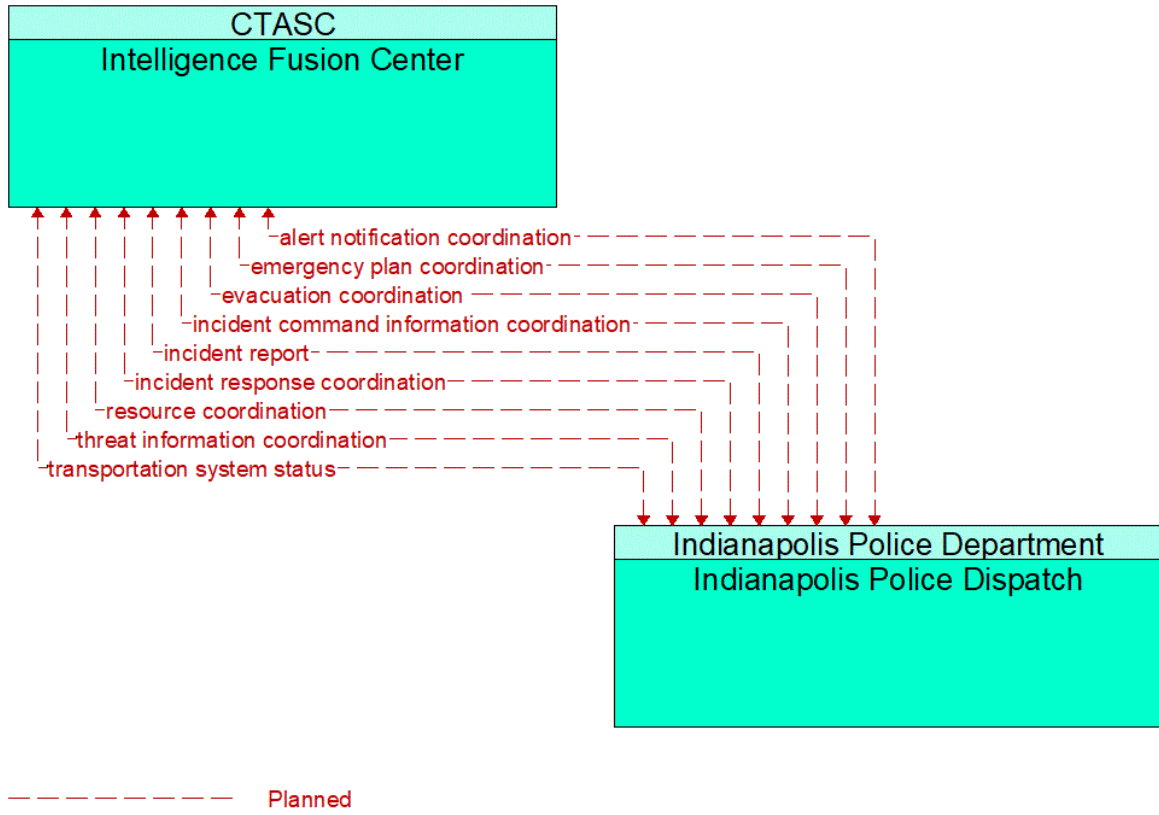
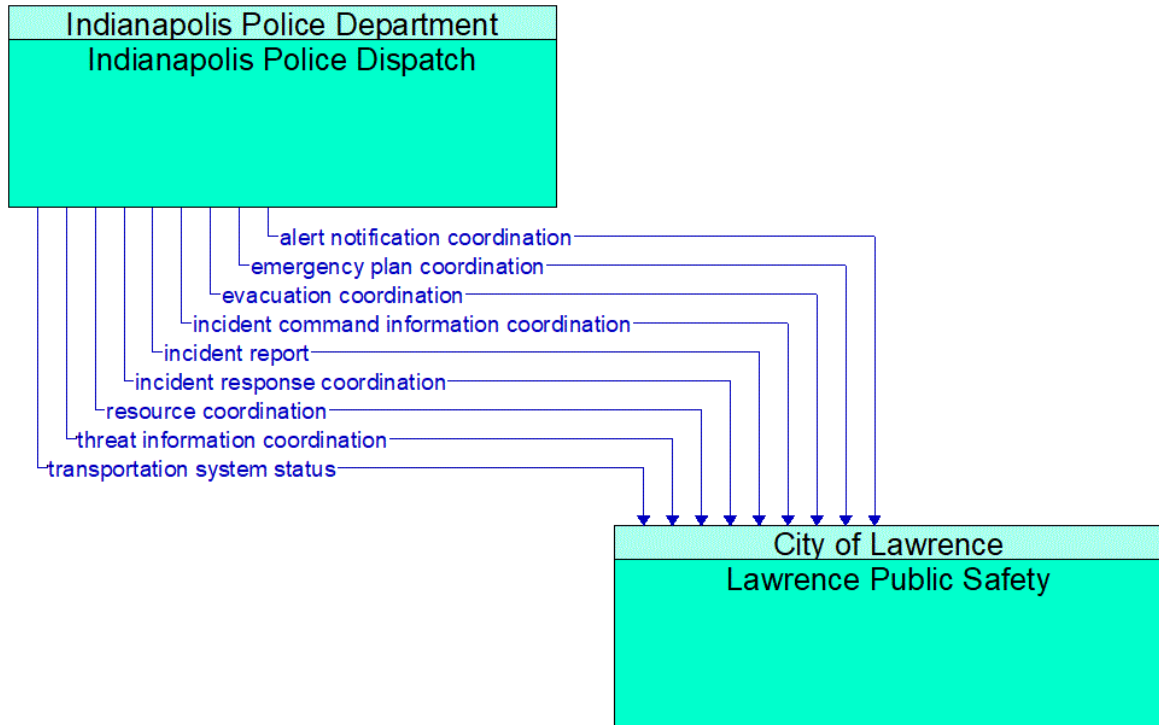


Figure 241: Indianapolis Police Dispatch - Intelligence Fusion Center Interface



Existing

Figure 242: Indianapolis Police Dispatch - Lawrence Public Safety Interface

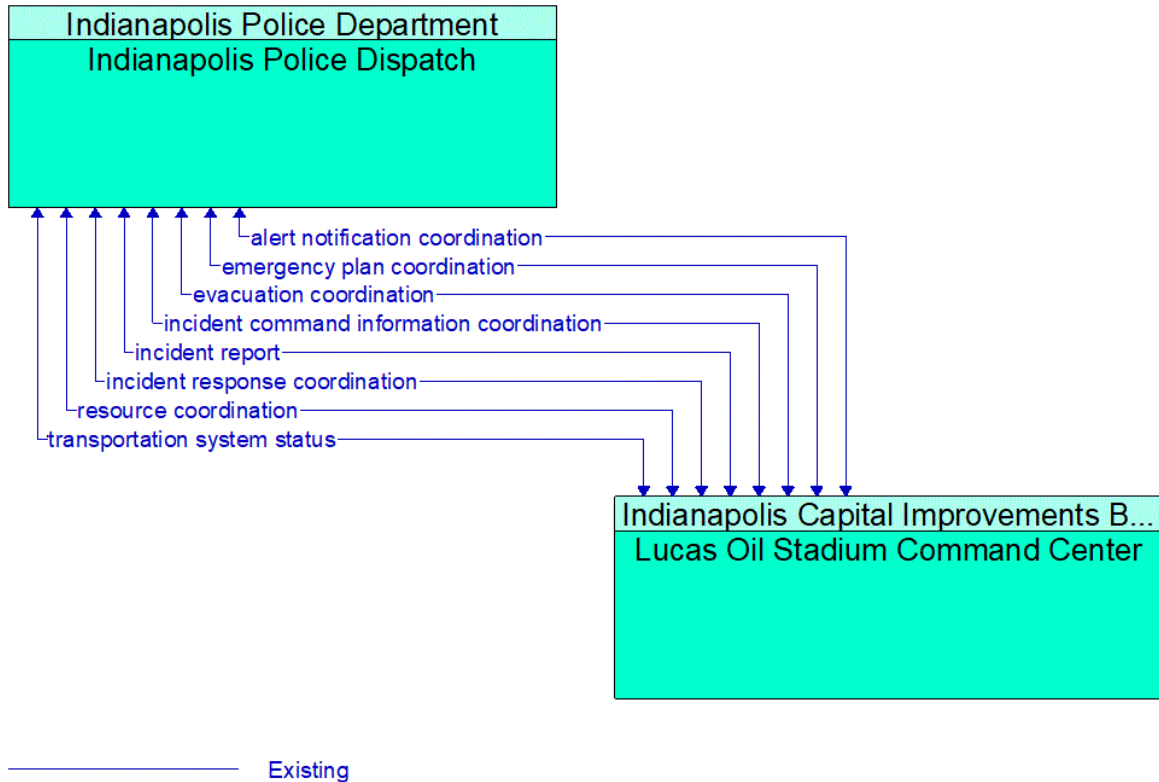


Figure 243: Indianapolis Police Dispatch - Lucas Oil Stadium Command Center Interface

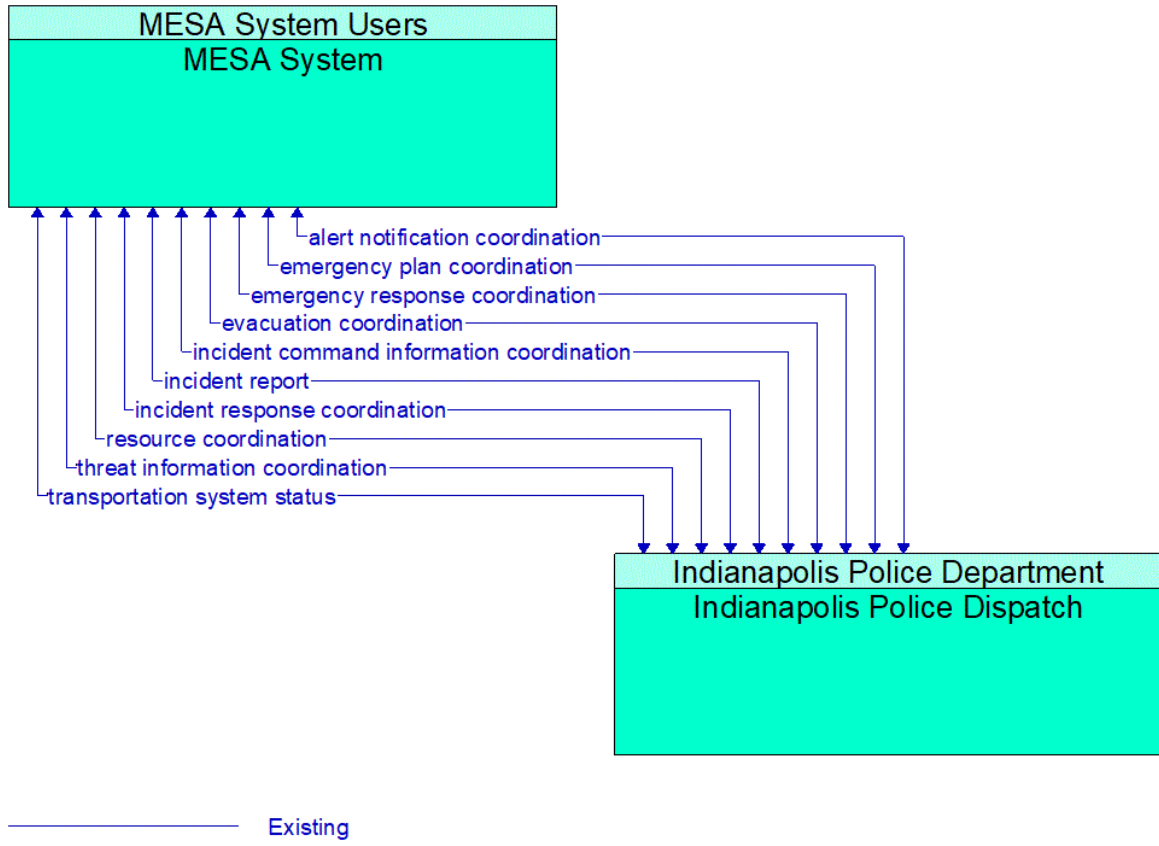


Figure 244: Indianapolis Police Dispatch - MESA System Interface

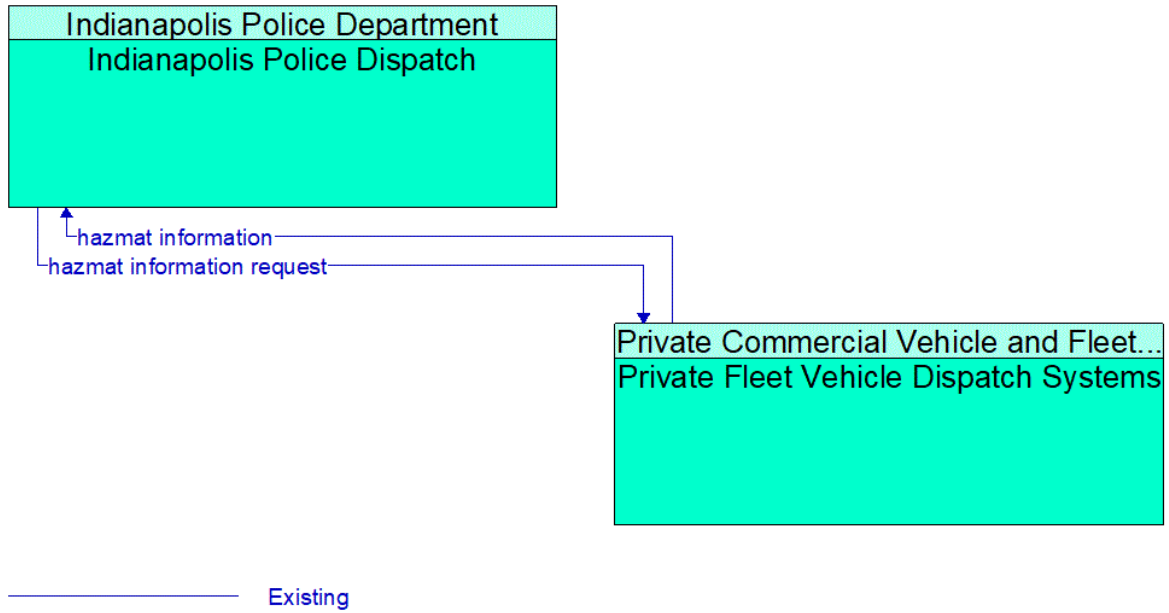
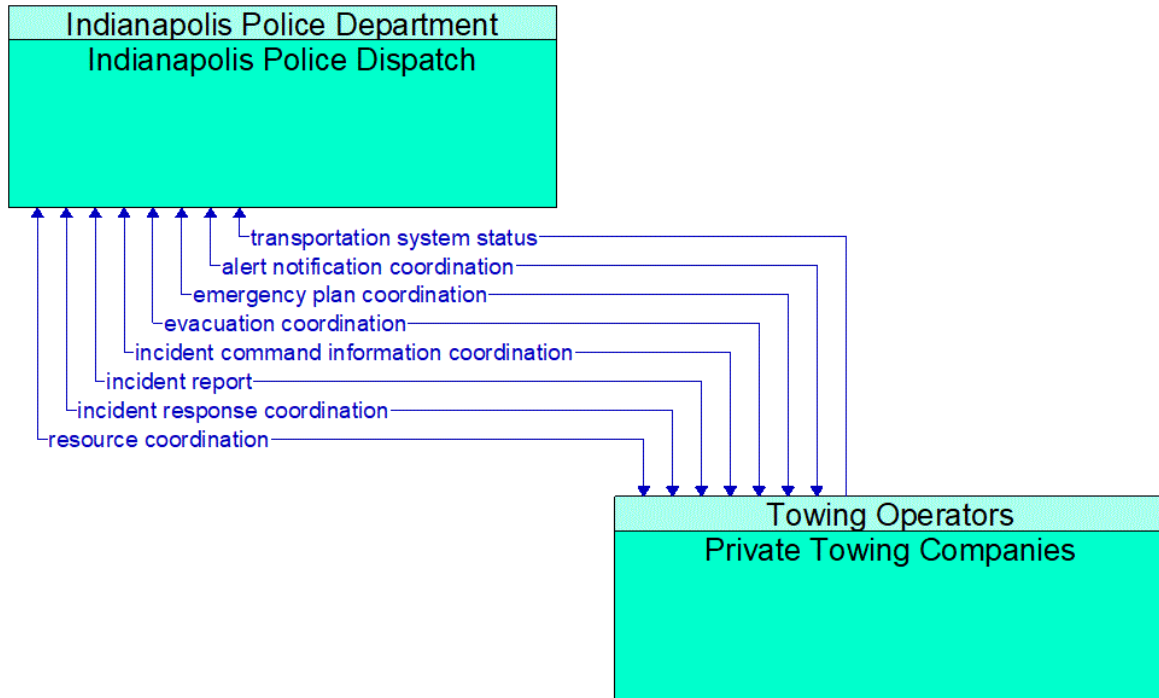


Figure 245: Indianapolis Police Dispatch - Private Fleet Vehicle Dispatch Systems Interface



Existing

Figure 246: Indianapolis Police Dispatch - Private Towing Companies Interface

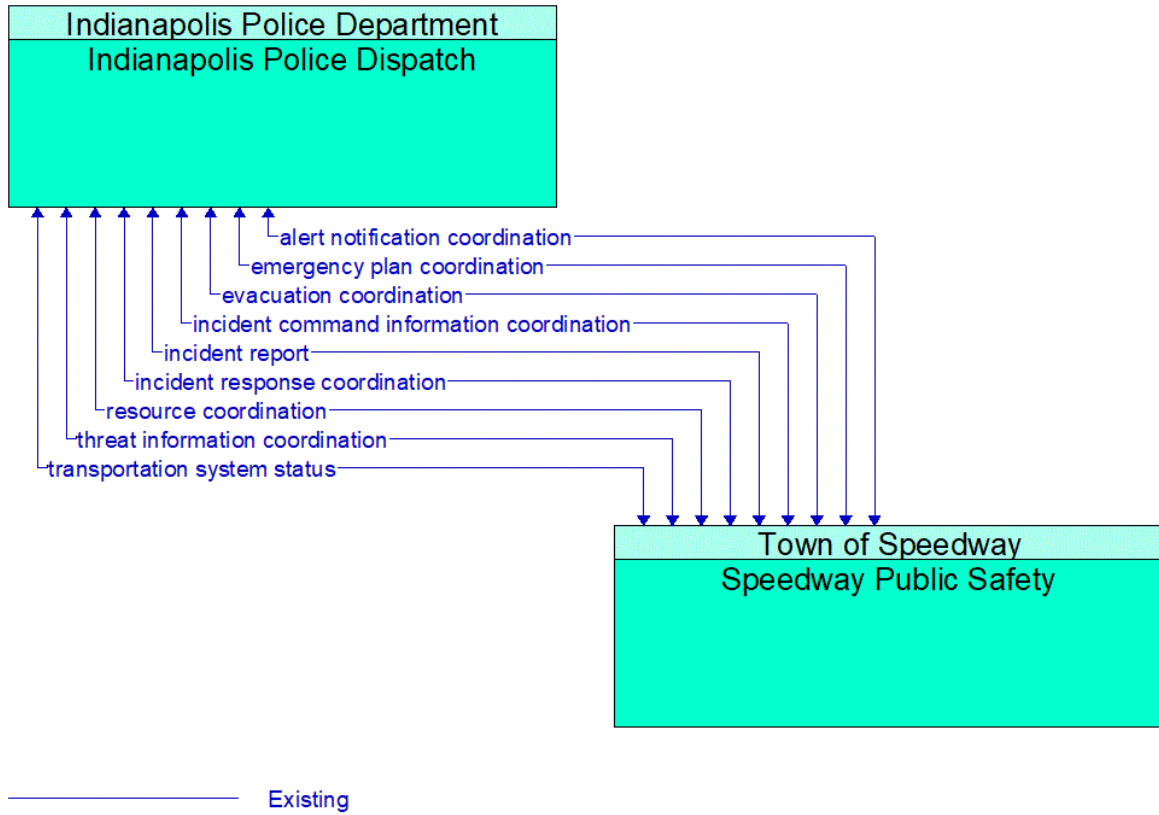


Figure 247: Indianapolis Police Dispatch - Speedway Public Safety Interface

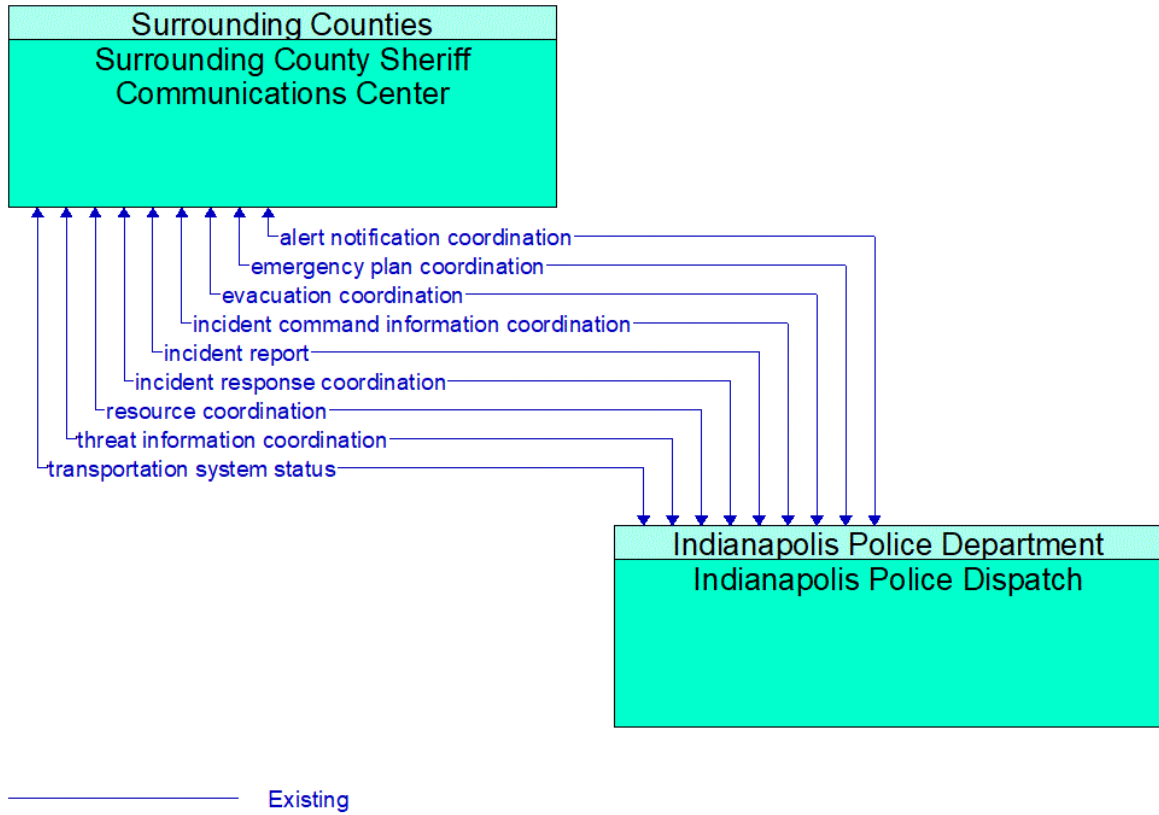


Figure 248: Indianapolis Police Dispatch - Surrounding County Sheriff Communications Center Interface

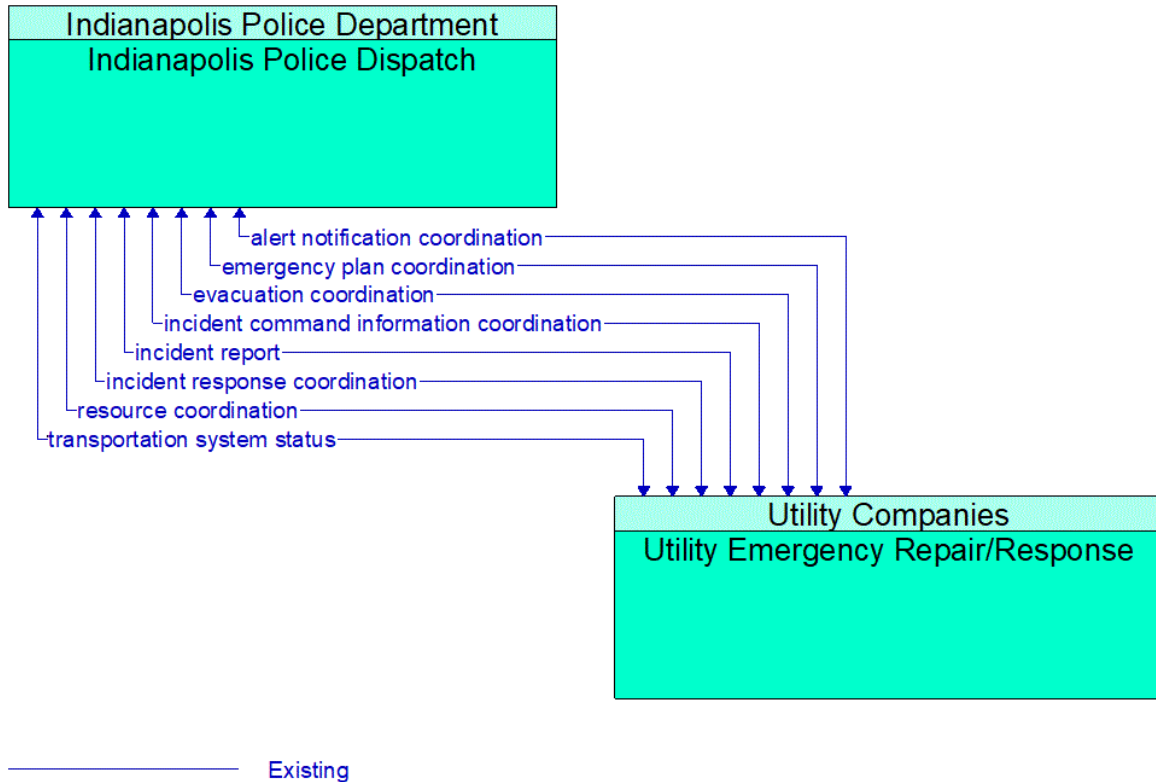


Figure 249: Indianapolis Police Dispatch - Utility Emergency Repair/Response Interface

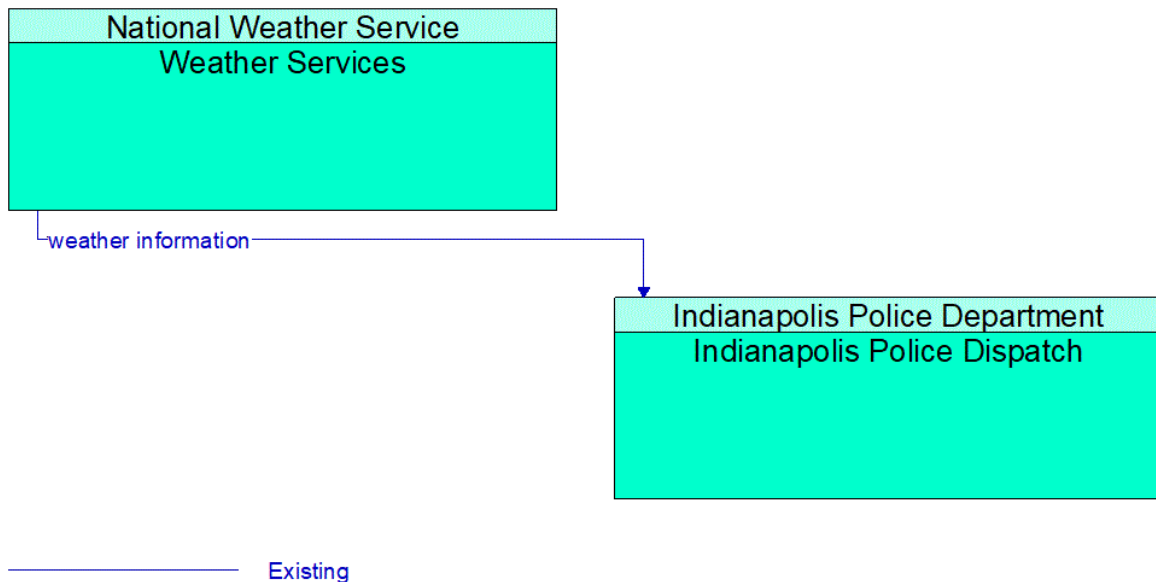


Figure 250: Indianapolis Police Dispatch - Weather Services Interface

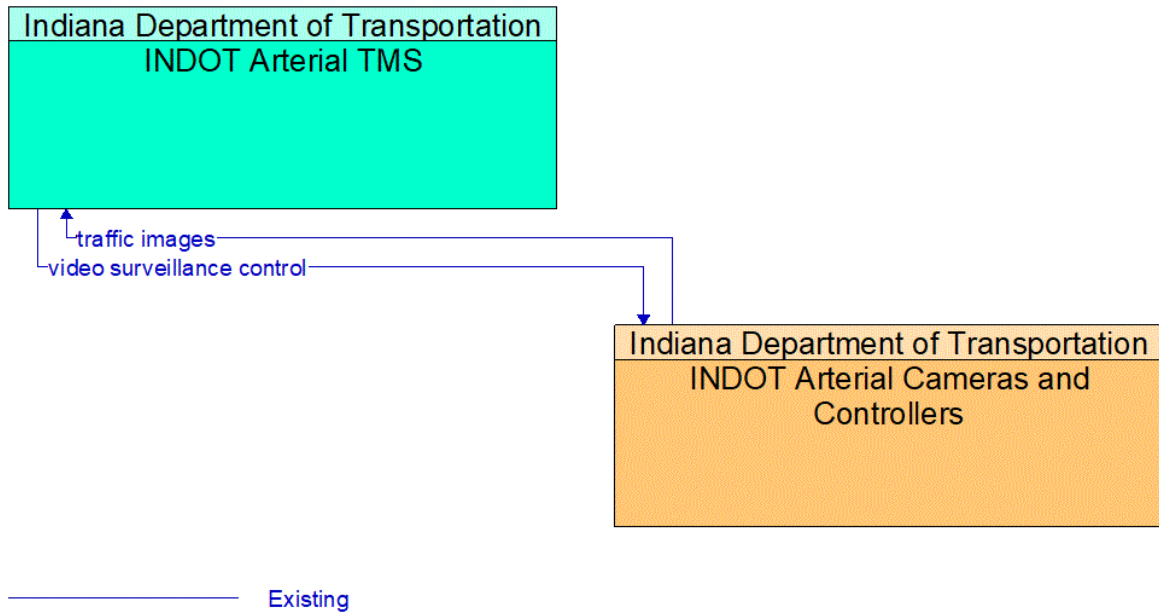


Figure 251: INDOT Arterial Cameras and Controllers - INDOT Arterial TMS Interface

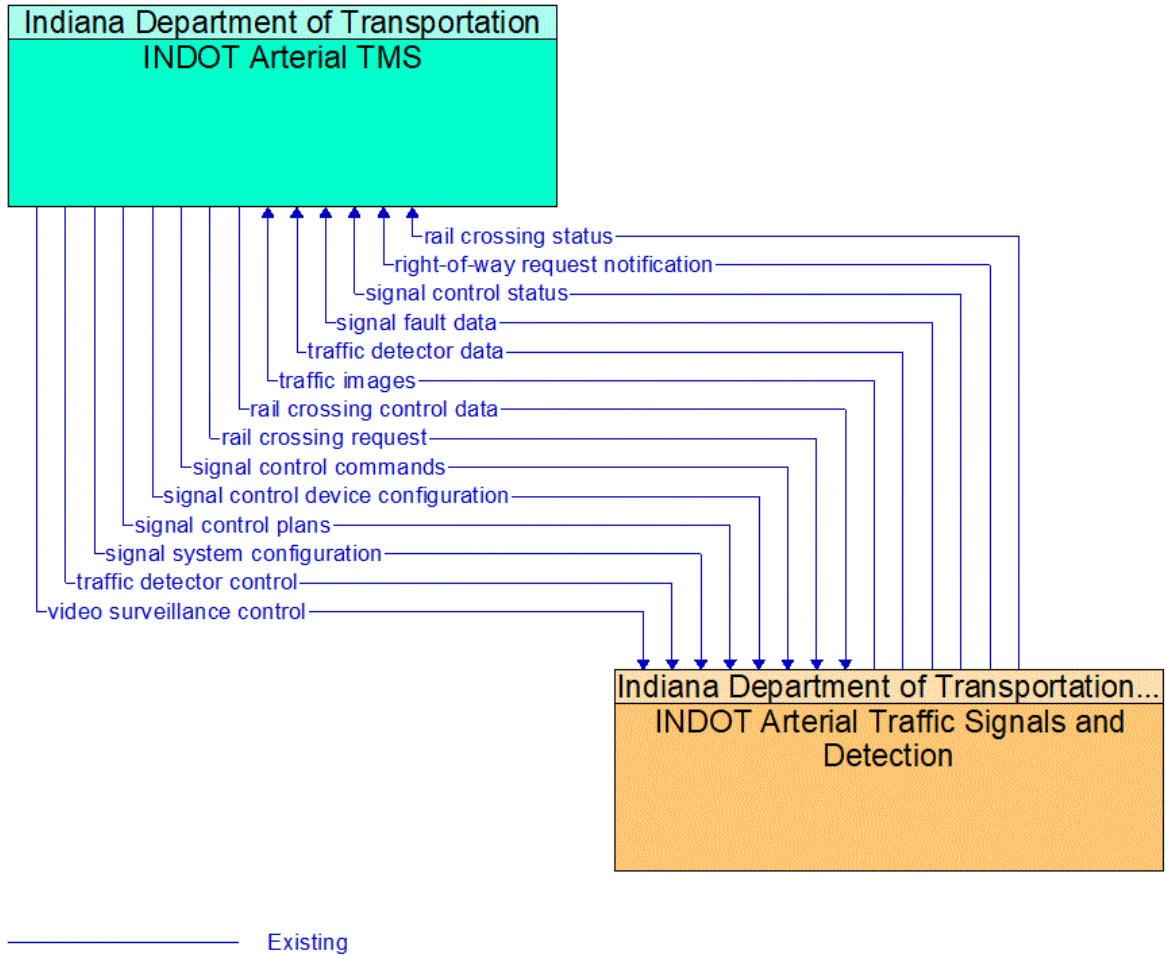


Figure 252: INDOT Arterial TMS - INDOT Arterial Traffic Signals and Detection Interface

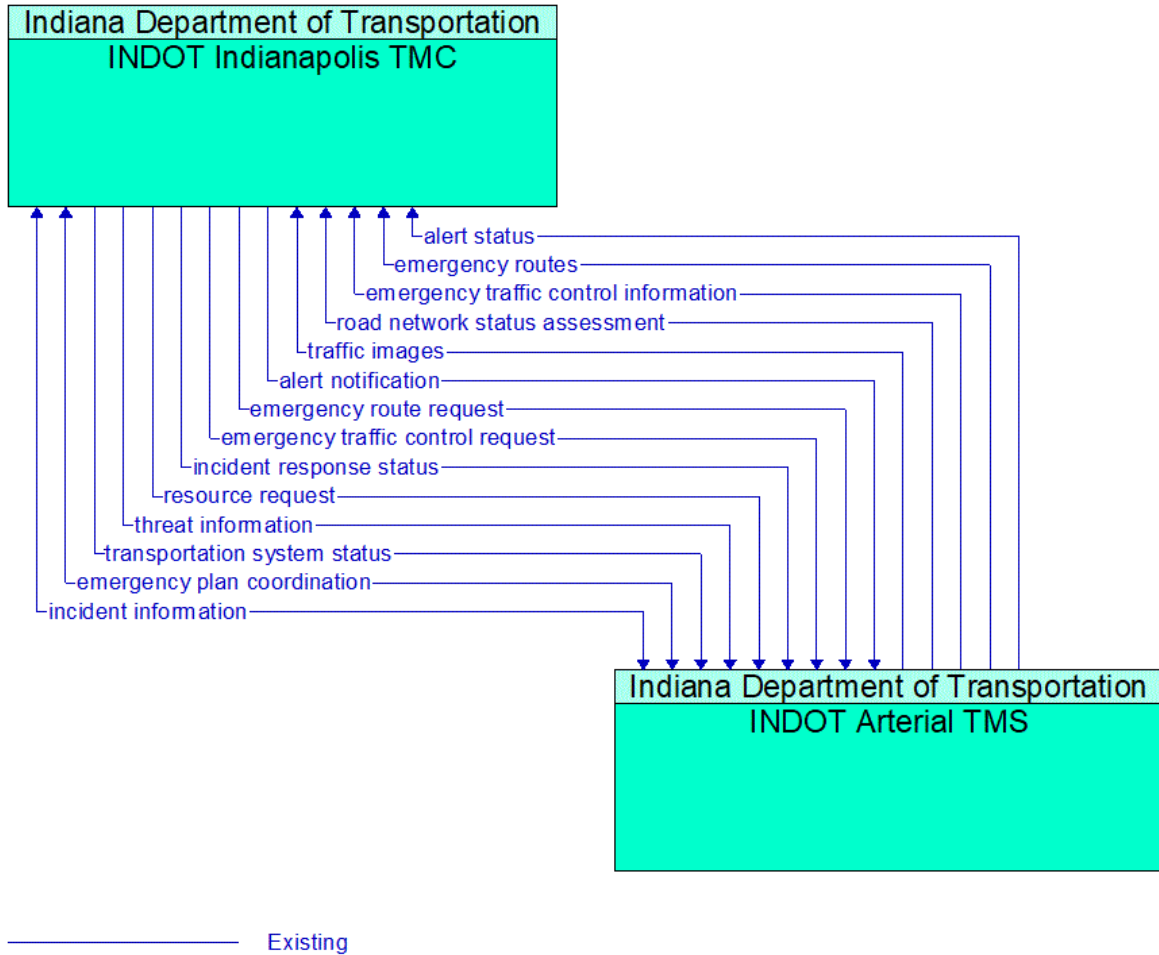


Figure 253: INDOT Arterial TMS - INDOT Indianapolis TMC Interface

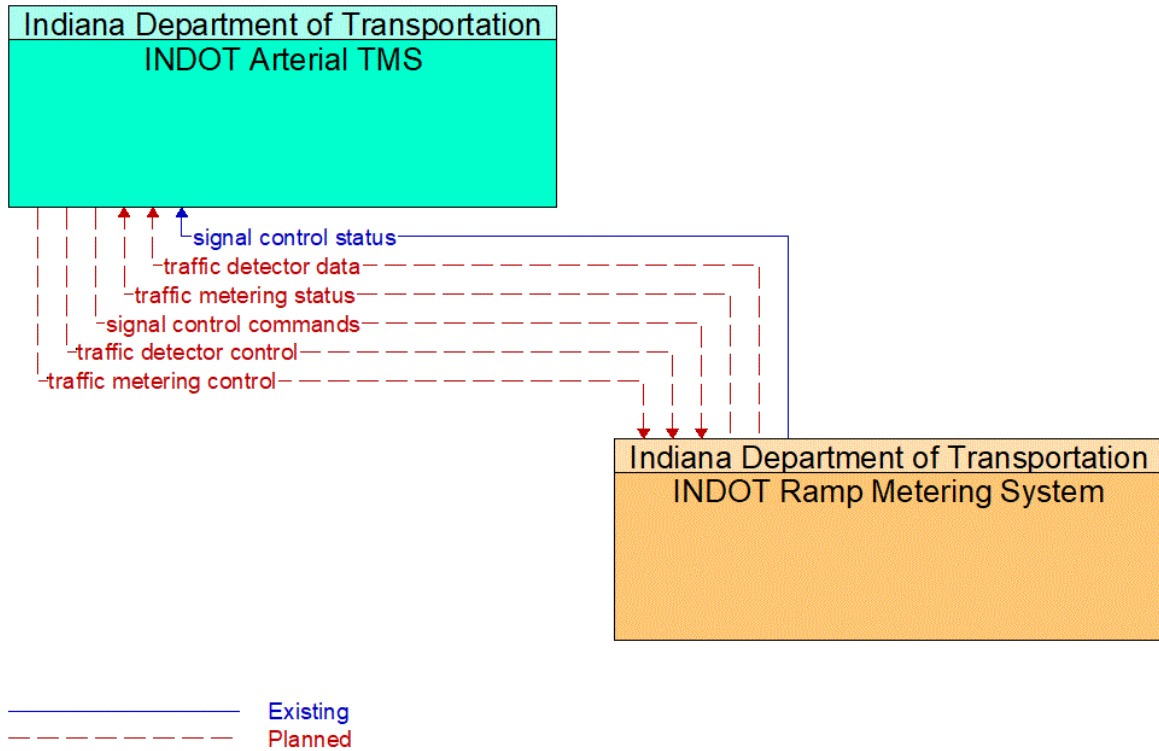


Figure 254: INDOT Arterial TMS - INDOT Ramp Metering System Interface

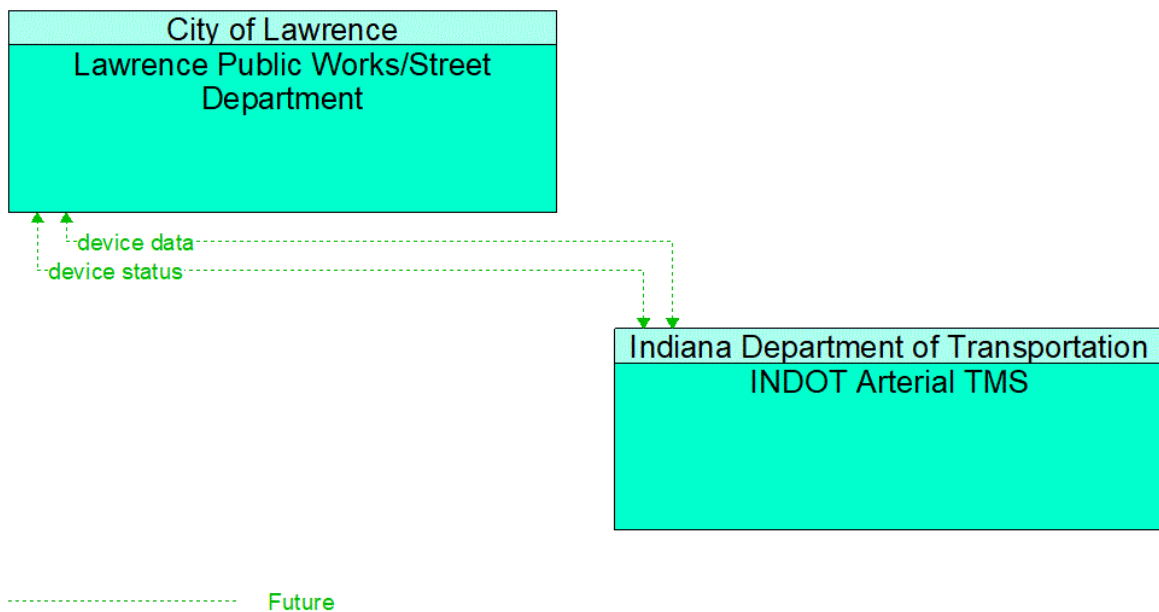


Figure 255: INDOT Arterial TMS - Lawrence Public Works/Street Department Interface

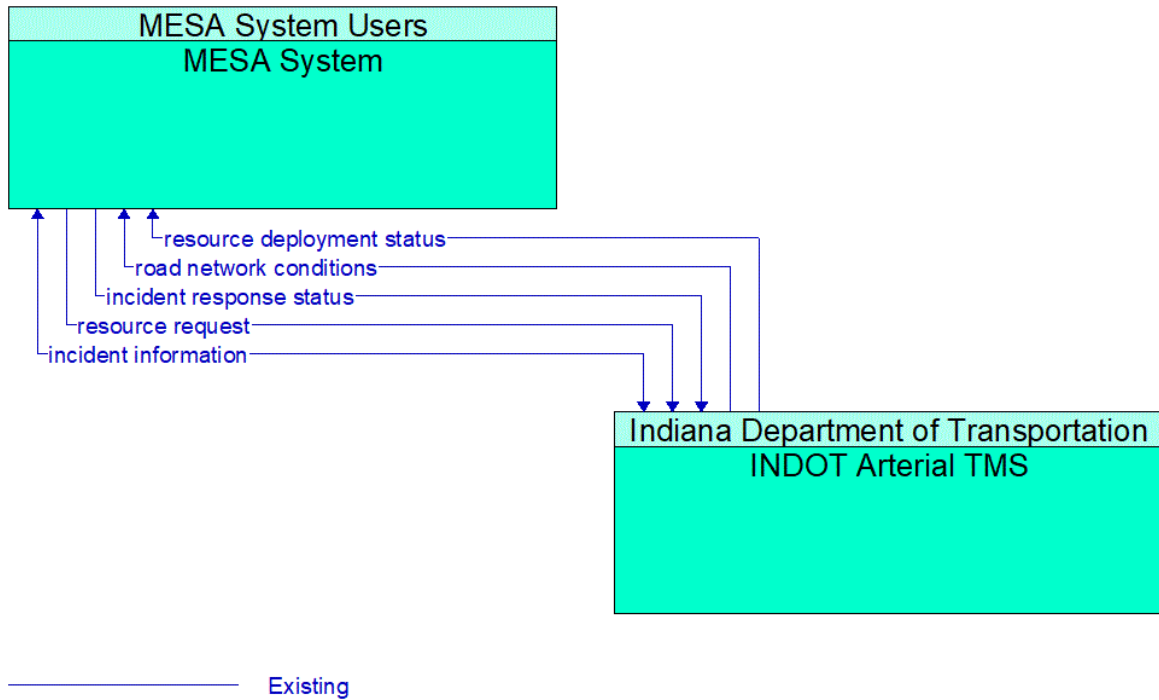


Figure 256: INDOT Arterial TMS - MESA System Interface

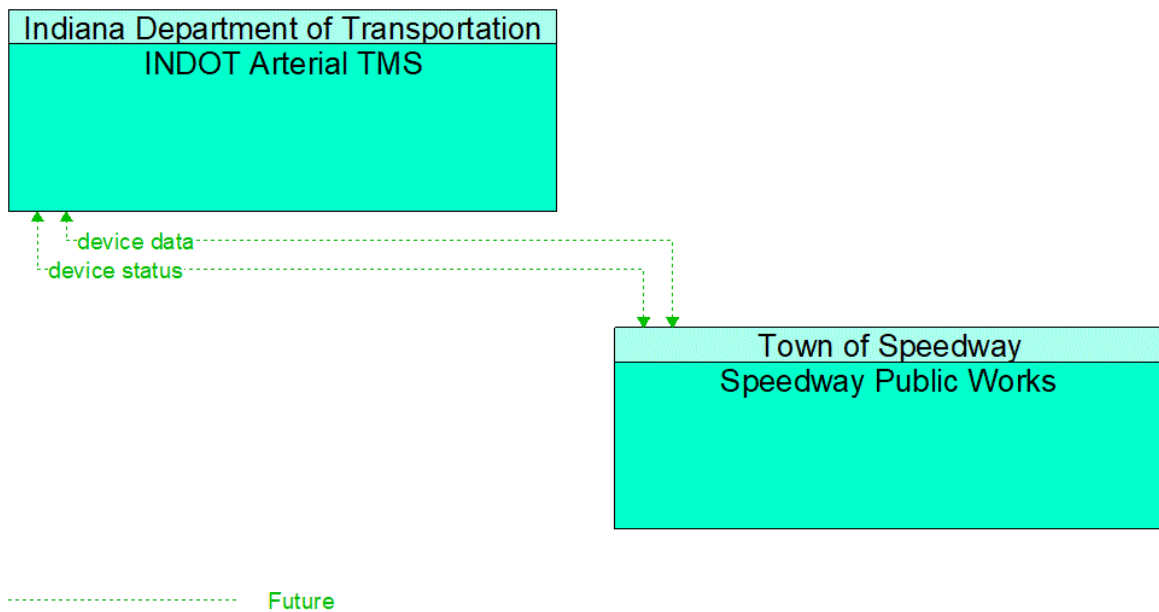


Figure 257: INDOT Arterial TMS - Speedway Public Works Interface

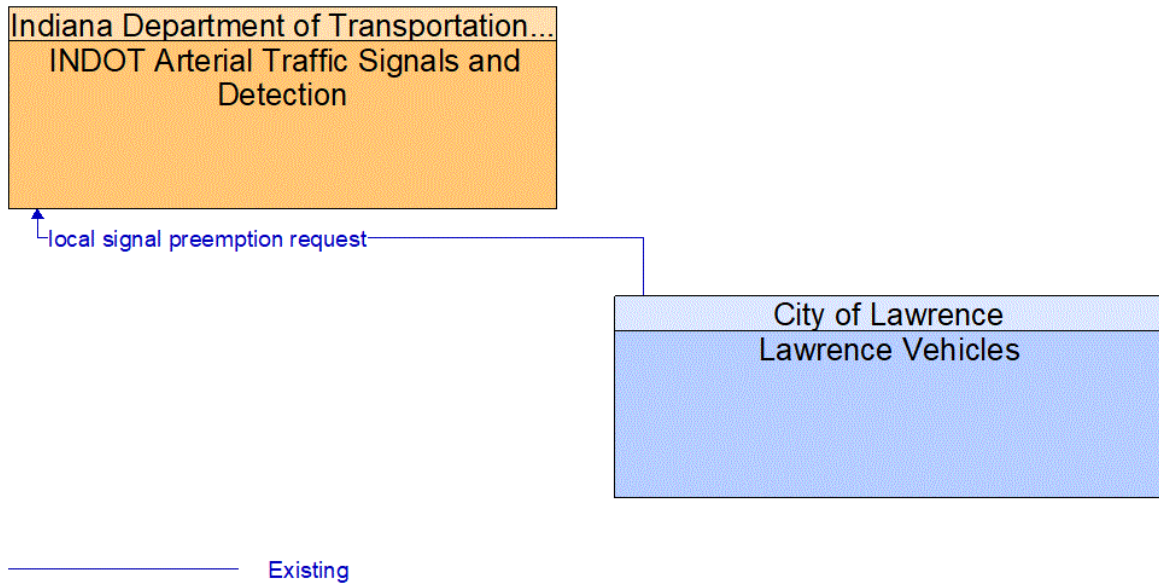


Figure 258: INDOT Arterial Traffic Signals and Detection - Lawrence Vehicles Interface

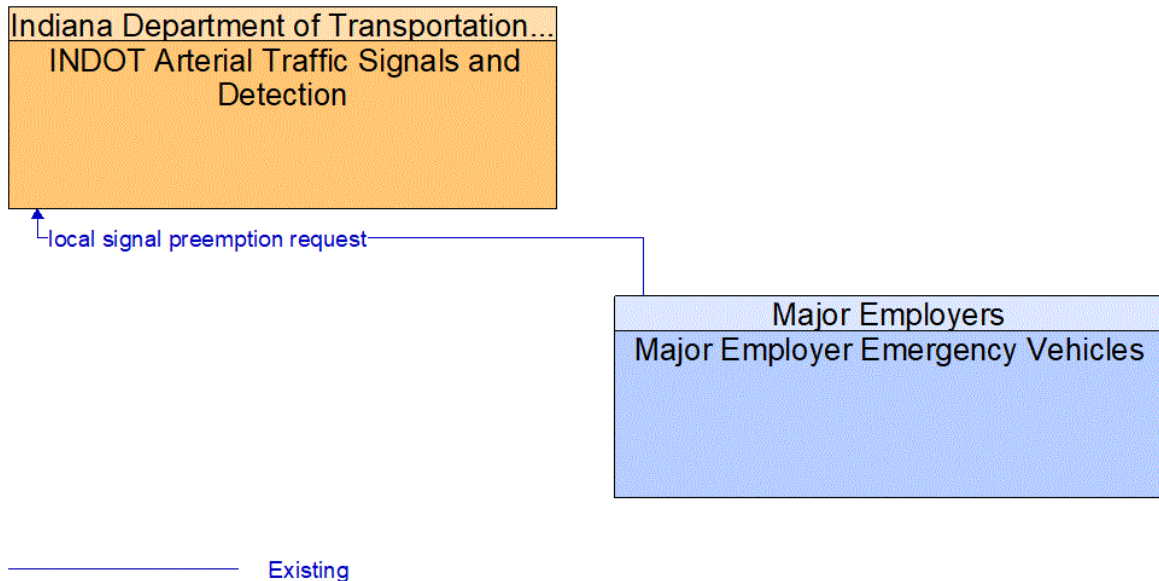


Figure 259: INDOT Arterial Traffic Signals and Detection - Major Employer Emergency Vehicles Interface

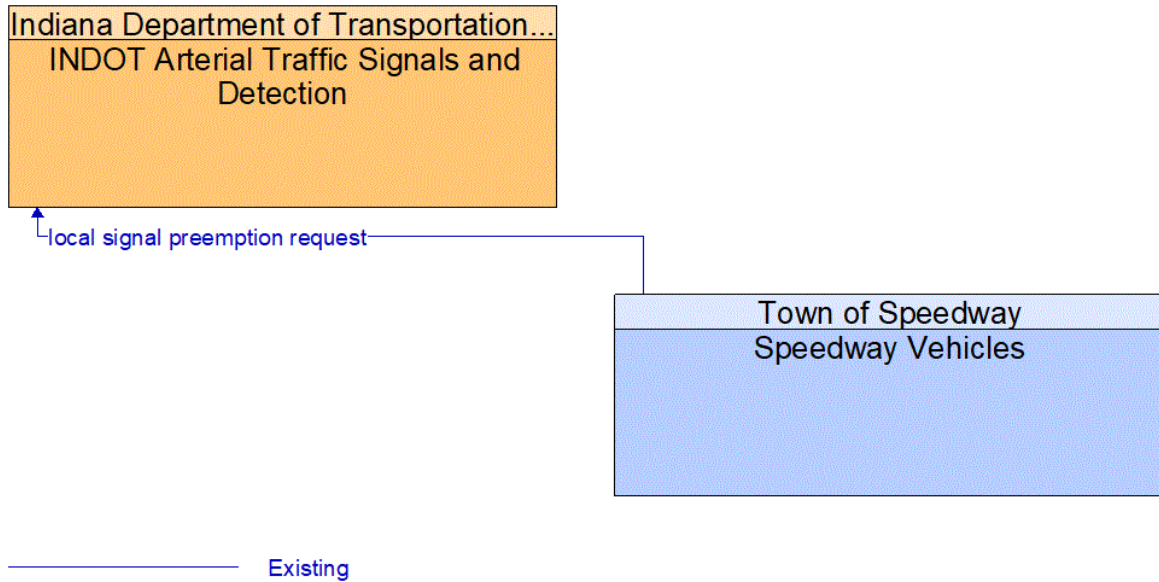


Figure 260: INDOT Arterial Traffic Signals and Detection - Speedway Vehicles Interface

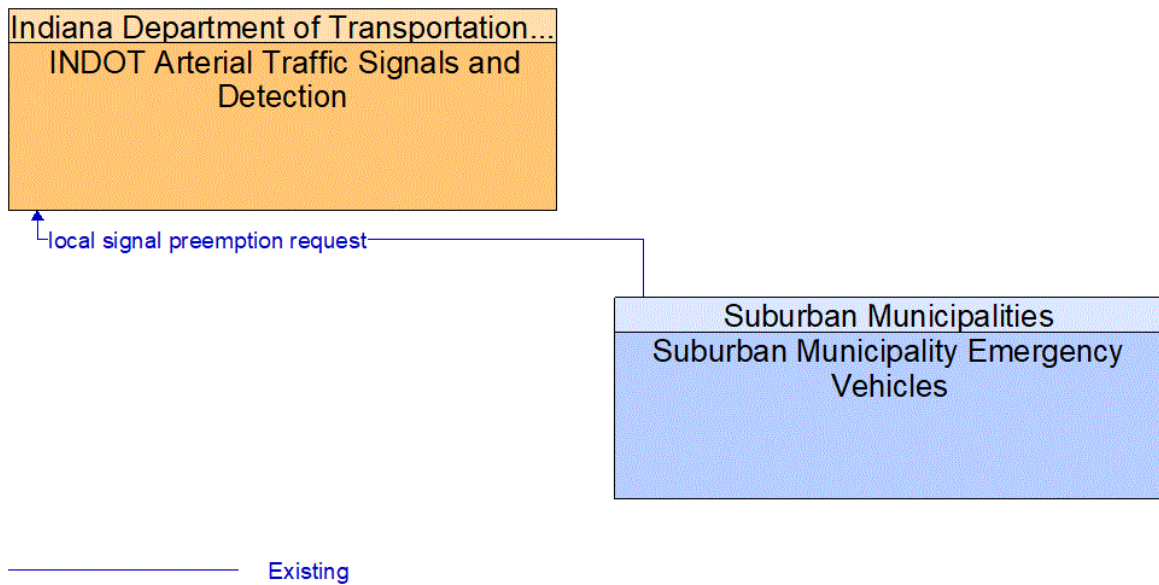


Figure 261: INDOT Arterial Traffic Signals and Detection - Suburban Municipality Emergency Vehicles Interface

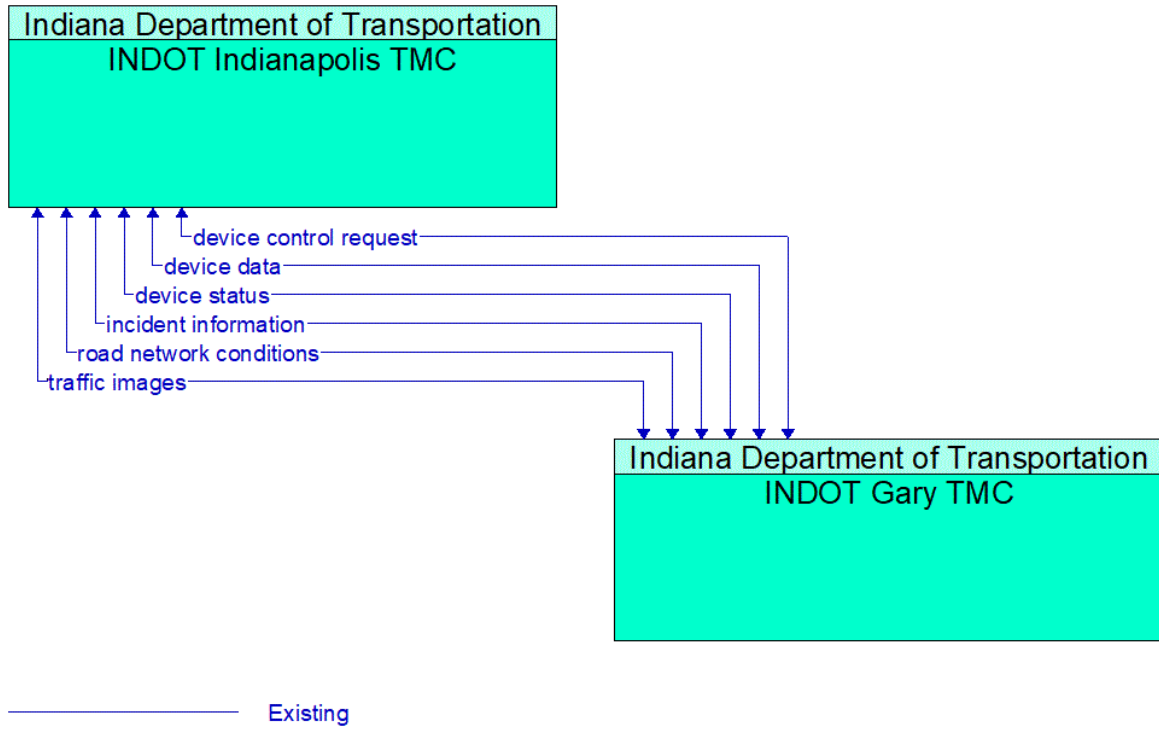


Figure 262: INDOT Gary TMC - INDOT Indianapolis TMC Interface

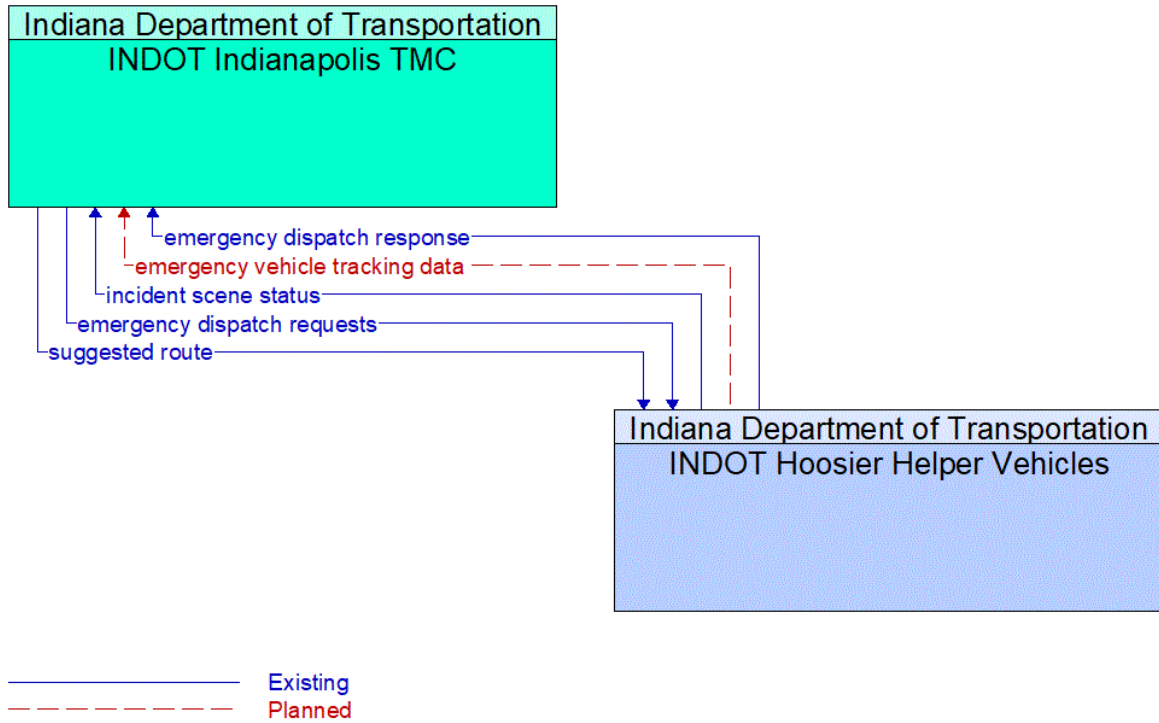


Figure 263: INDOT Hoosier Helper Vehicles - INDOT Indianapolis TMC Interface

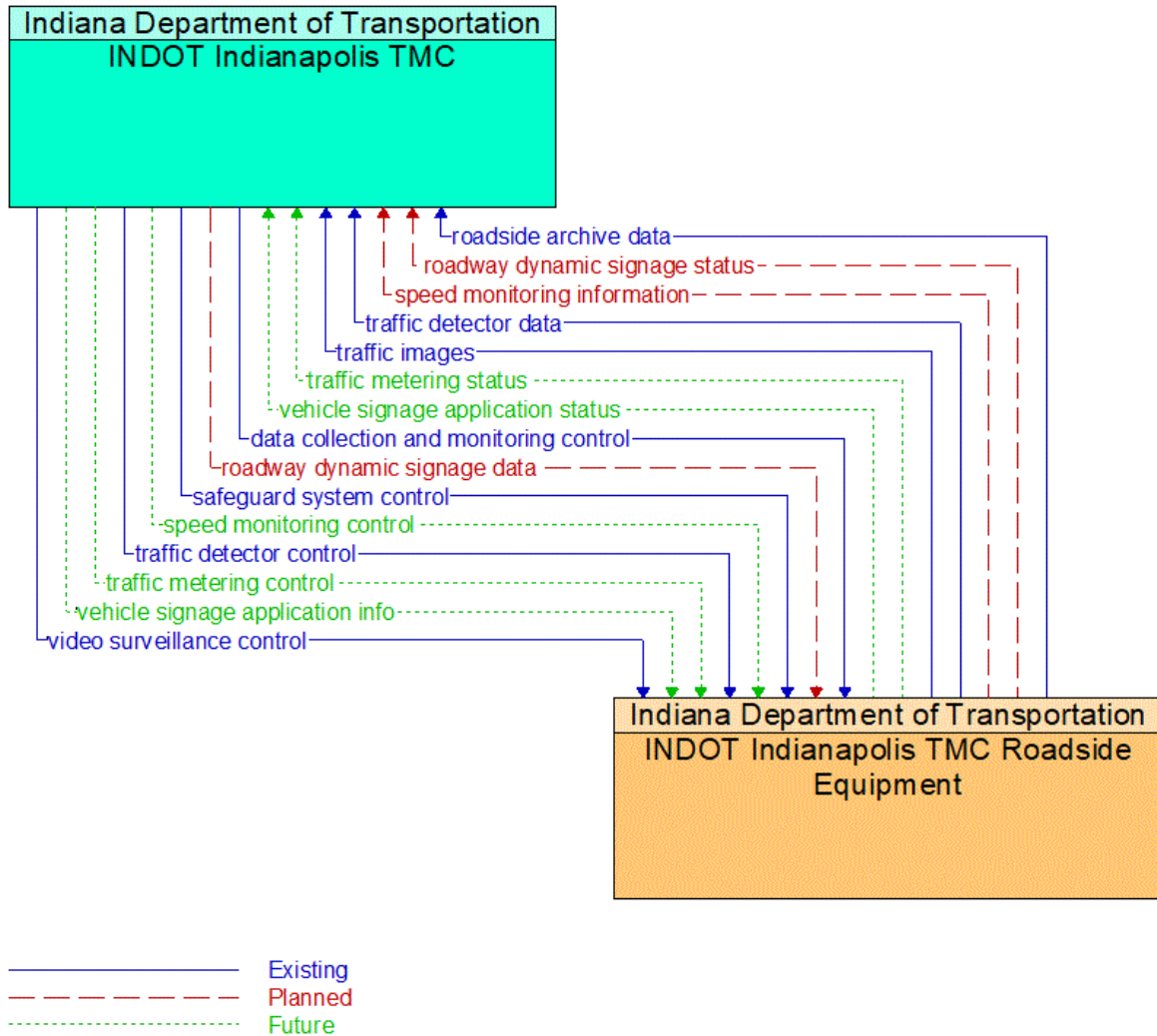
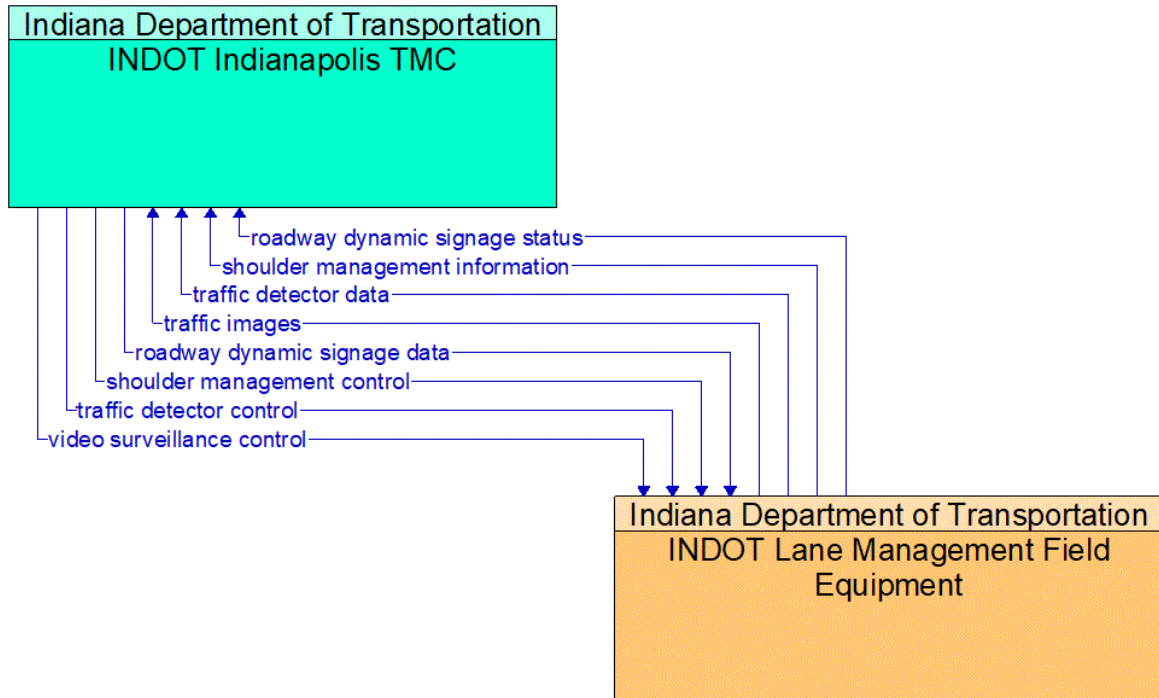


Figure 264: INDOT Indianapolis TMC - INDOT Indianapolis TMC Roadside Equipment Interface



Existing

Figure 265: INDOT Indianapolis TMC - INDOT Lane Management Field Equipment Interface

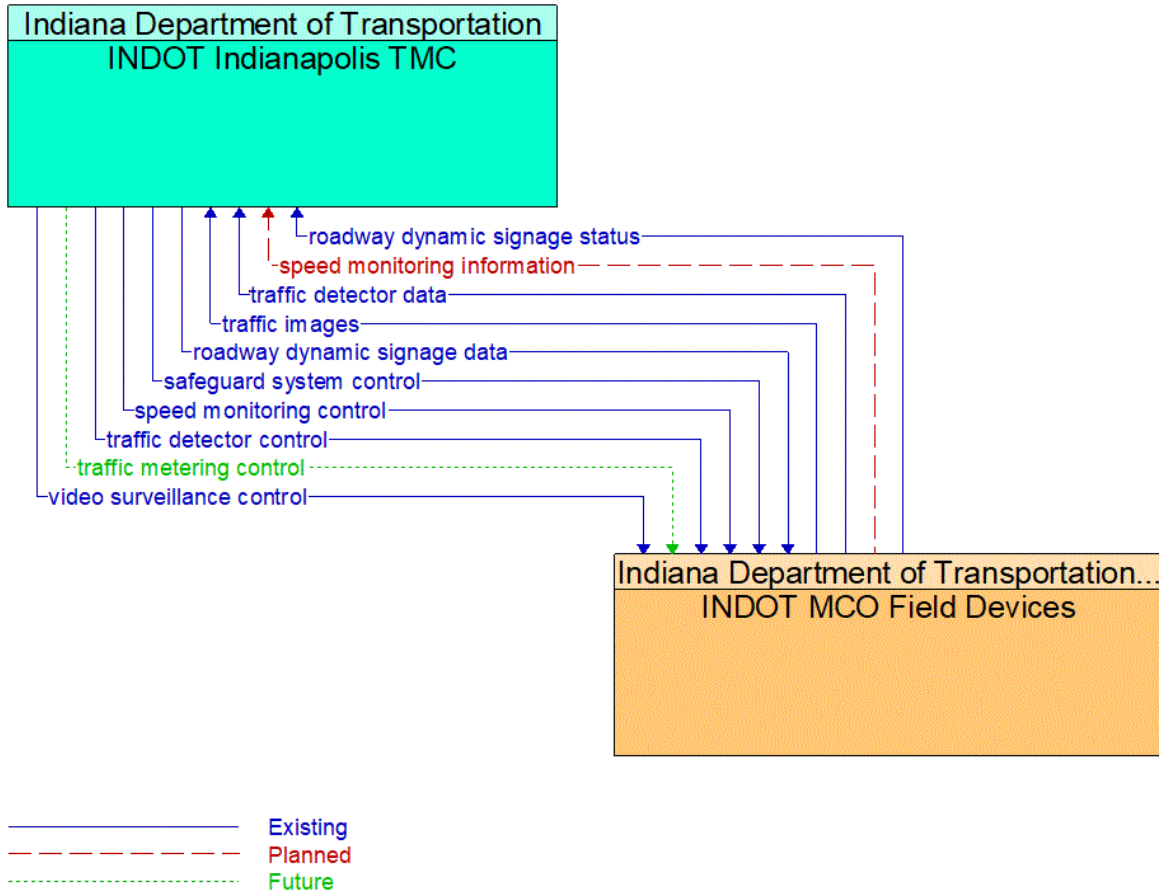
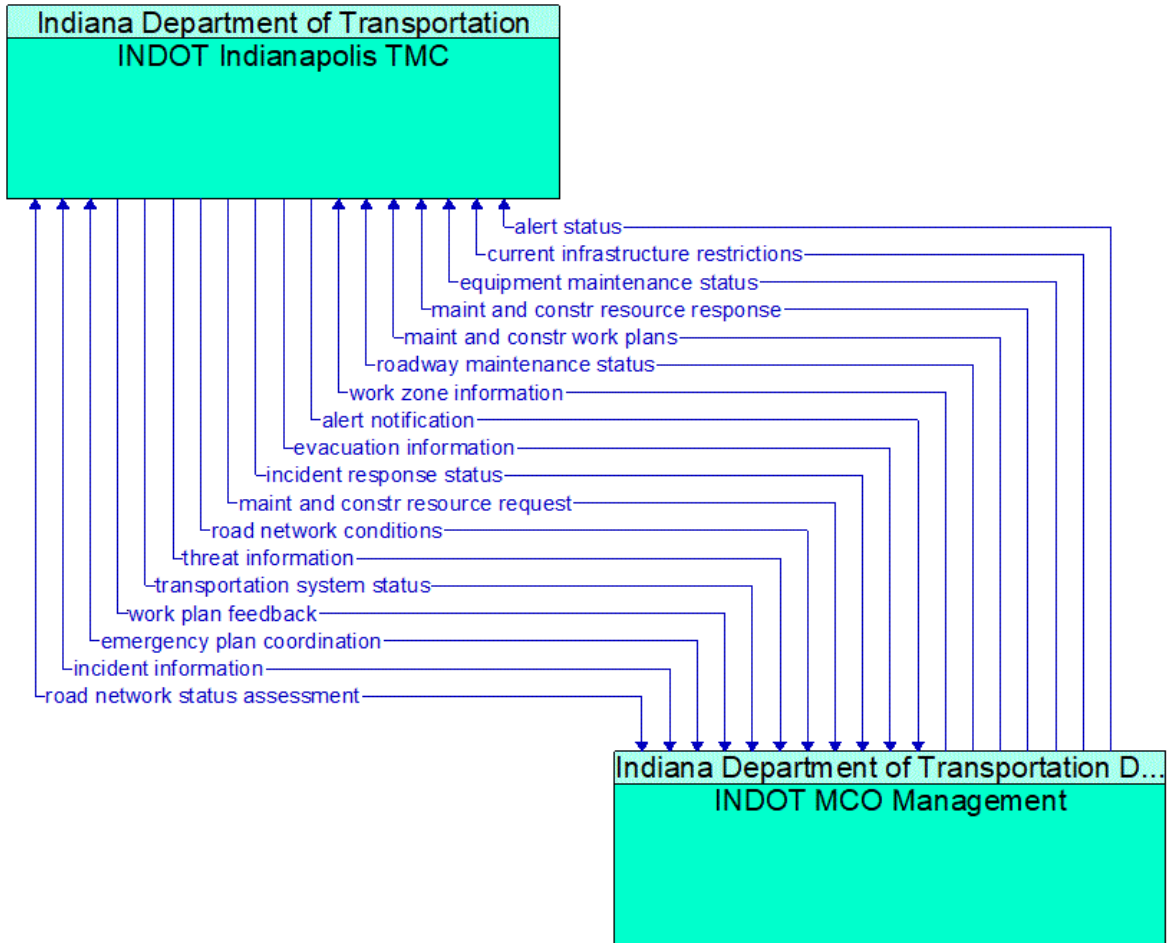
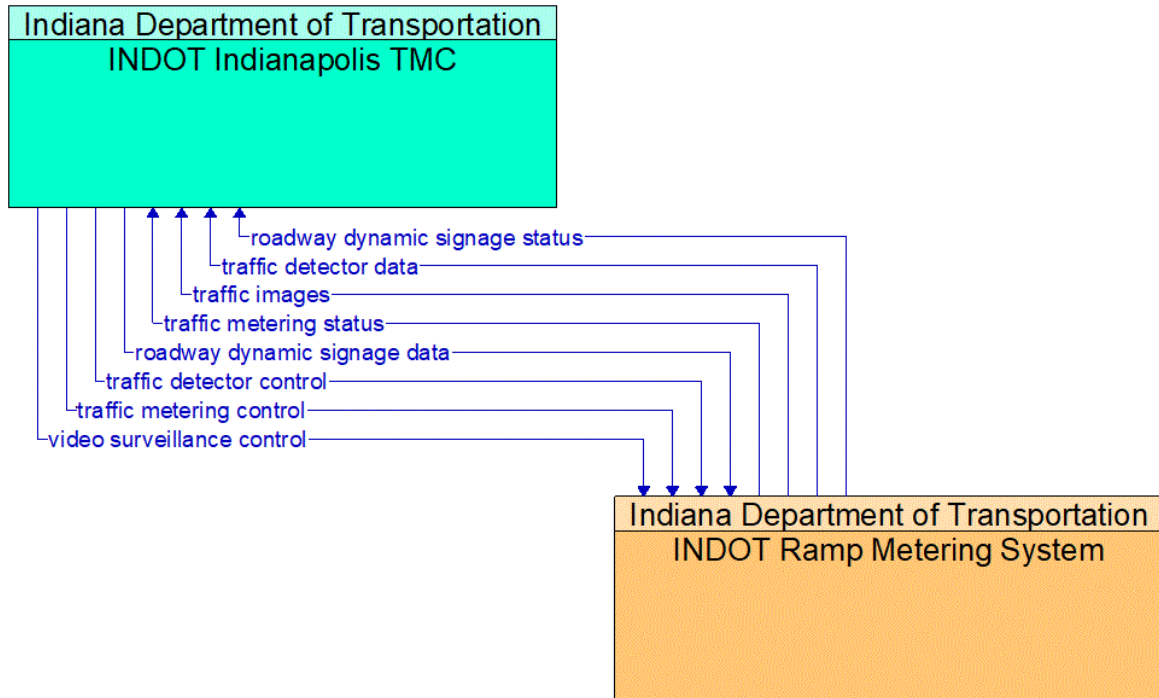


Figure 266: INDOT Indianapolis TMC - INDOT MCO Field Devices Interface



Existing

Figure 267: INDOT Indianapolis TMC - INDOT MCO Management Interface



Existing

Figure 268: INDOT Indianapolis TMC - INDOT Ramp Metering System Interface

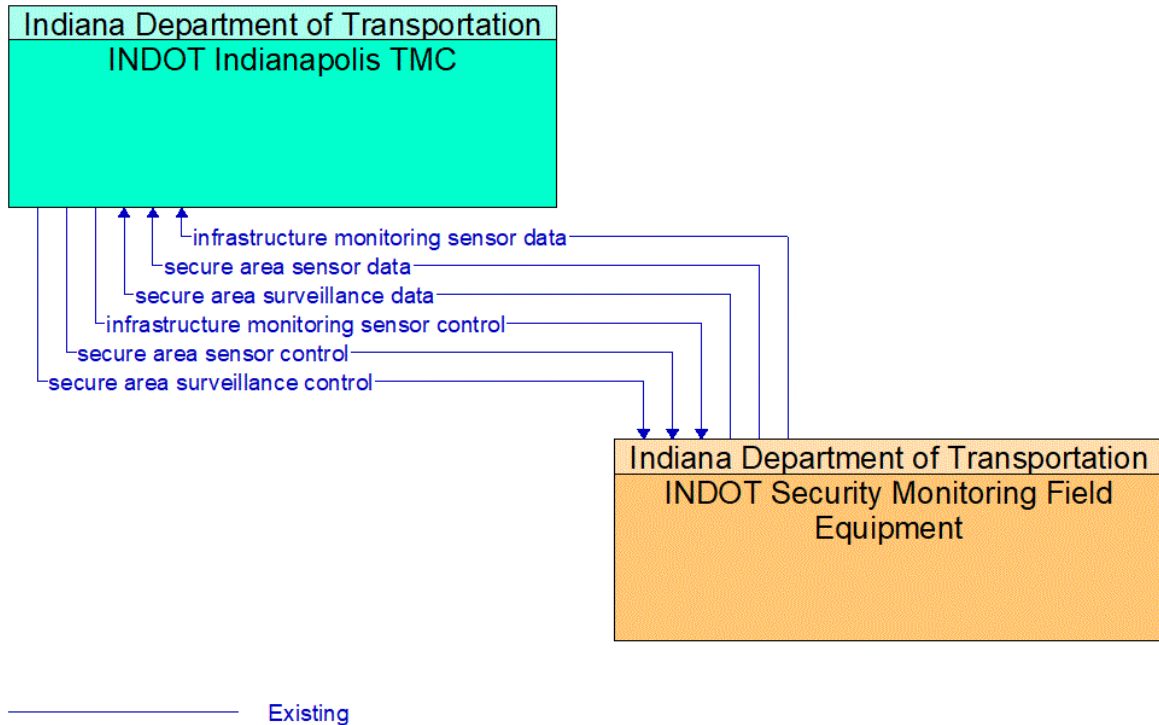


Figure 269: INDOT Indianapolis TMC - INDOT Security Monitoring Field Equipment Interface

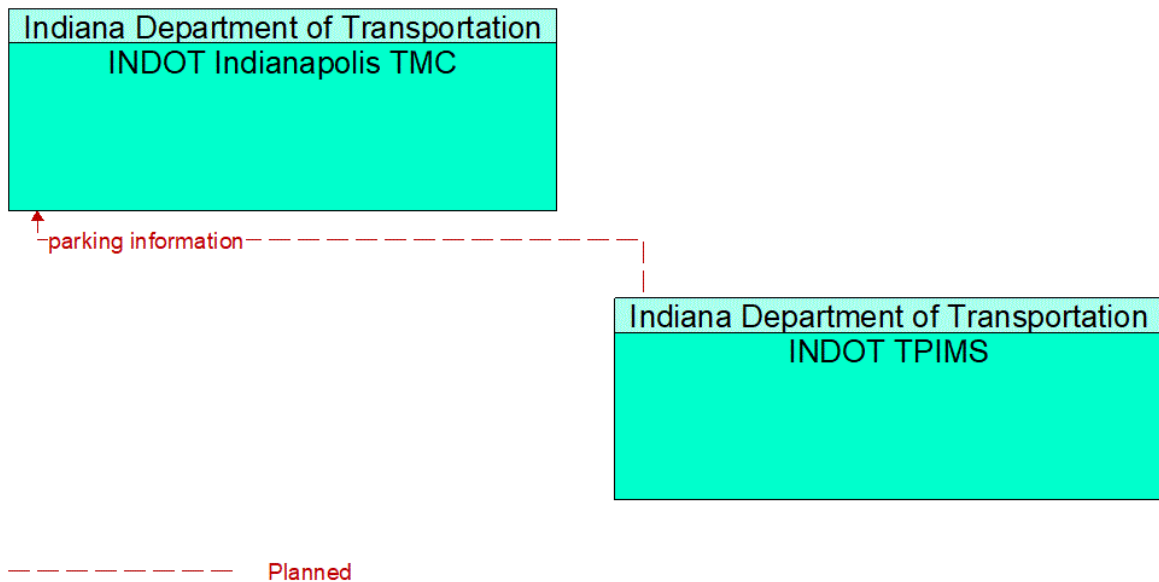


Figure 270: INDOT Indianapolis TMC - INDOT TPIMS Interface

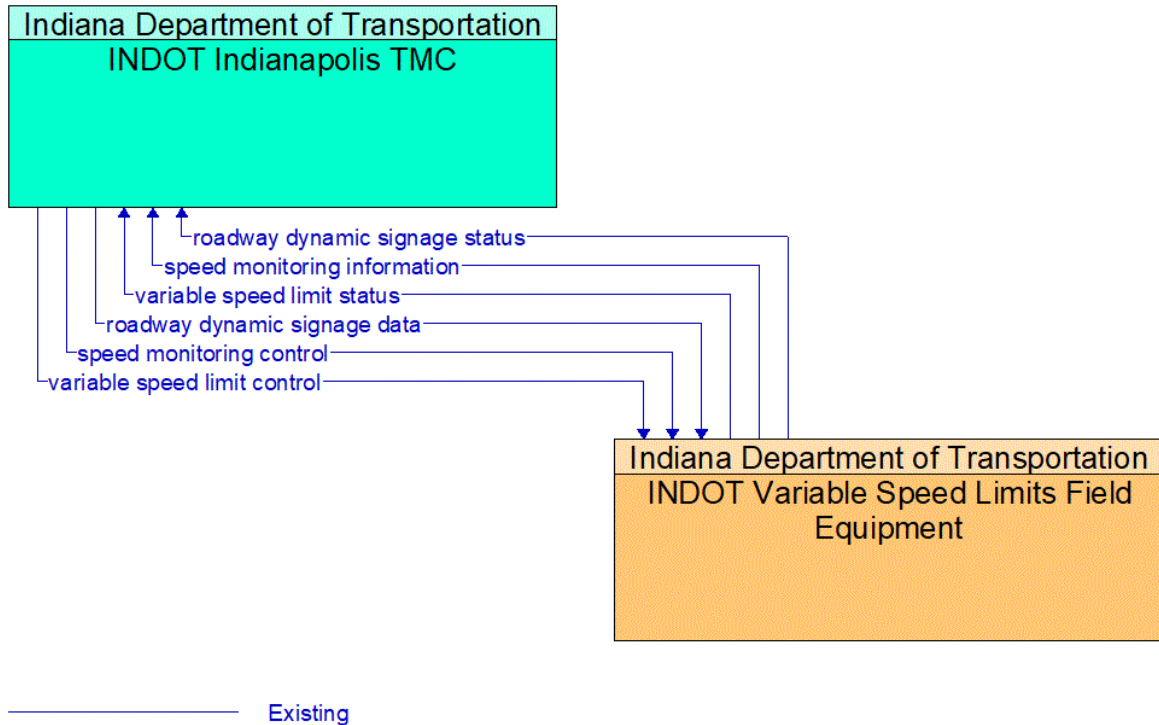


Figure 271: INDOT Indianapolis TMC - INDOT Variable Speed Limits Field Equipment Interface

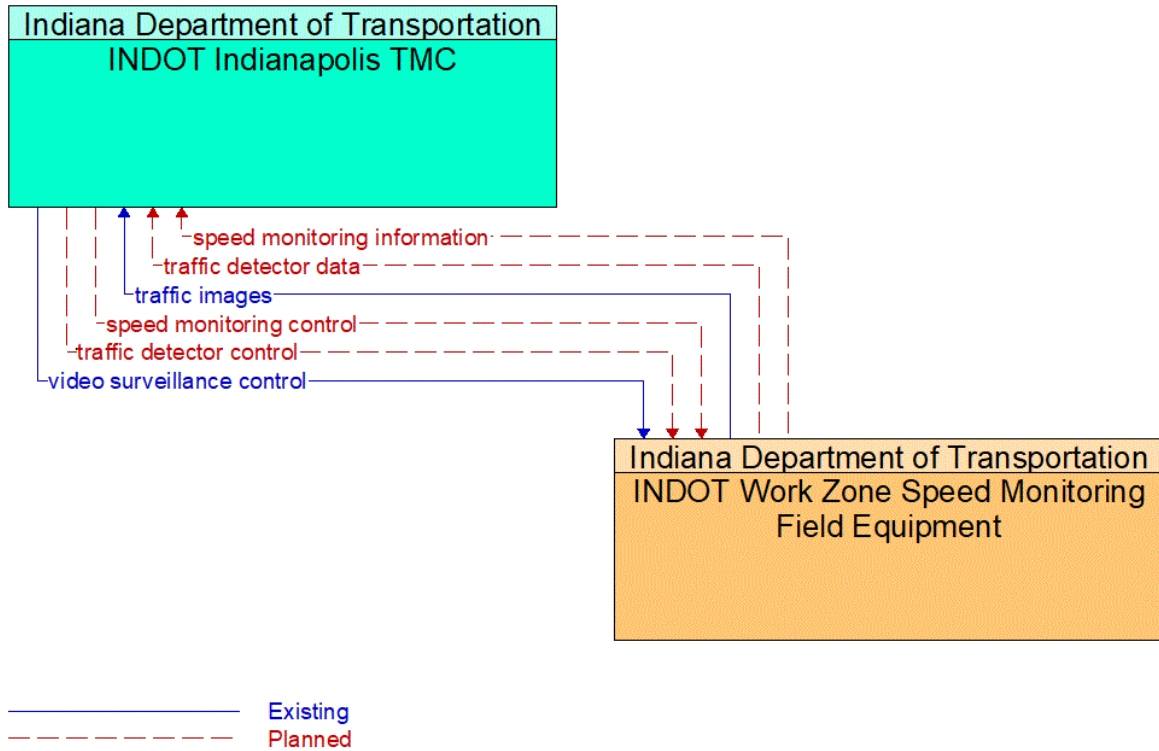


Figure 272: INDOT Indianapolis TMC - INDOT Work Zone Speed Monitoring Field Equipment Interface

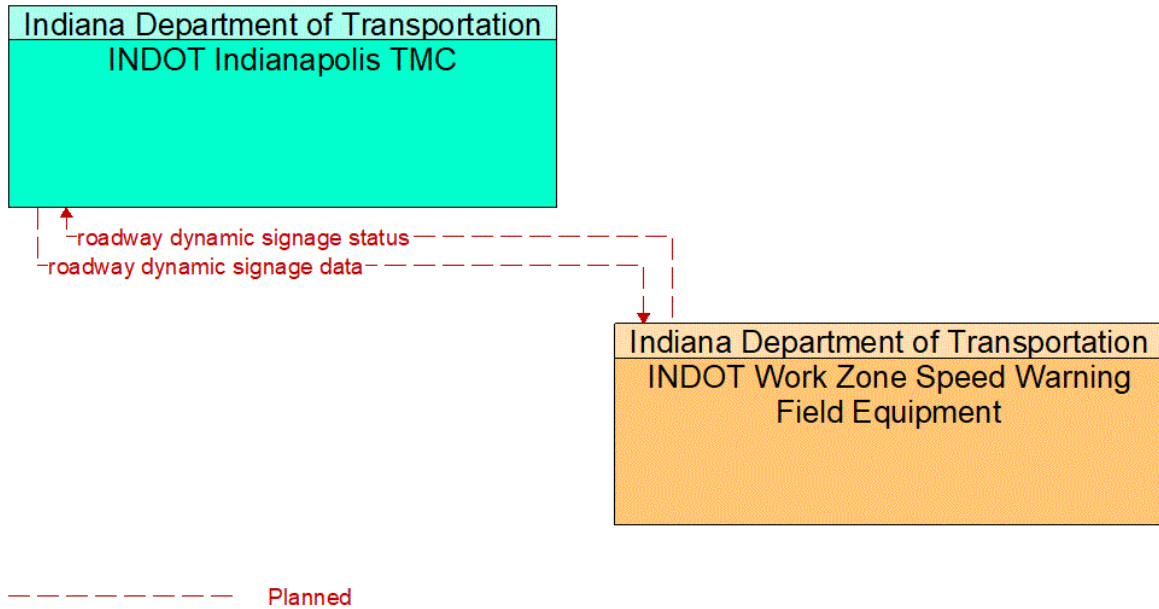


Figure 273: INDOT Indianapolis TMC - INDOT Work Zone Speed Warning Field Equipment Interface

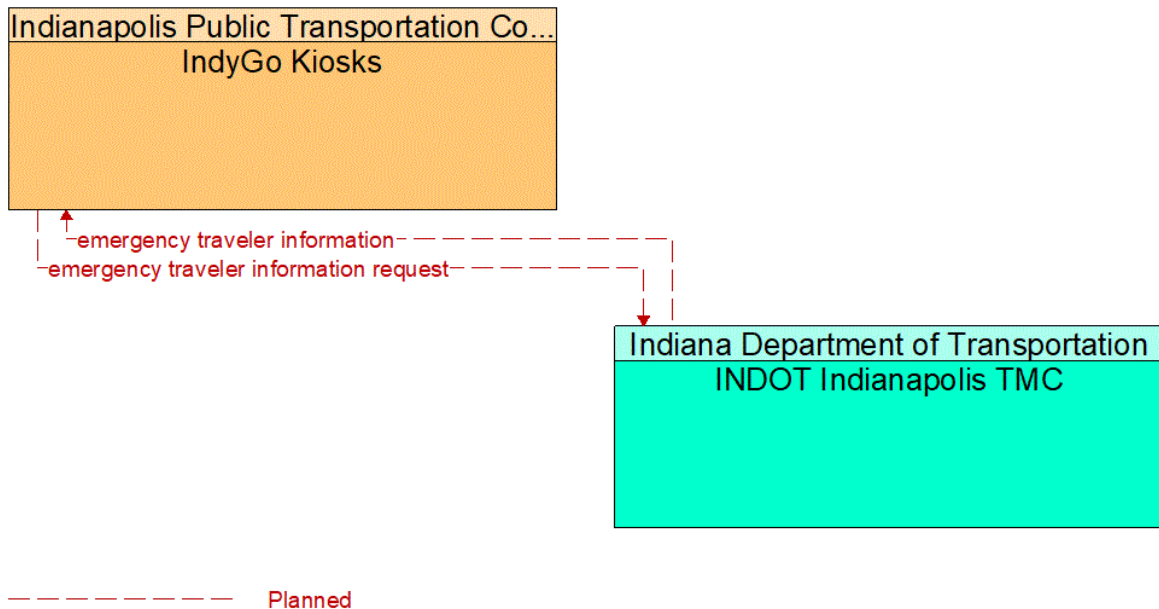


Figure 274: INDOT Indianapolis TMC - IndyGo Kiosks Interface

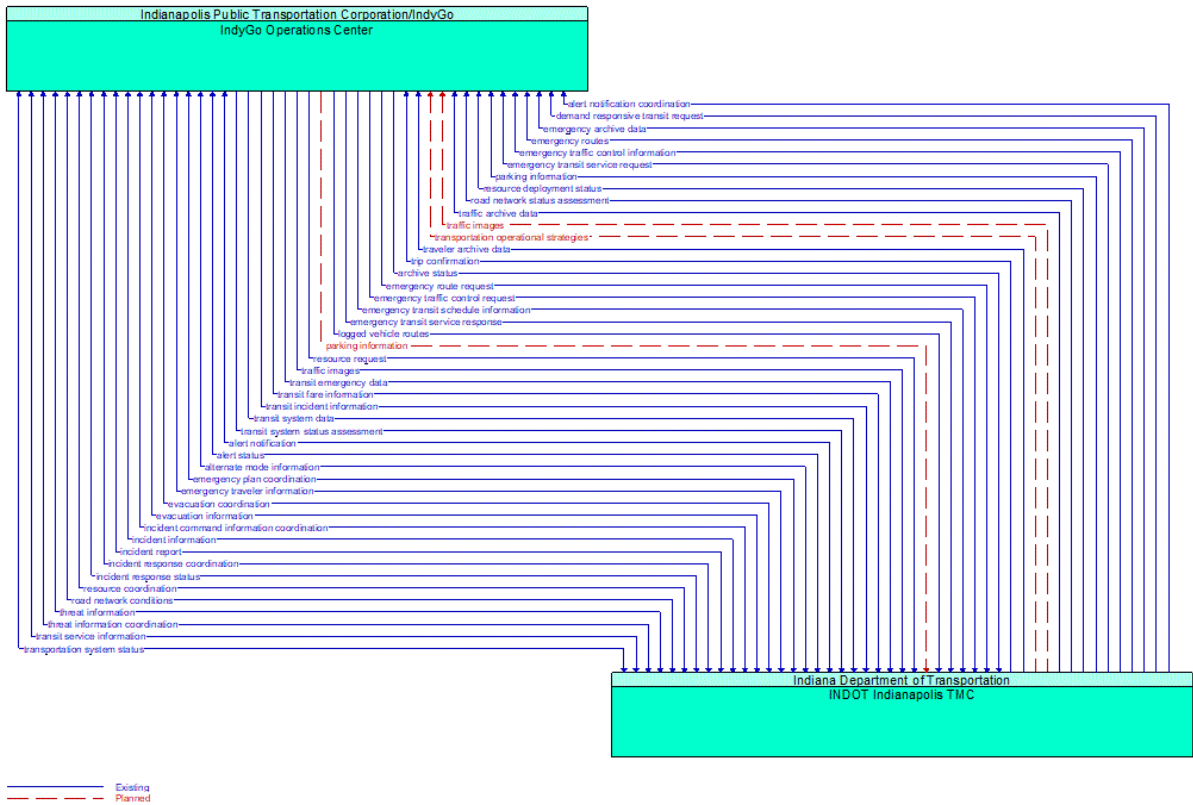


Figure 275: INDOT Indianapolis TMC - IndyGo Operations Center Interface

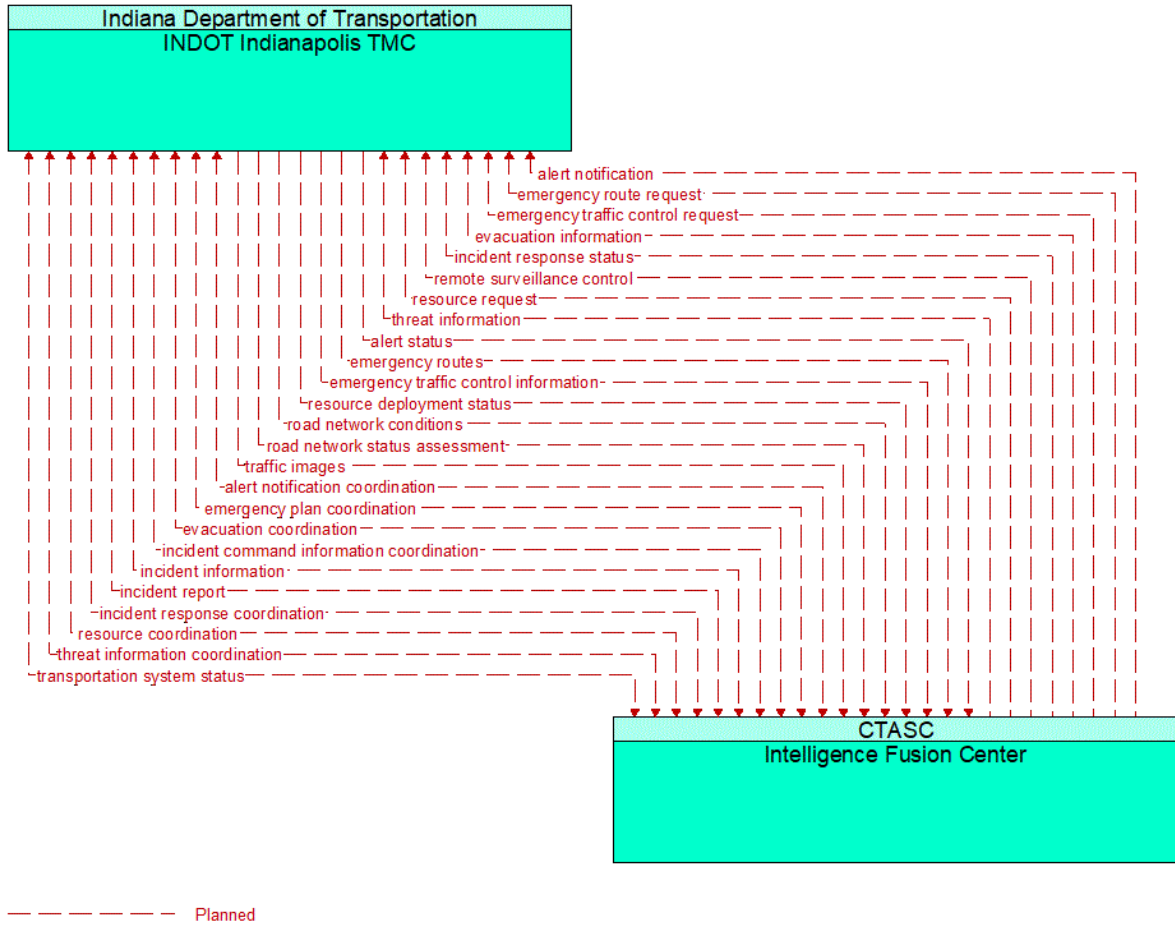


Figure 276: INDOT Indianapolis TMC - Intelligence Fusion Center Interface

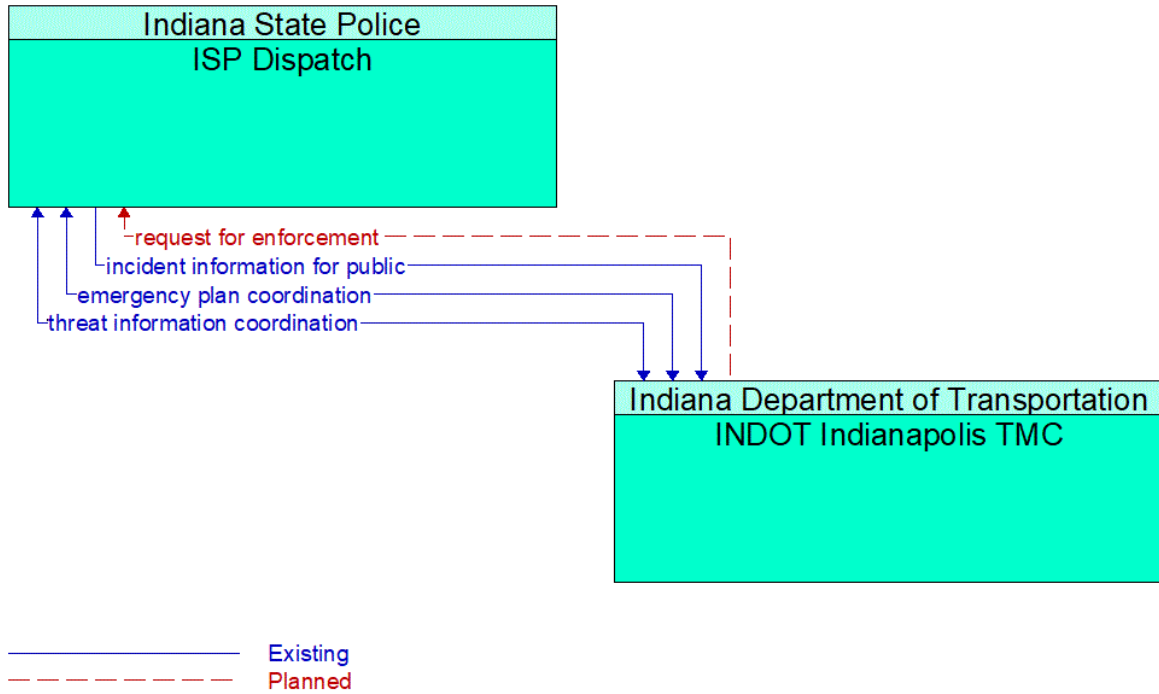


Figure 277: INDOT Indianapolis TMC - ISP Dispatch Interface

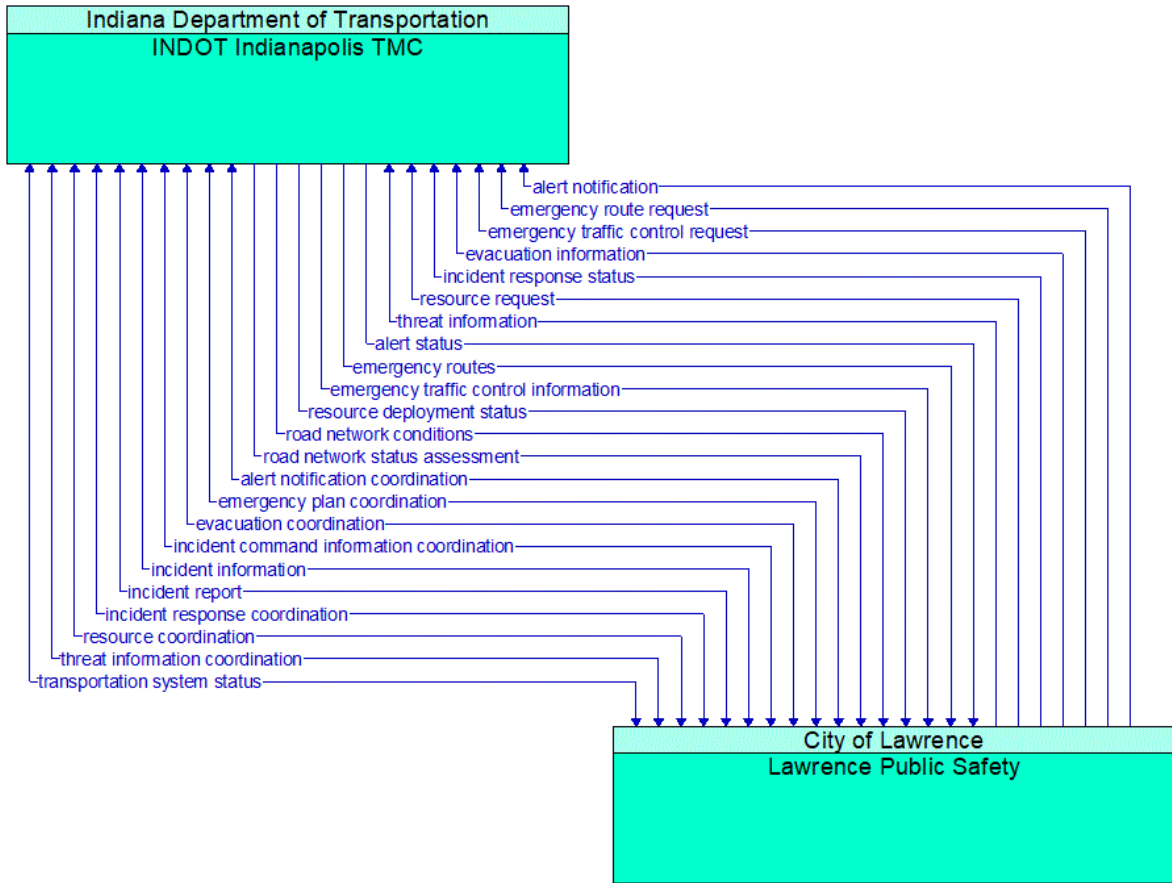


Figure 278: INDOT Indianapolis TMC - Lawrence Public Safety Interface

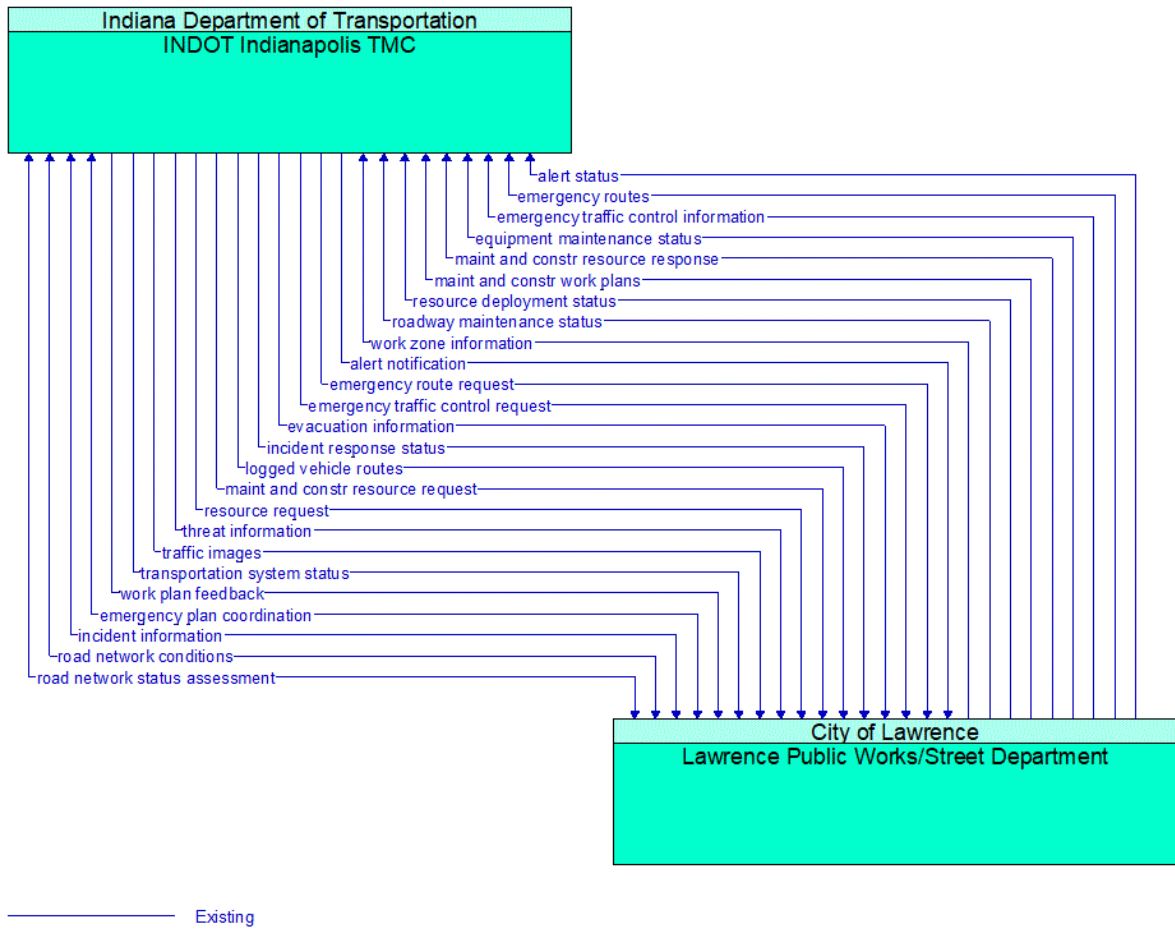


Figure 279: INDOT Indianapolis TMC - Lawrence Public Works/Street Department Interface

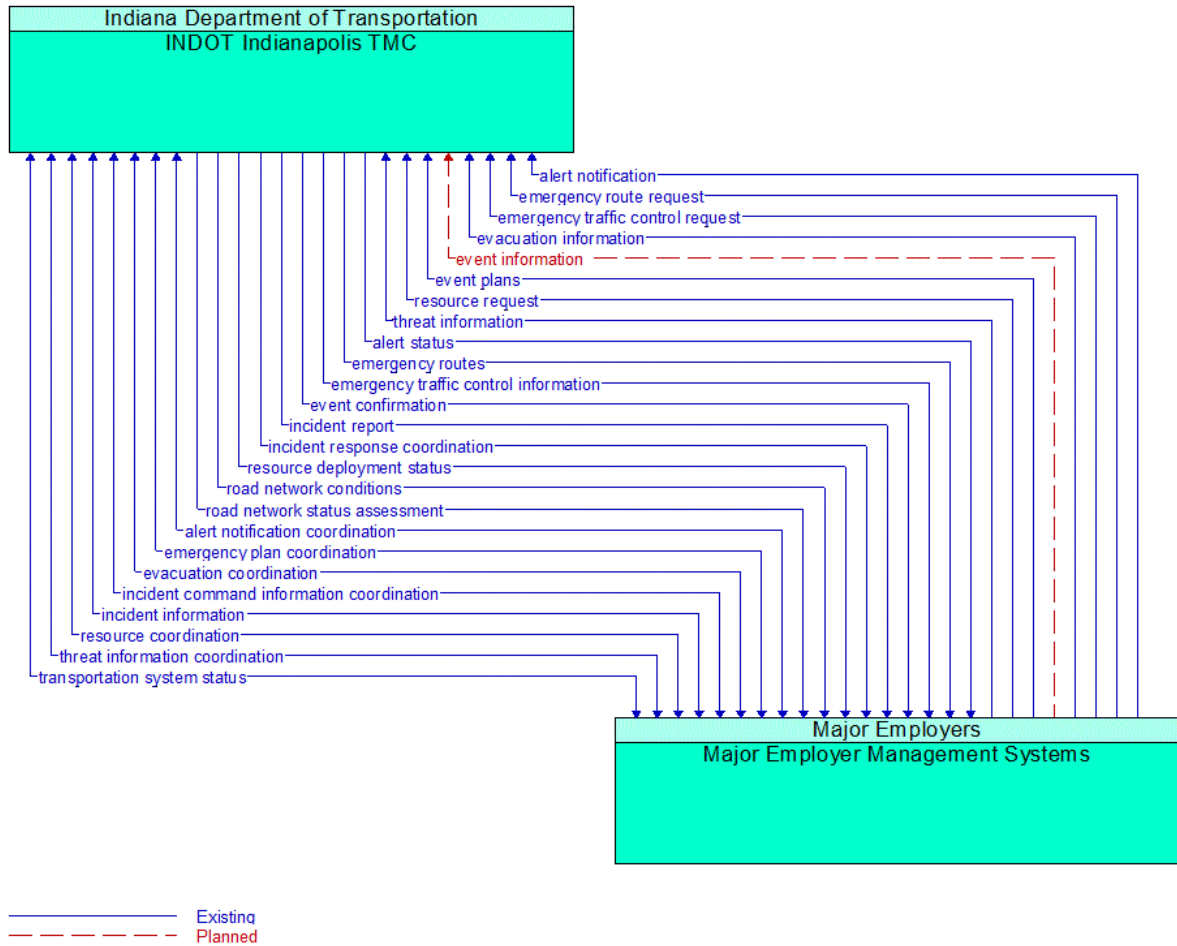


Figure 280: INDOT Indianapolis TMC - Major Employer Management Systems Interface

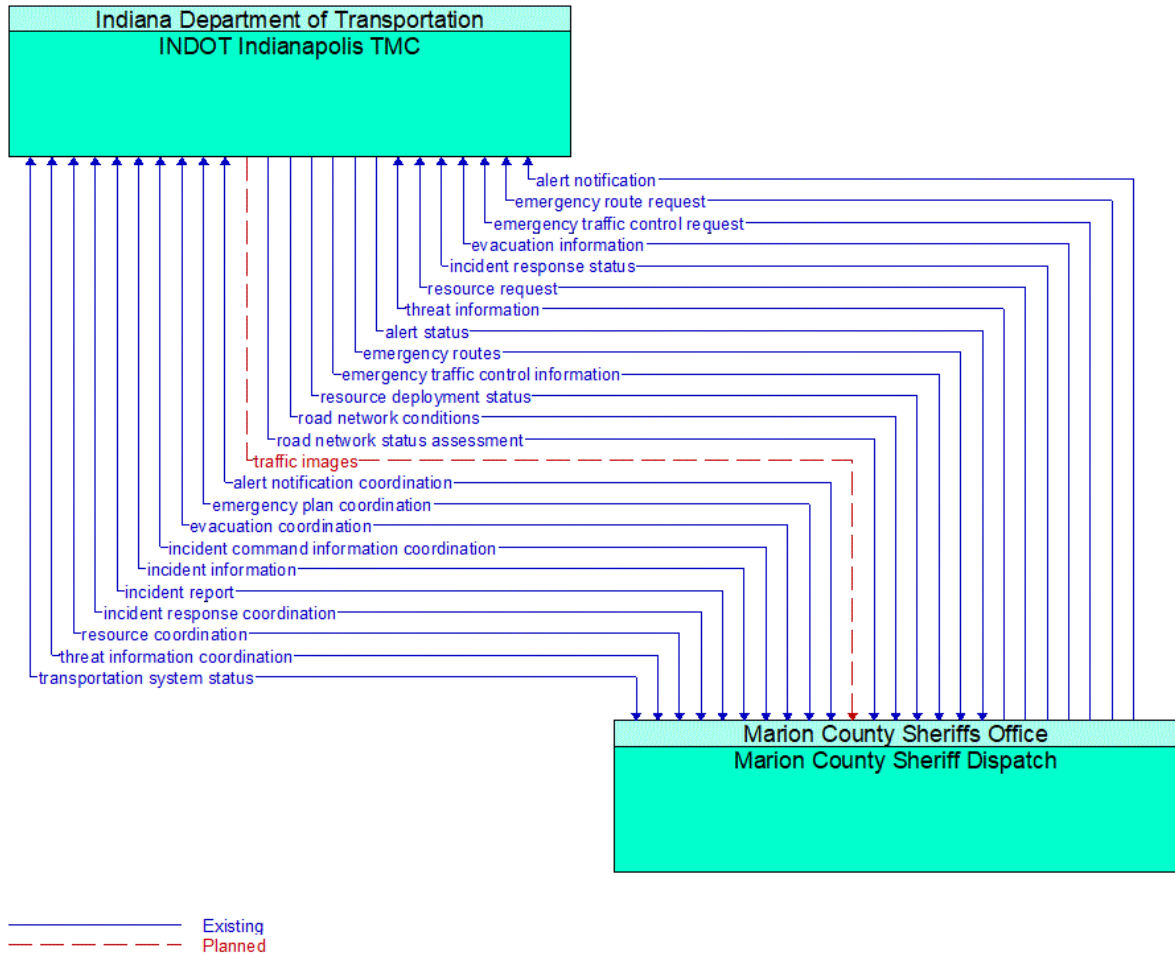


Figure 281: INDOT Indianapolis TMC - Marion County Sheriff Dispatch Interface

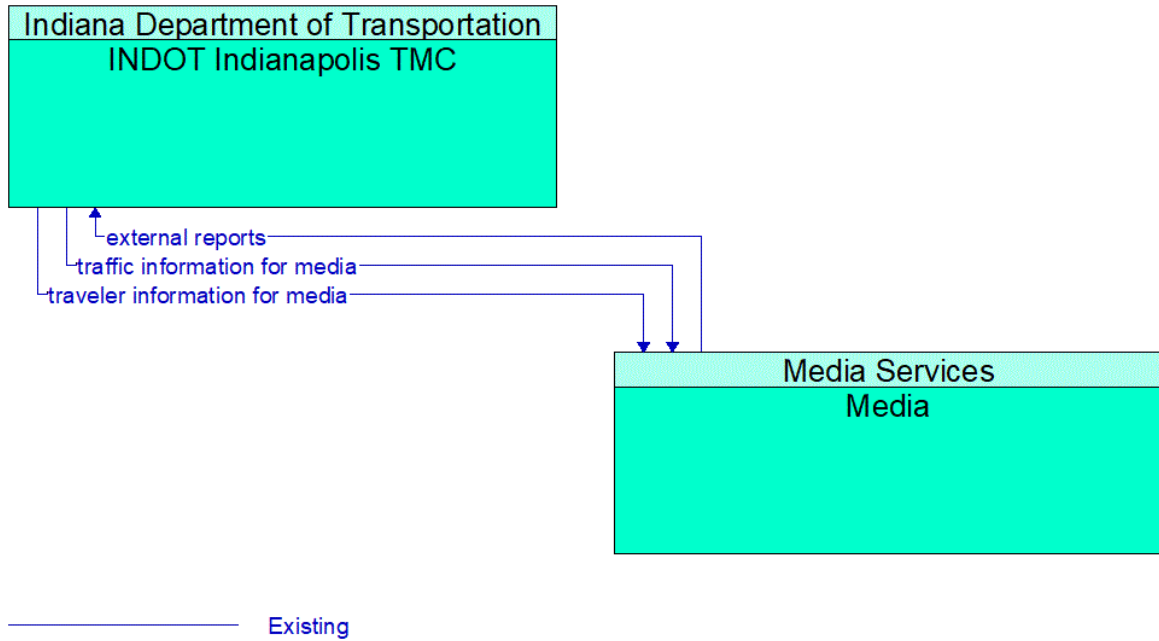
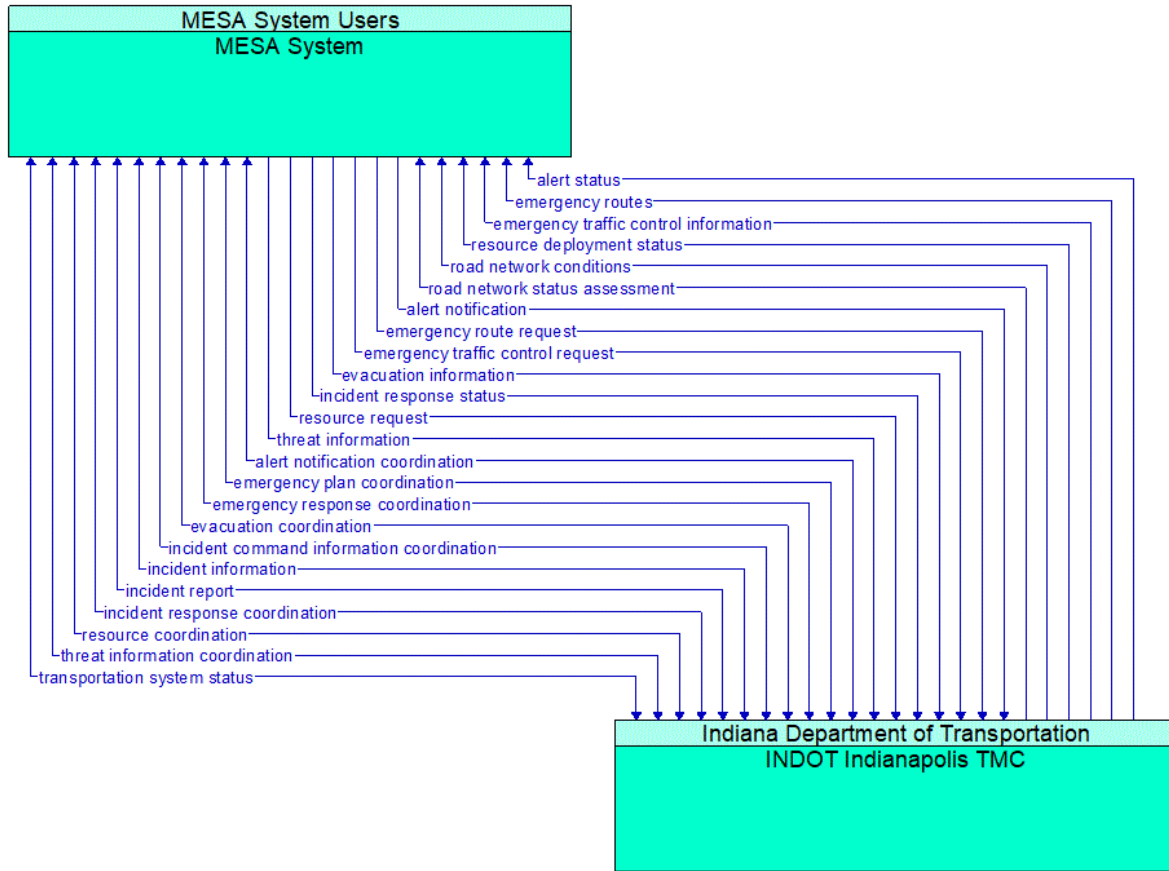


Figure 282: INDOT Indianapolis TMC - Media Interface



Existing

Figure 283: INDOT Indianapolis TMC - MESA System Interface

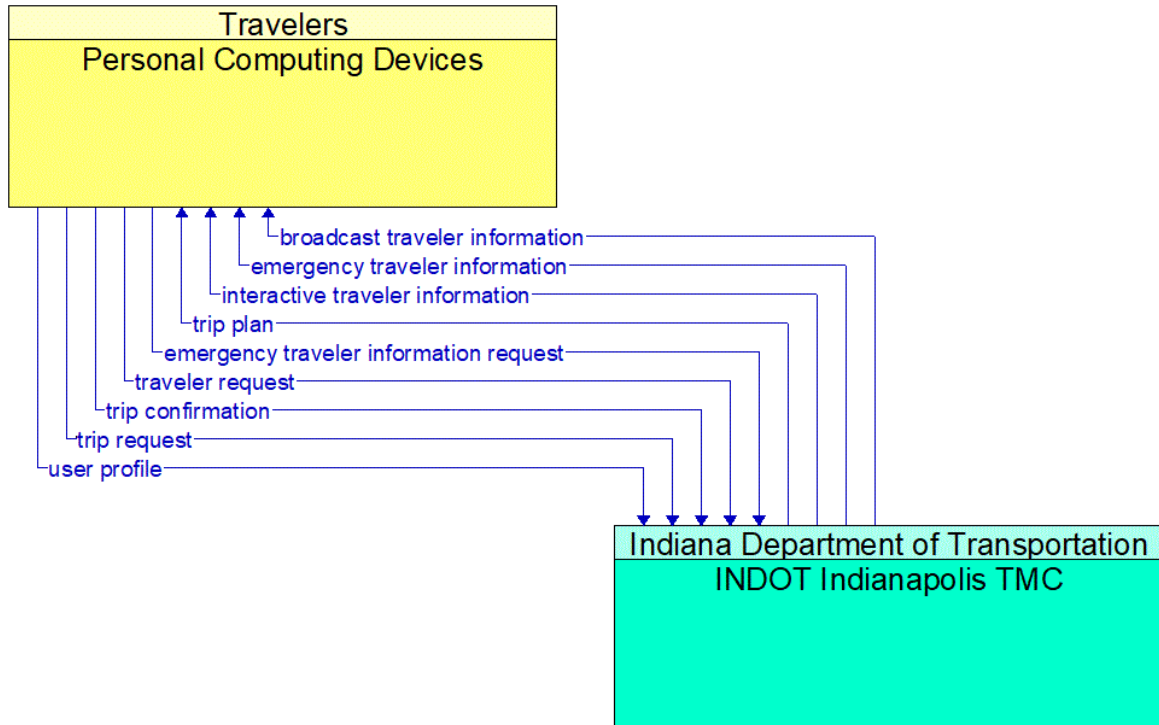


Figure 284: INDOT Indianapolis TMC - Personal Computing Devices Interface

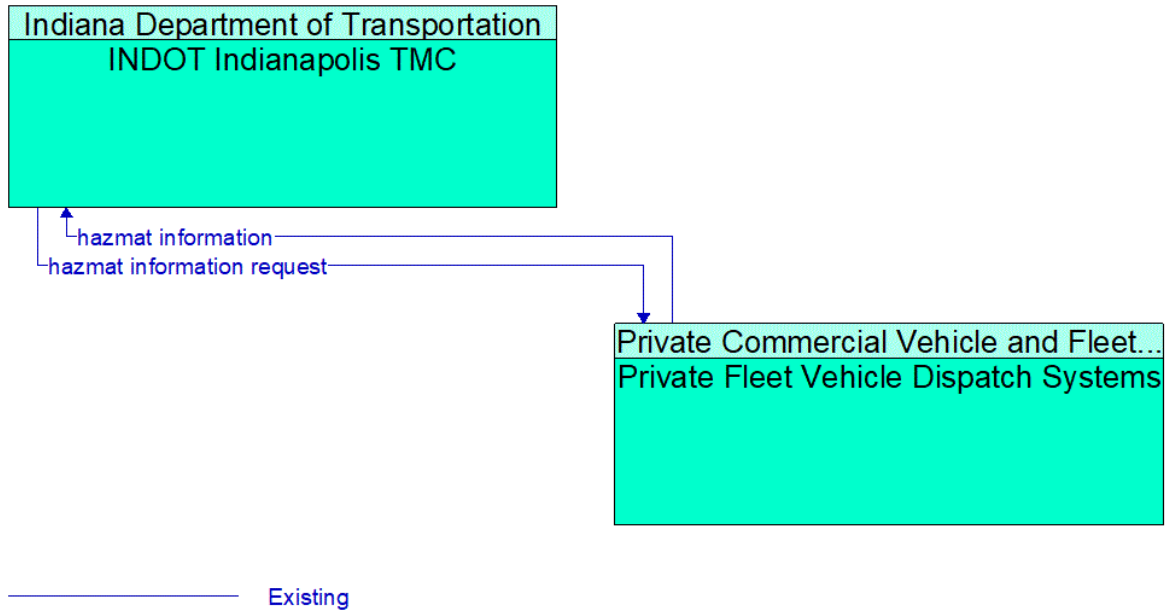


Figure 285: INDOT Indianapolis TMC - Private Fleet Vehicle Dispatch Systems Interface

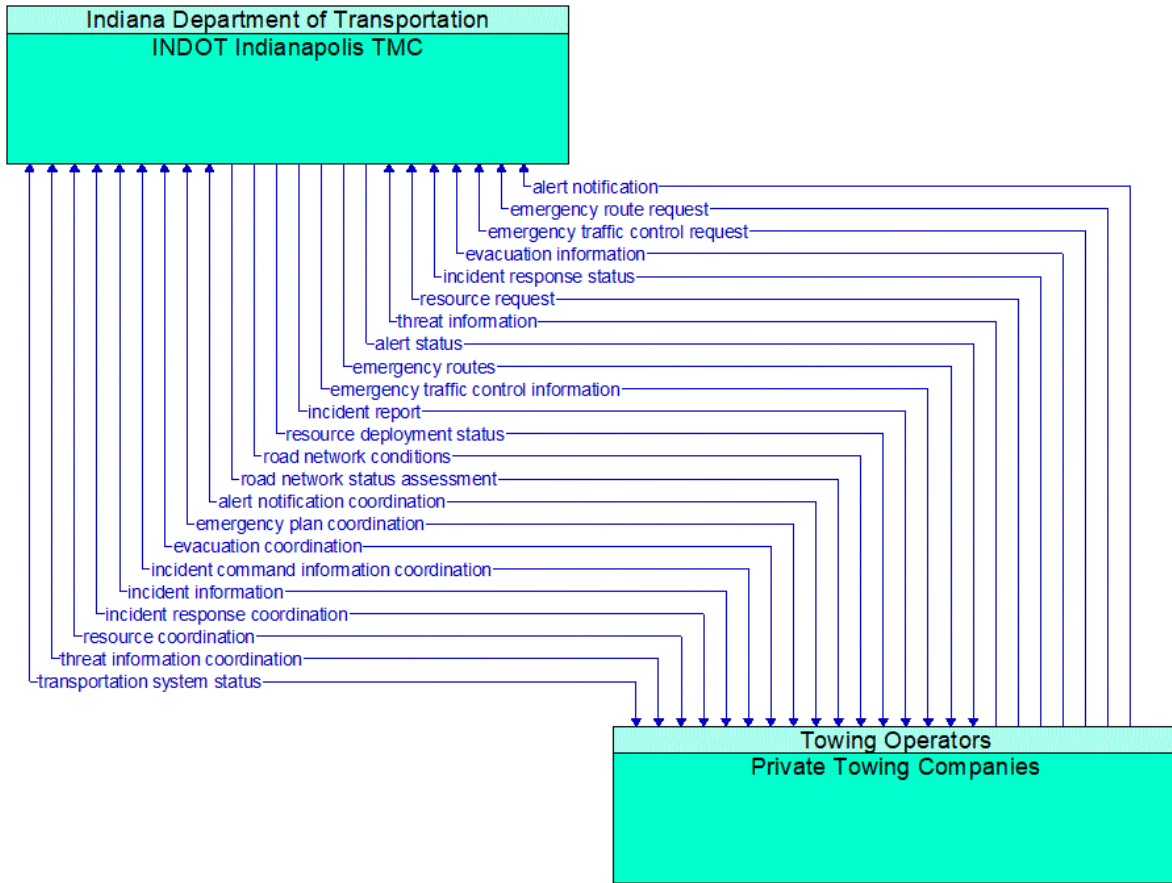


Figure 286: INDOT Indianapolis TMC - Private Towing Companies Interface

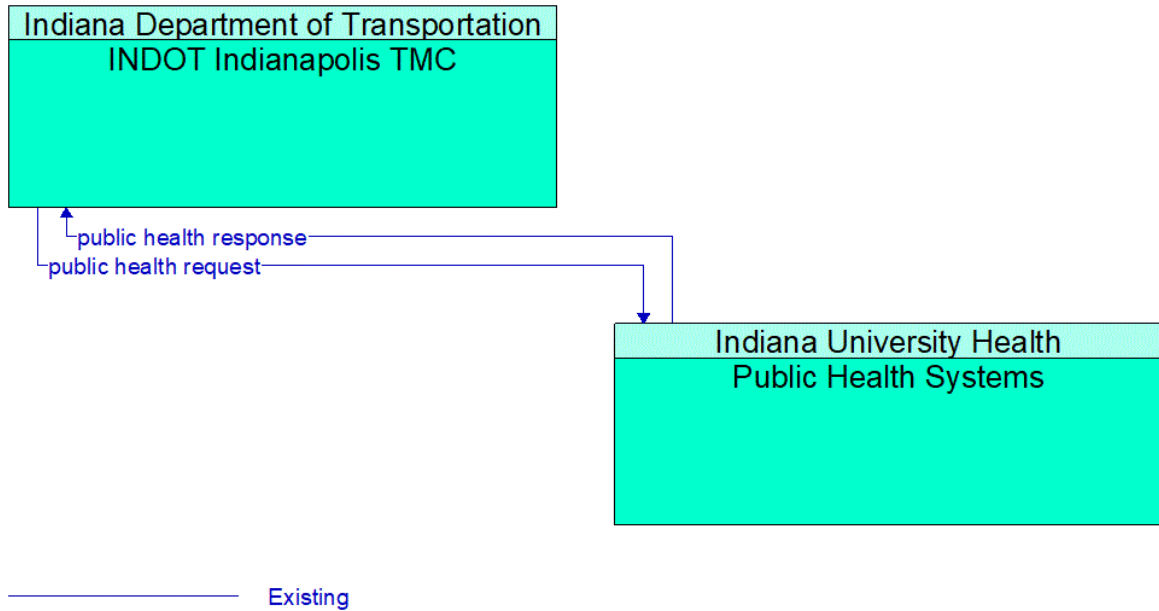


Figure 287: INDOT Indianapolis TMC - Public Health Systems Interface

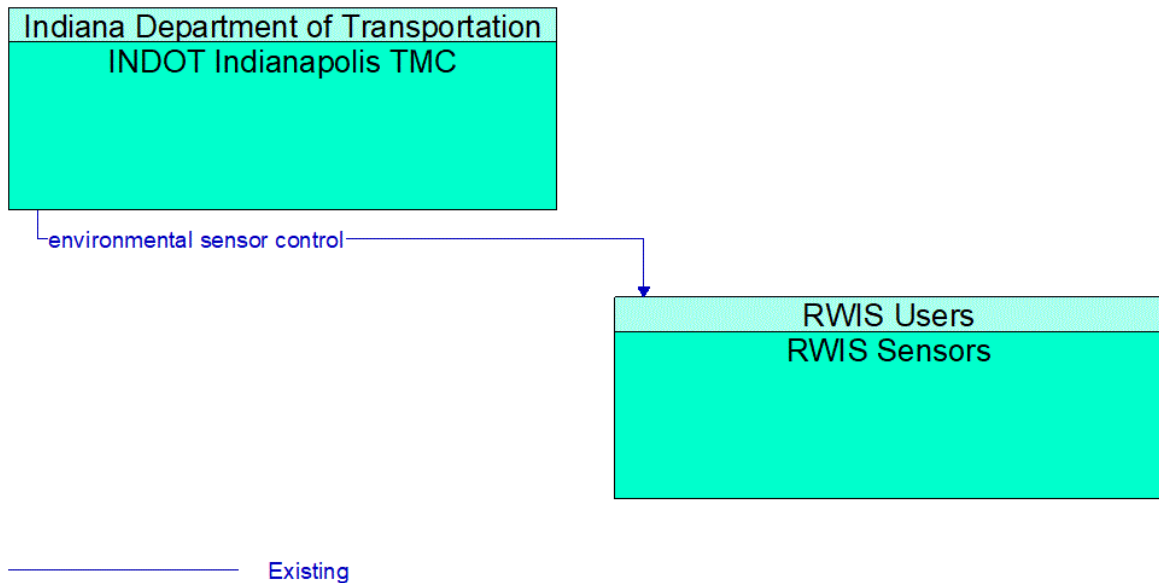


Figure 288: INDOT Indianapolis TMC - RWIS Sensors Interface

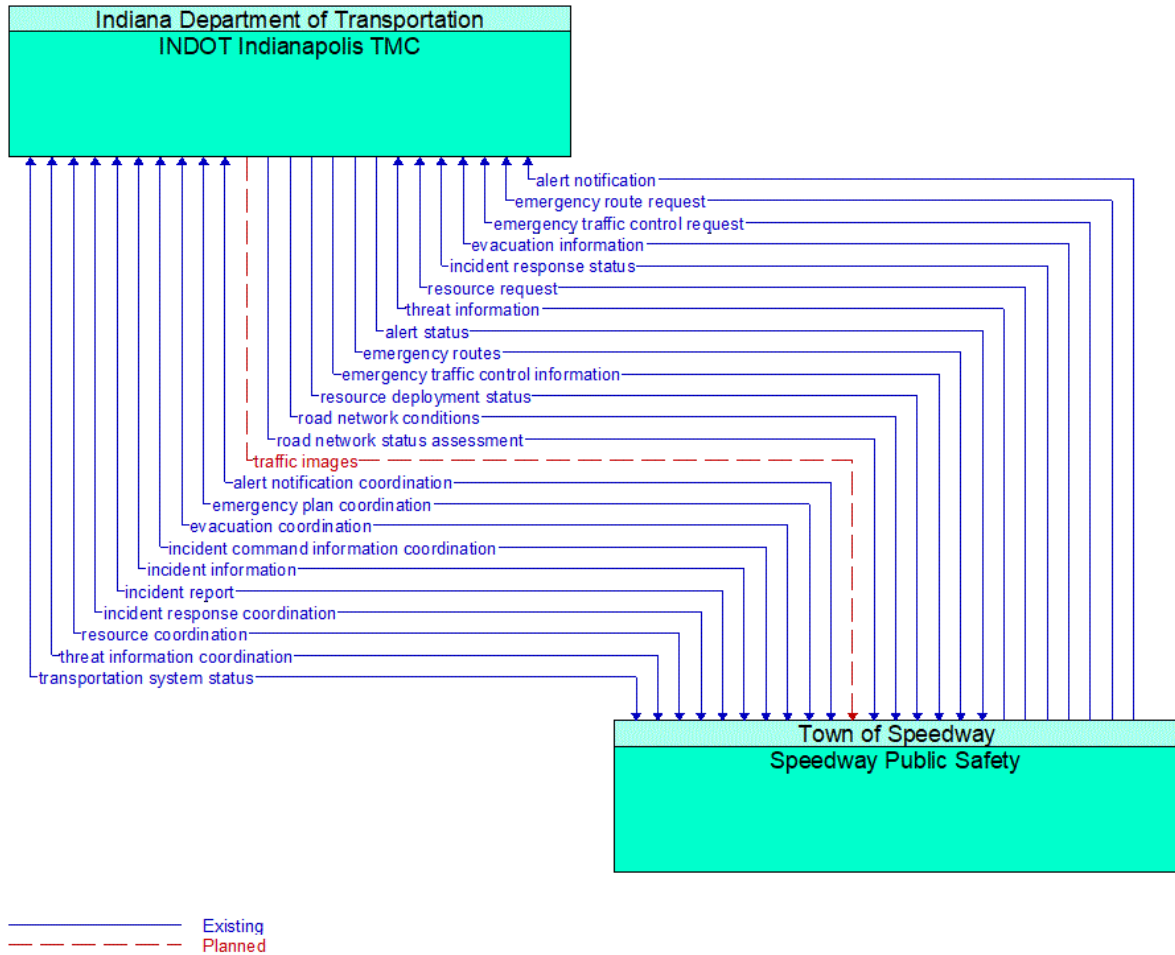


Figure 289: INDOT Indianapolis TMC - Speedway Public Safety Interface

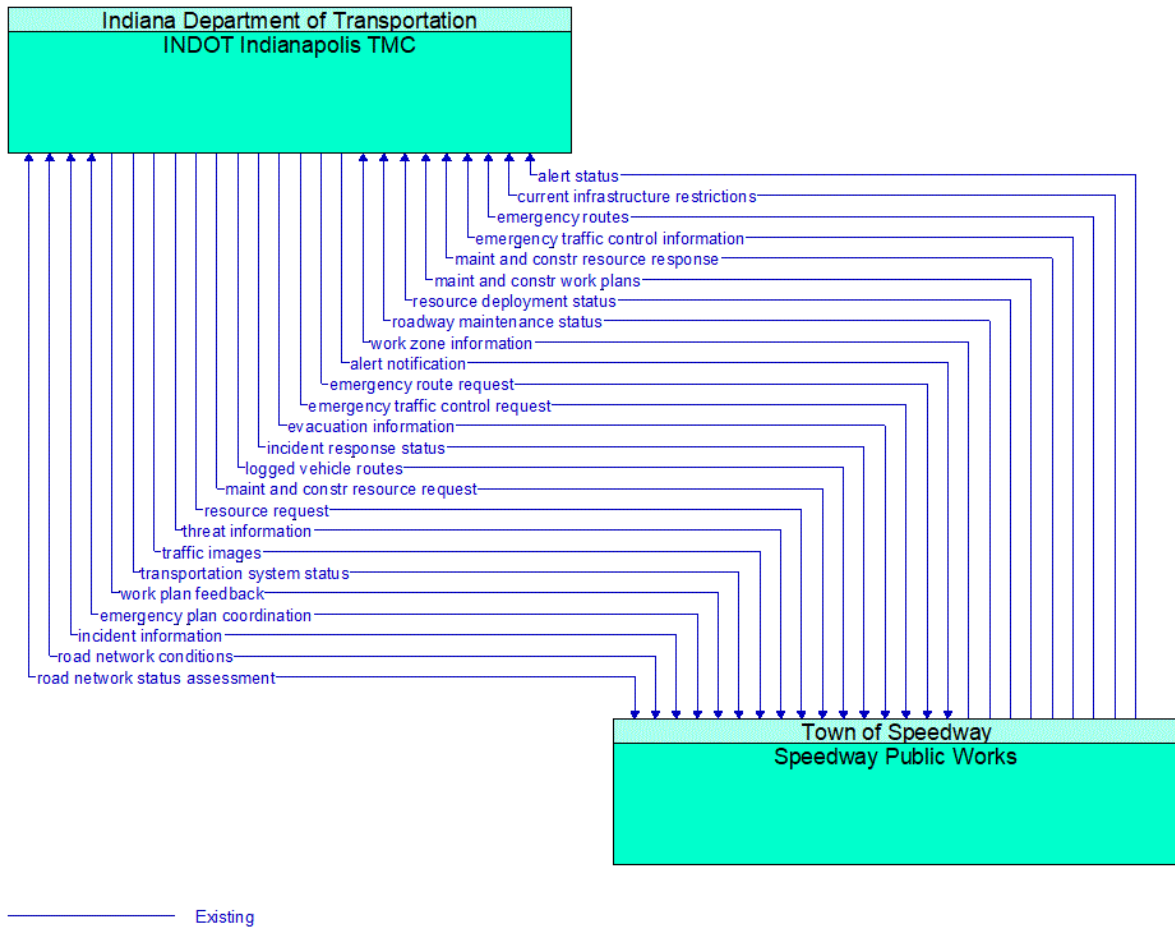


Figure 290: INDOT Indianapolis TMC - Speedway Public Works Interface

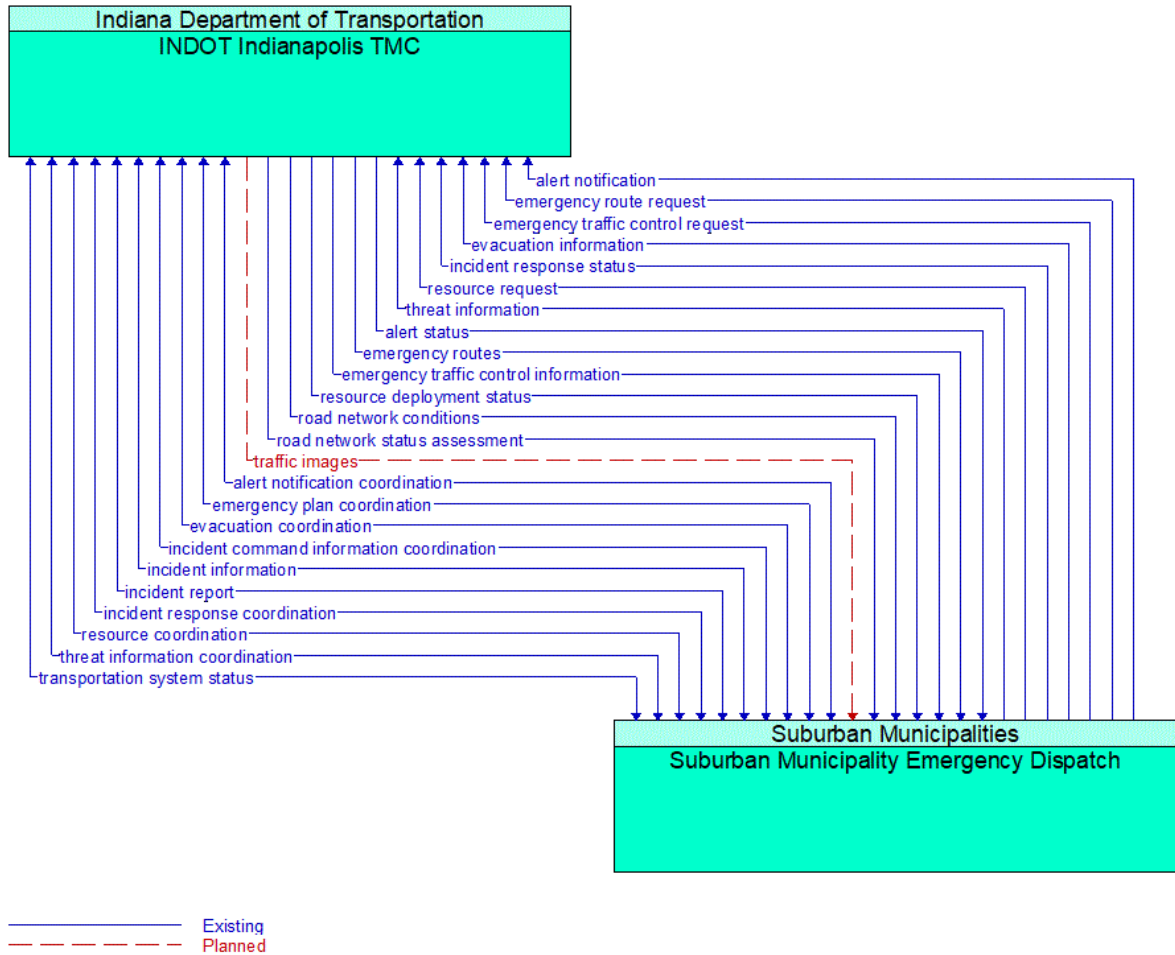


Figure 291: INDOT Indianapolis TMC - Suburban Municipality Emergency Dispatch Interface

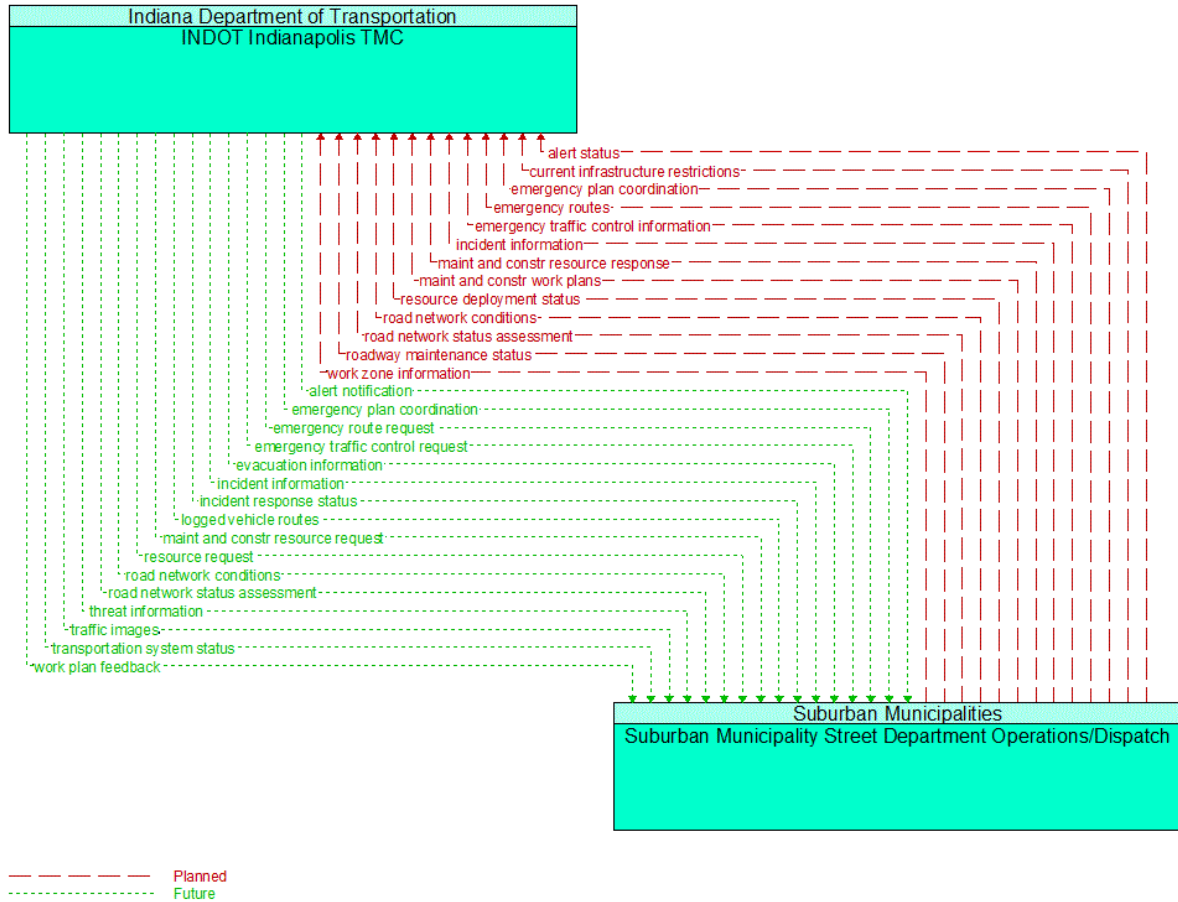


Figure 292: INDOT Indianapolis TMC - Suburban Municipality Street Department Operations/Dispatch Interface

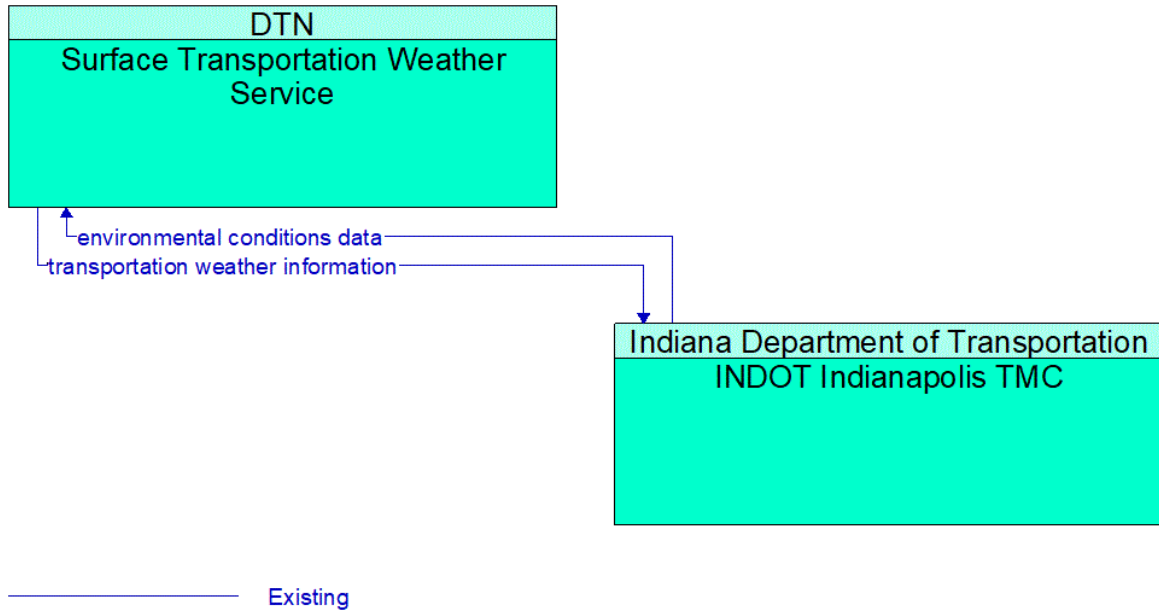


Figure 293: INDOT Indianapolis TMC - Surface Transportation Weather Service Interface

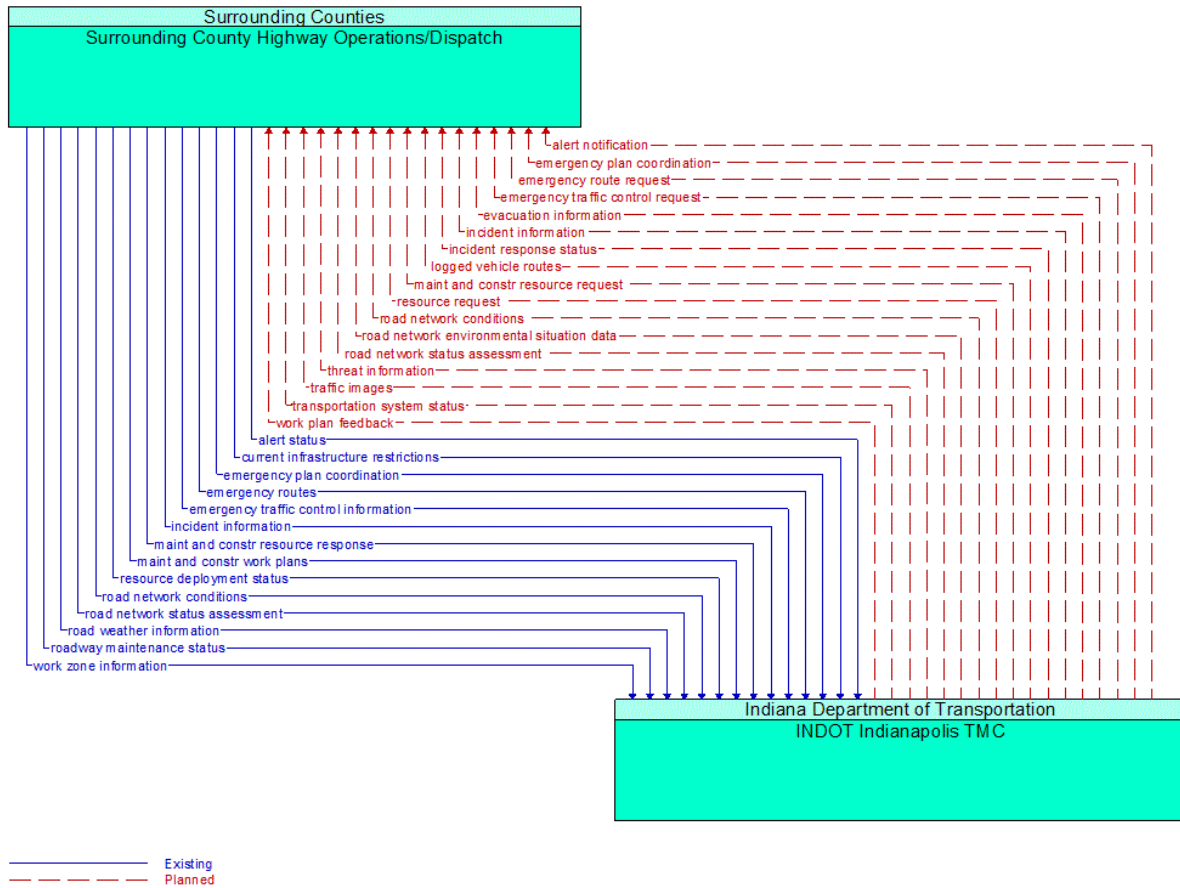


Figure 294: INDOT Indianapolis TMC - Surrounding County Highway Operations/Dispatch Interface

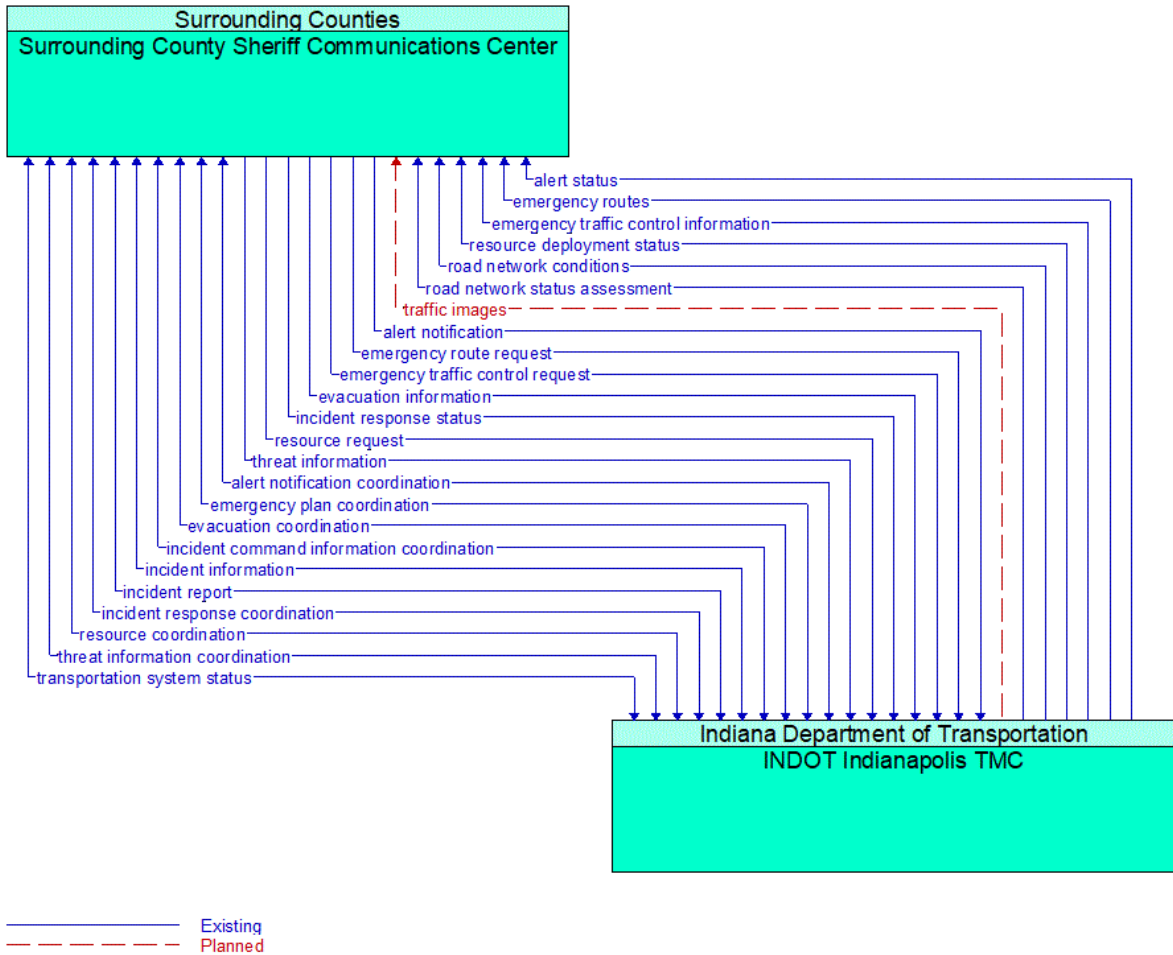


Figure 295: INDOT Indianapolis TMC - Surrounding County Sheriff Communications Center Interface

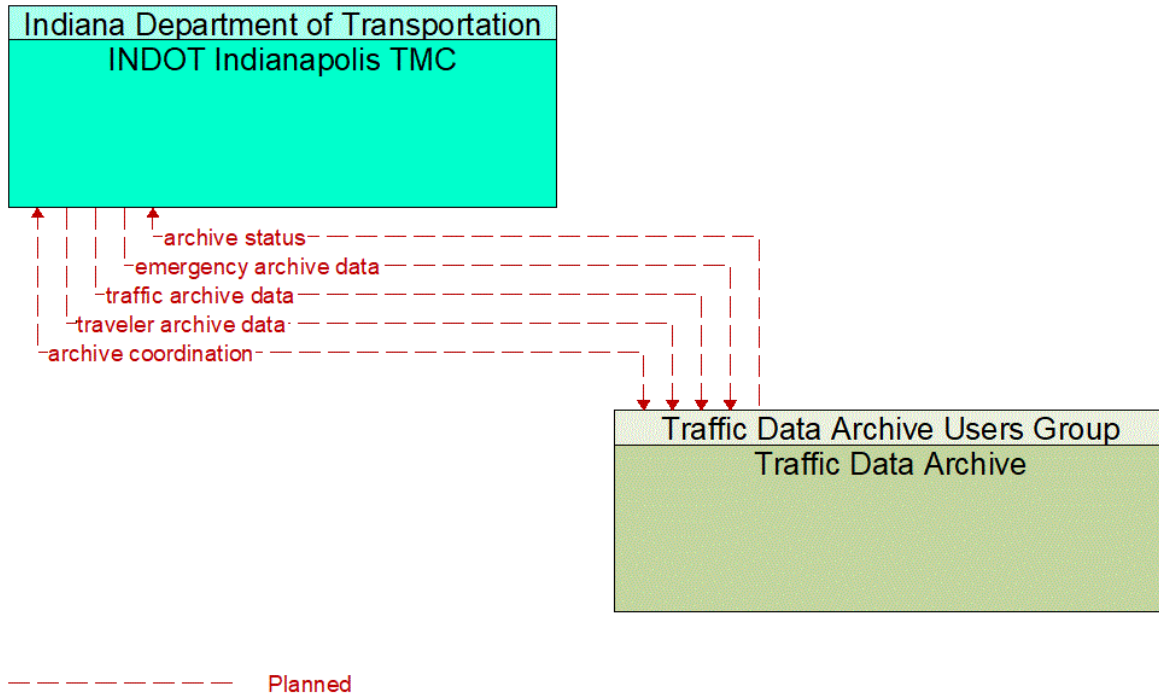


Figure 296: INDOT Indianapolis TMC - Traffic Data Archive Interface

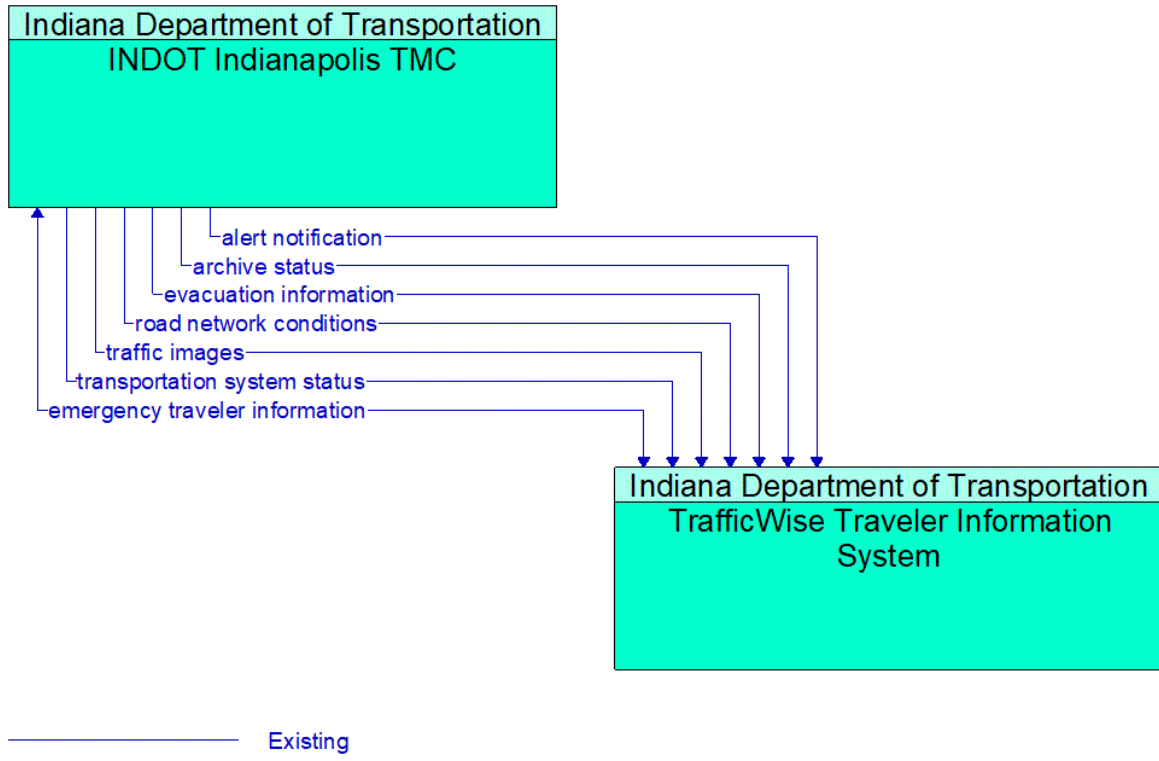
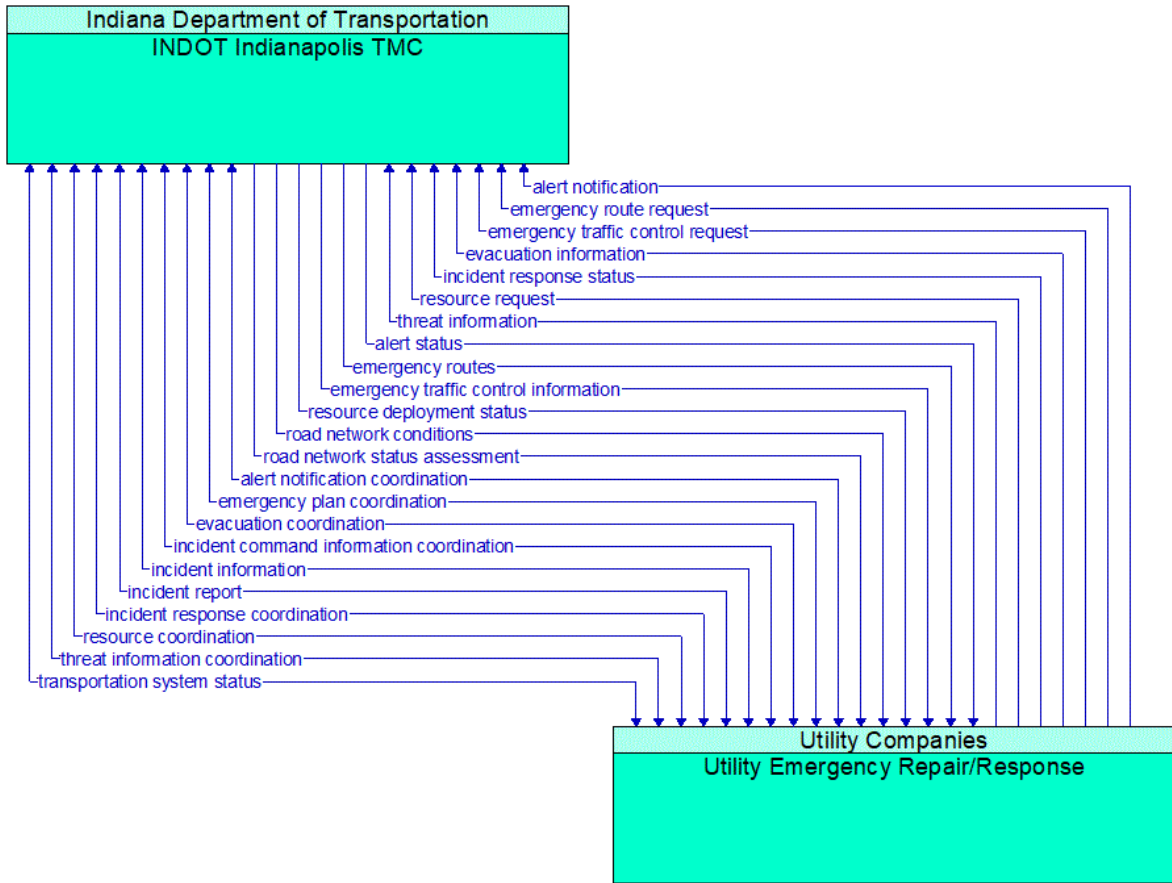


Figure 297: INDOT Indianapolis TMC - TrafficWise Traveler Information System Interface



Existing

Figure 298: INDOT Indianapolis TMC - Utility Emergency Repair/Response Interface

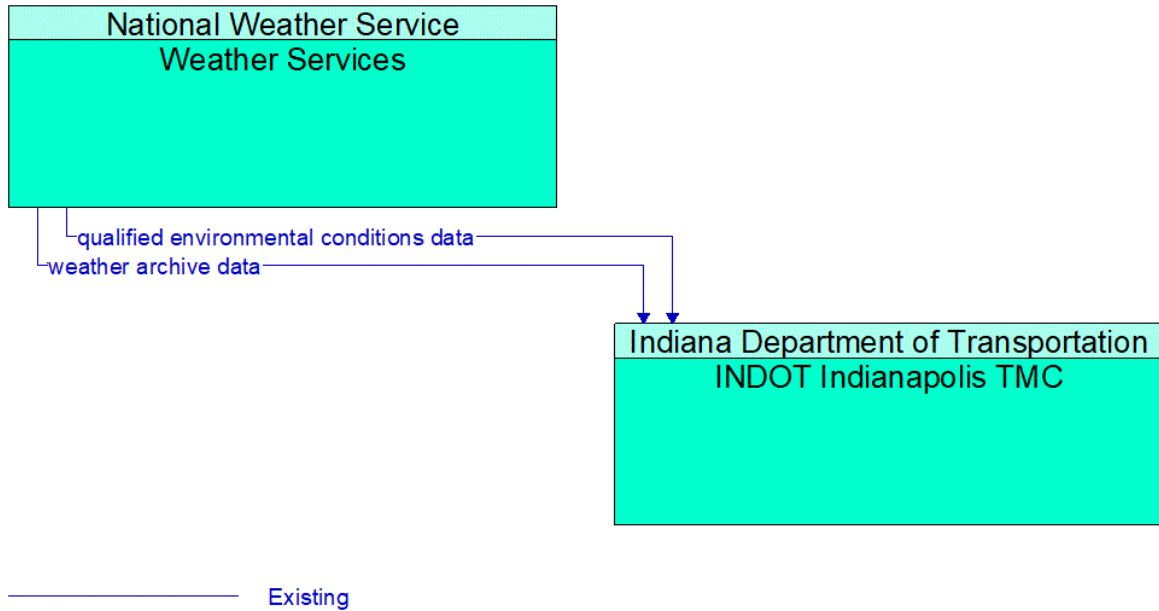


Figure 299: INDOT Indianapolis TMC - Weather Services Interface

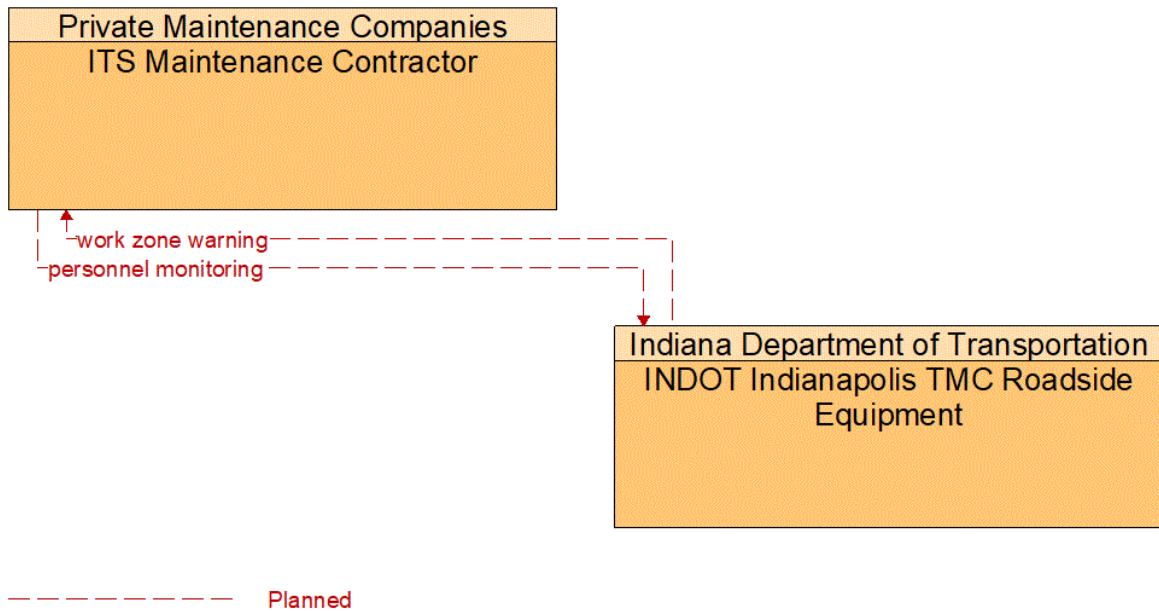


Figure 300: INDOT Indianapolis TMC Roadside Equipment - ITS Maintenance Contractor Interface

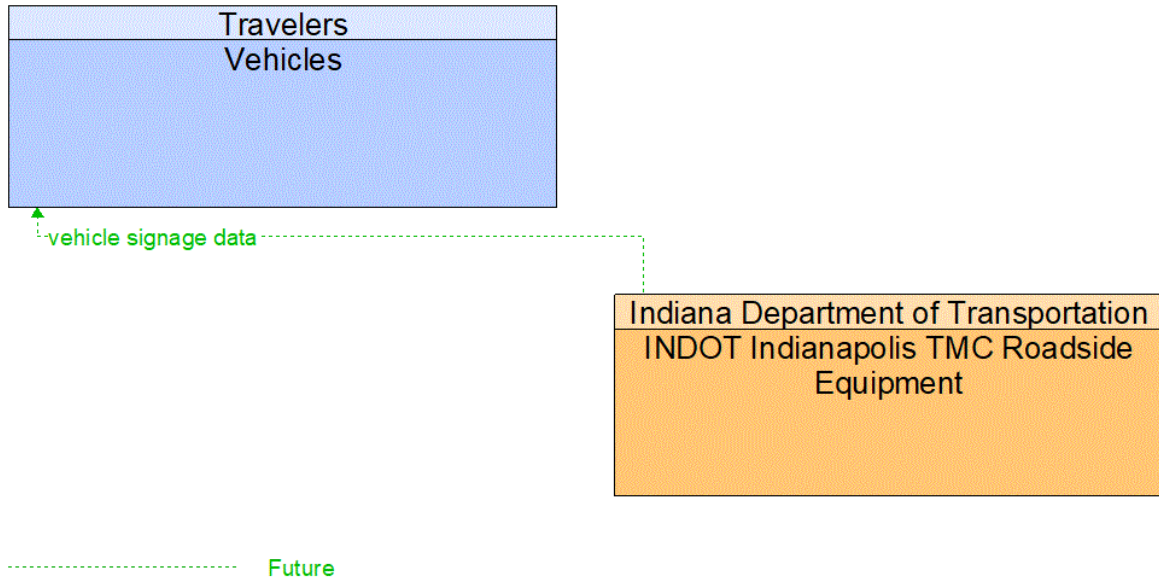


Figure 301: INDOT Indianapolis TMC Roadside Equipment - Vehicles Interface

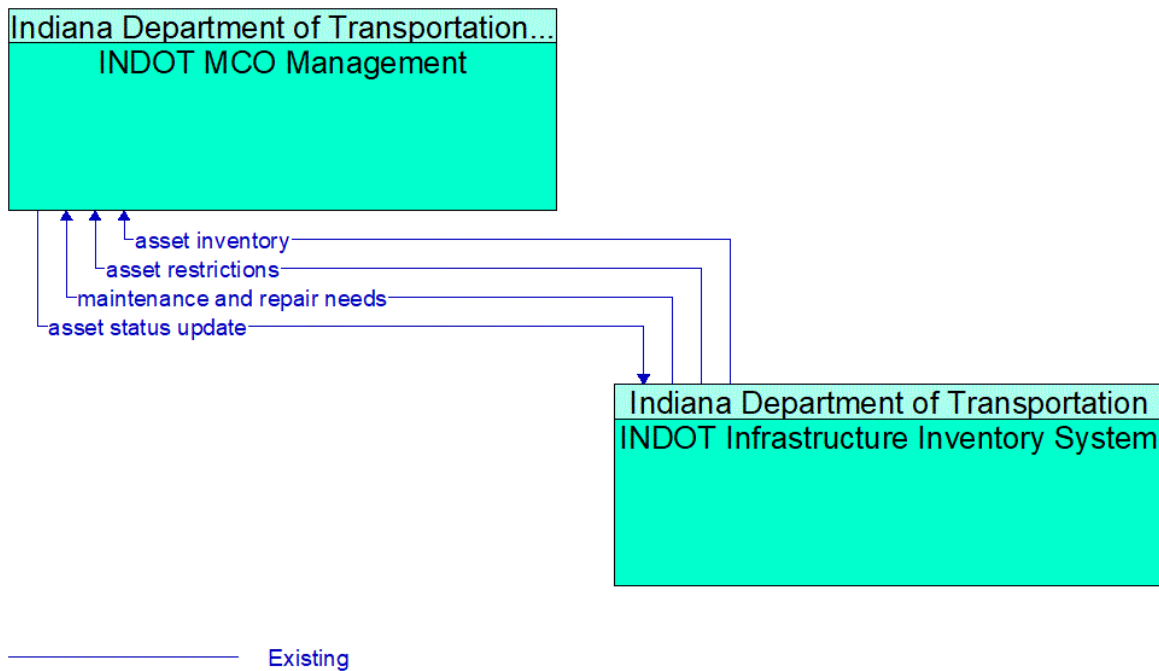


Figure 302: INDOT Infrastructure Inventory System - INDOT MCO Management Interface

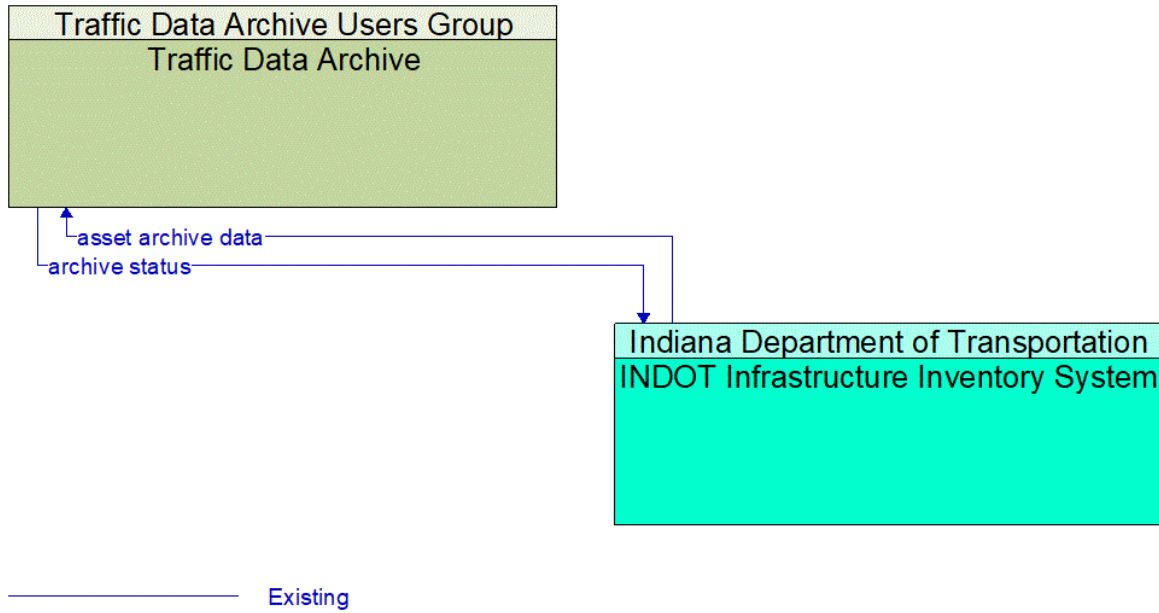


Figure 303: INDOT Infrastructure Inventory System - Traffic Data Archive Interface

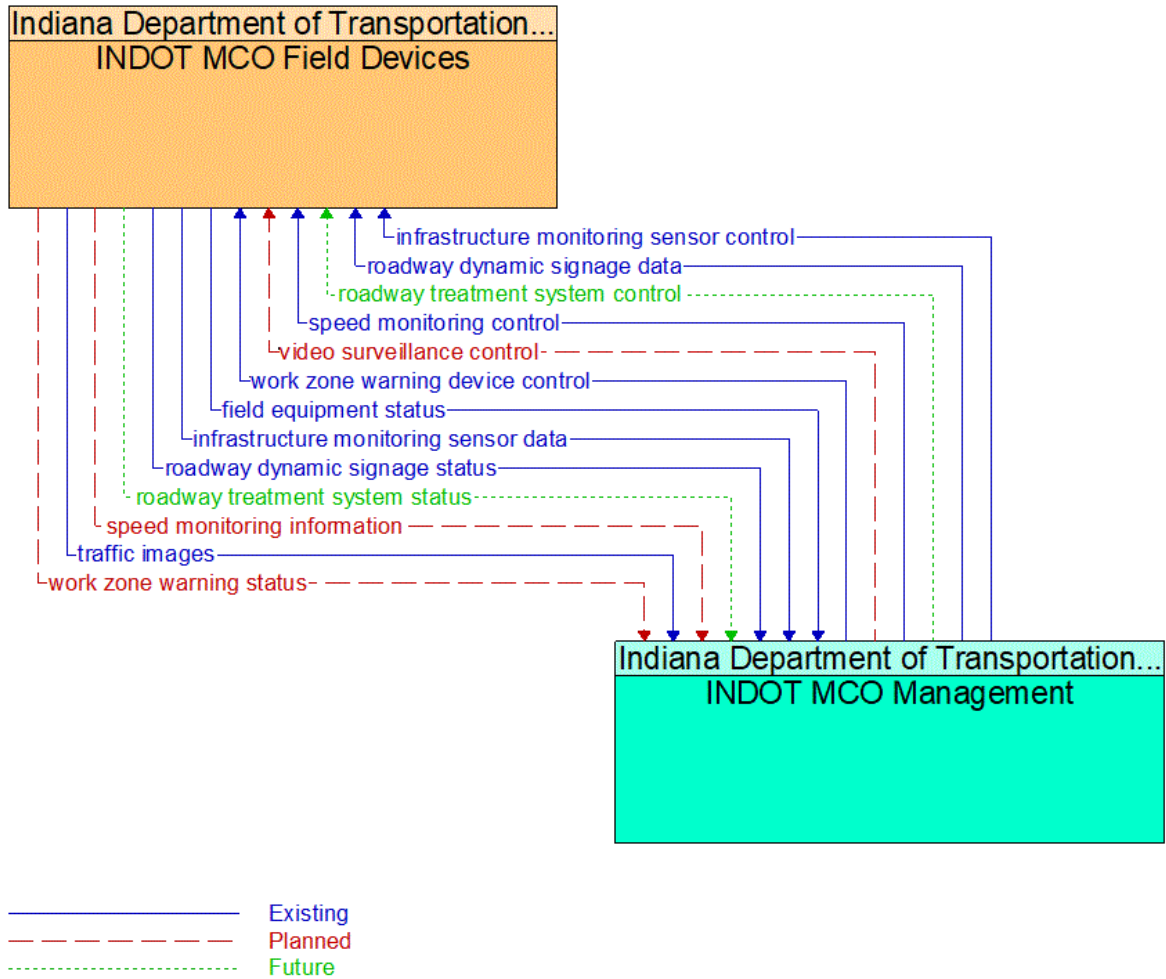


Figure 304: INDOT MCO Field Devices - INDOT MCO Management Interface

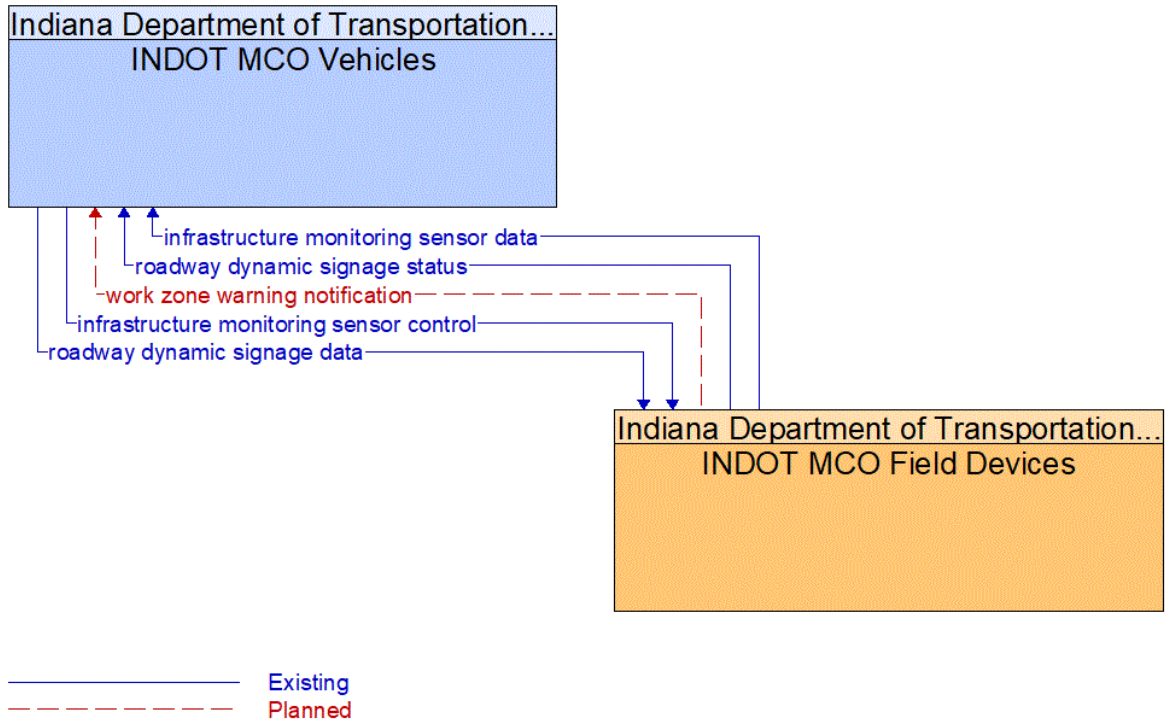


Figure 305: INDOT MCO Field Devices - INDOT MCO Vehicles Interface

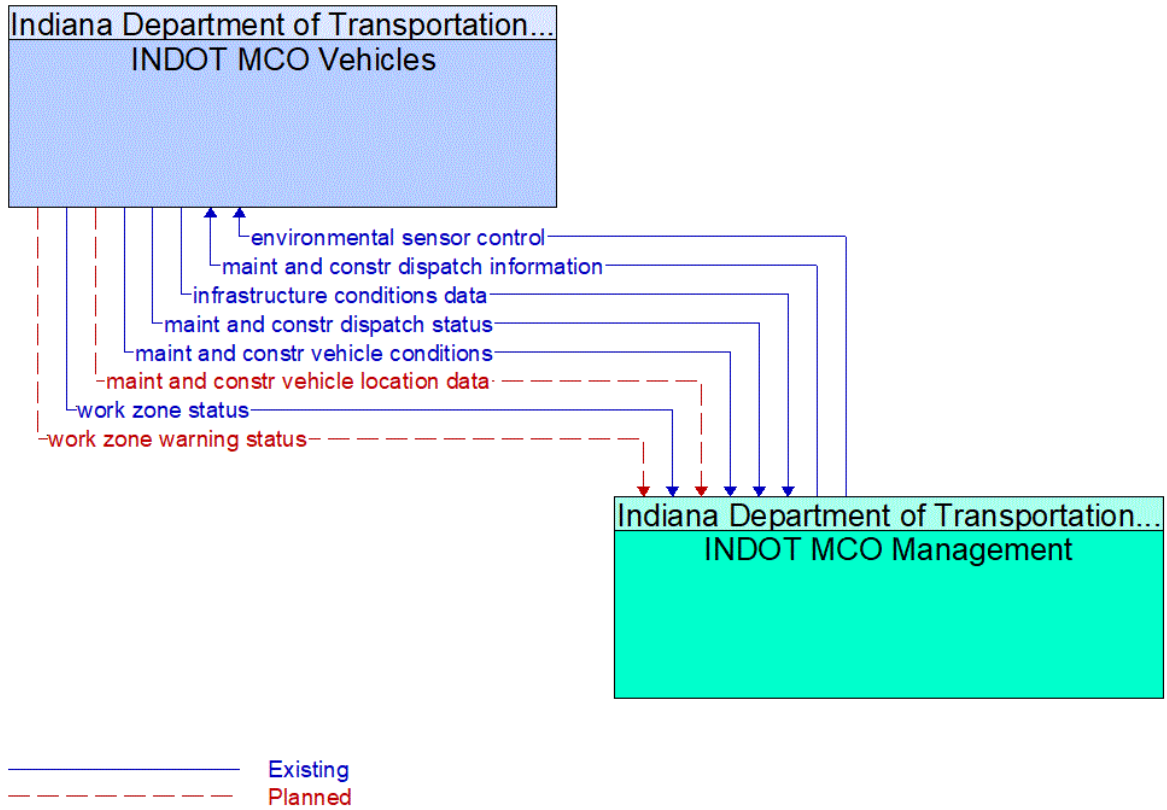


Figure 306: INDOT MCO Management - INDOT MCO Vehicles Interface

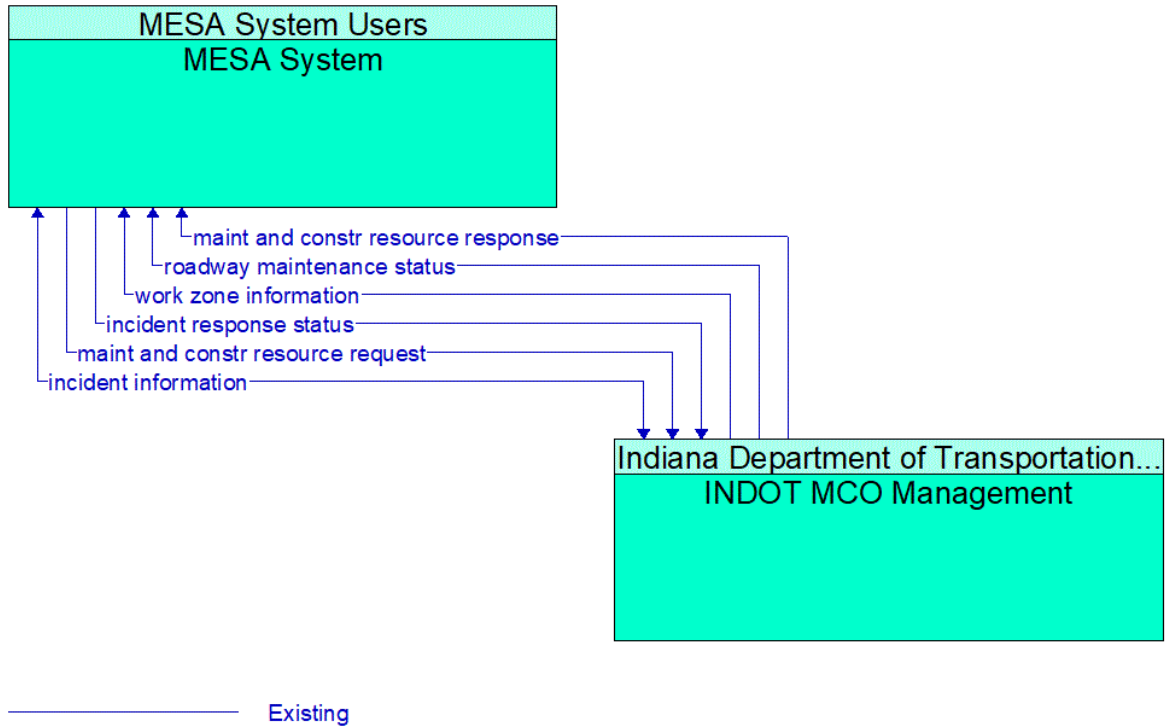
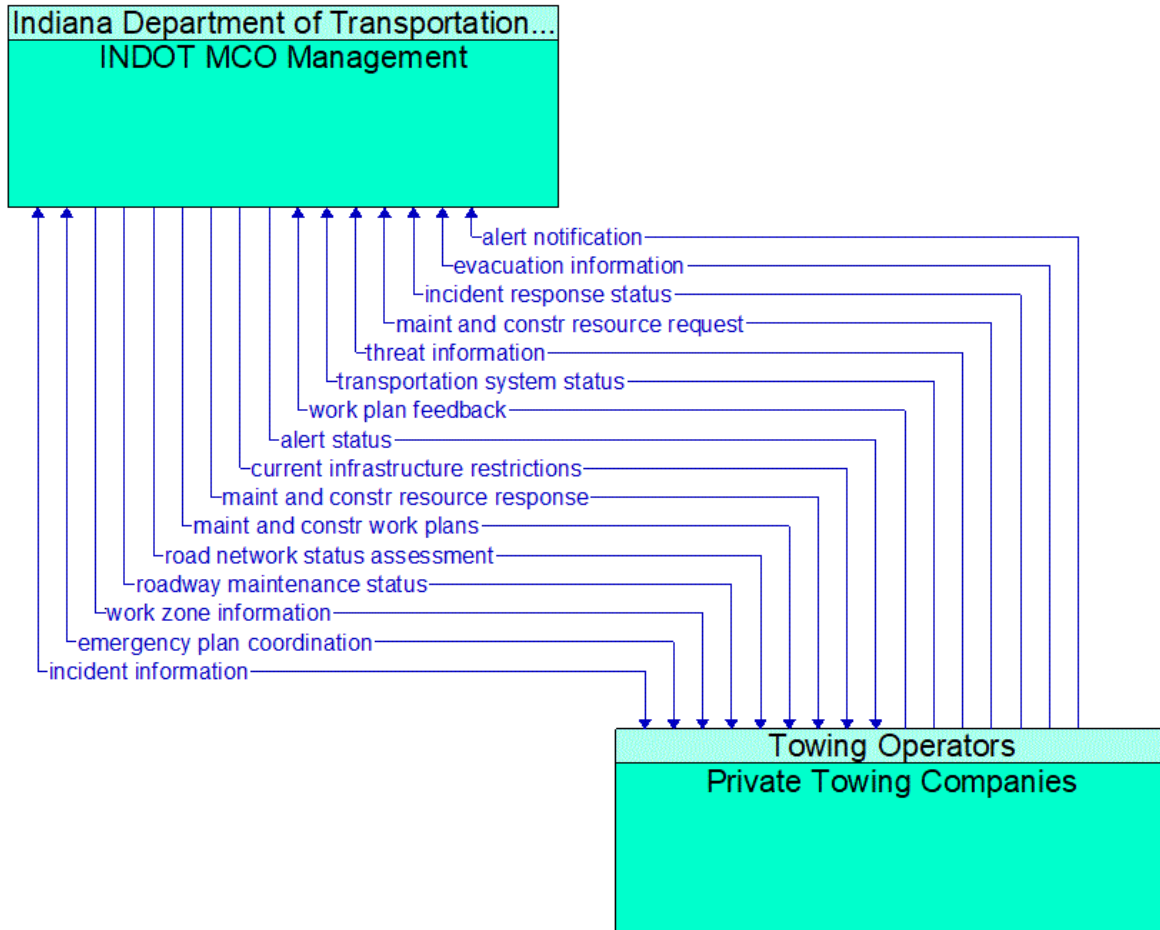


Figure 307: INDOT MCO Management - MESA System Interface



Existing

Figure 308: INDOT MCO Management - Private Towing Companies Interface

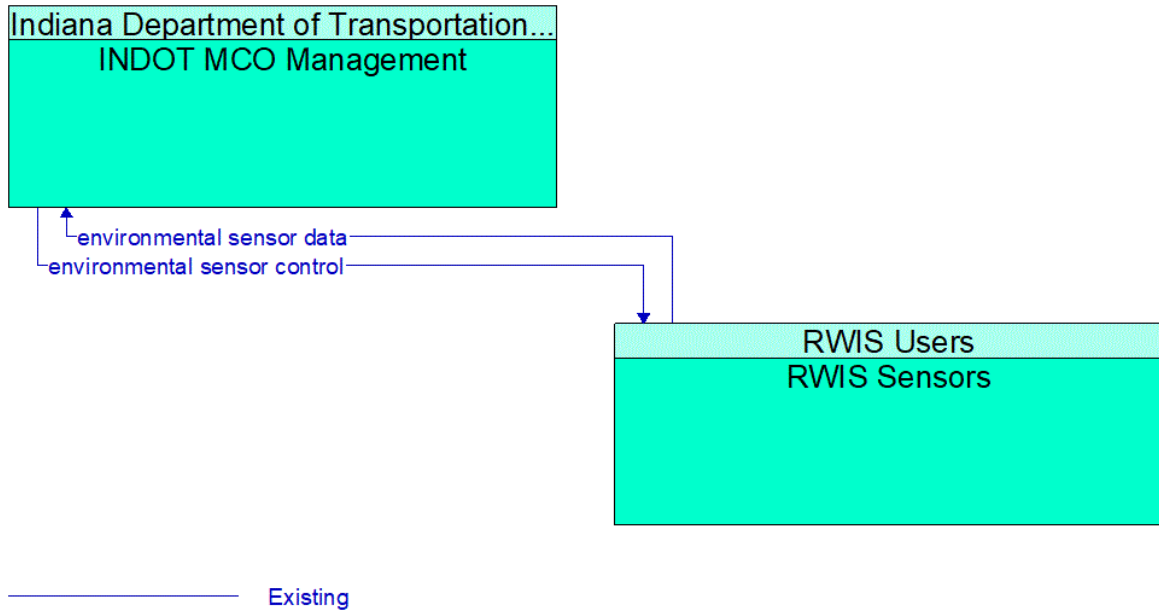


Figure 309: INDOT MCO Management - RWIS Sensors Interface

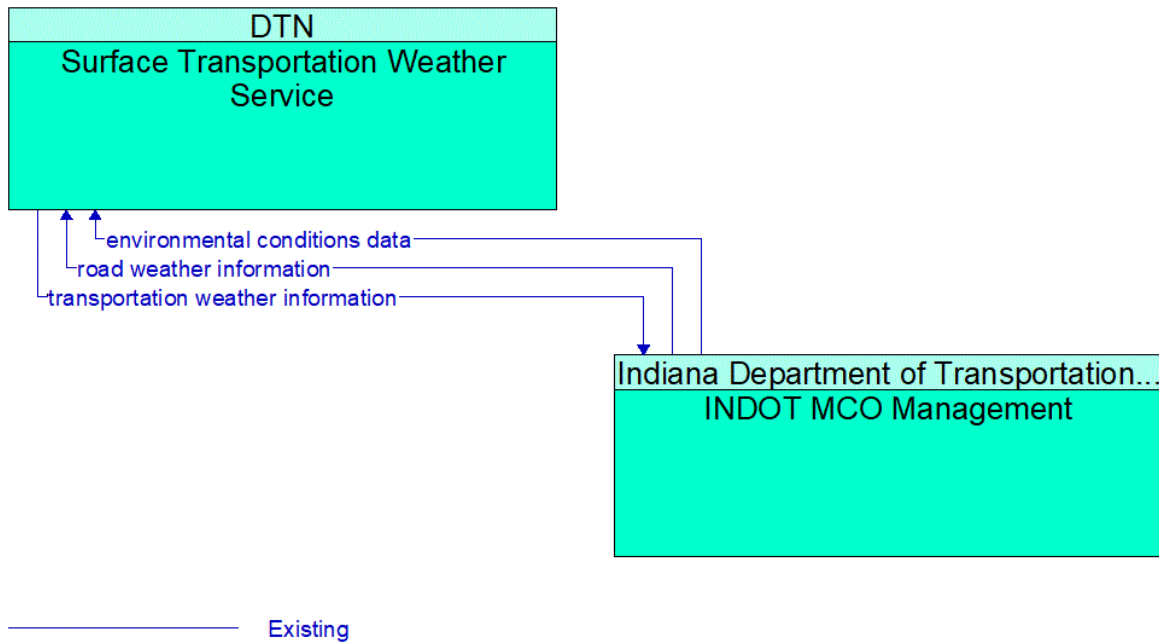


Figure 310: INDOT MCO Management - Surface Transportation Weather Service Interface

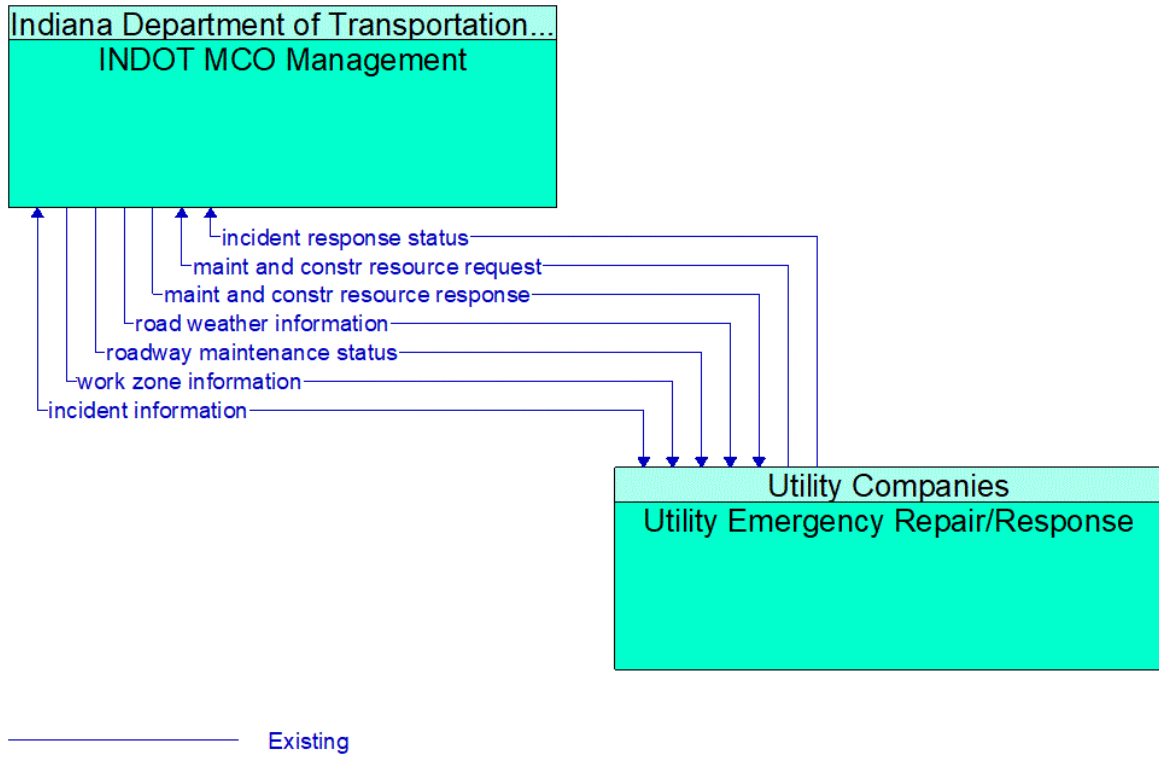


Figure 311: INDOT MCO Management - Utility Emergency Repair/Response Interface

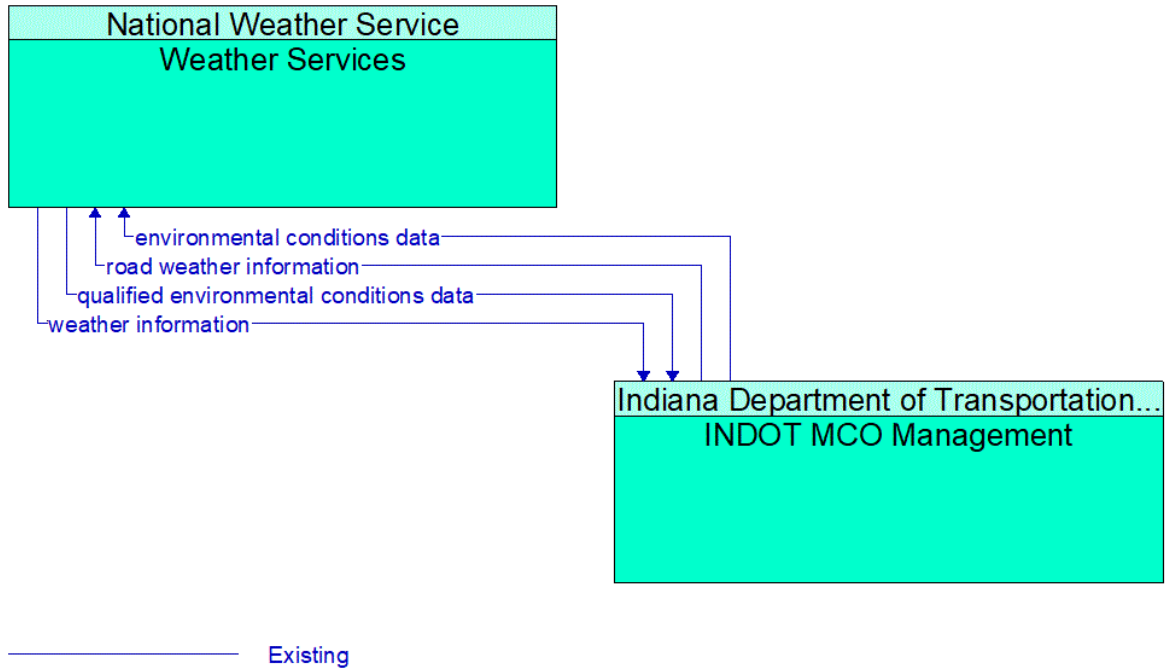


Figure 312: INDOT MCO Management - Weather Services Interface

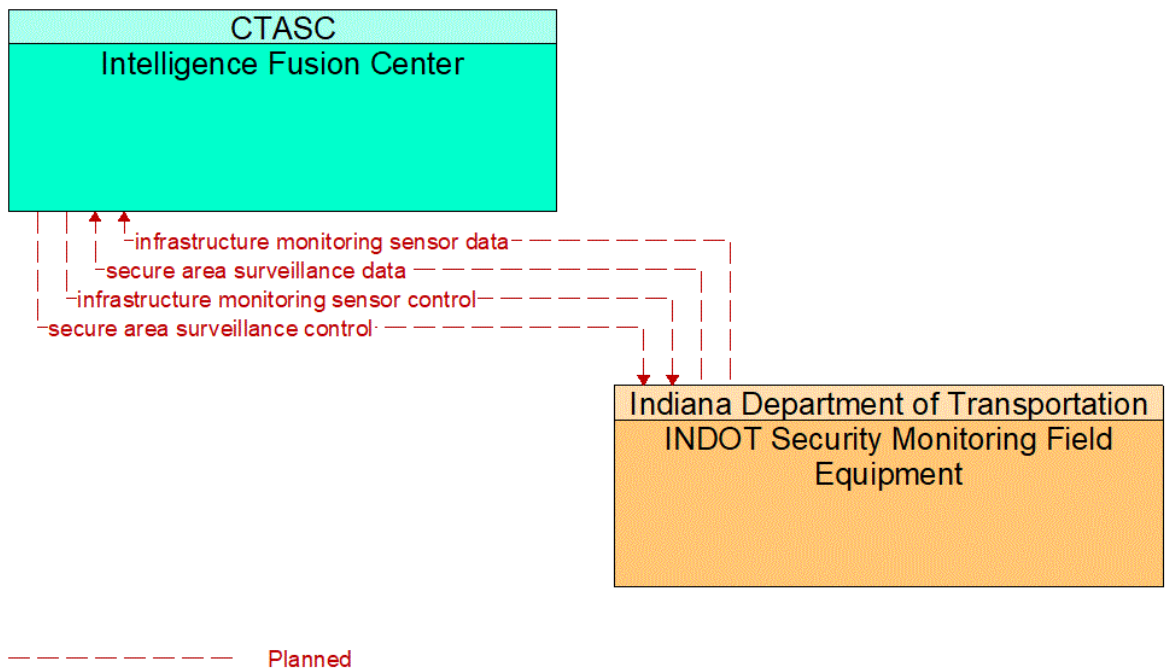


Figure 313: INDOT Security Monitoring Field Equipment - Intelligence Fusion Center Interface

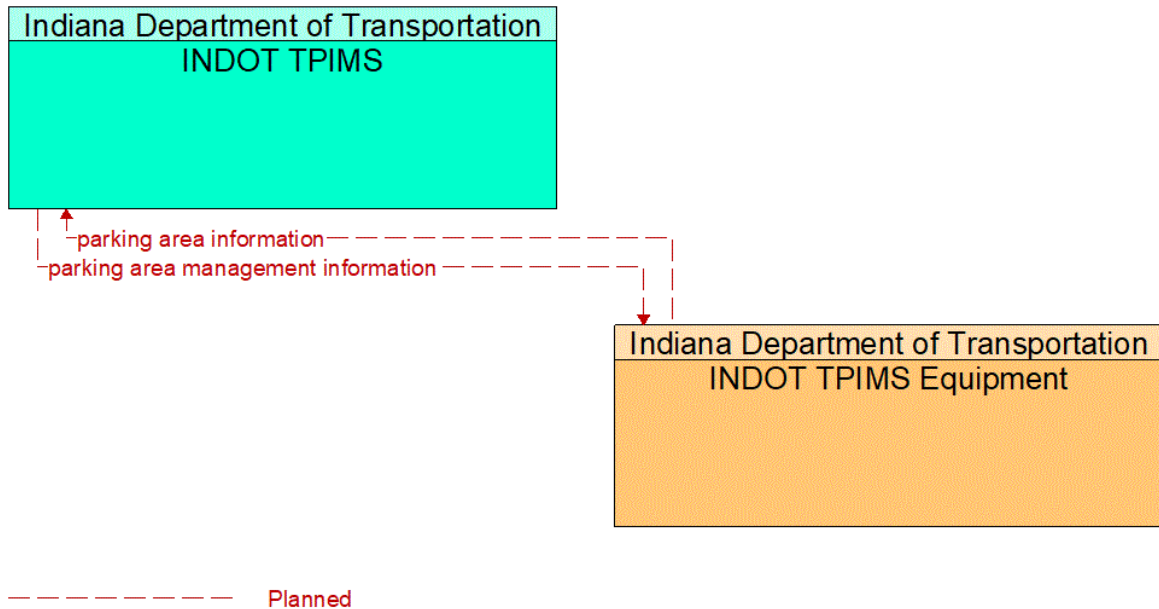


Figure 314: INDOT TPIMS - INDOT TPIMS Equipment Interface

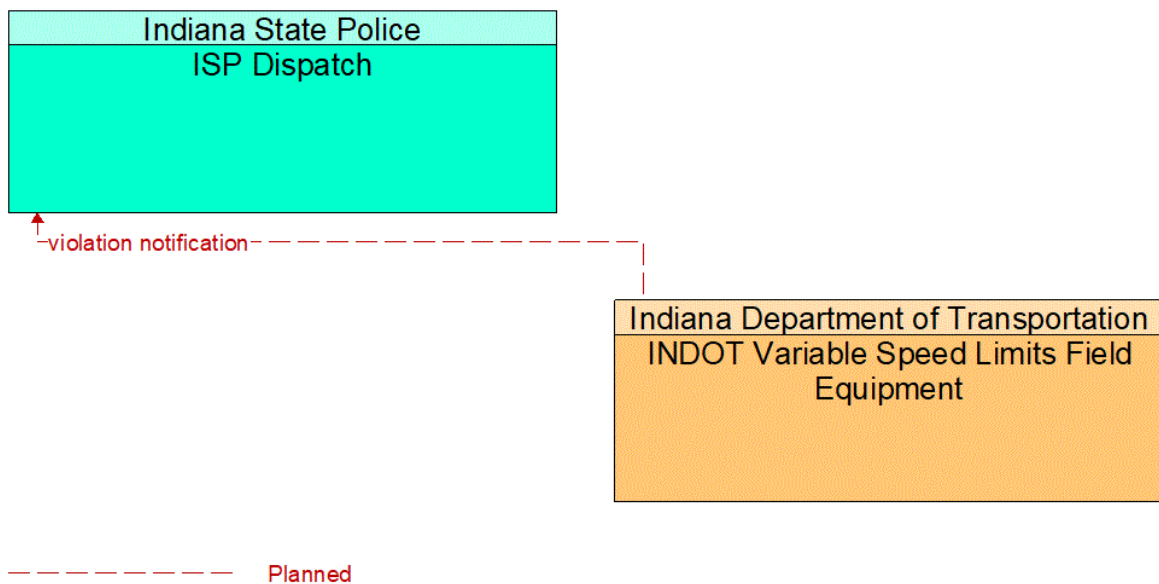


Figure 315: INDOT Variable Speed Limits Field Equipment - ISP Dispatch Interface

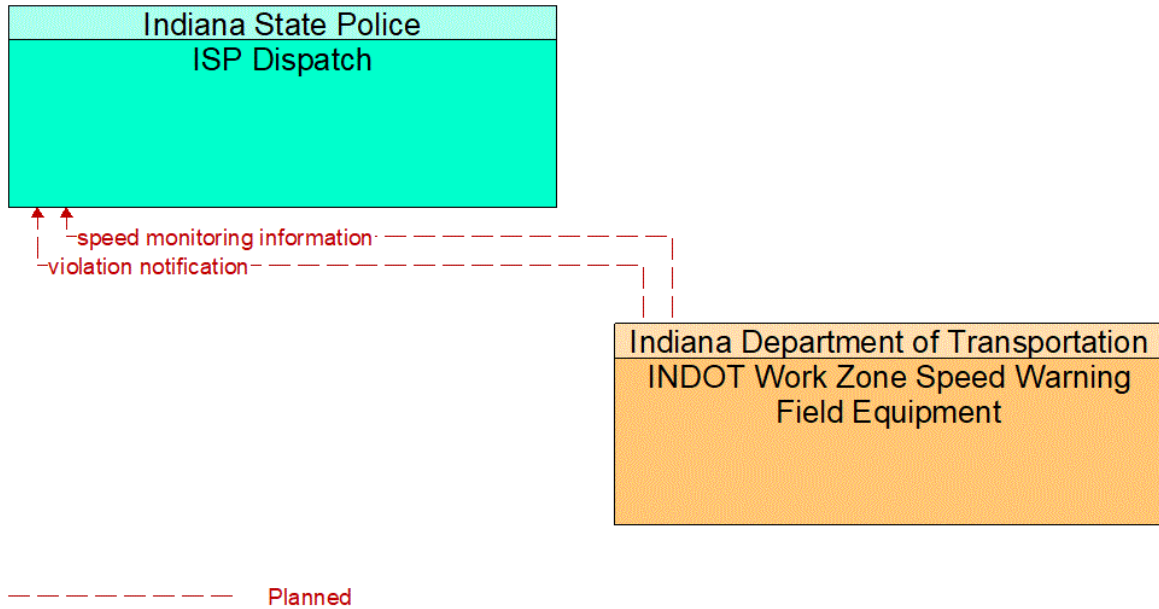


Figure 316: INDOT Work Zone Speed Warning Field Equipment - ISP Dispatch Interface

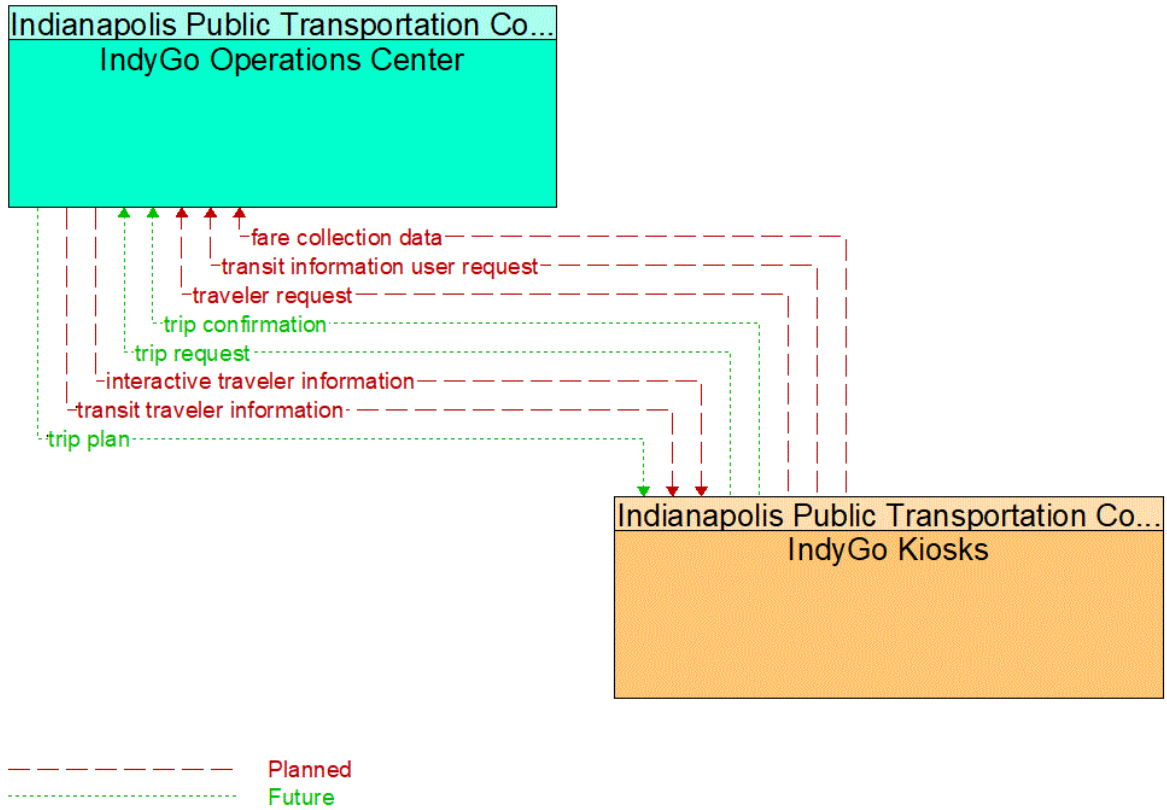


Figure 317: IndyGo Kiosks - IndyGo Operations Center Interface

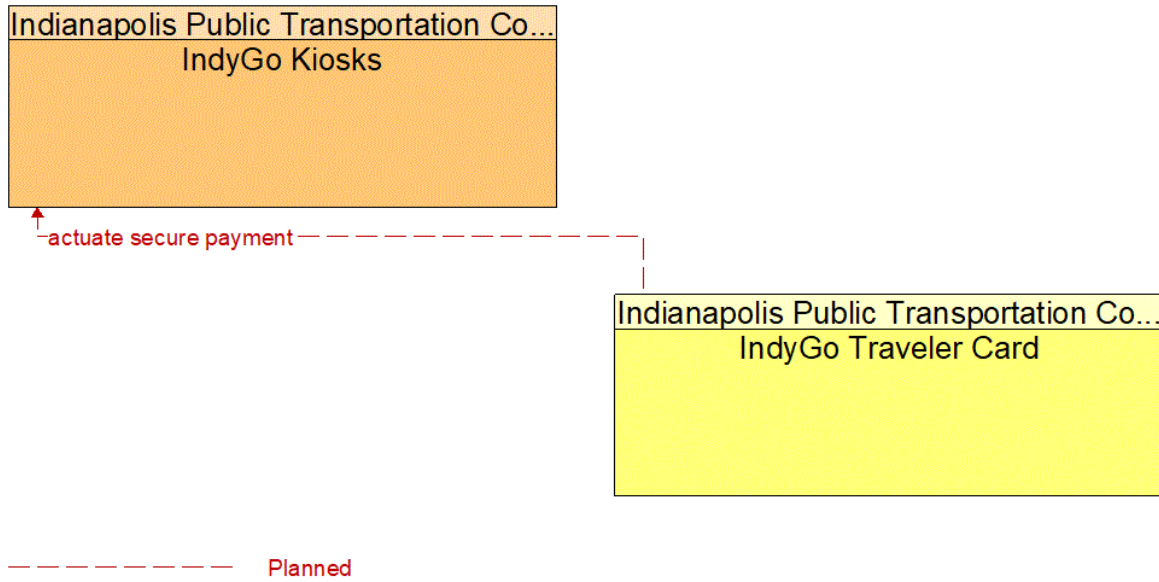


Figure 318: IndyGo Kiosks - IndyGo Traveler Card Interface

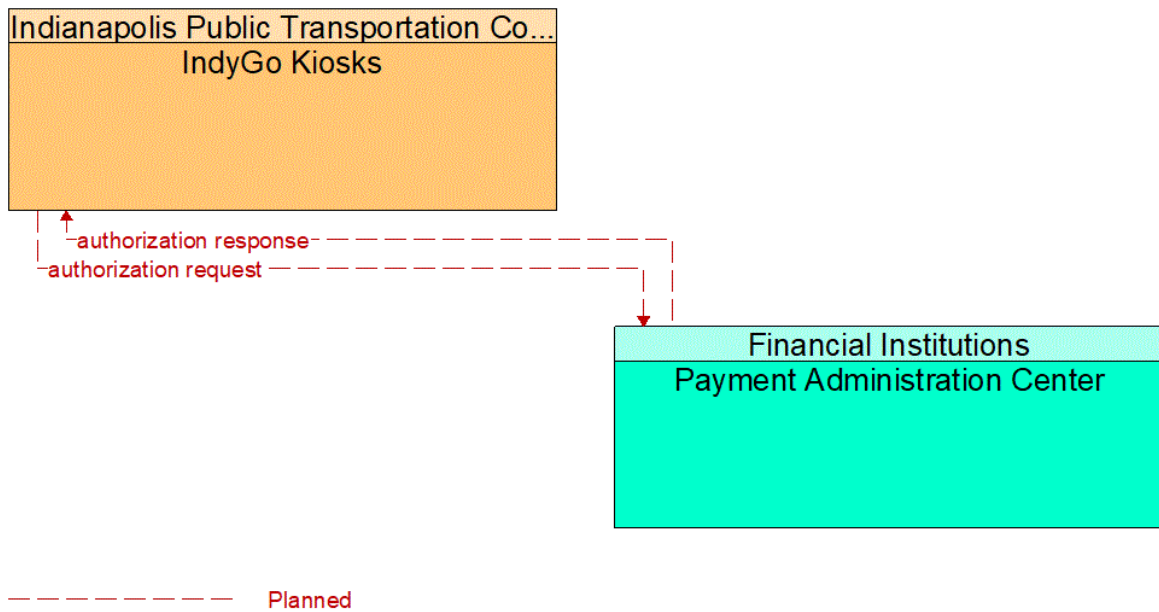


Figure 319: IndyGo Kiosks - Payment Administration Center Interface

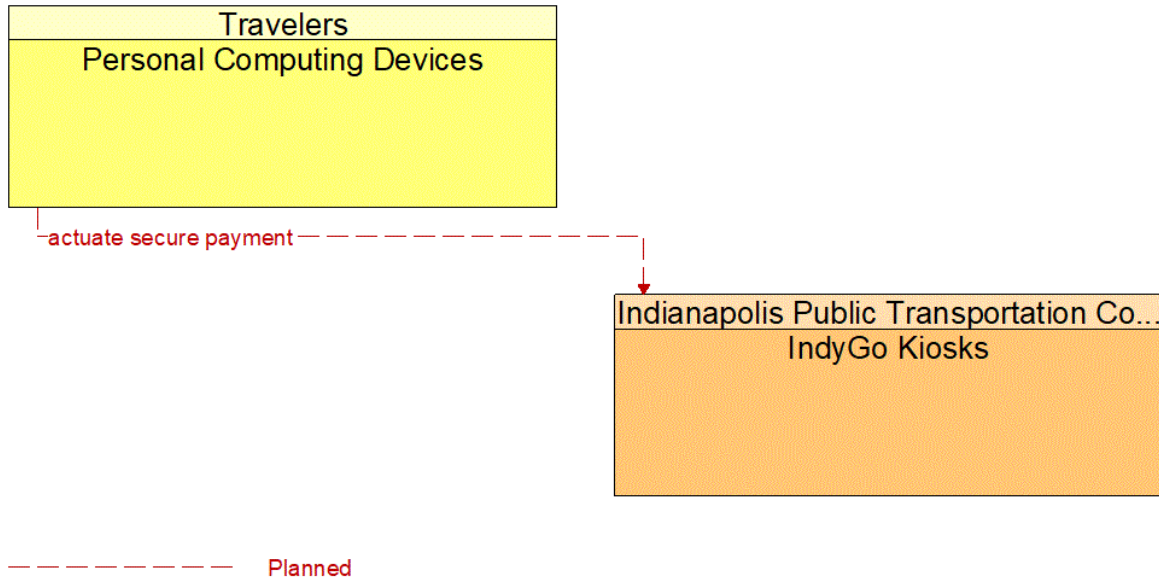


Figure 320: IndyGo Kiosks - Personal Computing Devices Interface

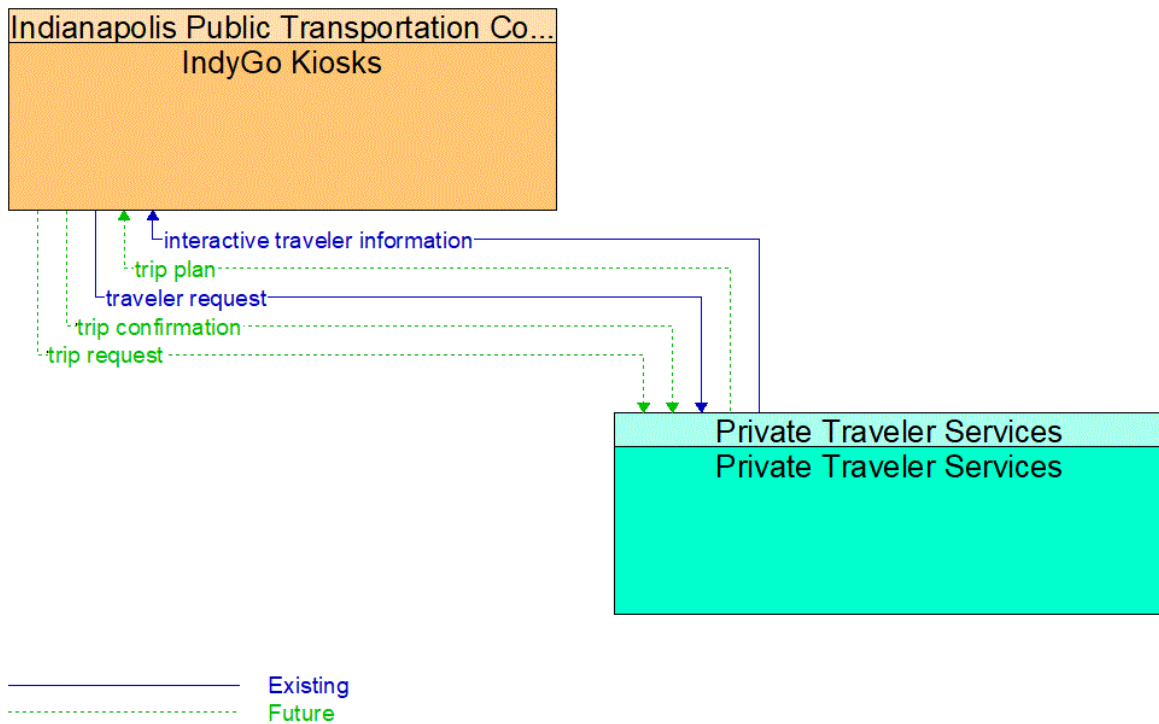


Figure 321: IndyGo Kiosks - Private Traveler Services Interface

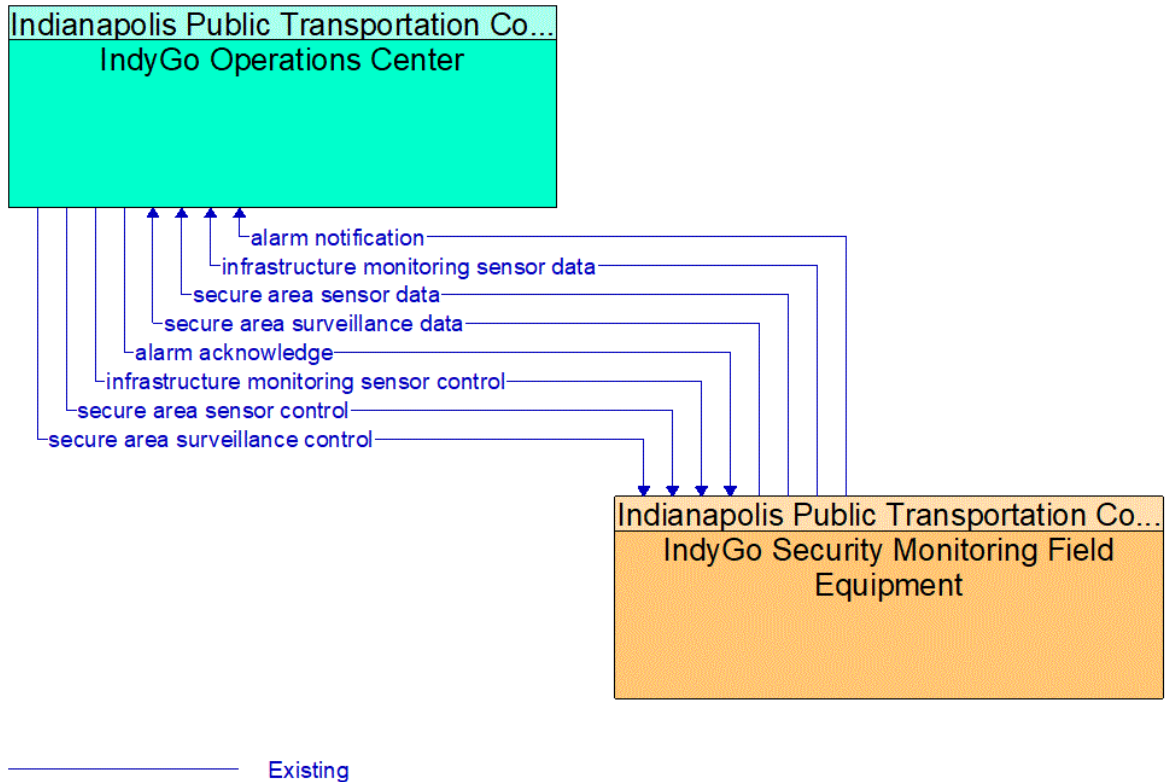


Figure 322: IndyGo Operations Center - IndyGo Security Monitoring Field Equipment Interface

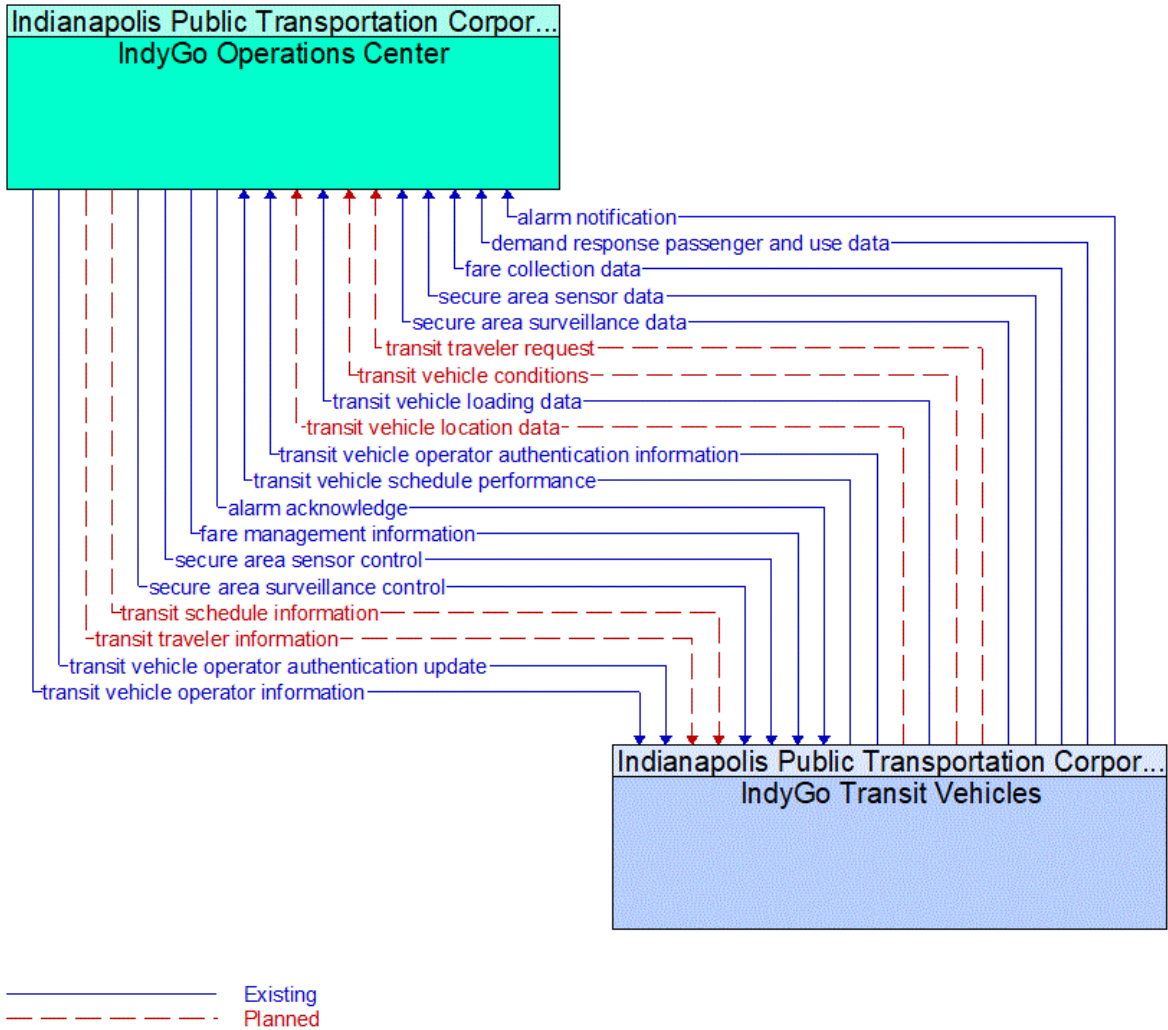


Figure 323: IndyGo Operations Center - IndyGo Transit Vehicles Interface

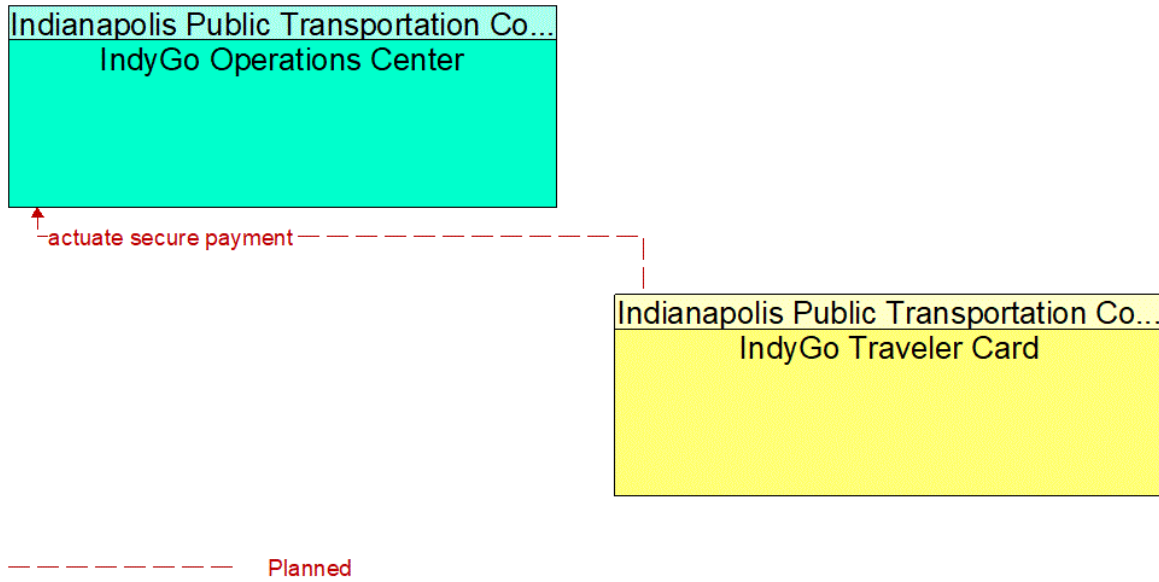


Figure 324: IndyGo Operations Center - IndyGo Traveler Card Interface

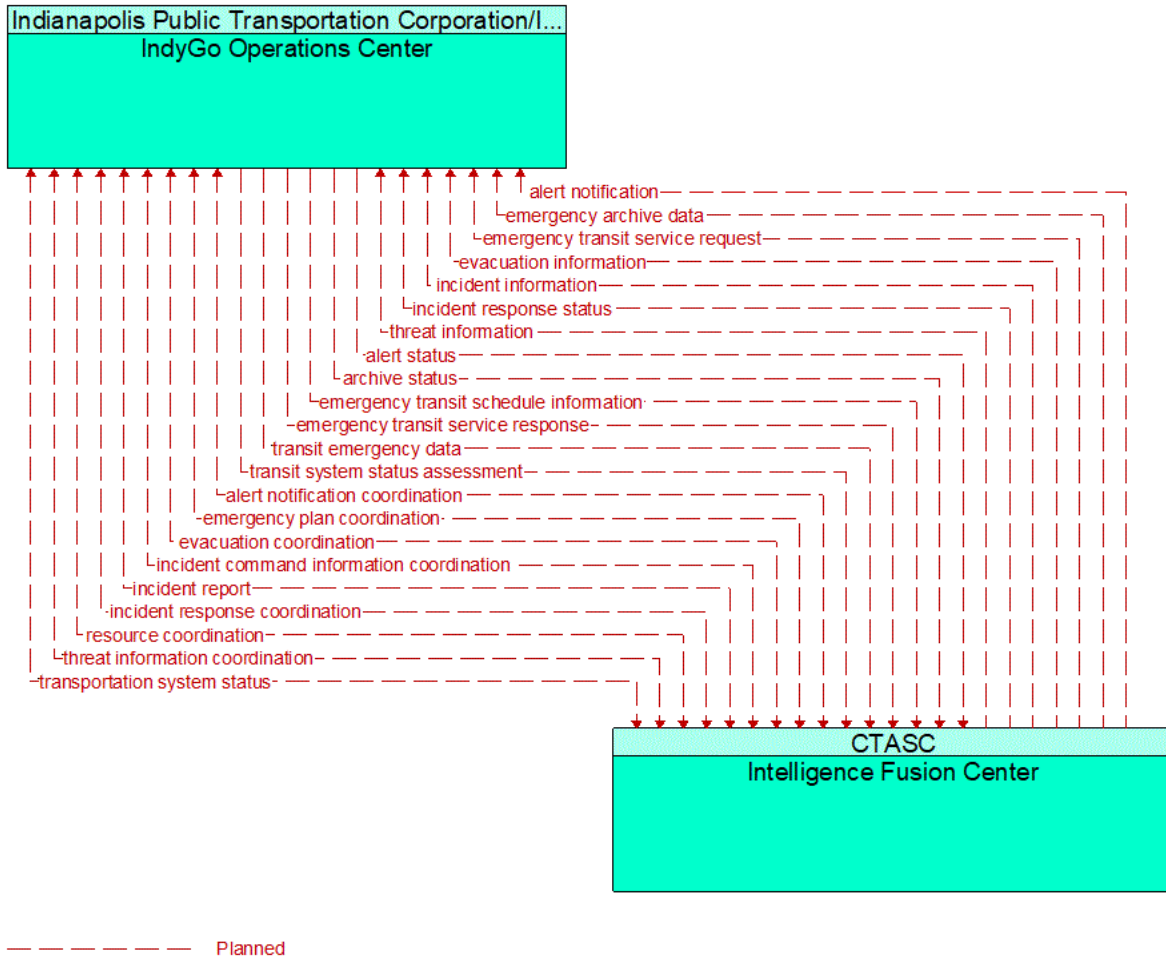


Figure 325: IndyGo Operations Center - Intelligence Fusion Center Interface

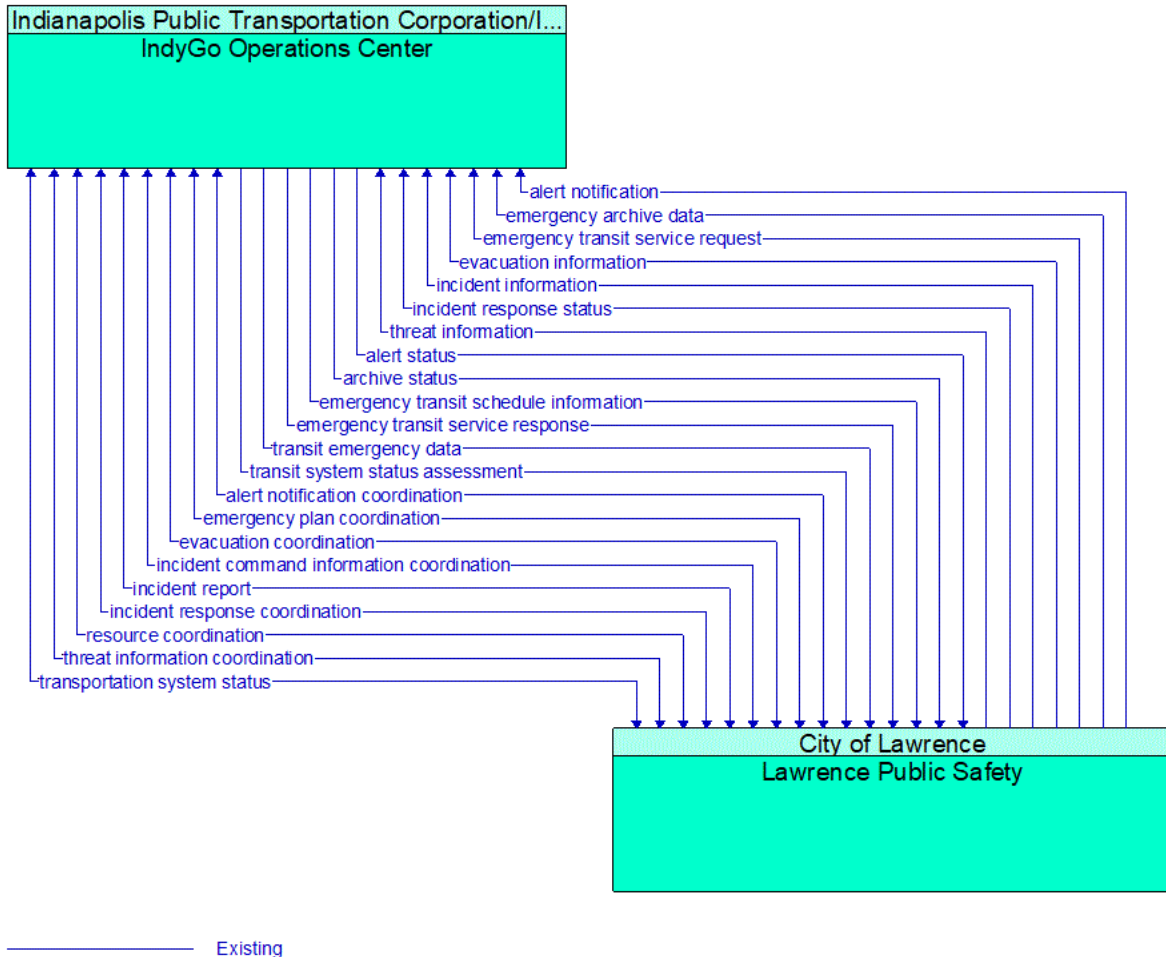


Figure 326: IndyGo Operations Center - Lawrence Public Safety Interface

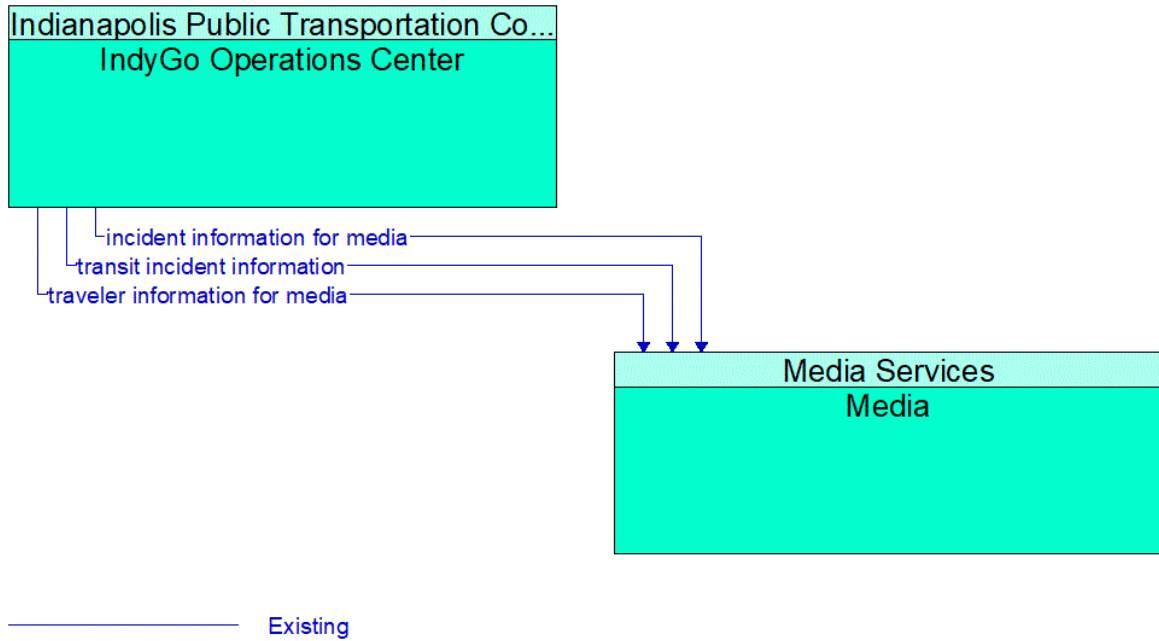


Figure 327: IndyGo Operations Center - Media Interface

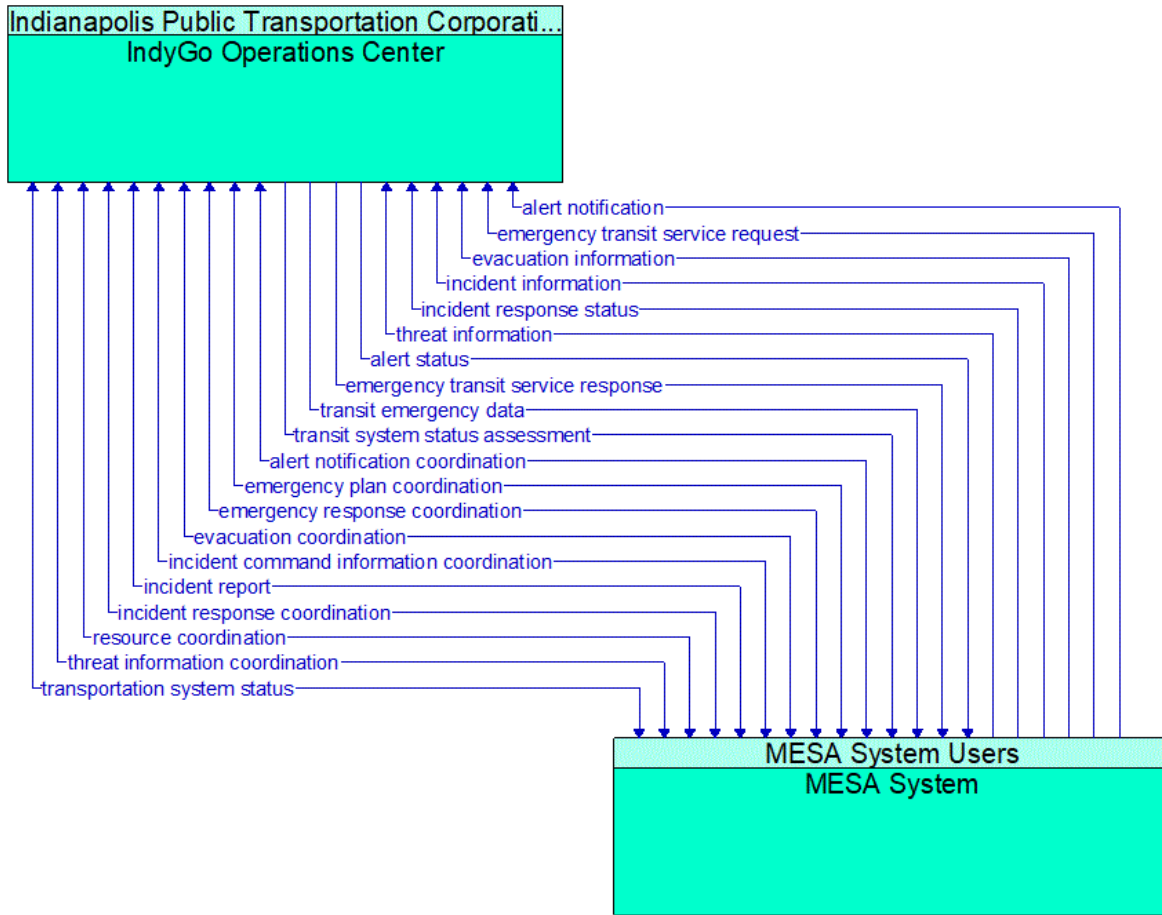


Figure 328: IndyGo Operations Center - MESA System Interface

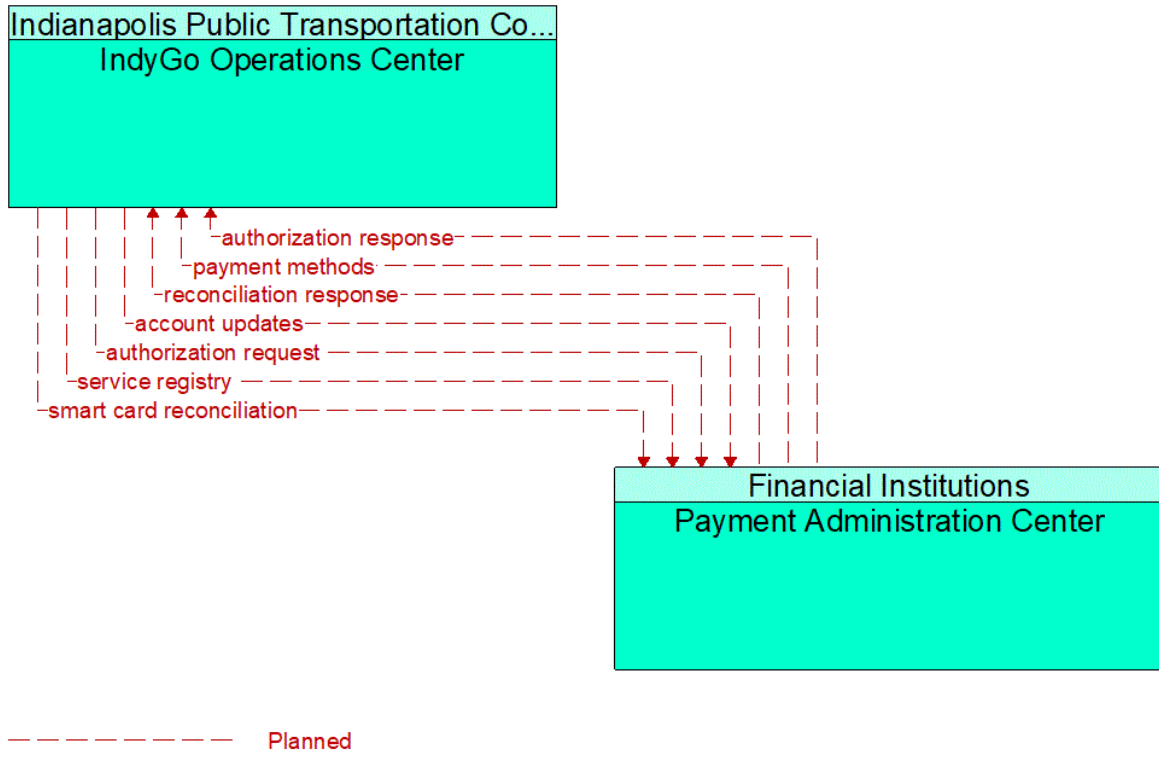


Figure 329: IndyGo Operations Center - Payment Administration Center Interface

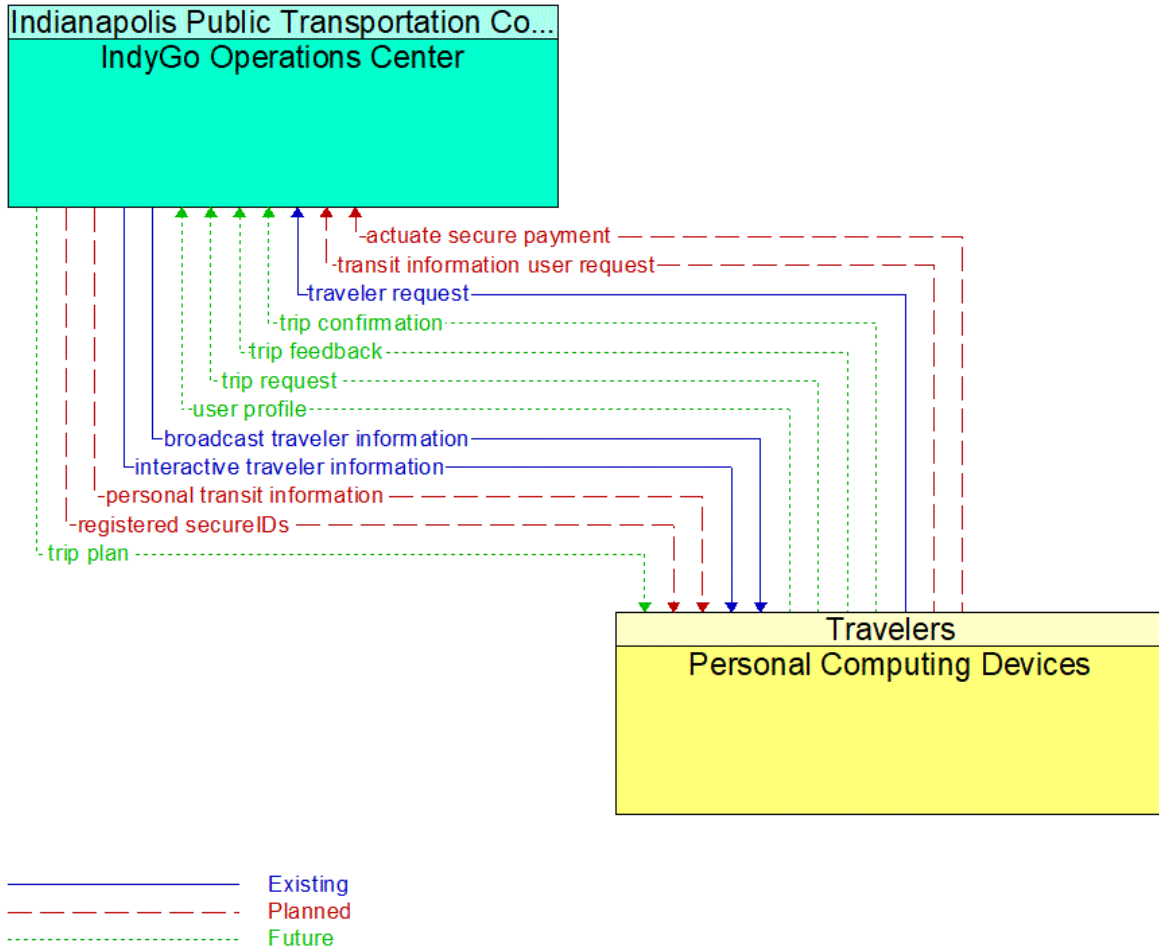


Figure 330: IndyGo Operations Center - Personal Computing Devices Interface

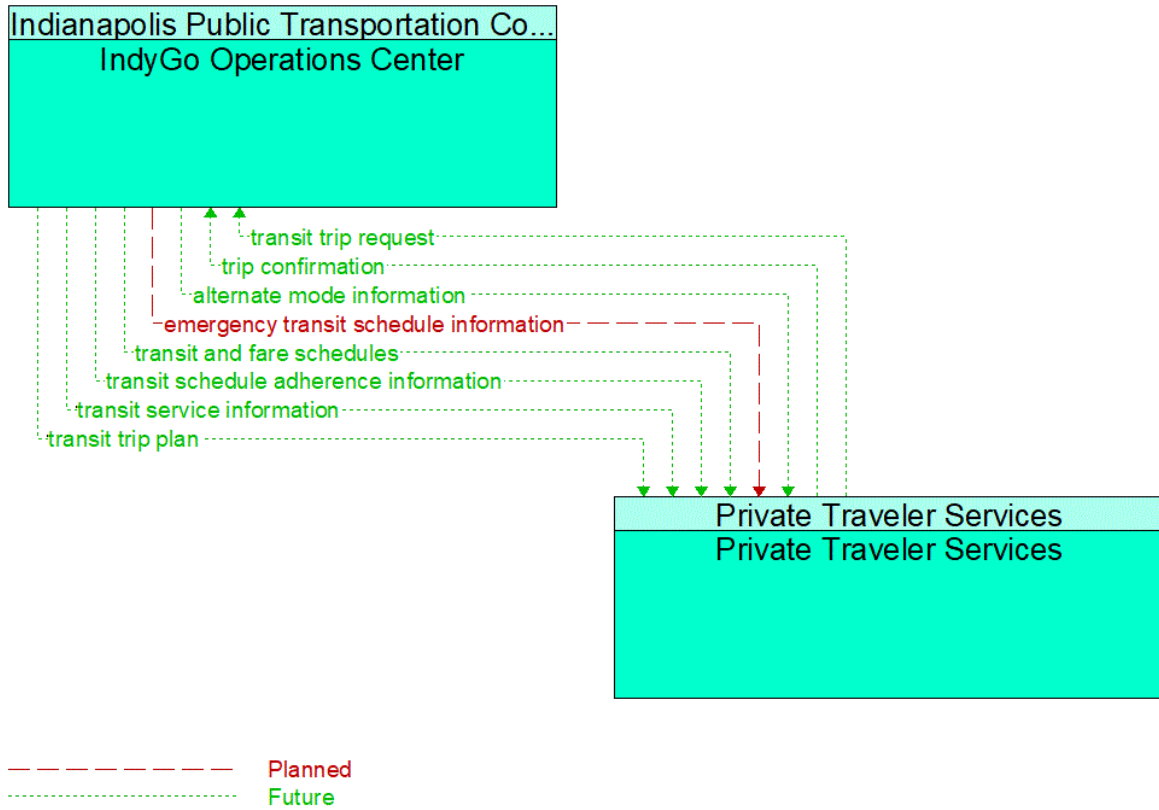


Figure 331: IndyGo Operations Center - Private Traveler Services Interface

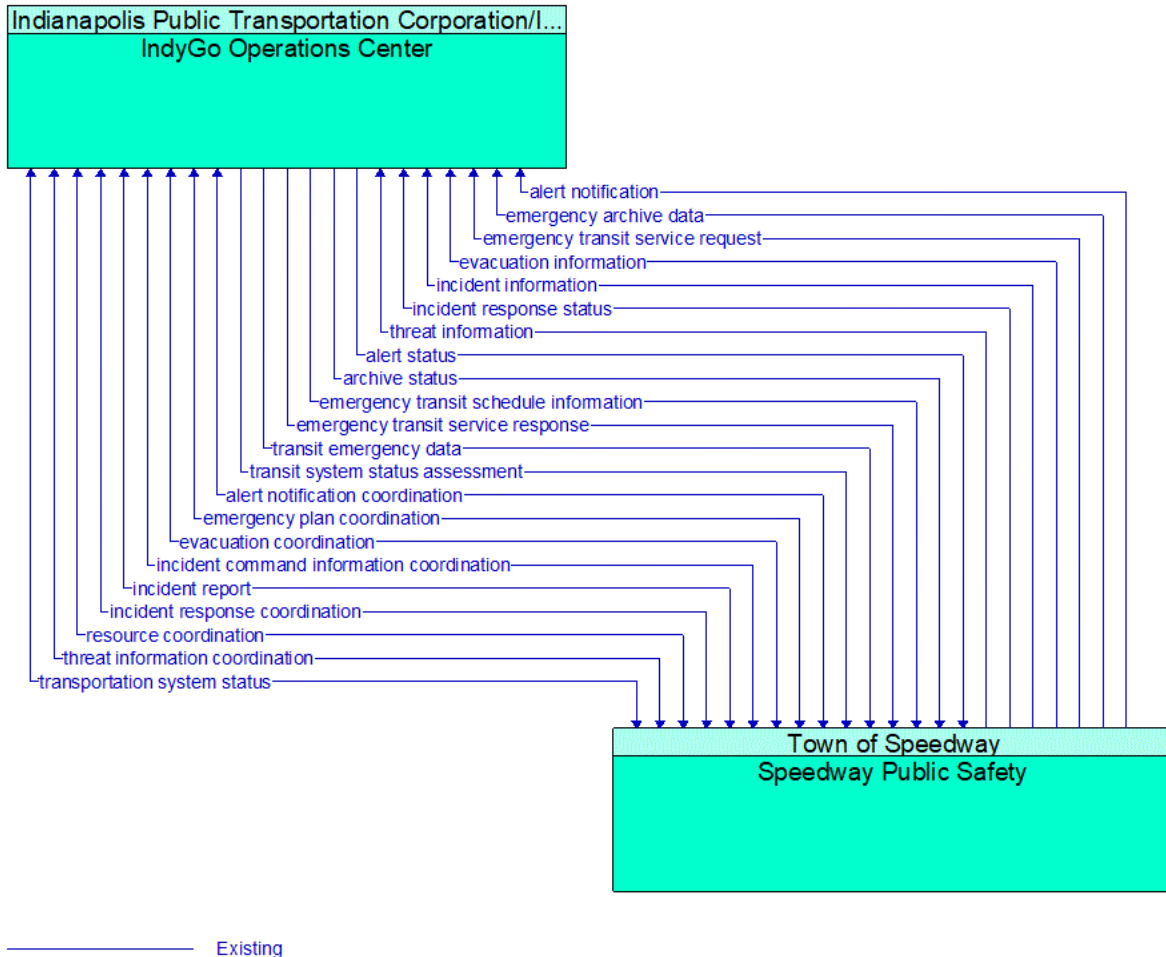


Figure 332: IndyGo Operations Center - Speedway Public Safety Interface

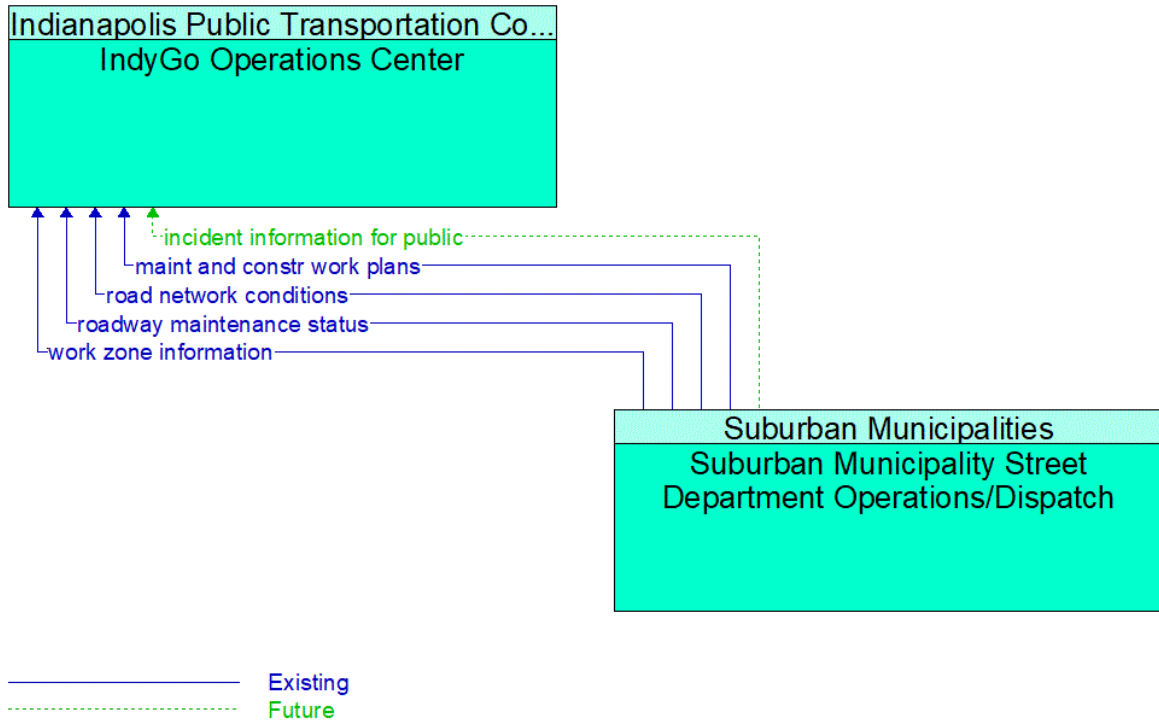


Figure 333: IndyGo Operations Center - Suburban Municipality Street Department Operations/Dispatch Interface

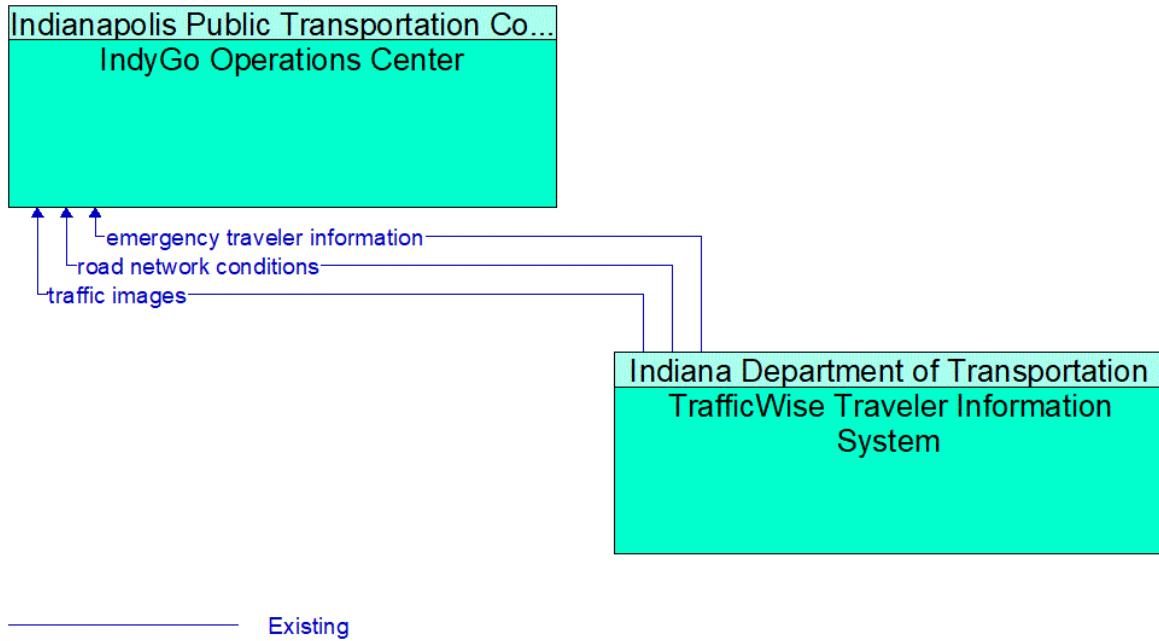


Figure 334: IndyGo Operations Center - TrafficWise Traveler Information System Interface

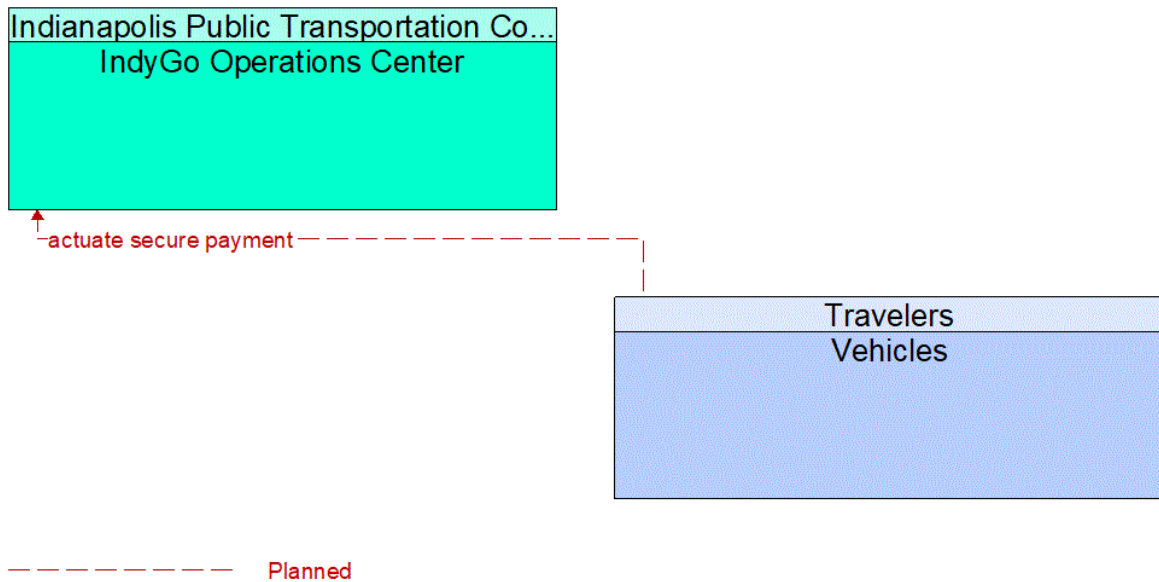


Figure 335: IndyGo Operations Center - Vehicles Interface

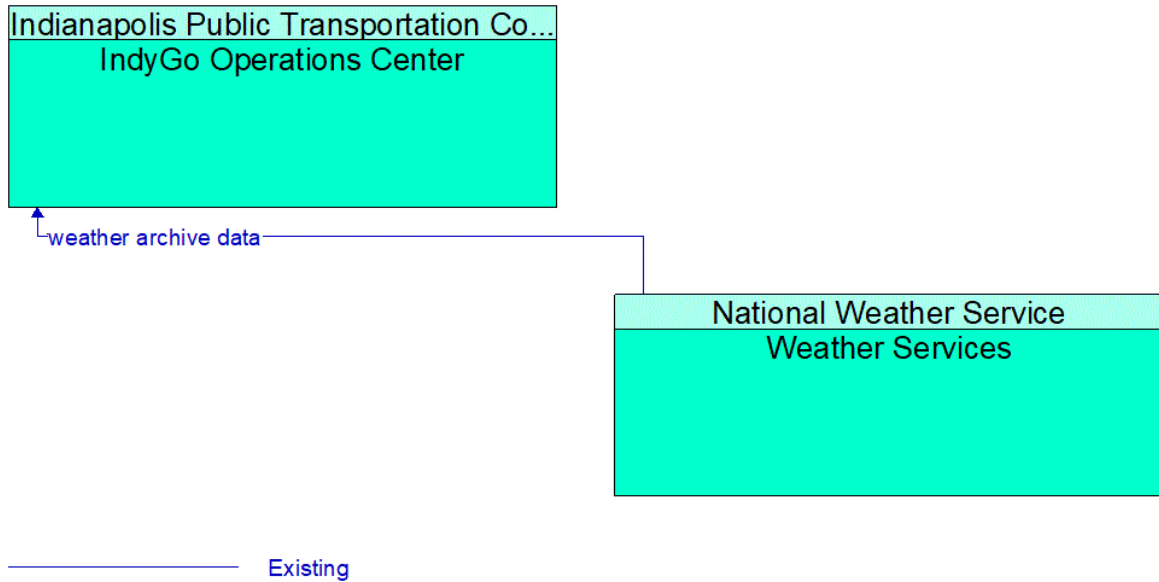


Figure 336: IndyGo Operations Center - Weather Services Interface

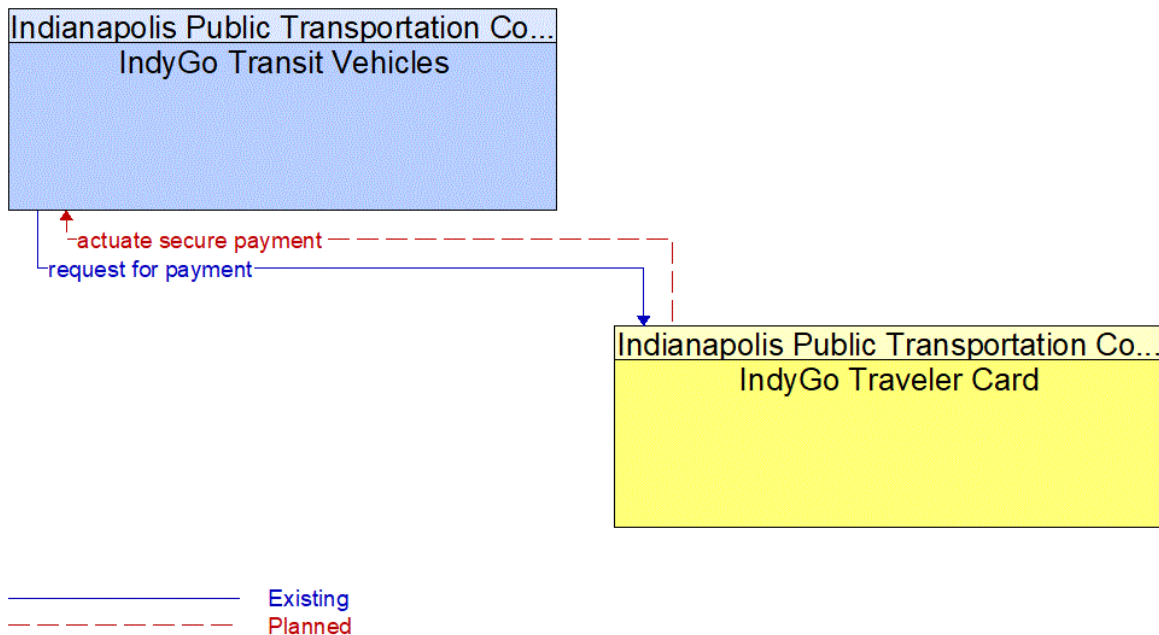


Figure 337: IndyGo Transit Vehicles - IndyGo Traveler Card Interface

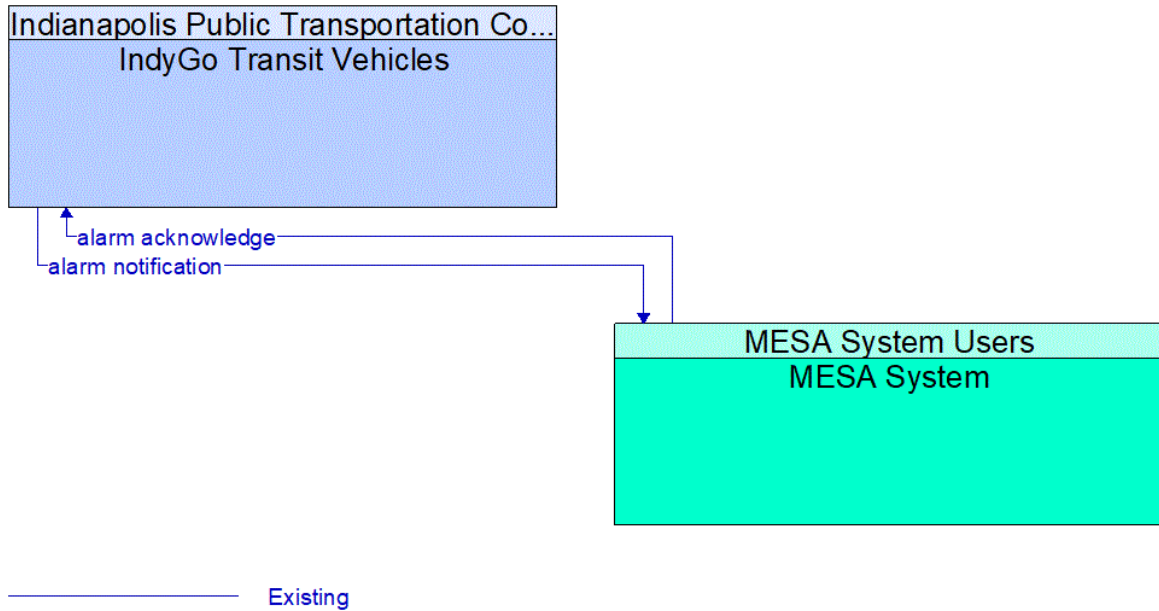


Figure 338: IndyGo Transit Vehicles - MESA System Interface

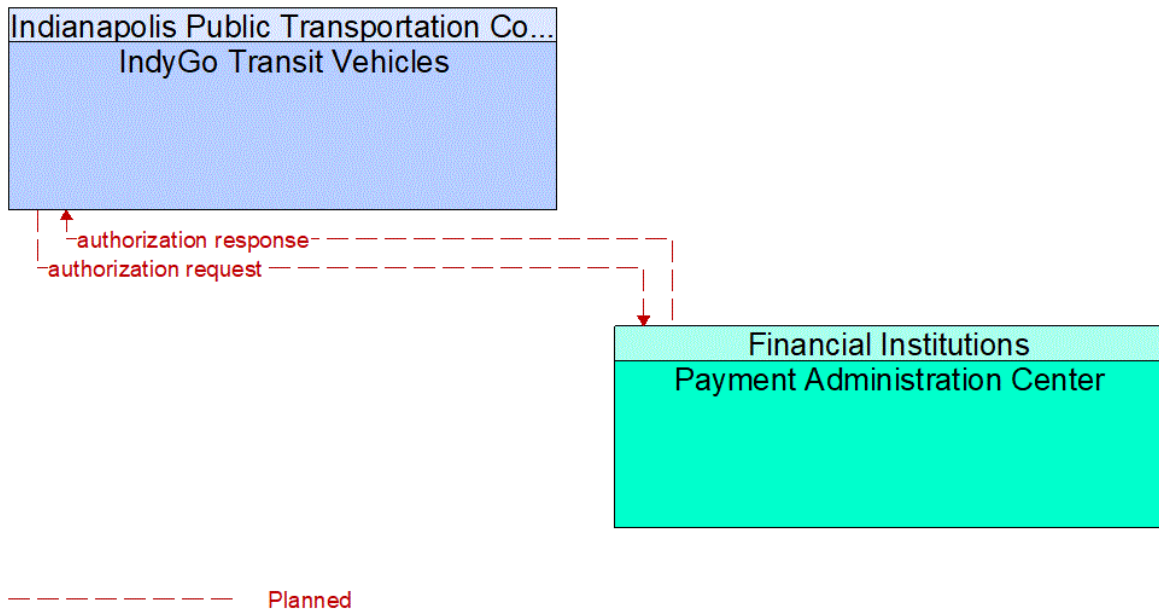


Figure 339: IndyGo Transit Vehicles - Payment Administration Center Interface

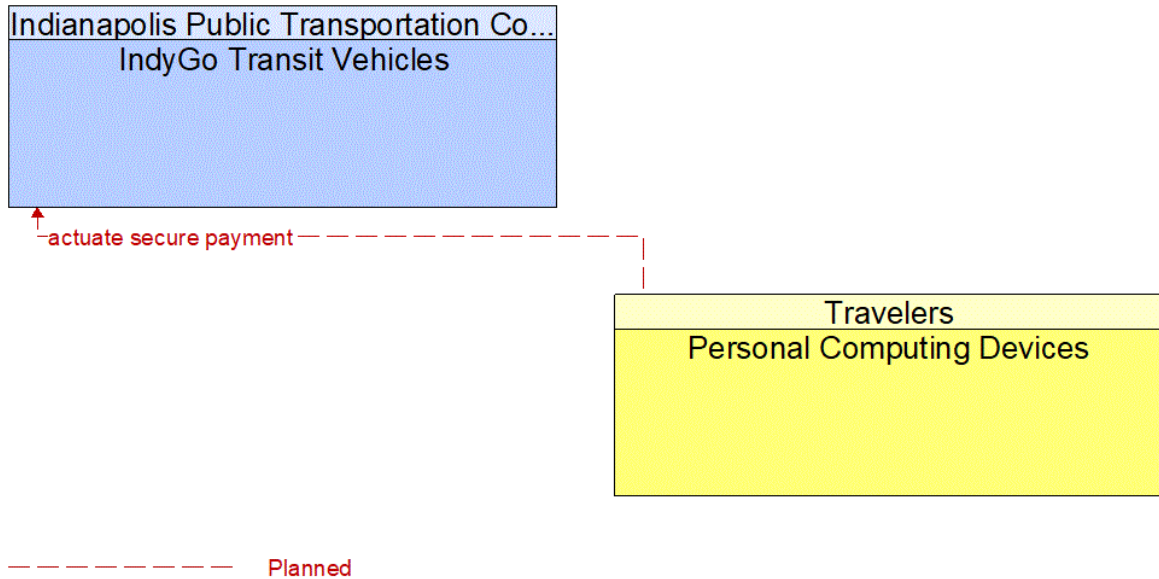


Figure 340: IndyGo Transit Vehicles - Personal Computing Devices Interface

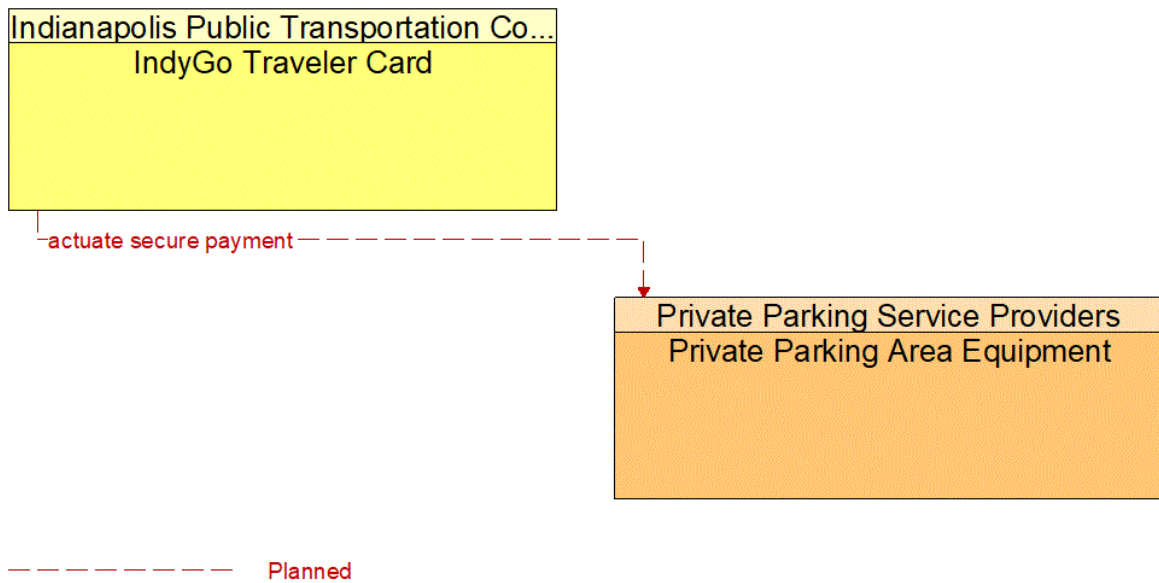


Figure 341: IndyGo Traveler Card - Private Parking Area Equipment Interface

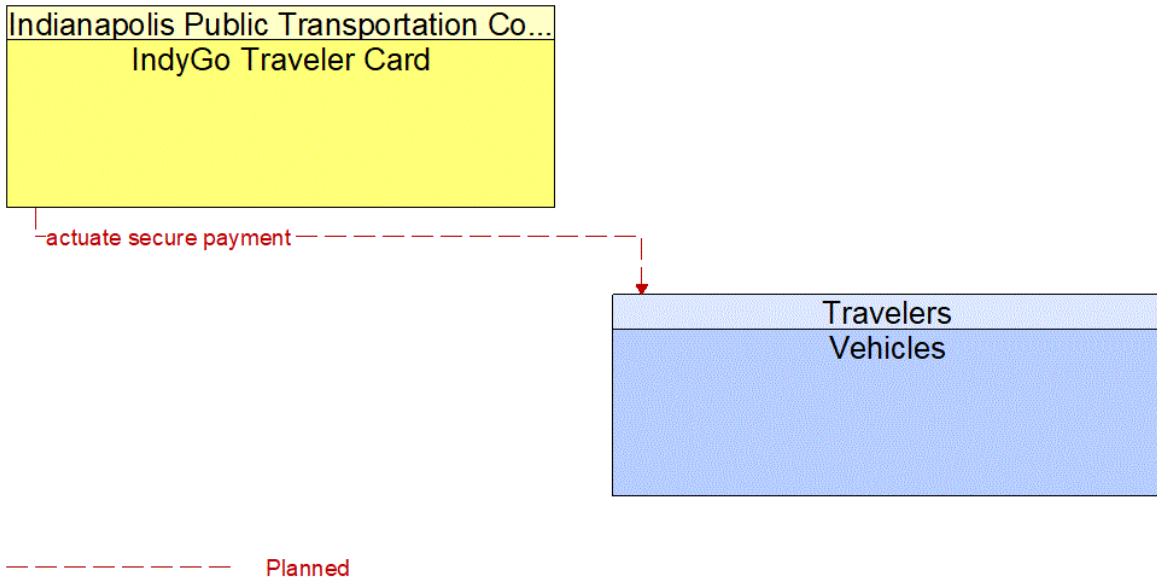


Figure 342: IndyGo Traveler Card - Vehicles Interface

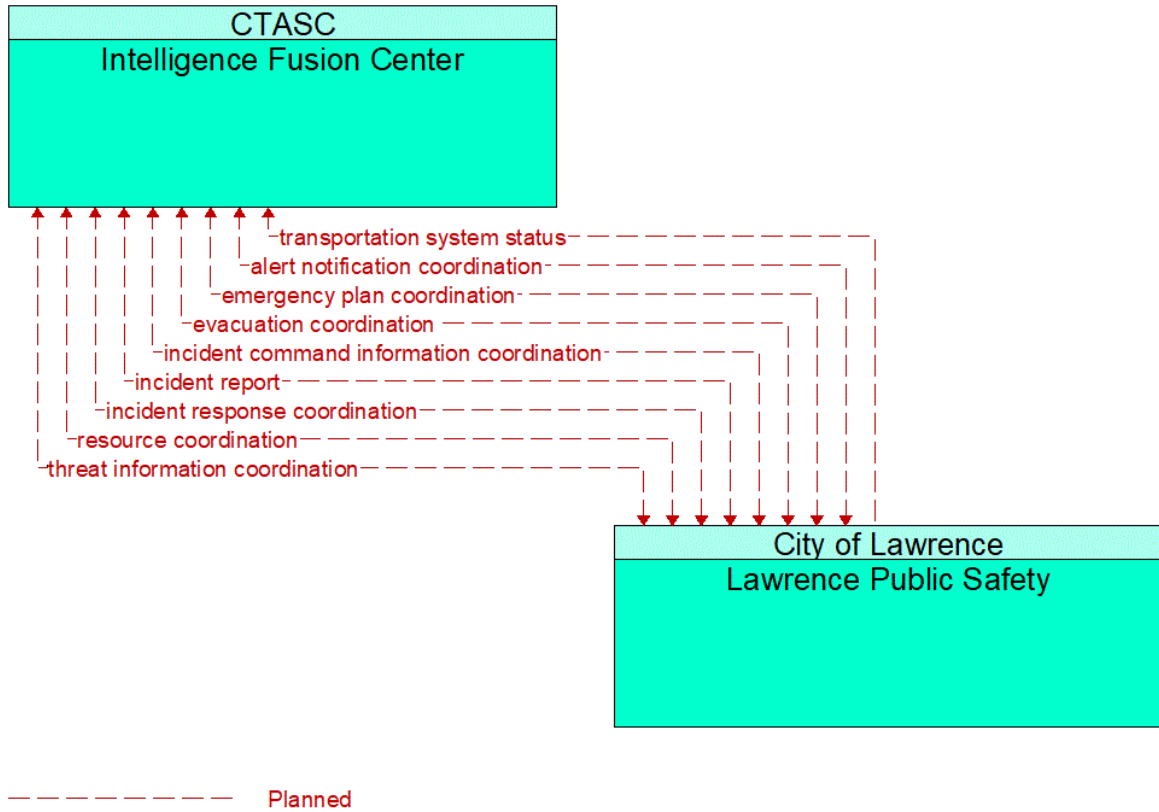


Figure 343: Intelligence Fusion Center - Lawrence Public Safety Interface

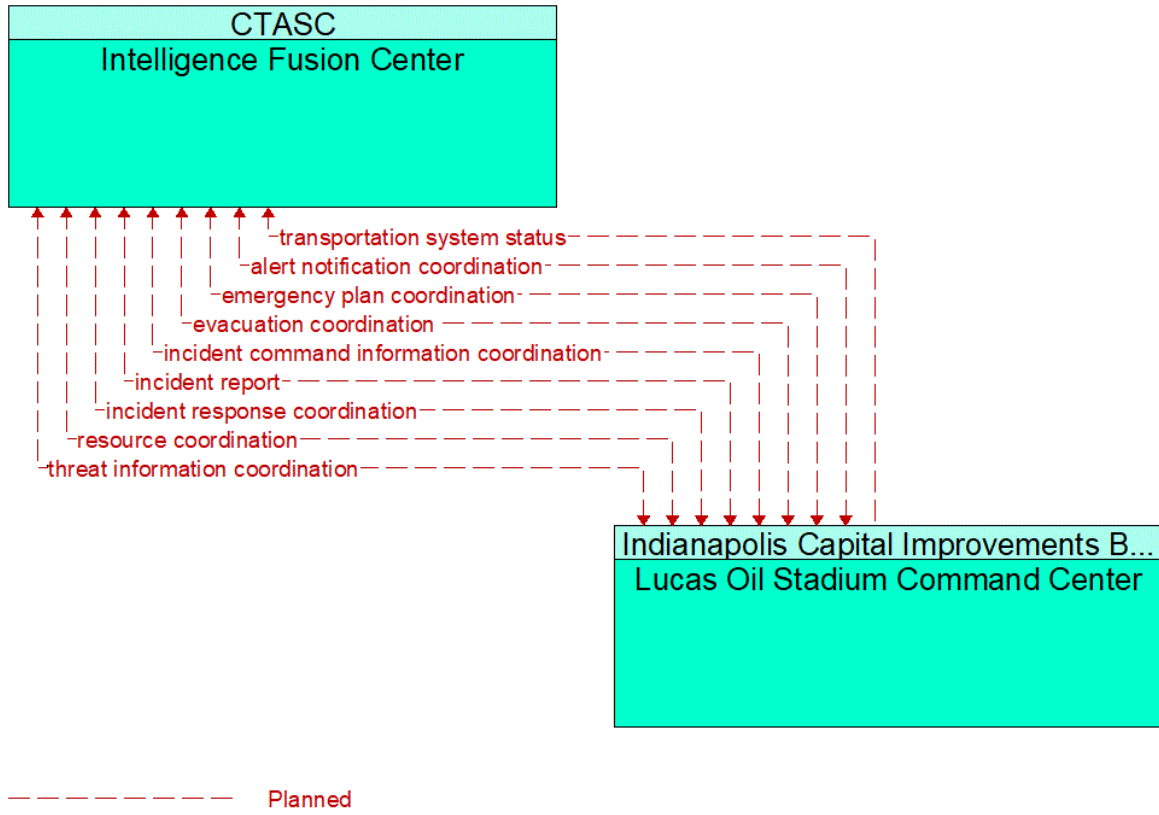


Figure 344: Intelligence Fusion Center - Lucas Oil Stadium Command Center Interface

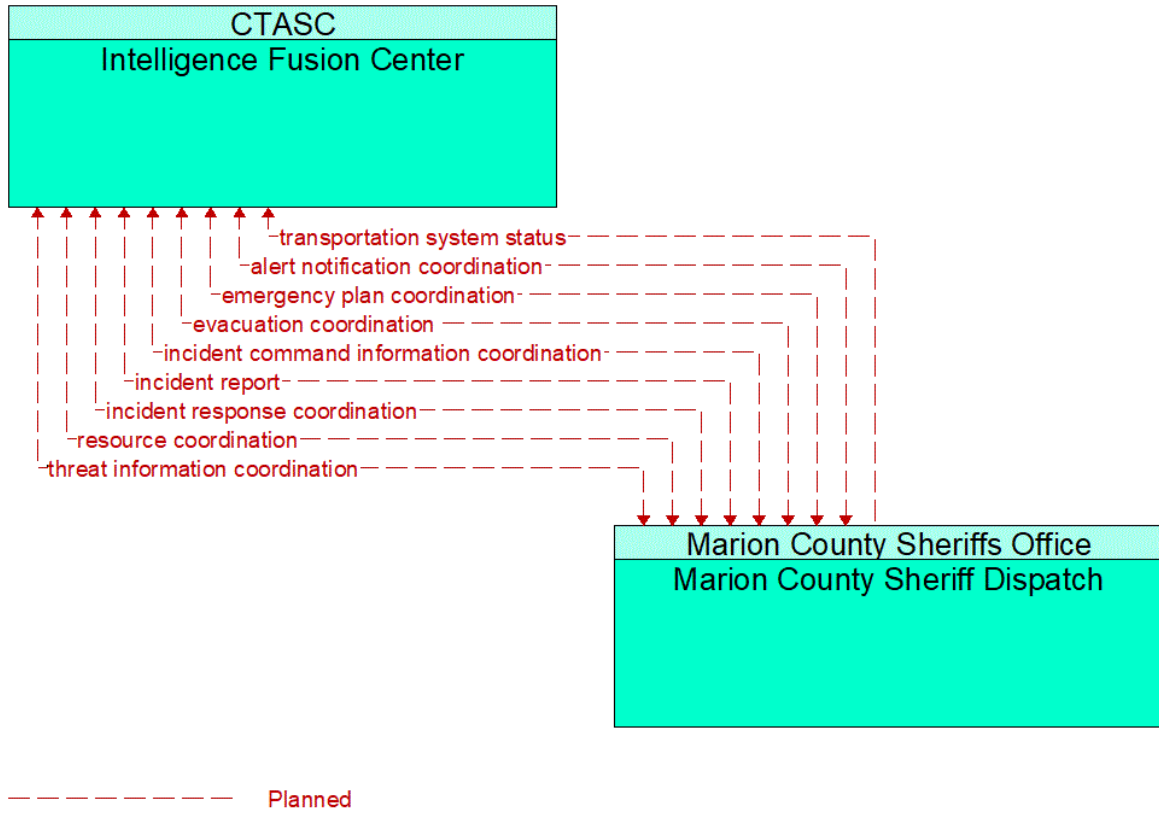


Figure 345: Intelligence Fusion Center - Marion County Sheriff Dispatch Interface

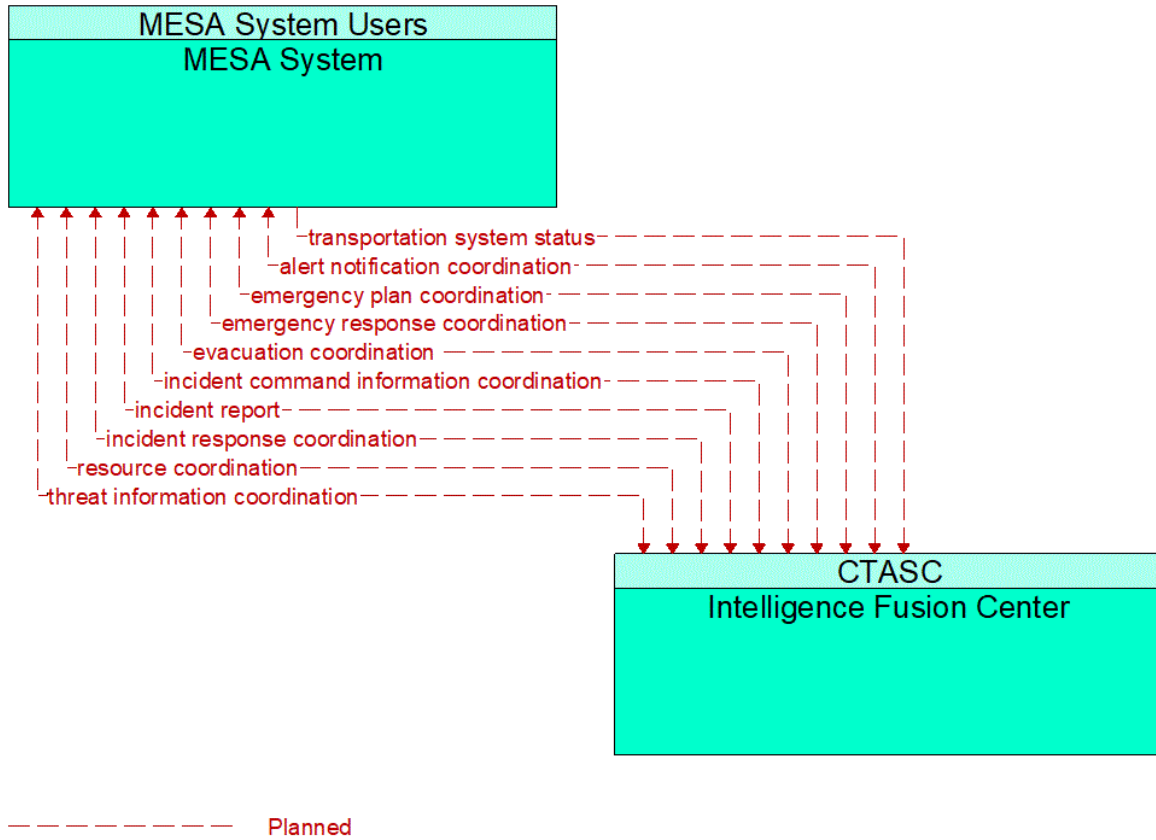


Figure 346: Intelligence Fusion Center - MESA System Interface

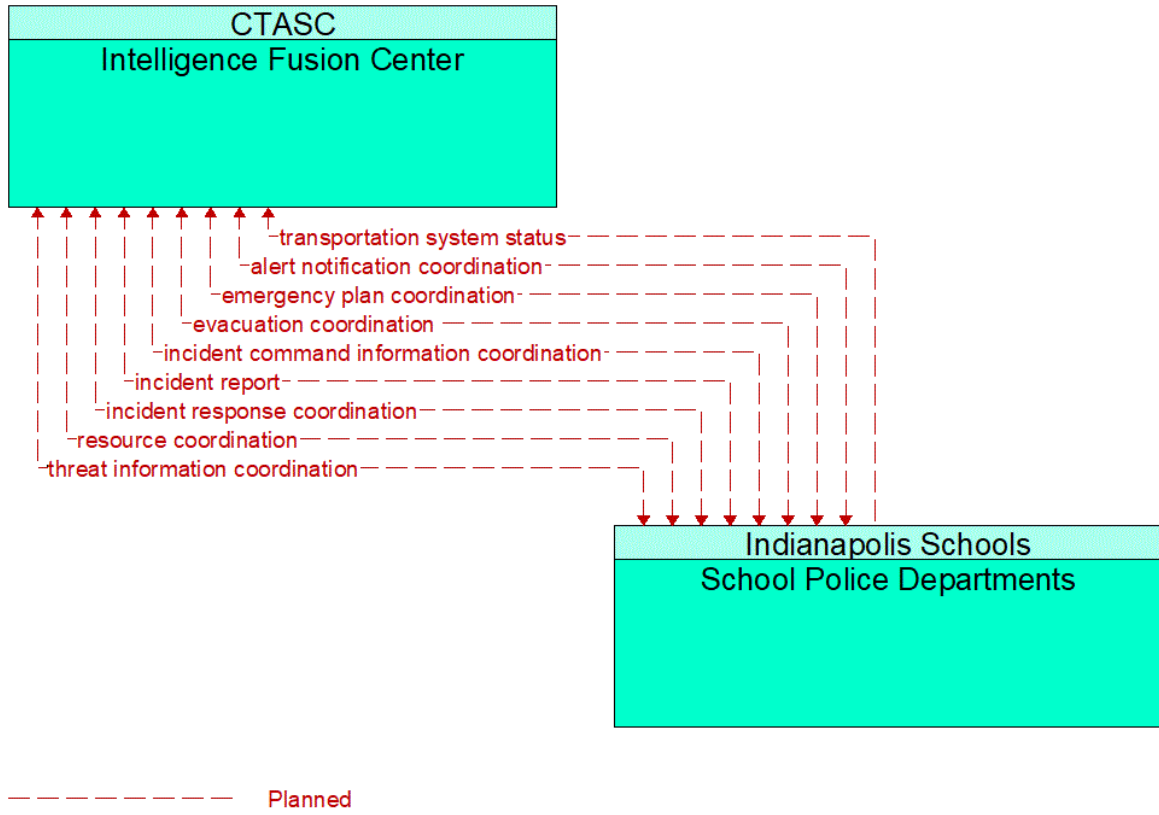


Figure 347: Intelligence Fusion Center - School Police Departments Interface

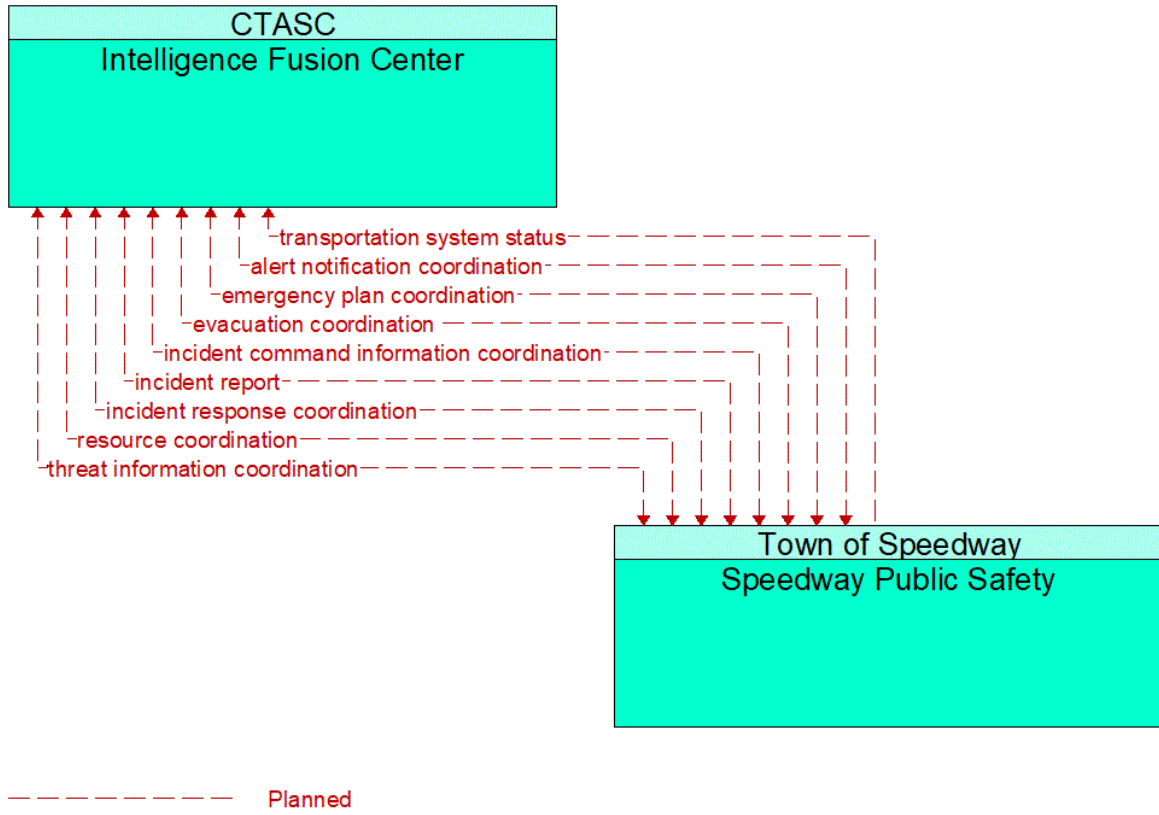


Figure 348: Intelligence Fusion Center - Speedway Public Safety Interface

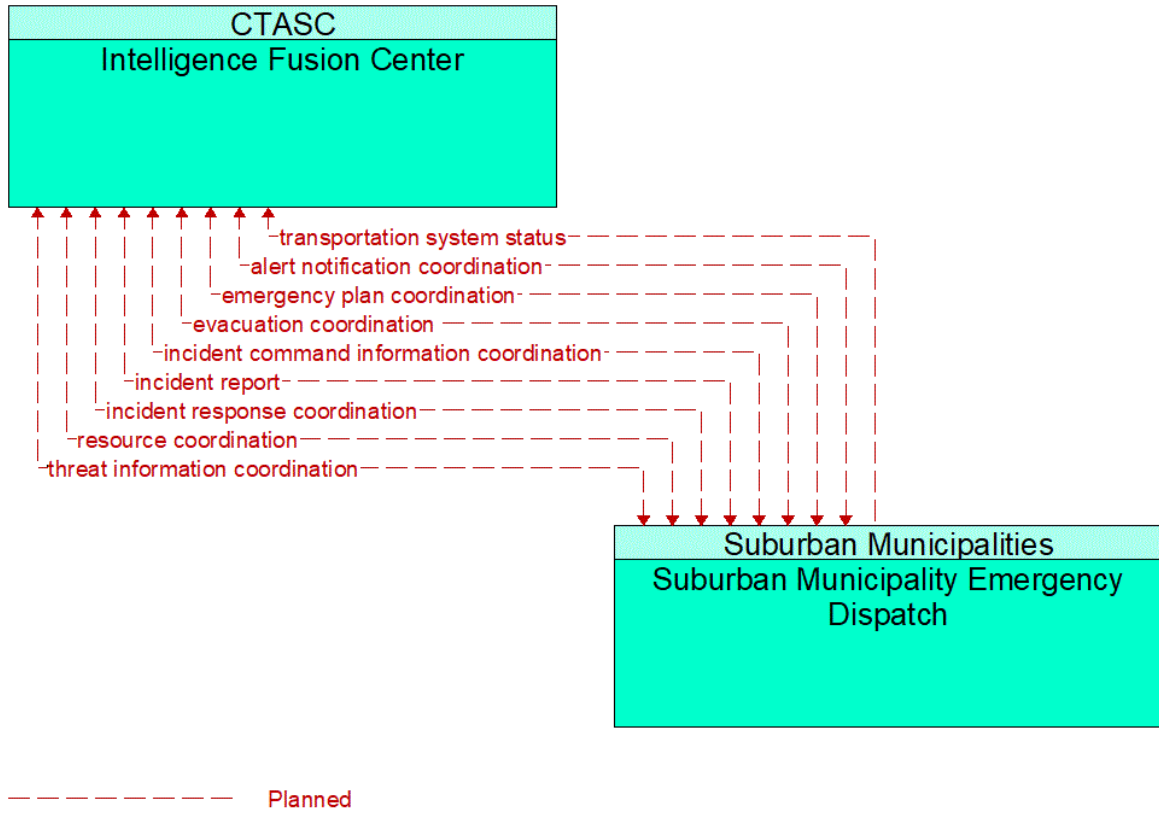


Figure 349: Intelligence Fusion Center - Suburban Municipality Emergency Dispatch Interface

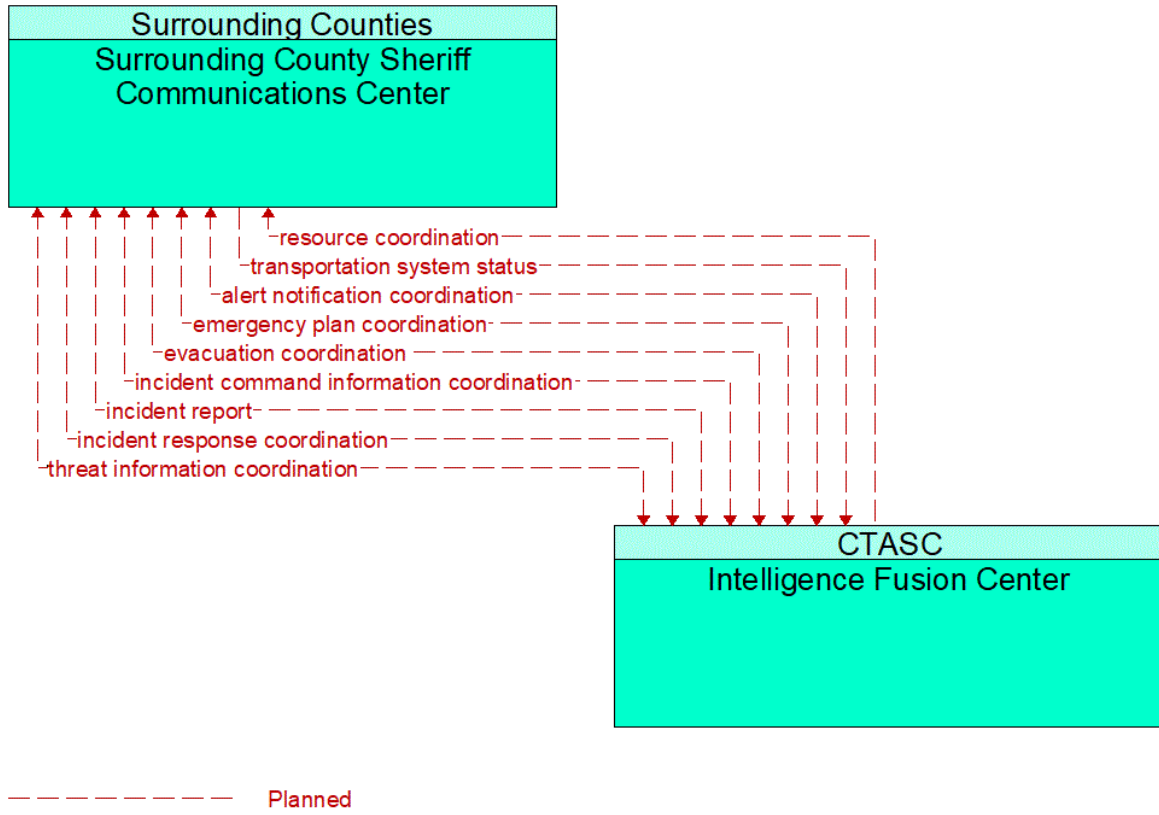


Figure 350: Intelligence Fusion Center - Surrounding County Sheriff Communications Center Interface

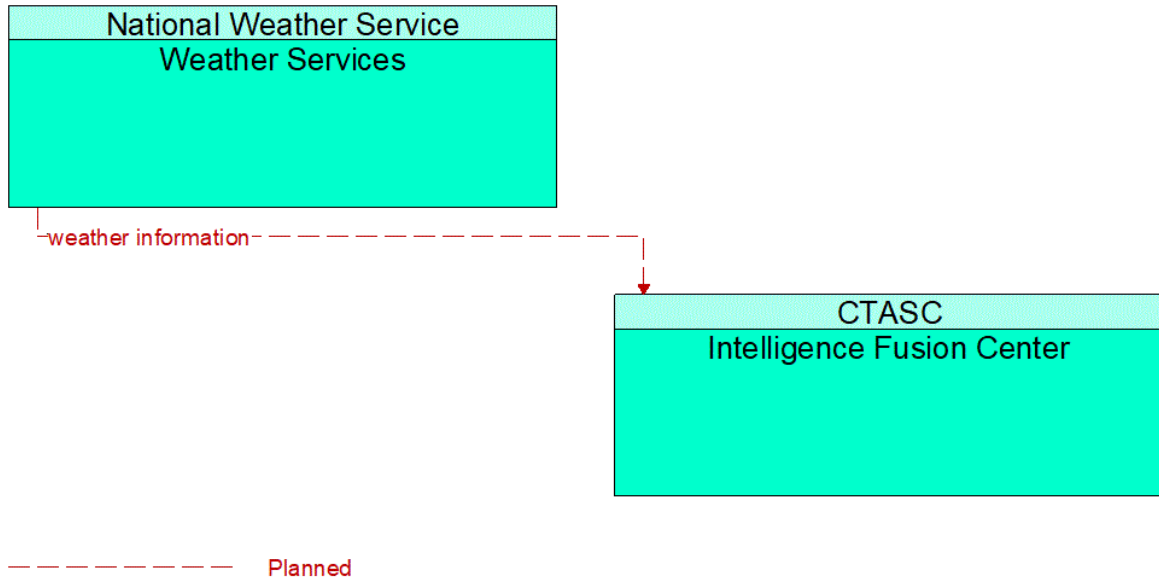


Figure 351: Intelligence Fusion Center - Weather Services Interface

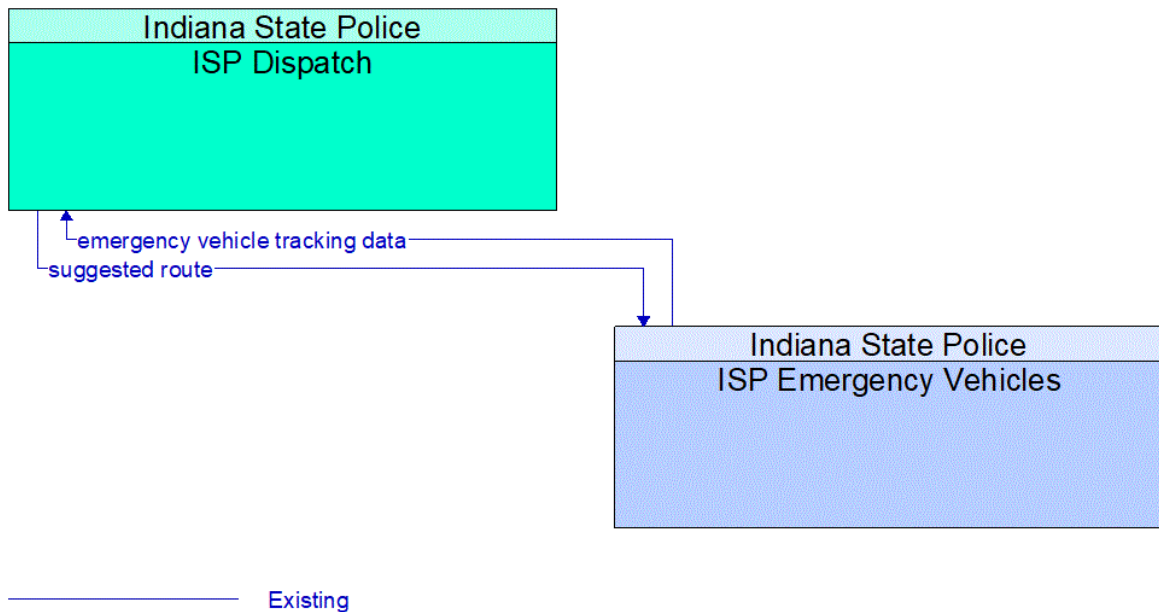


Figure 352: ISP Dispatch - ISP Emergency Vehicles Interface

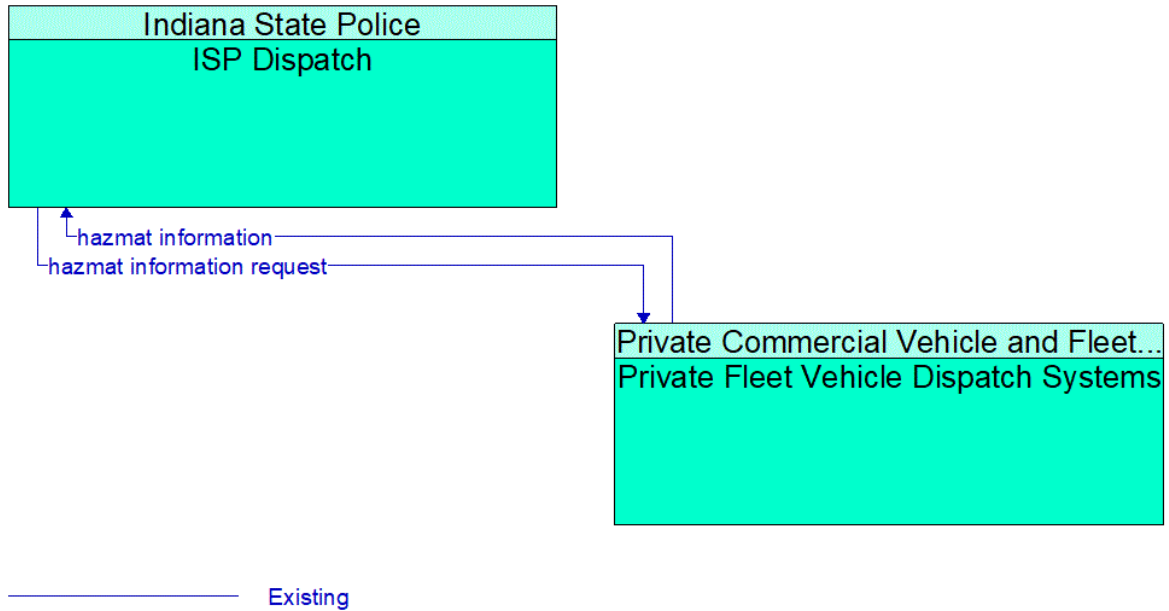


Figure 353: ISP Dispatch - Private Fleet Vehicle Dispatch Systems Interface

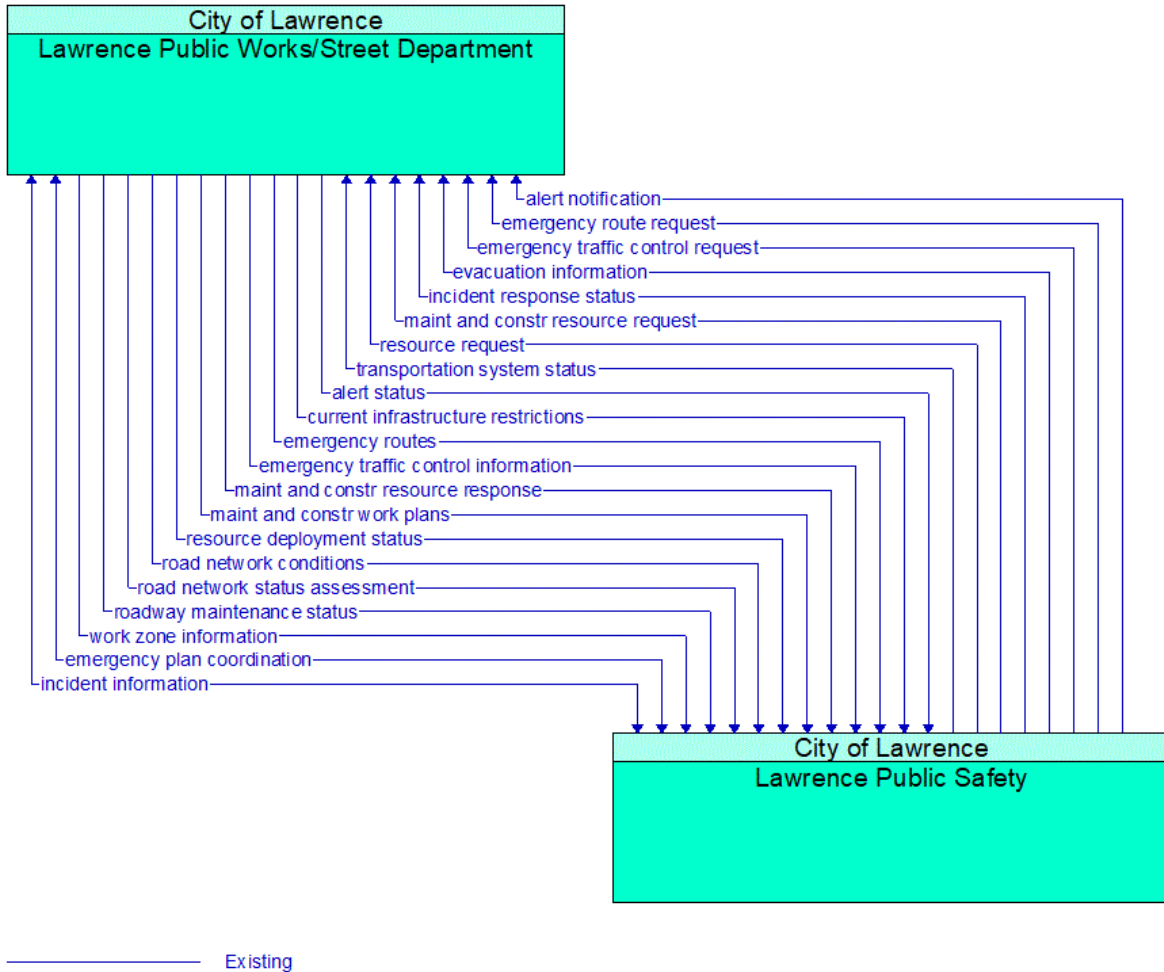


Figure 354: Lawrence Public Safety - Lawrence Public Works/Street Department Interface

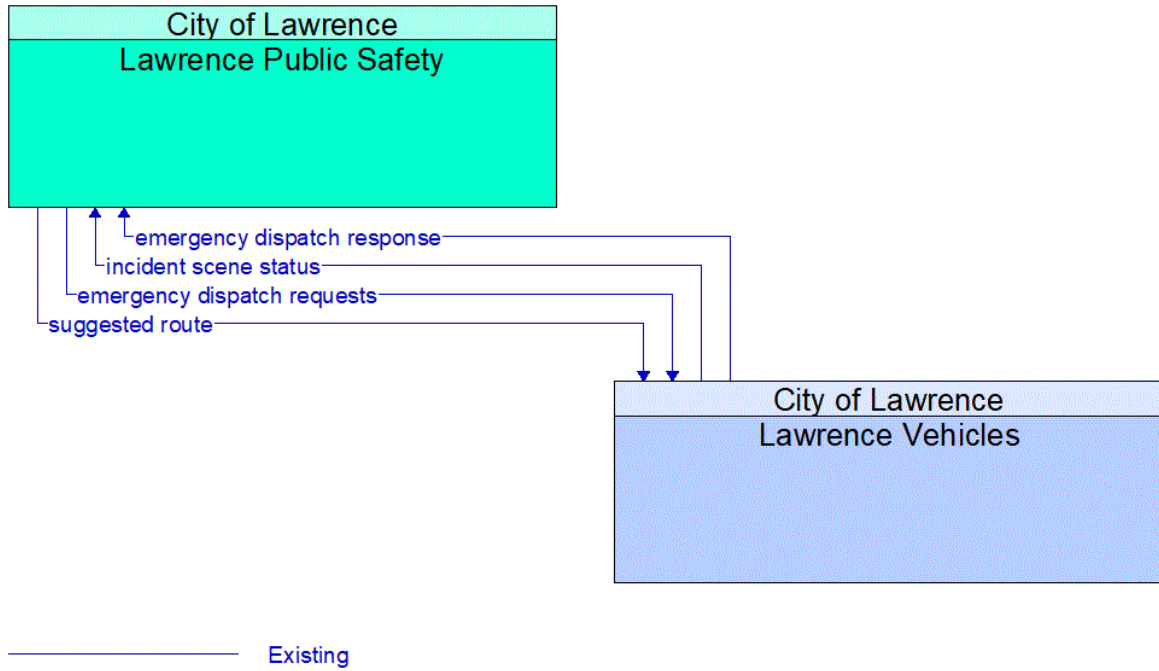
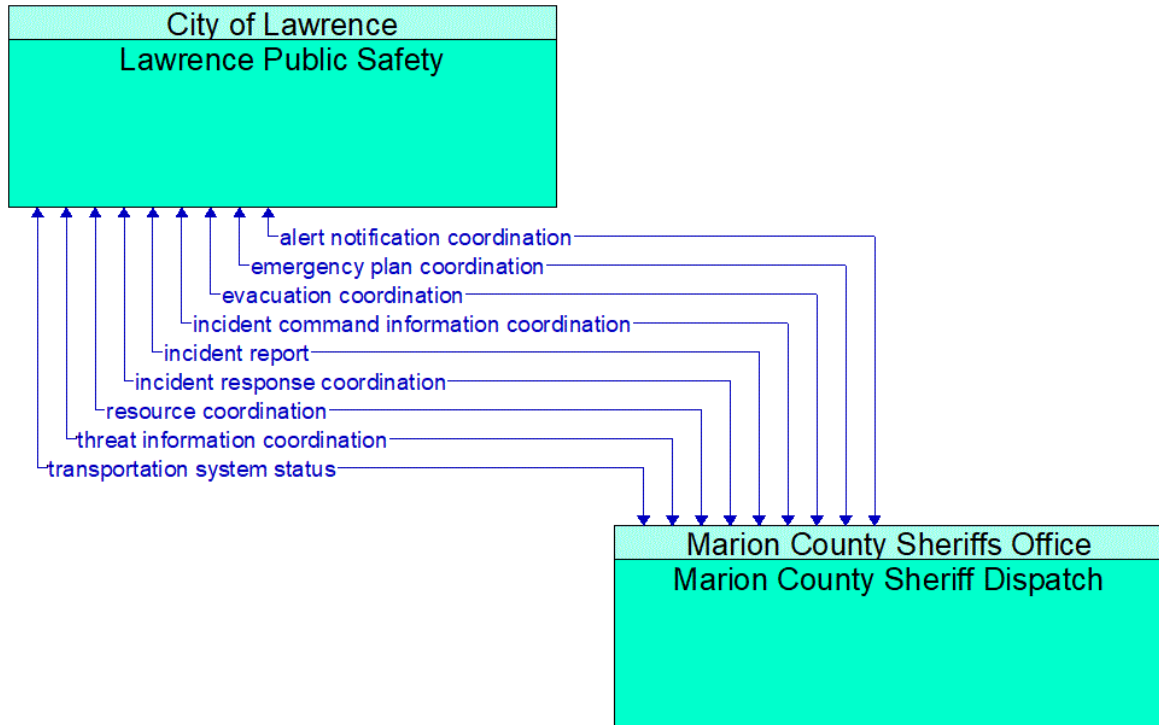


Figure 355: Lawrence Public Safety - Lawrence Vehicles Interface



Existing

Figure 356: Lawrence Public Safety - Marion County Sheriff Dispatch Interface

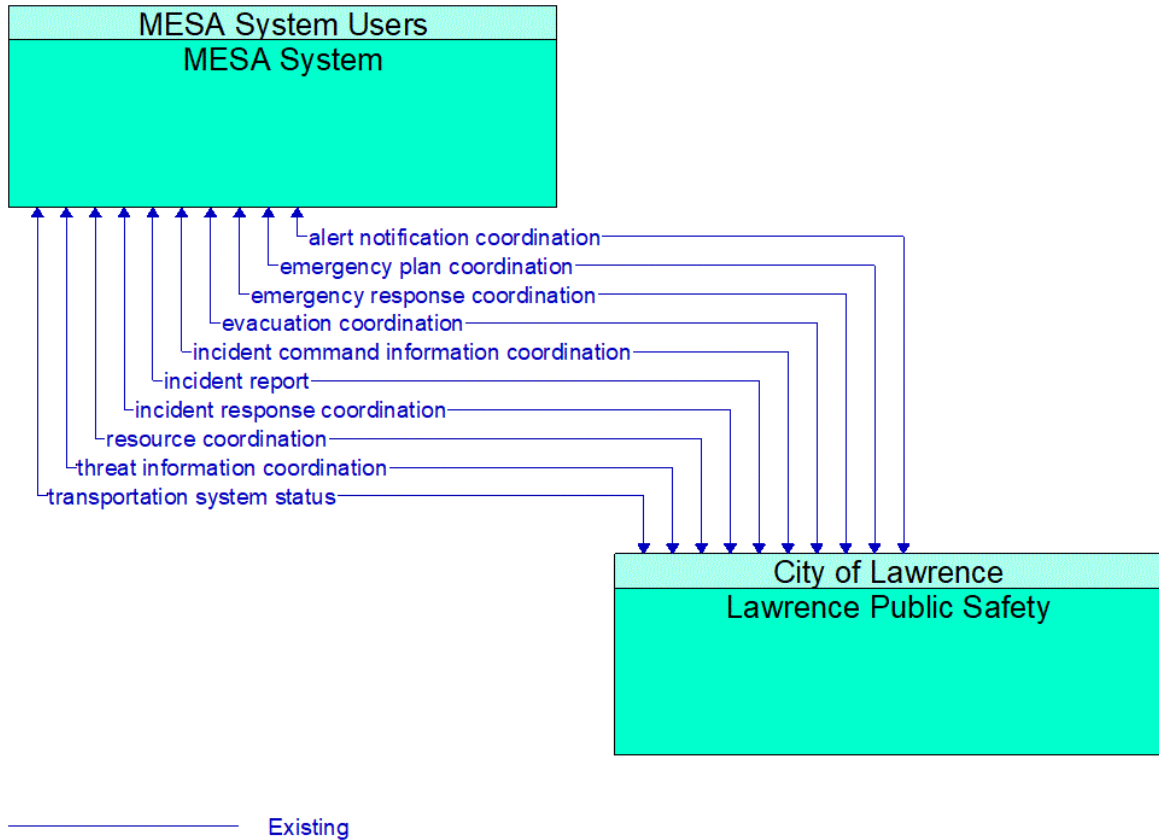


Figure 357: Lawrence Public Safety - MESA System Interface

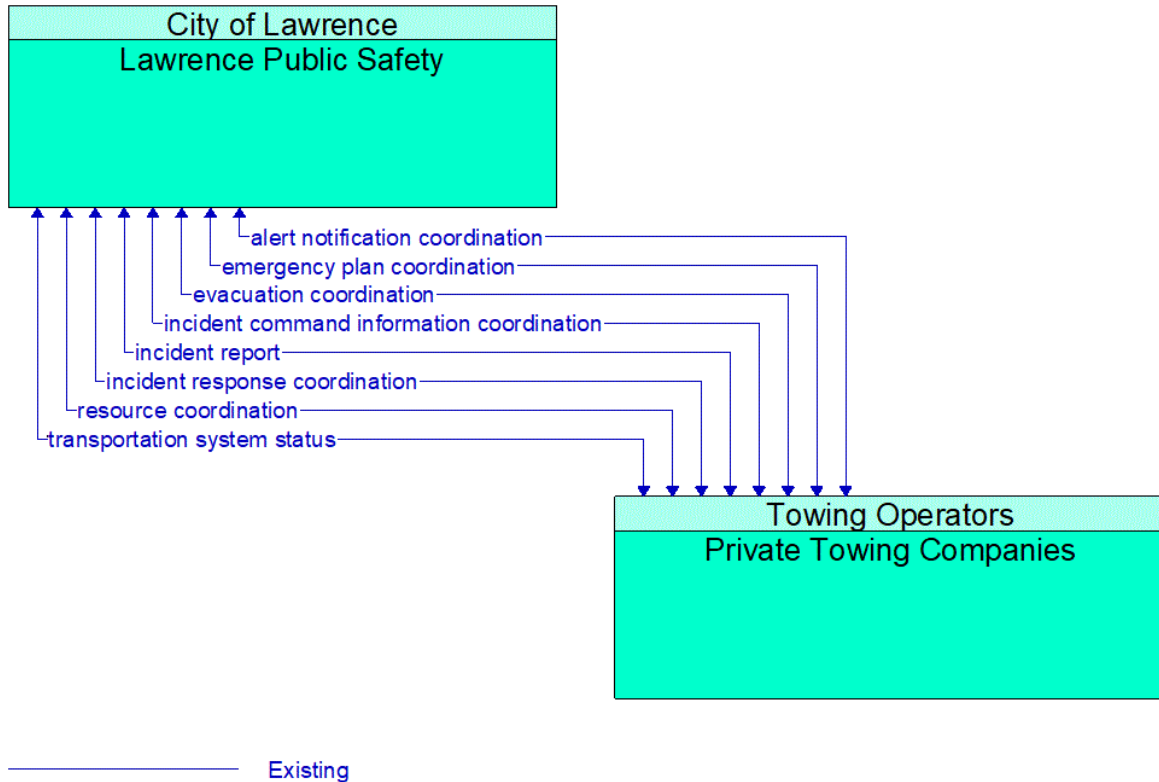


Figure 358: Lawrence Public Safety - Private Towing Companies Interface

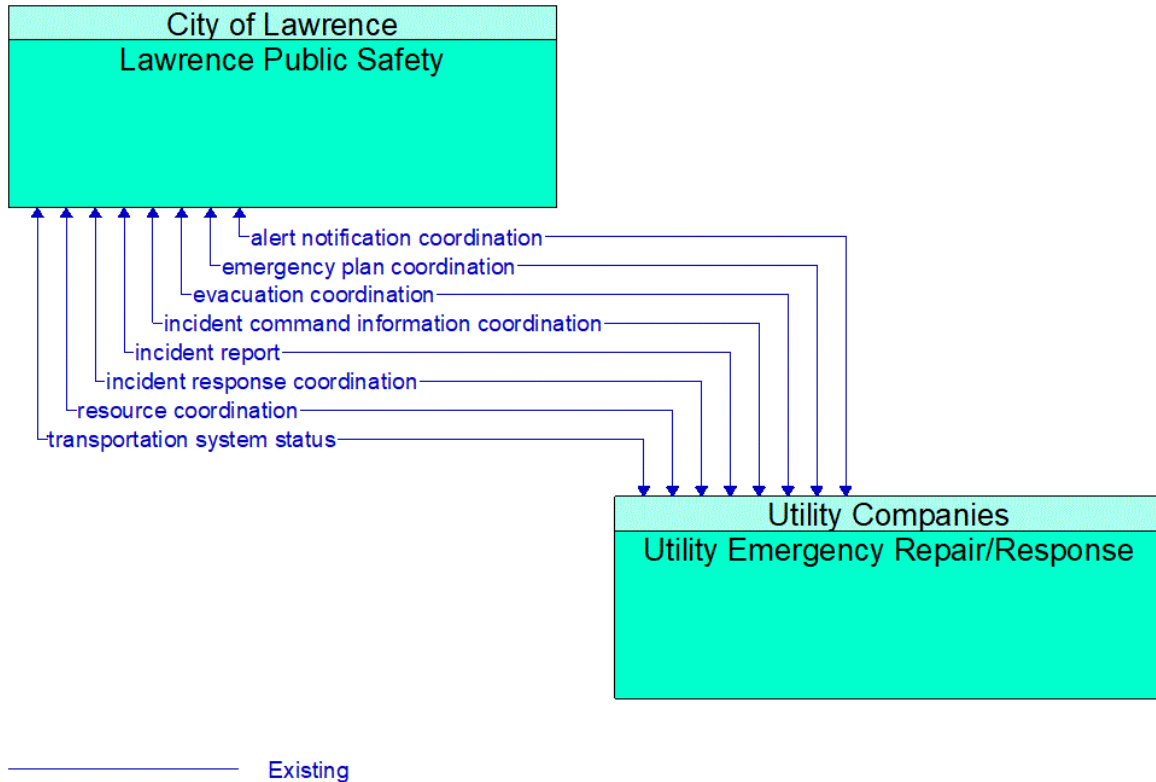


Figure 359: Lawrence Public Safety - Utility Emergency Repair/Response Interface

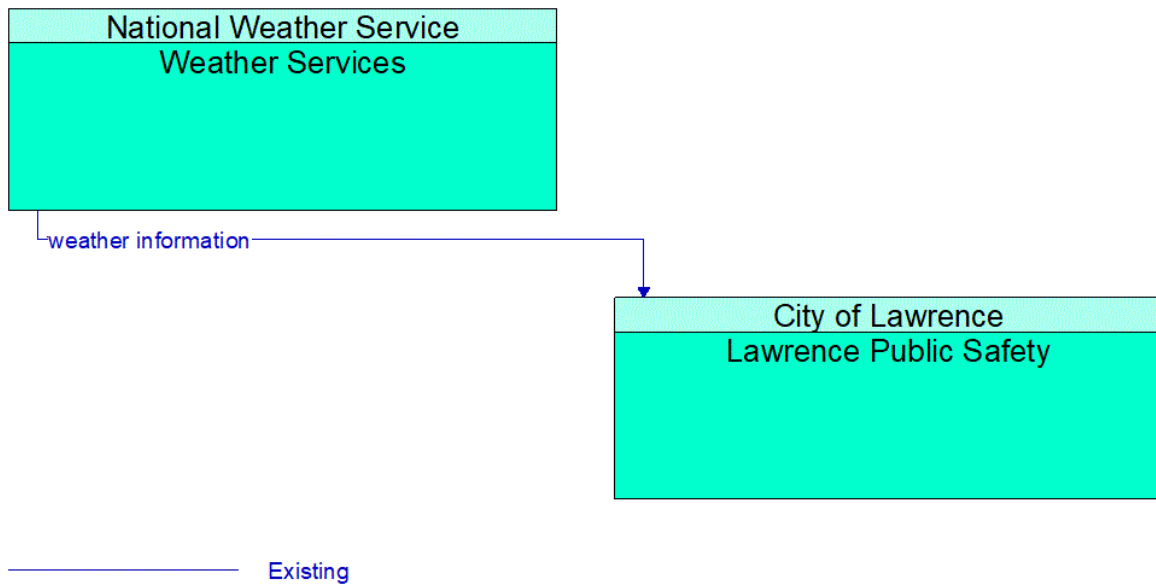


Figure 360: Lawrence Public Safety - Weather Services Interface

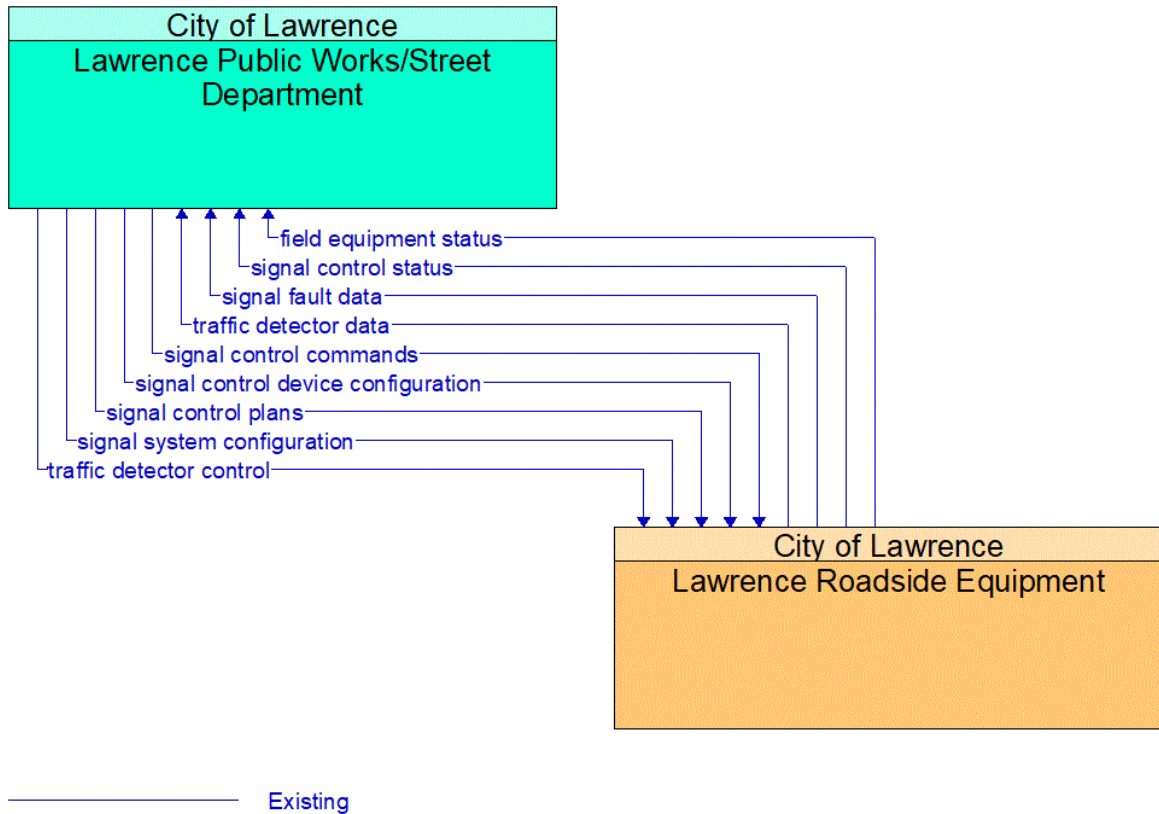


Figure 361: Lawrence Public Works/Street Department - Lawrence Roadside Equipment Interface

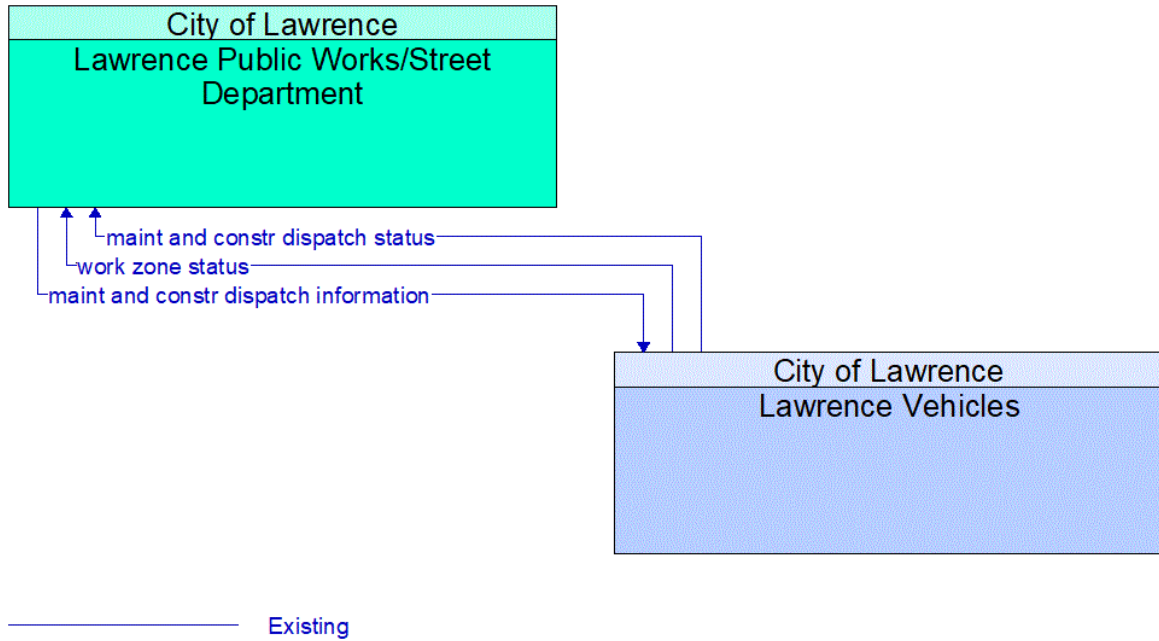
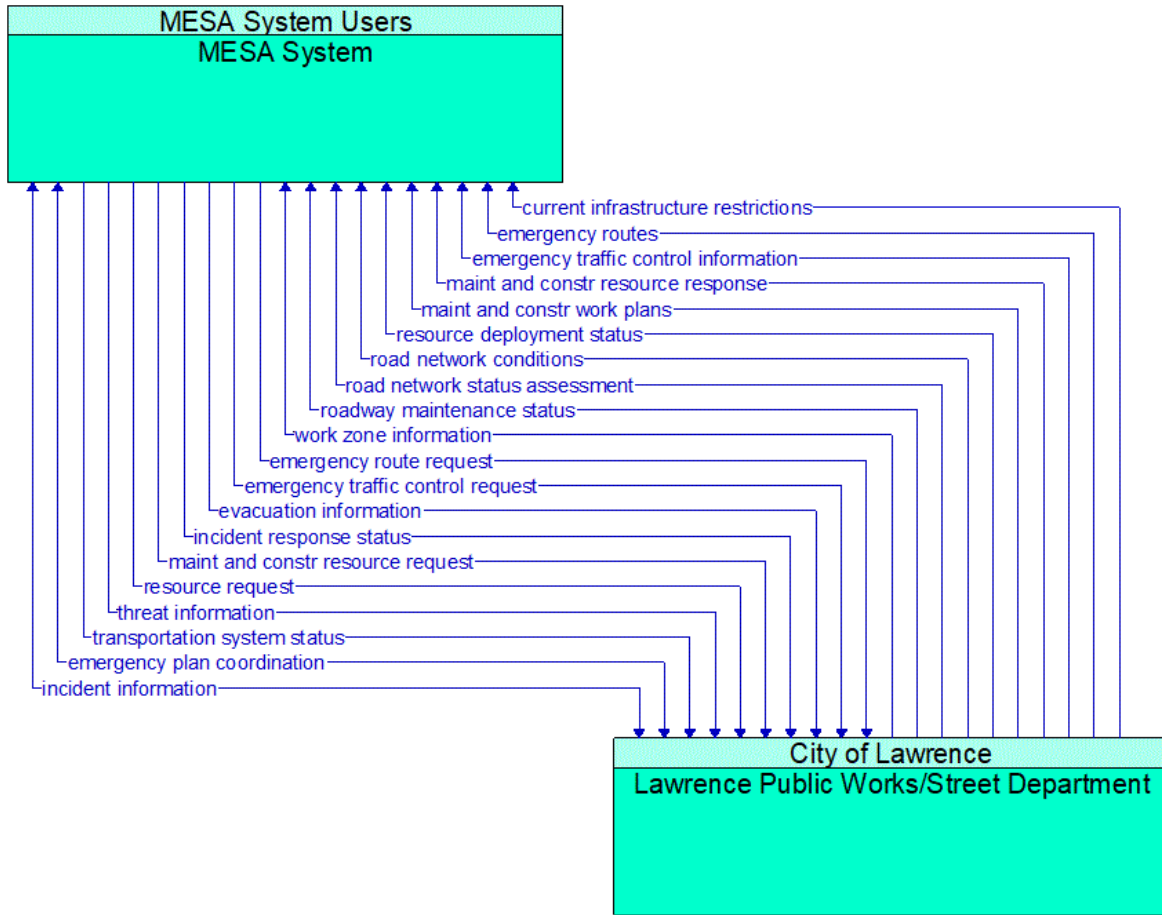


Figure 362: Lawrence Public Works/Street Department - Lawrence Vehicles Interface



Existing

Figure 363: Lawrence Public Works/Street Department - MESA System Interface

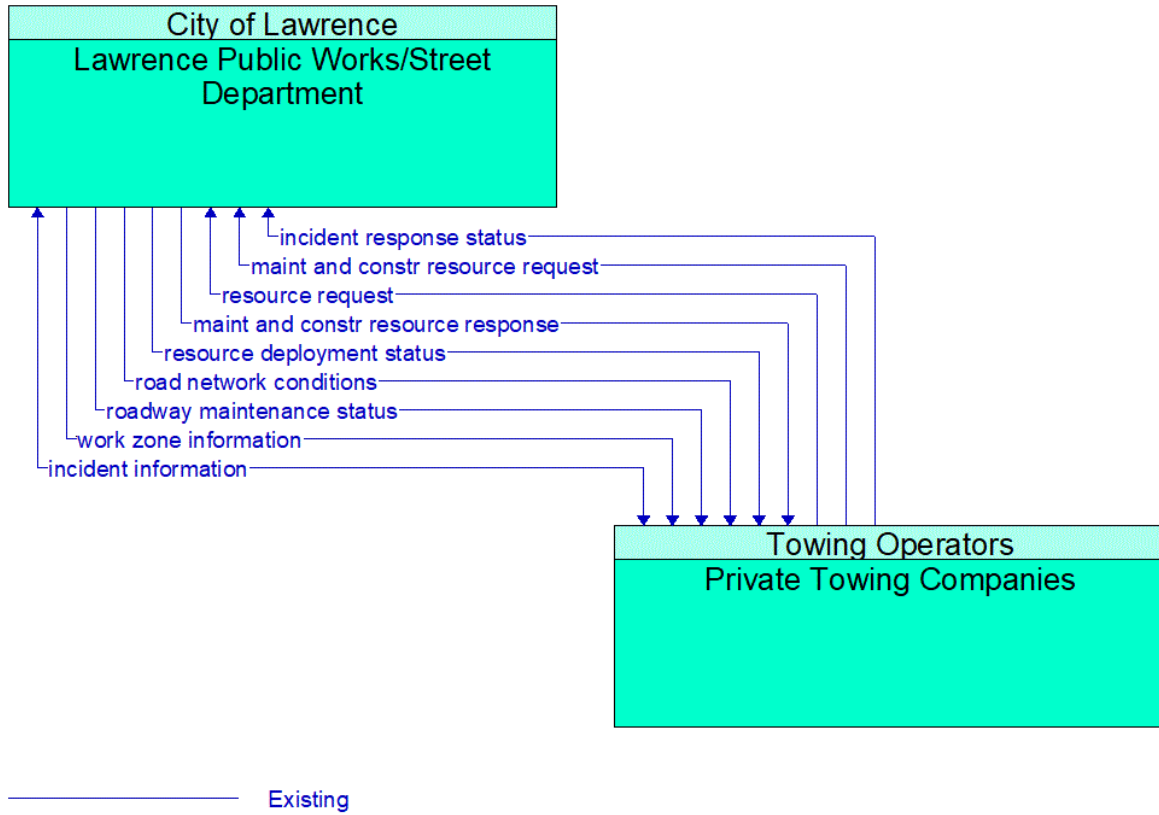


Figure 364: Lawrence Public Works/Street Department - Private Towing Companies Interface

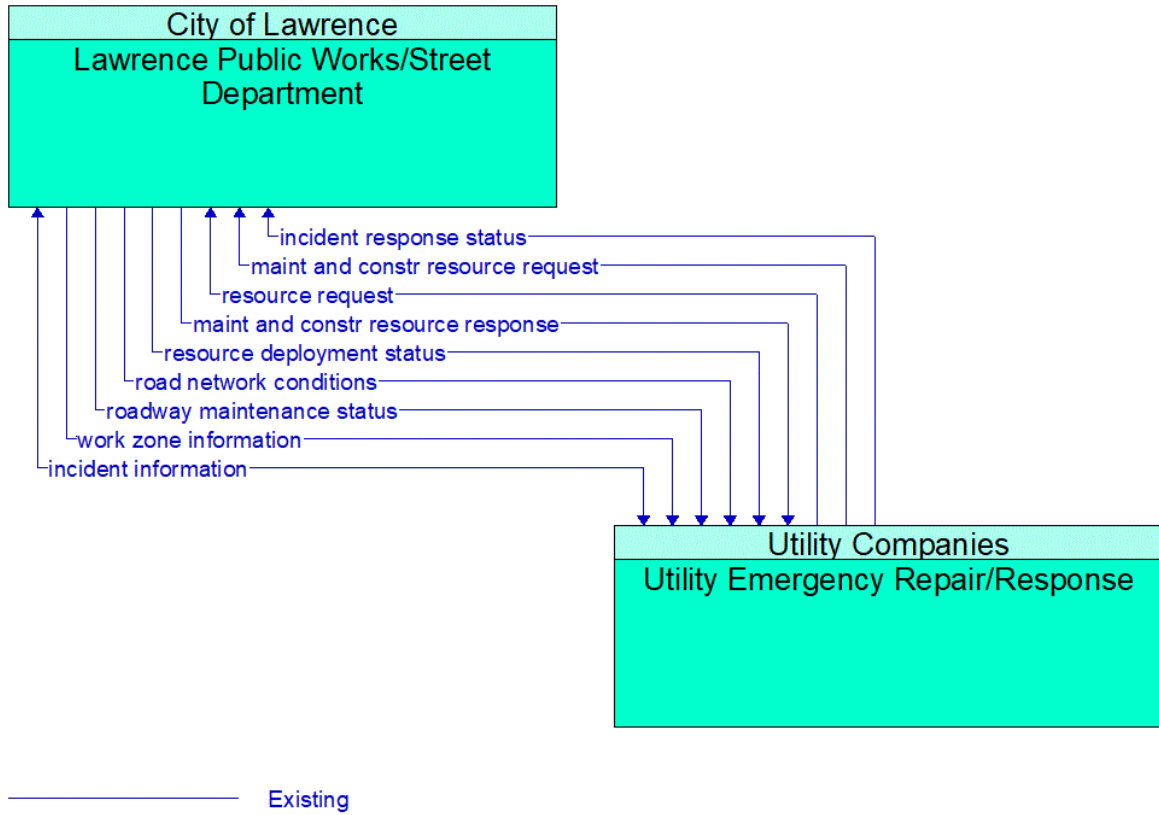


Figure 365: Lawrence Public Works/Street Department - Utility Emergency Repair/Response Interface

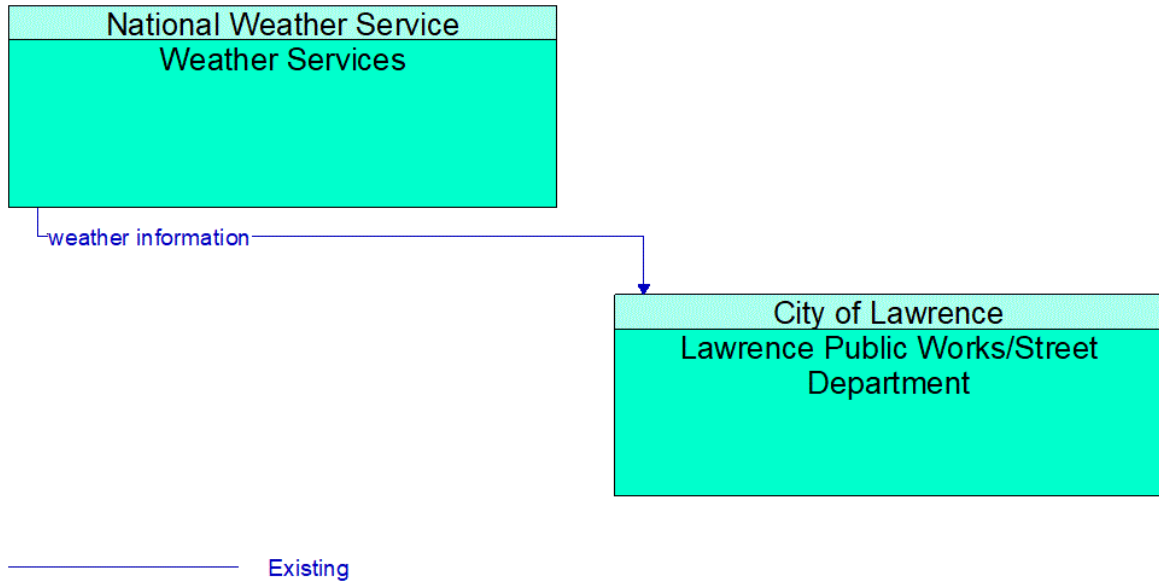


Figure 366: Lawrence Public Works/Street Department - Weather Services Interface

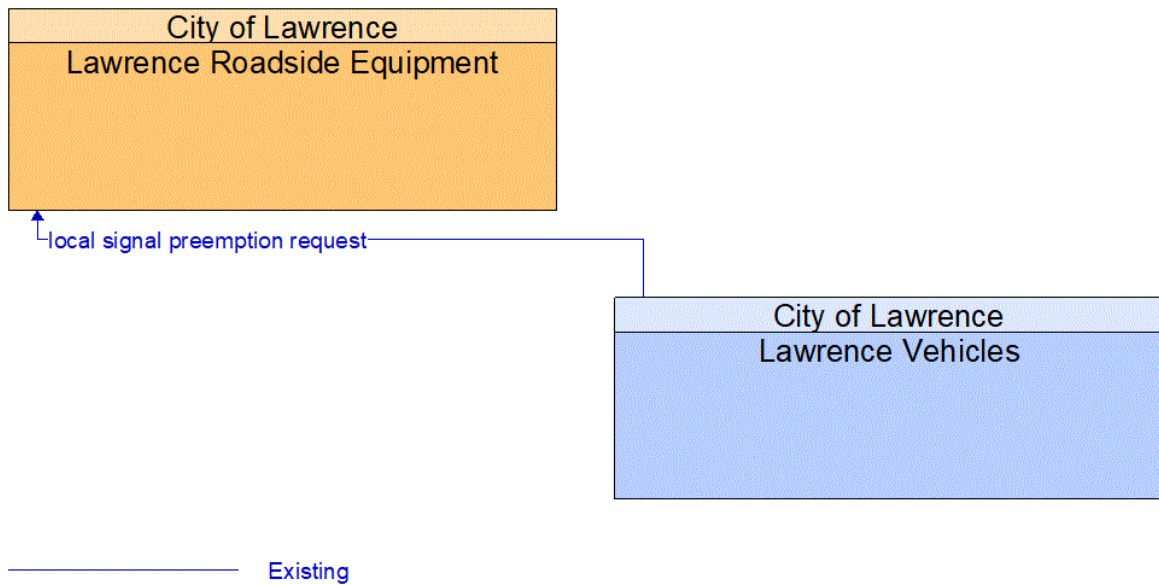


Figure 367: Lawrence Roadside Equipment - Lawrence Vehicles Interface

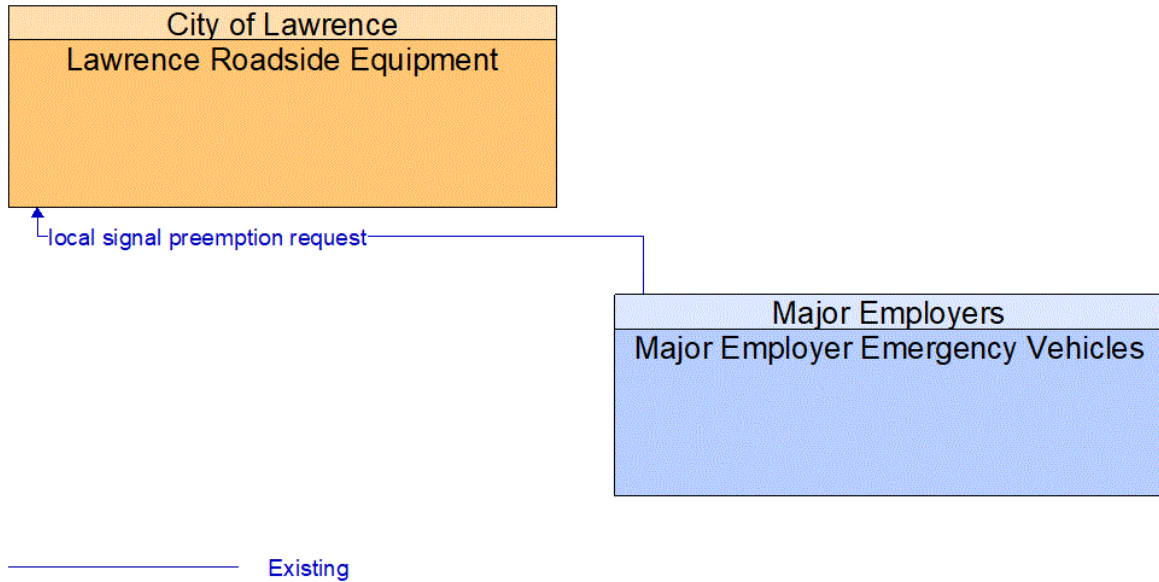


Figure 368: Lawrence Roadside Equipment - Major Employer Emergency Vehicles Interface

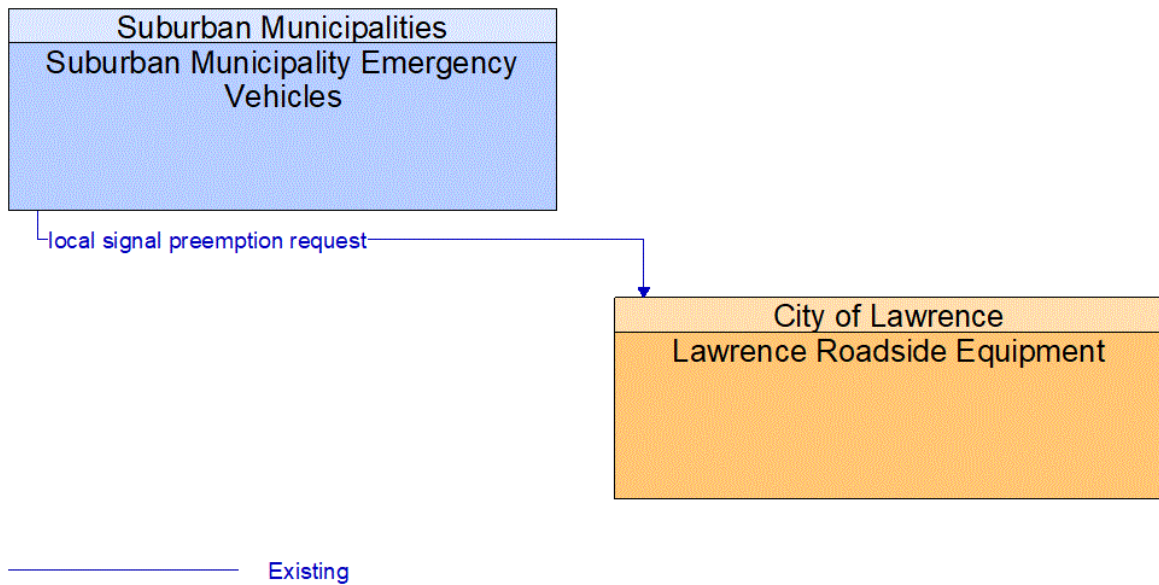


Figure 369: Lawrence Roadside Equipment - Suburban Municipality Emergency Vehicles Interface

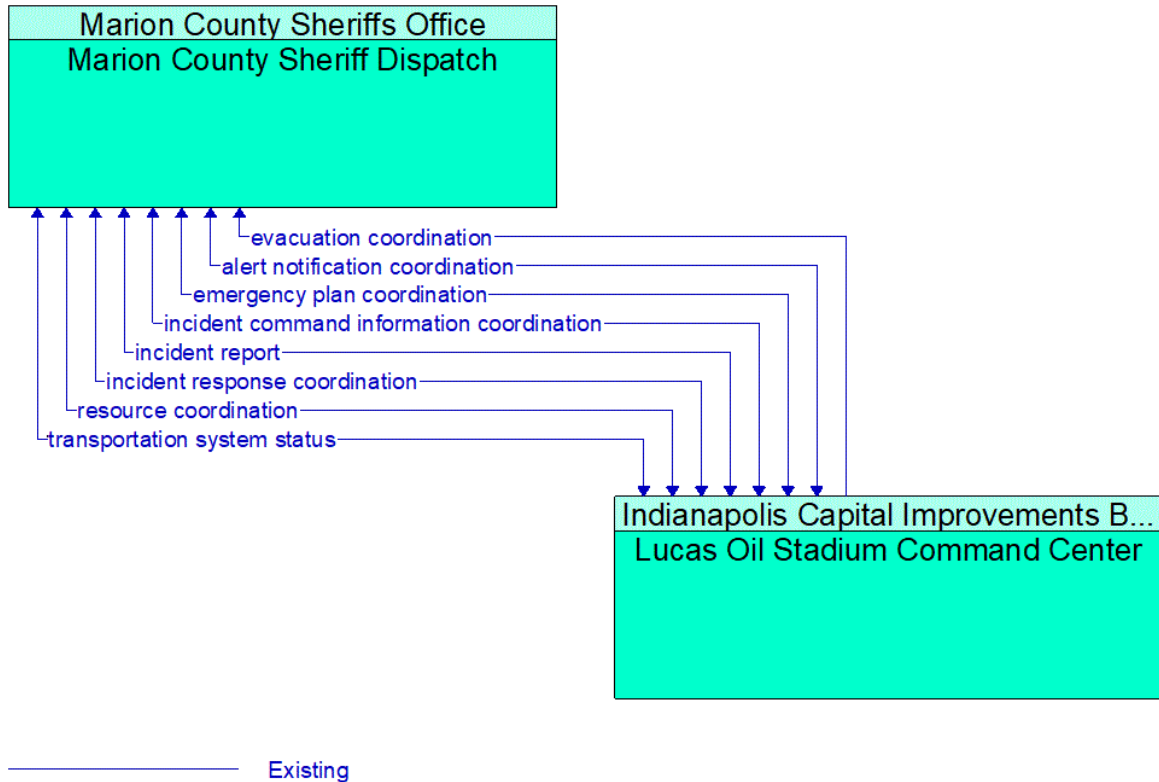


Figure 370: Lucas Oil Stadium Command Center - Marion County Sheriff Dispatch Interface

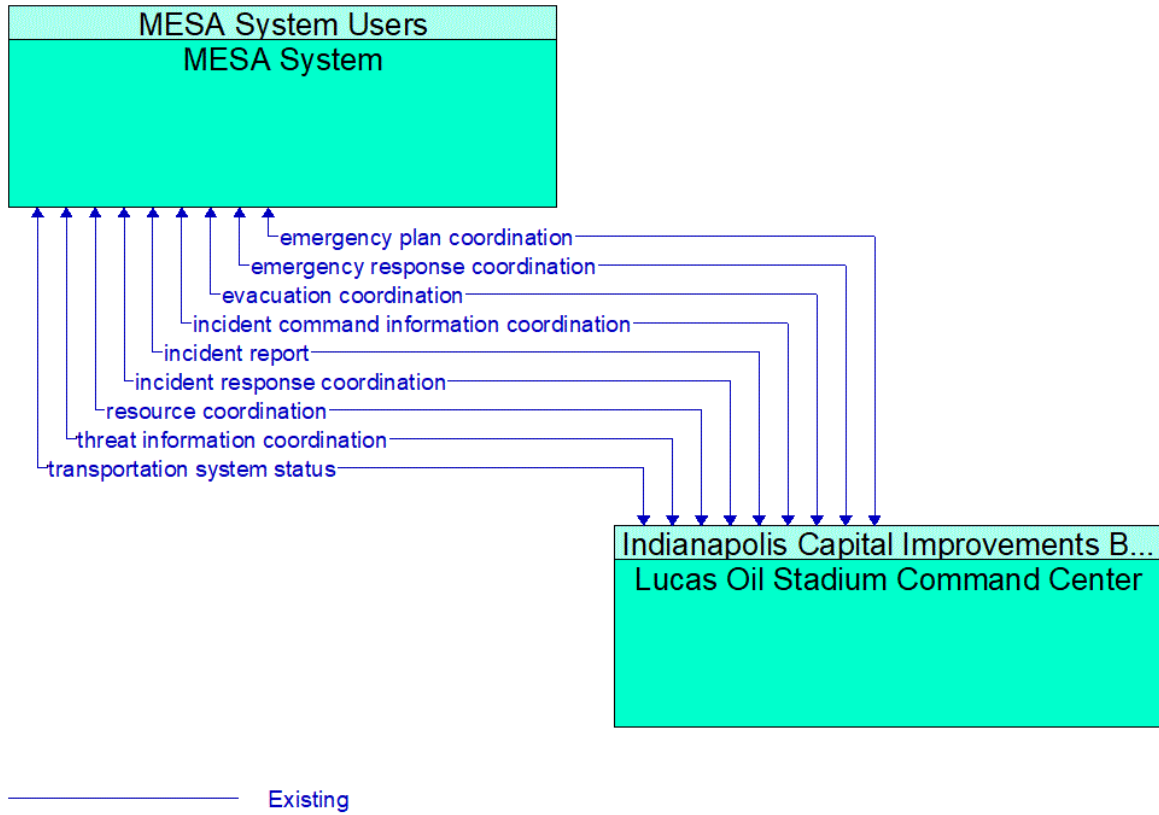


Figure 371: Lucas Oil Stadium Command Center - MESA System Interface

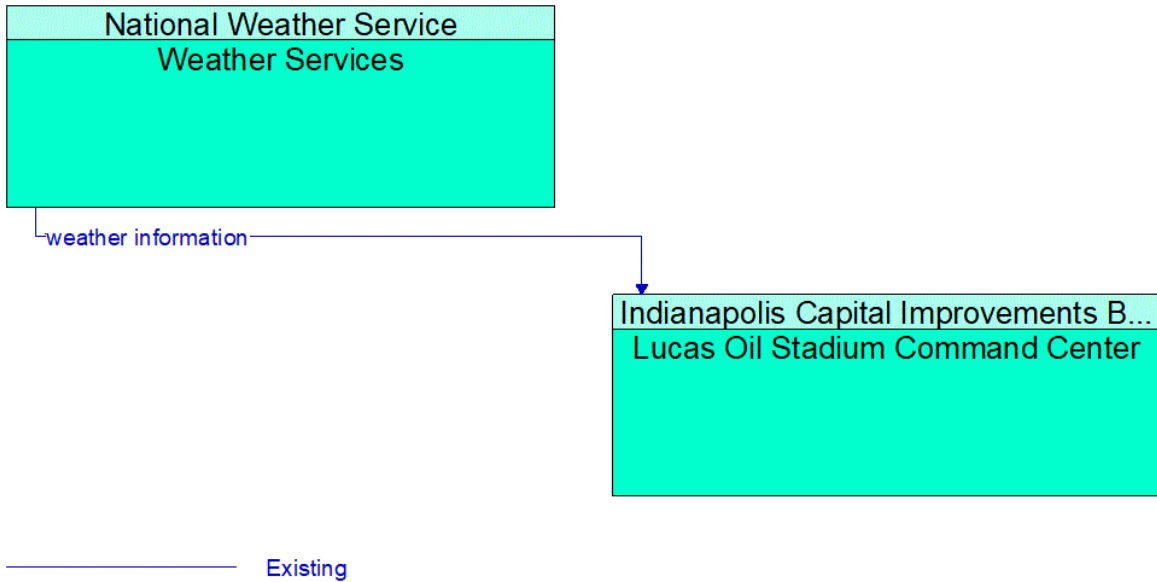


Figure 372: Lucas Oil Stadium Command Center - Weather Services Interface

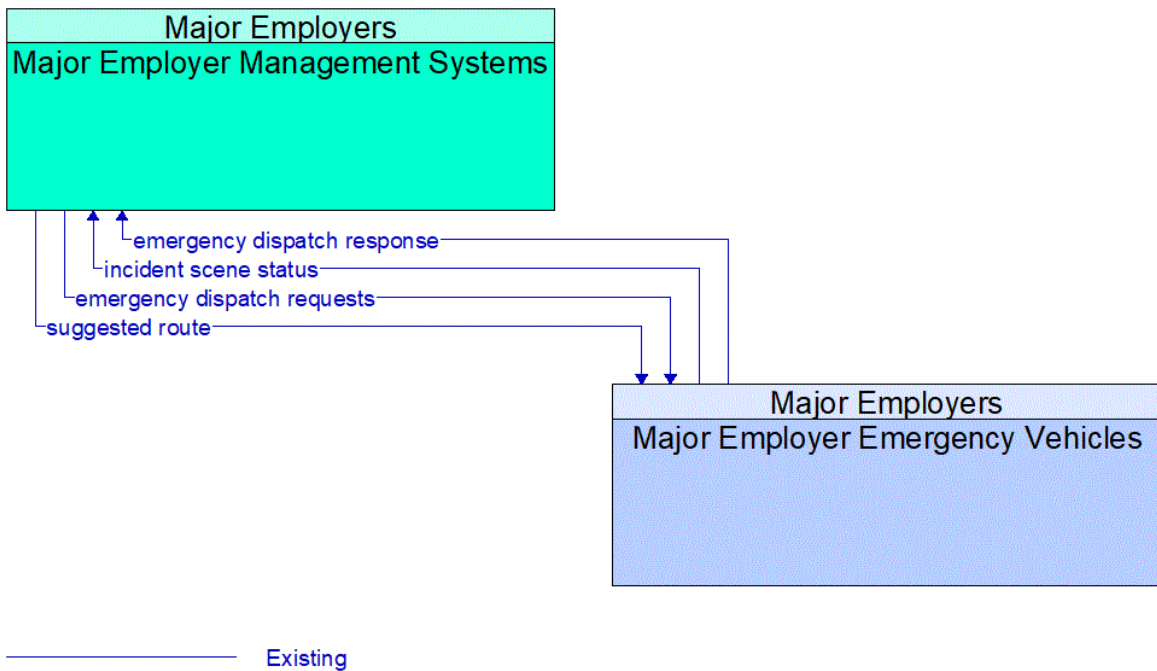


Figure 373: Major Employer Emergency Vehicles - Major Employer Management Systems Interface

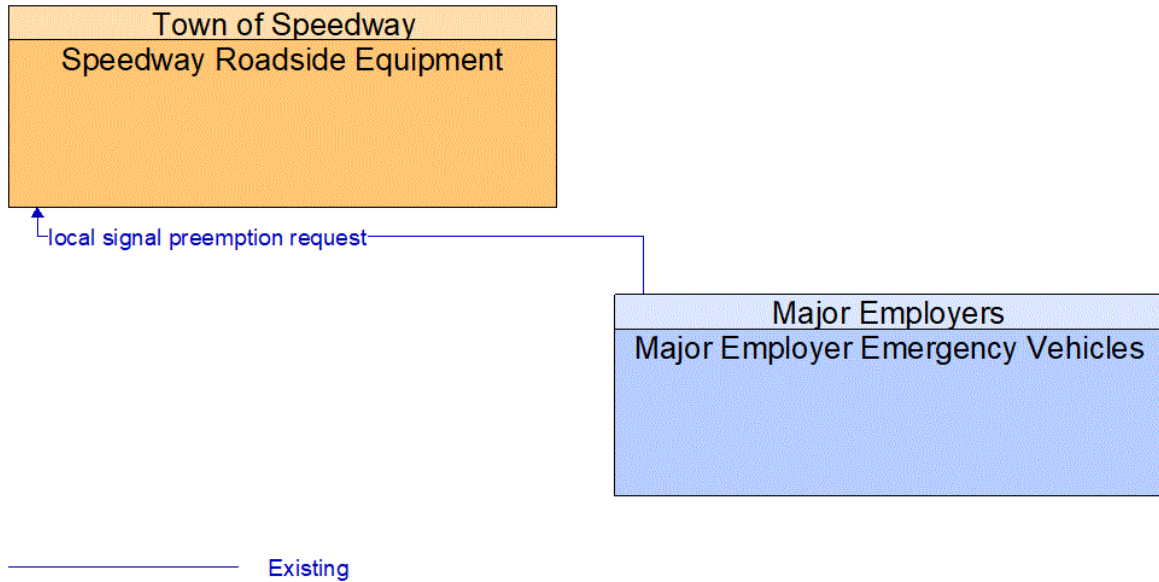


Figure 374: Major Employer Emergency Vehicles - Speedway Roadside Equipment Interface

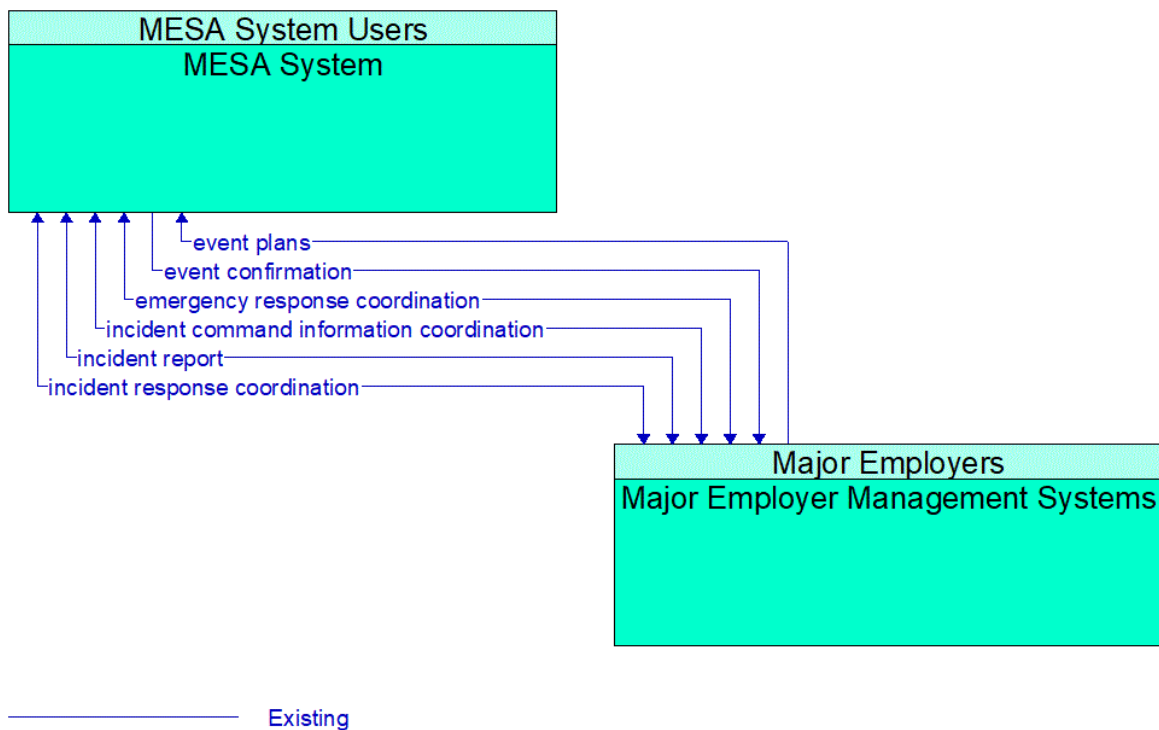


Figure 375: Major Employer Management Systems - MESA System Interface

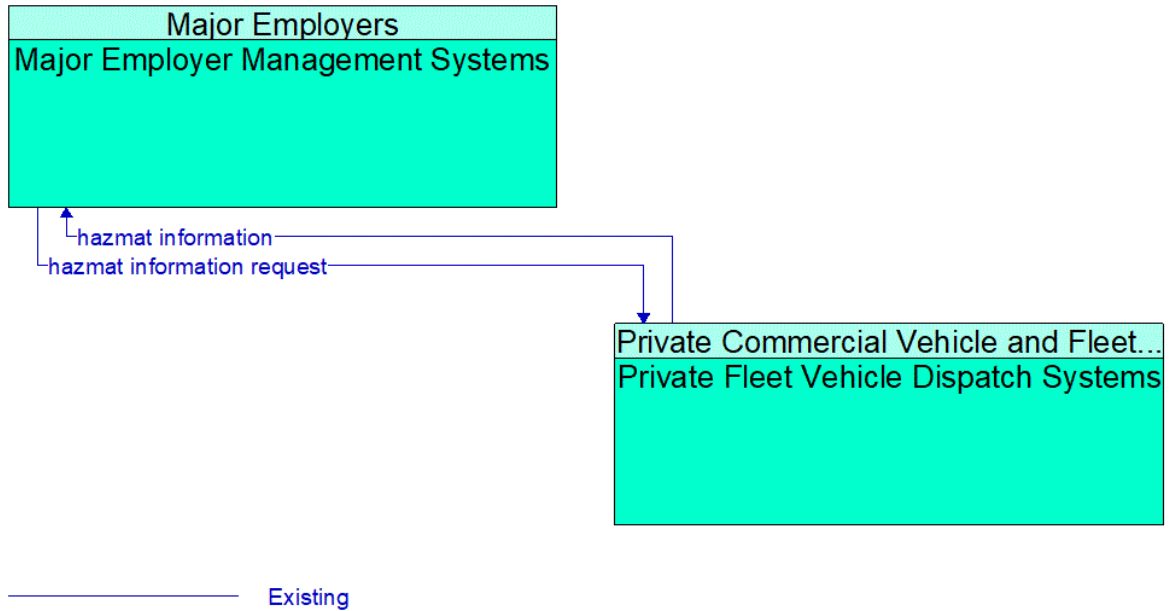


Figure 376: Major Employer Management Systems - Private Fleet Vehicle Dispatch Systems Interface

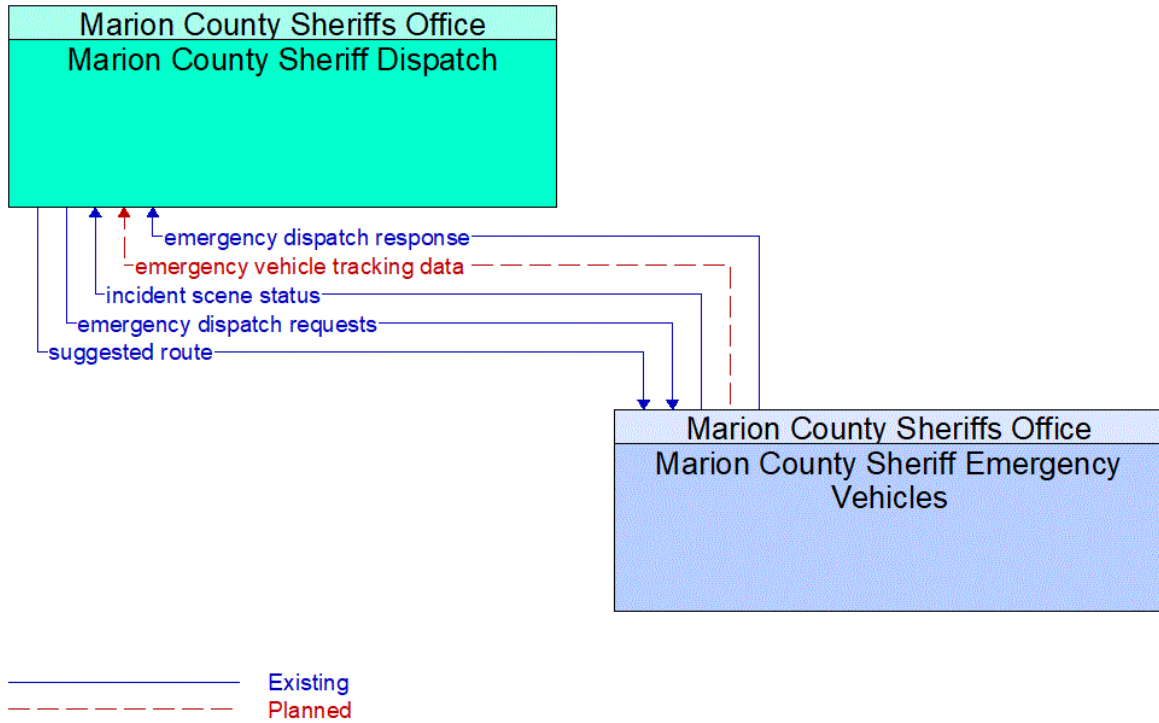


Figure 377: Marion County Sheriff Dispatch - Marion County Sheriff Emergency Vehicles Interface

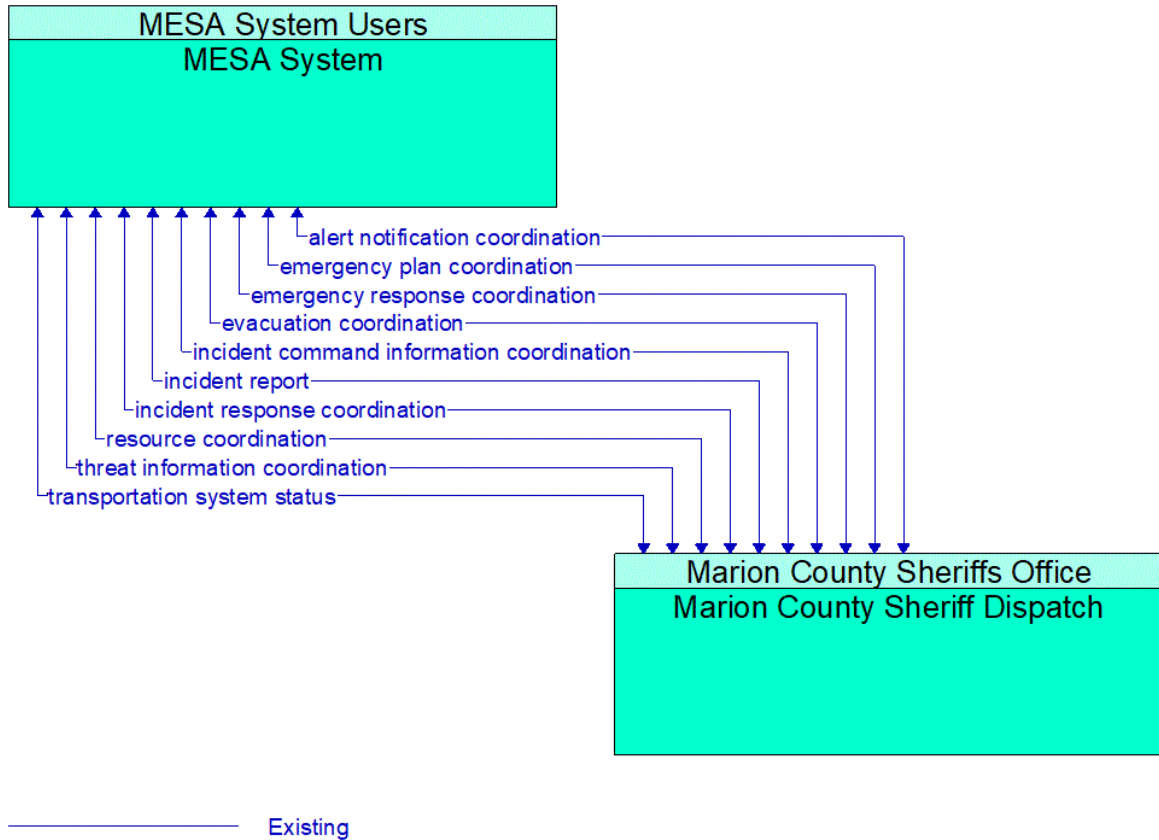


Figure 378: Marion County Sheriff Dispatch - MESA System Interface

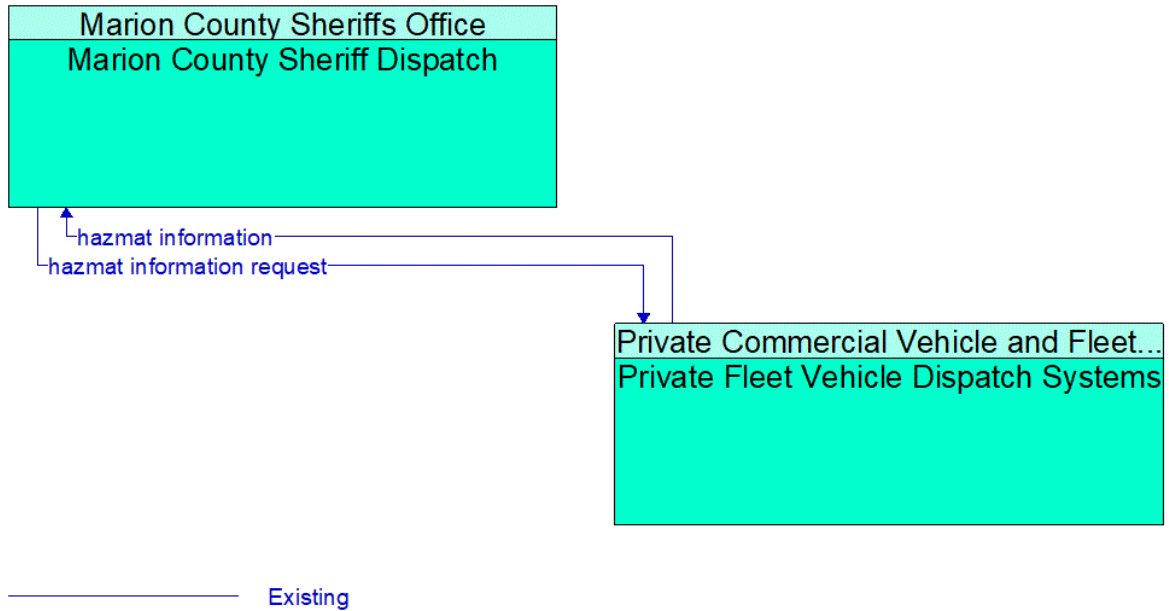


Figure 379: Marion County Sheriff Dispatch - Private Fleet Vehicle Dispatch Systems Interface

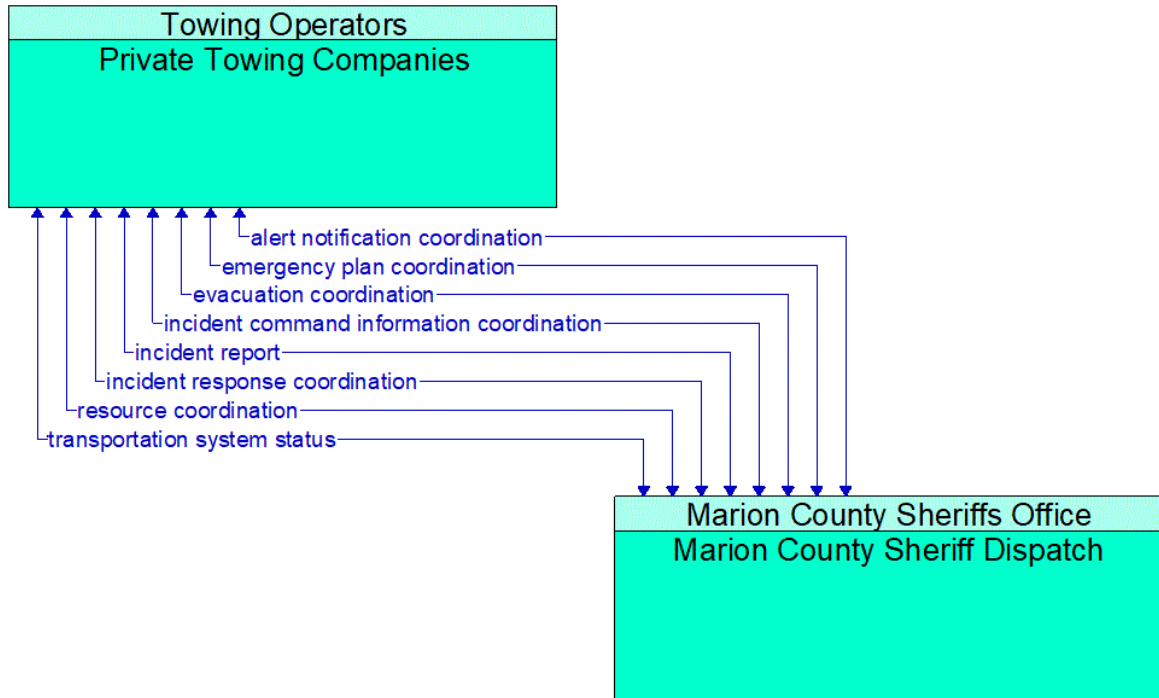
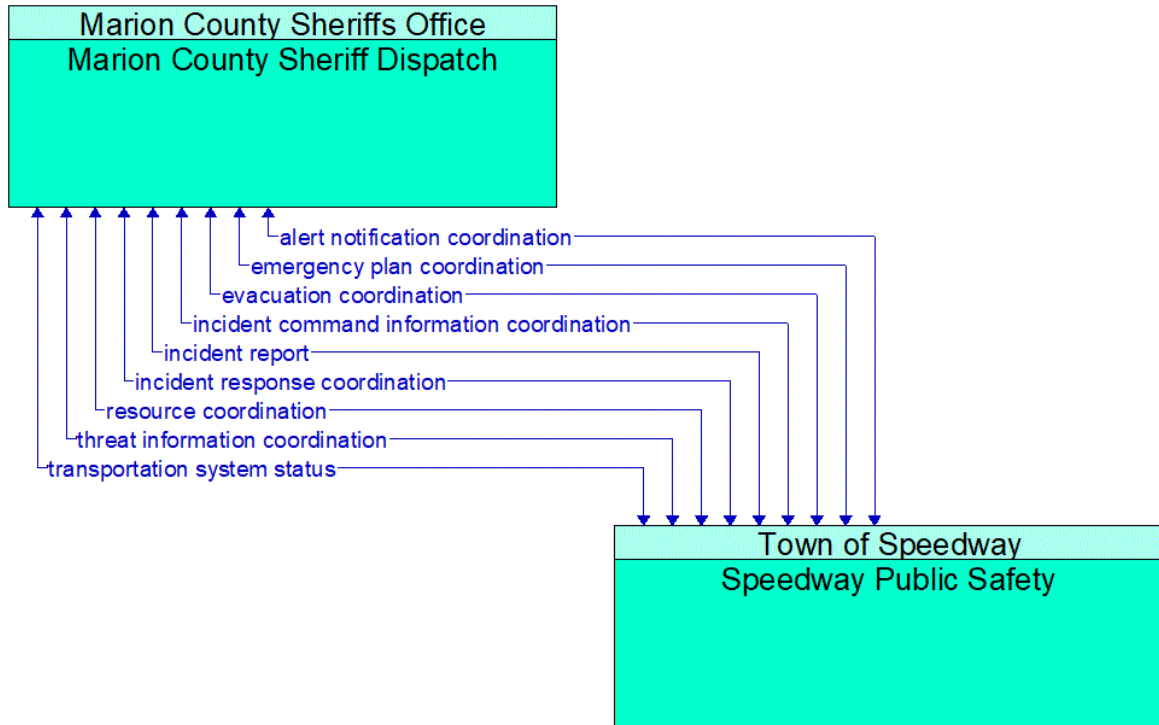


Figure 380: Marion County Sheriff Dispatch - Private Towing Companies Interface



Existing

Figure 381: Marion County Sheriff Dispatch - Speedway Public Safety Interface

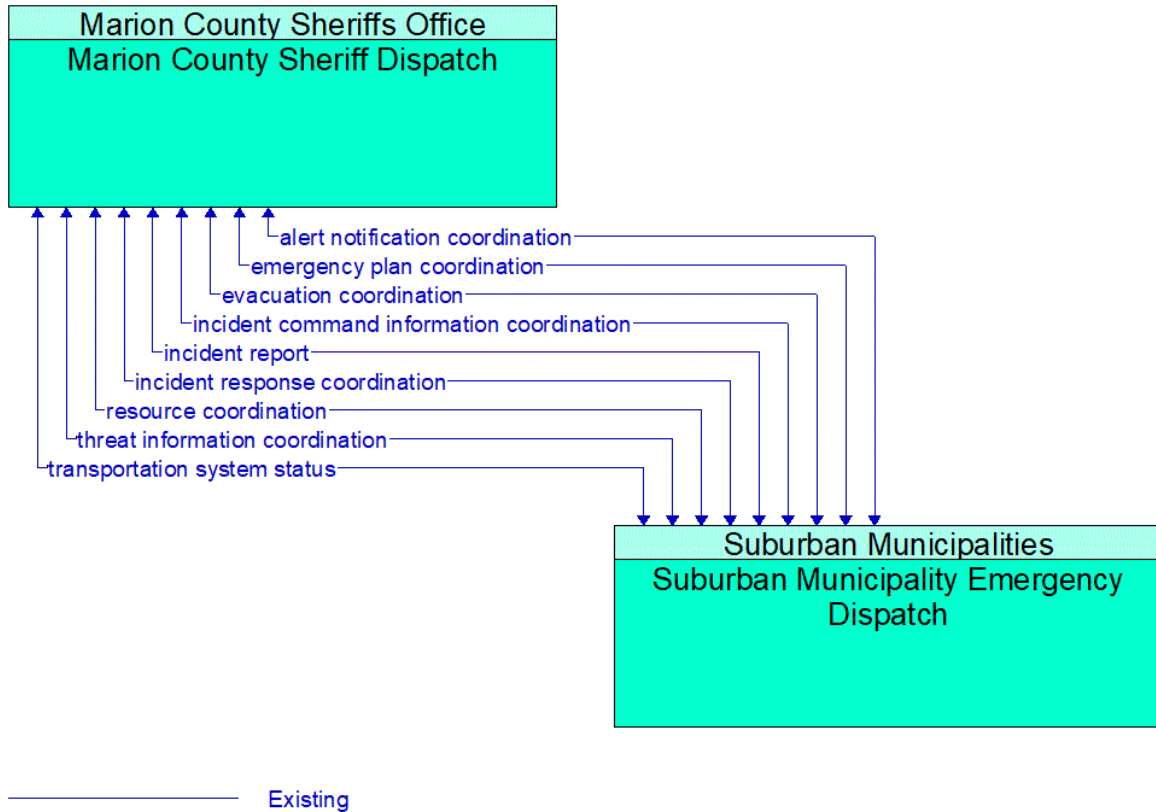
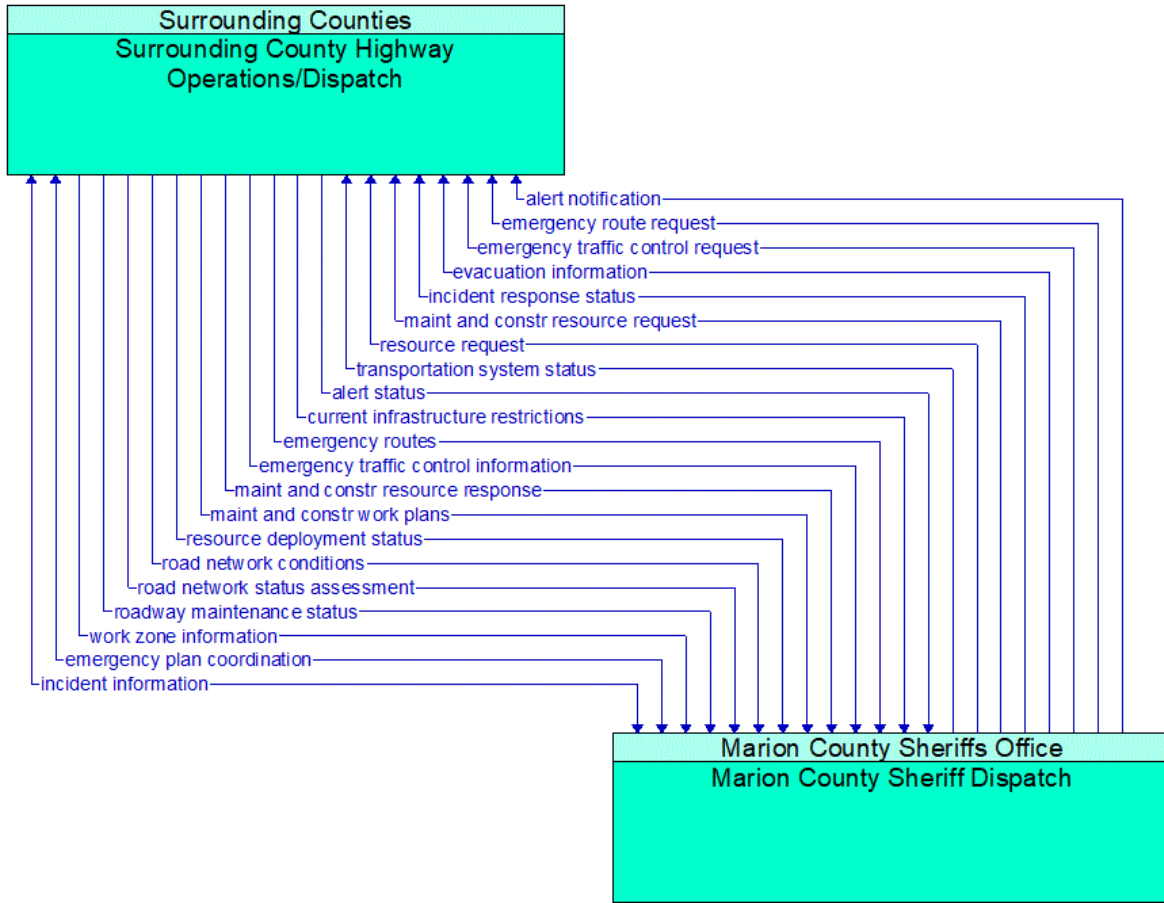


Figure 382: Marion County Sheriff Dispatch - Suburban Municipality Emergency Dispatch Interface



Existing

Figure 383: Marion County Sheriff Dispatch - Surrounding County Highway Operations/Dispatch Interface

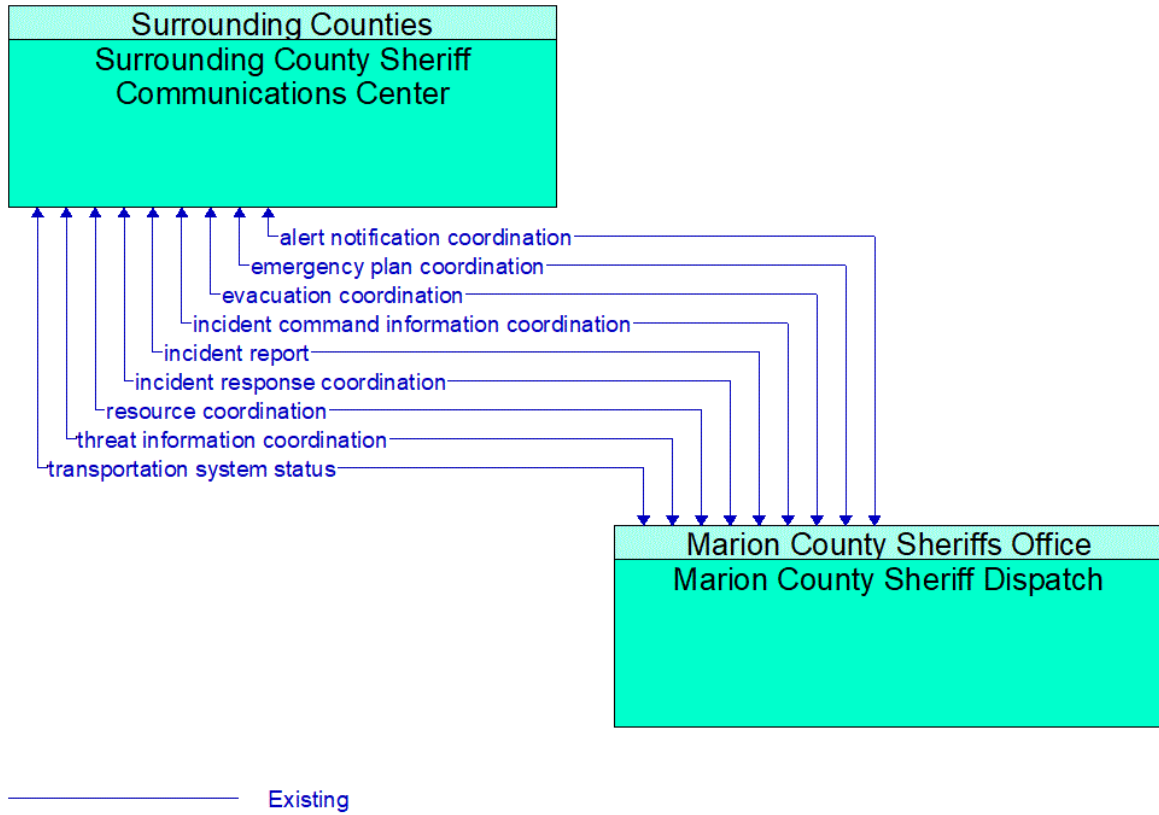


Figure 384: Marion County Sheriff Dispatch - Surrounding County Sheriff Communications Center Interface

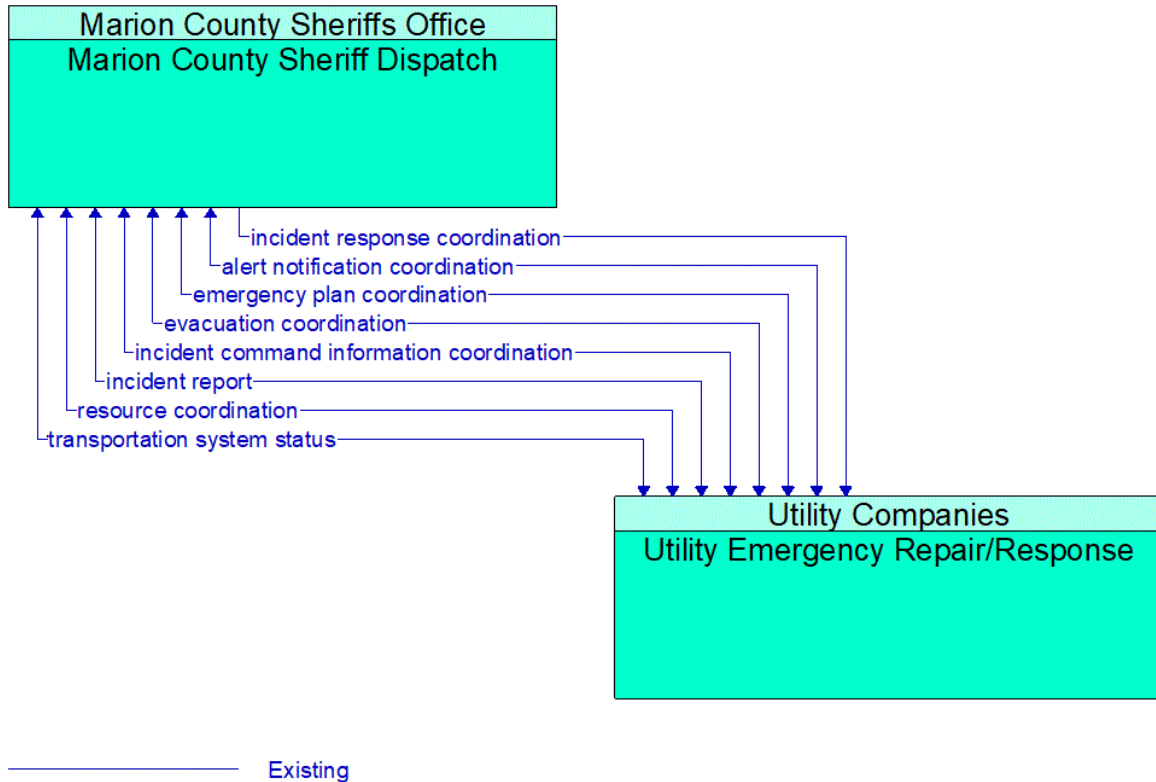


Figure 385: Marion County Sheriff Dispatch - Utility Emergency Repair/Response Interface

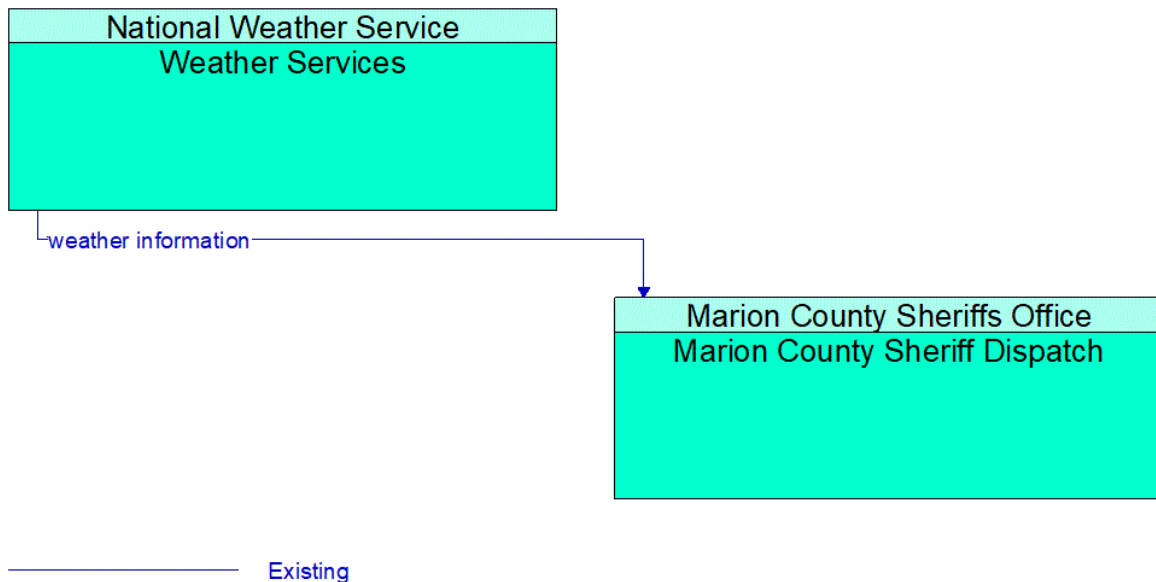


Figure 386: Marion County Sheriff Dispatch - Weather Services Interface

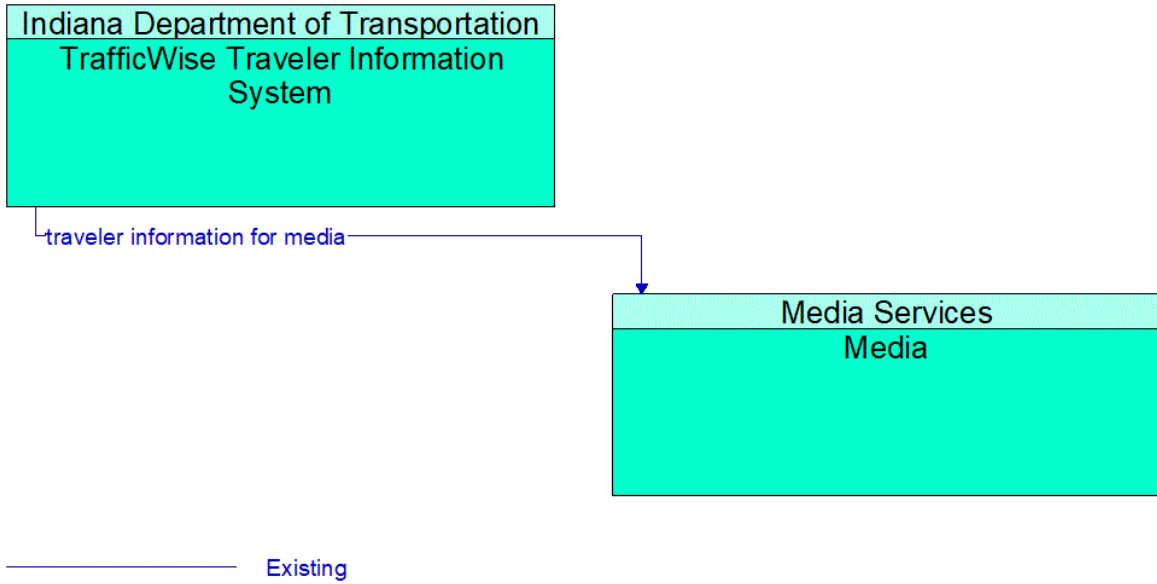


Figure 387: Media - TrafficWise Traveler Information System Interface

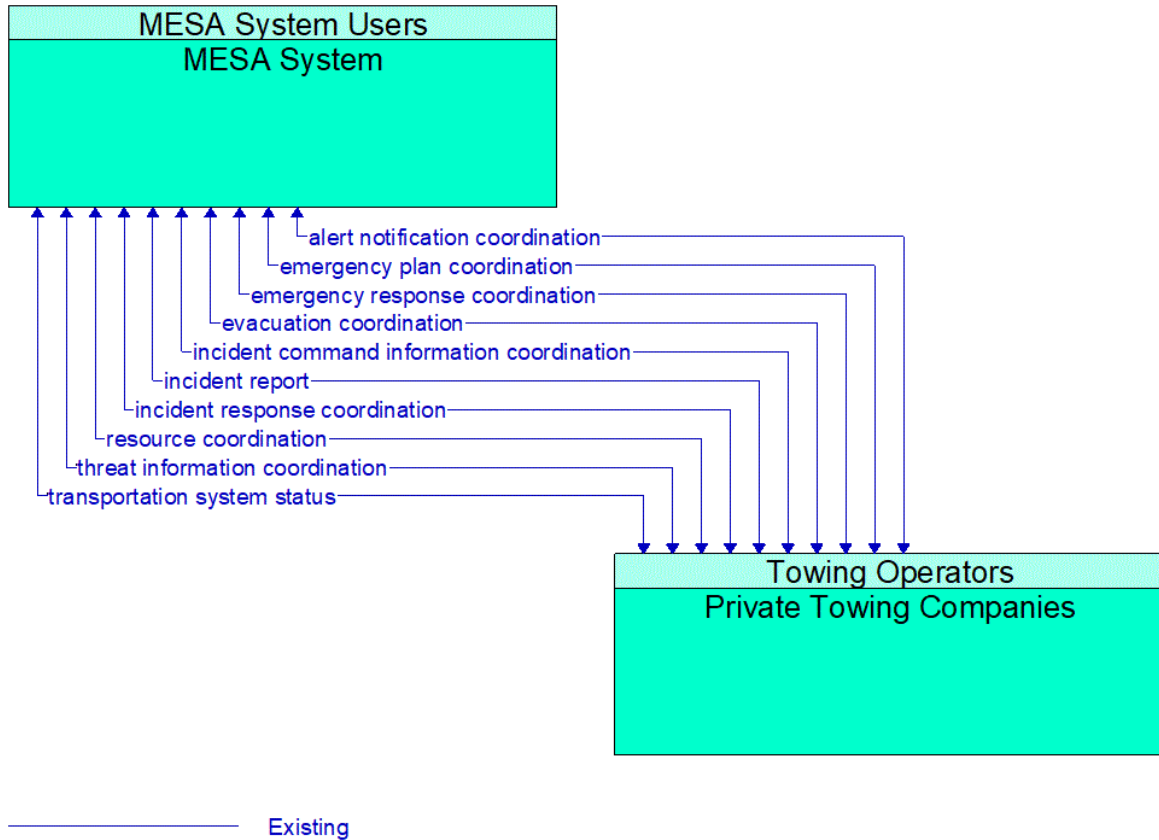


Figure 388: MESA System - Private Towing Companies Interface

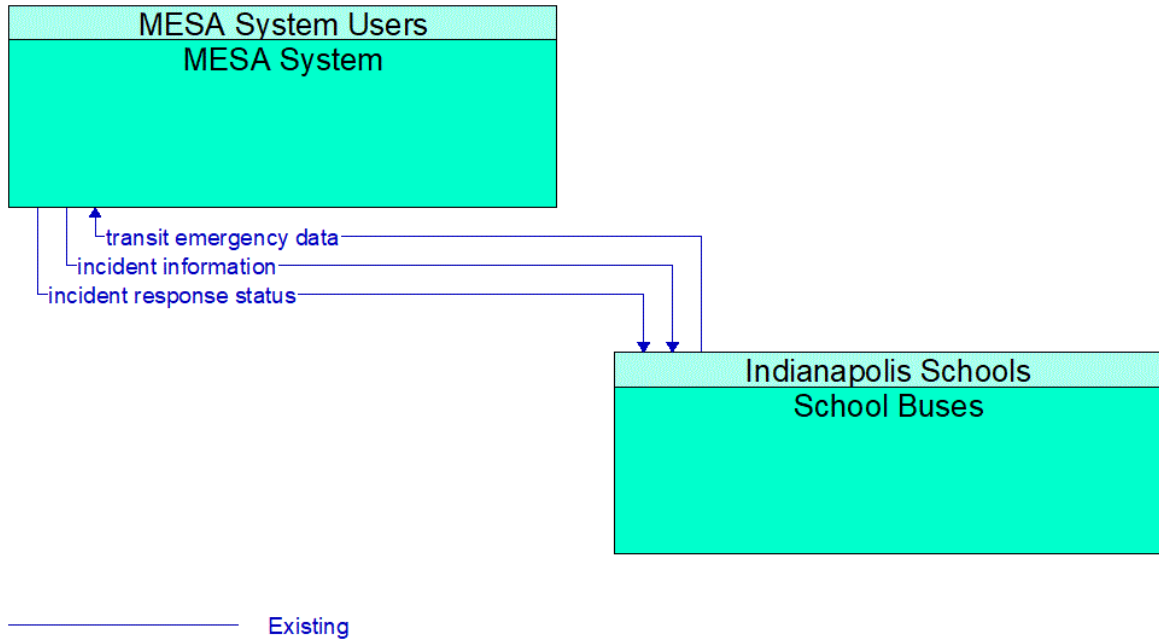
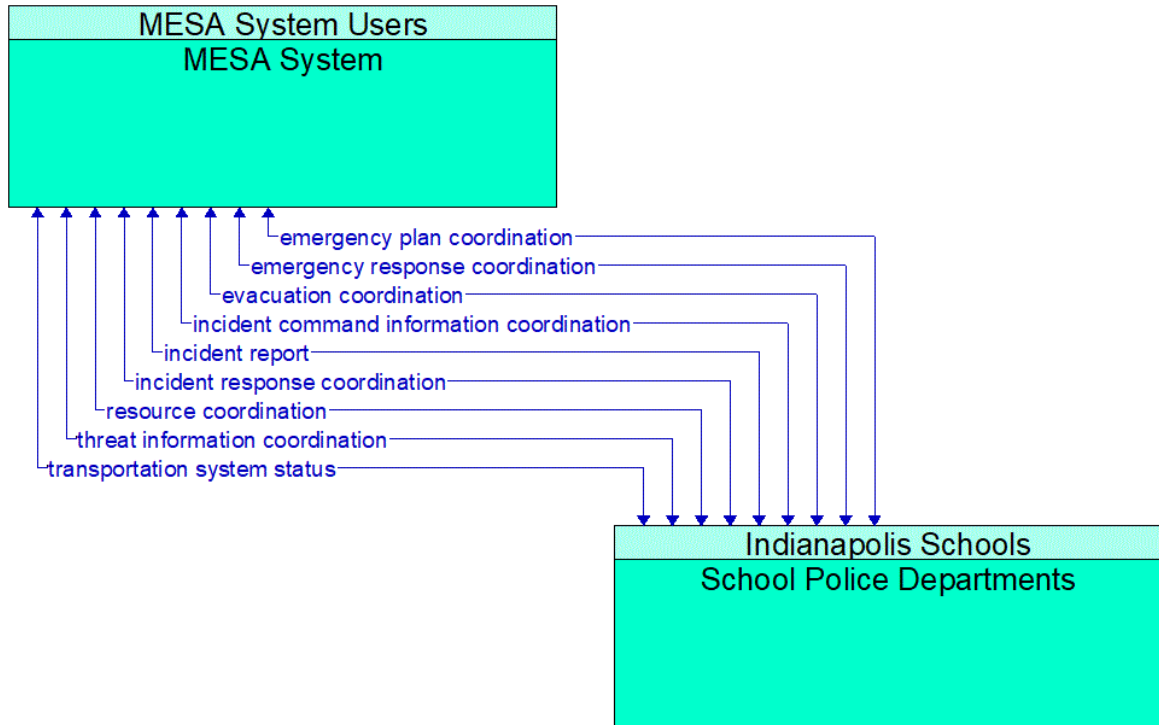


Figure 389: MESA System - School Buses Interface



Existing

Figure 390: MESA System - School Police Departments Interface

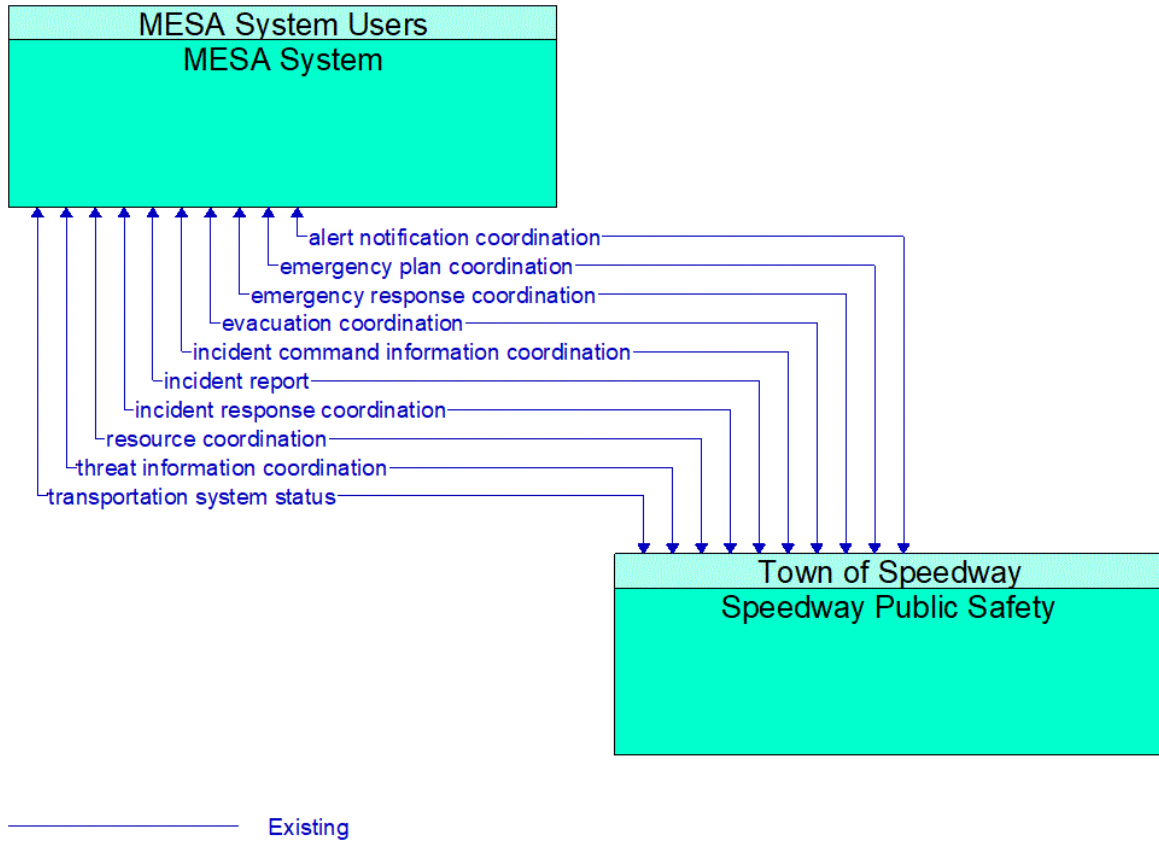
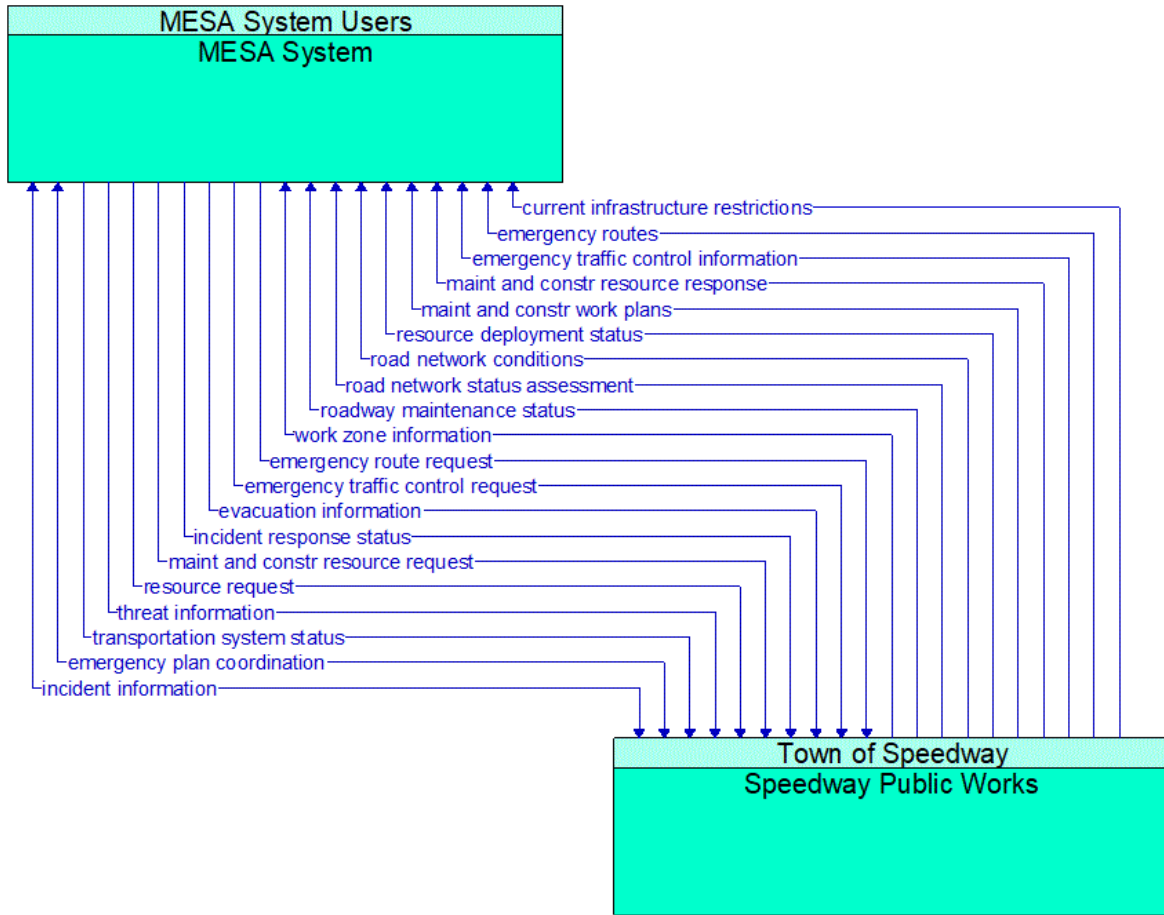


Figure 391: MESA System - Speedway Public Safety Interface



Existing

Figure 392: MESA System - Speedway Public Works Interface

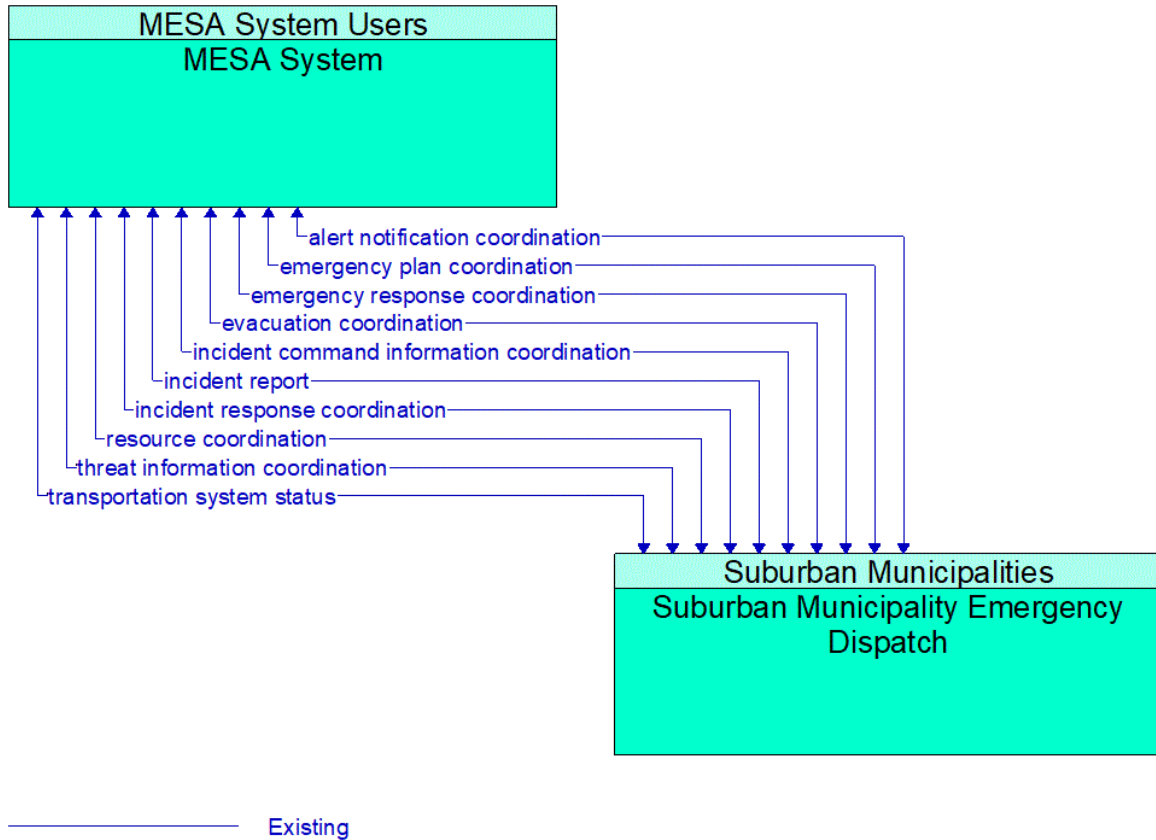
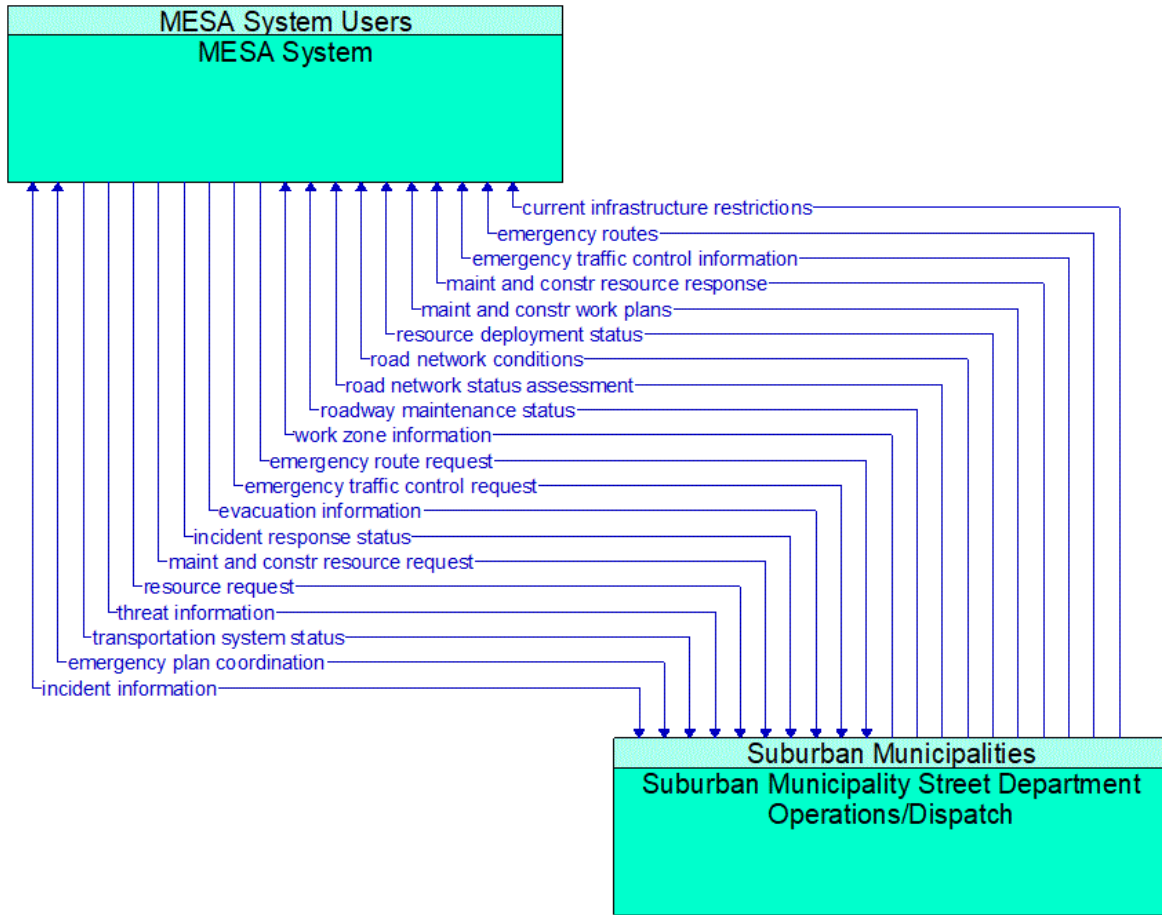
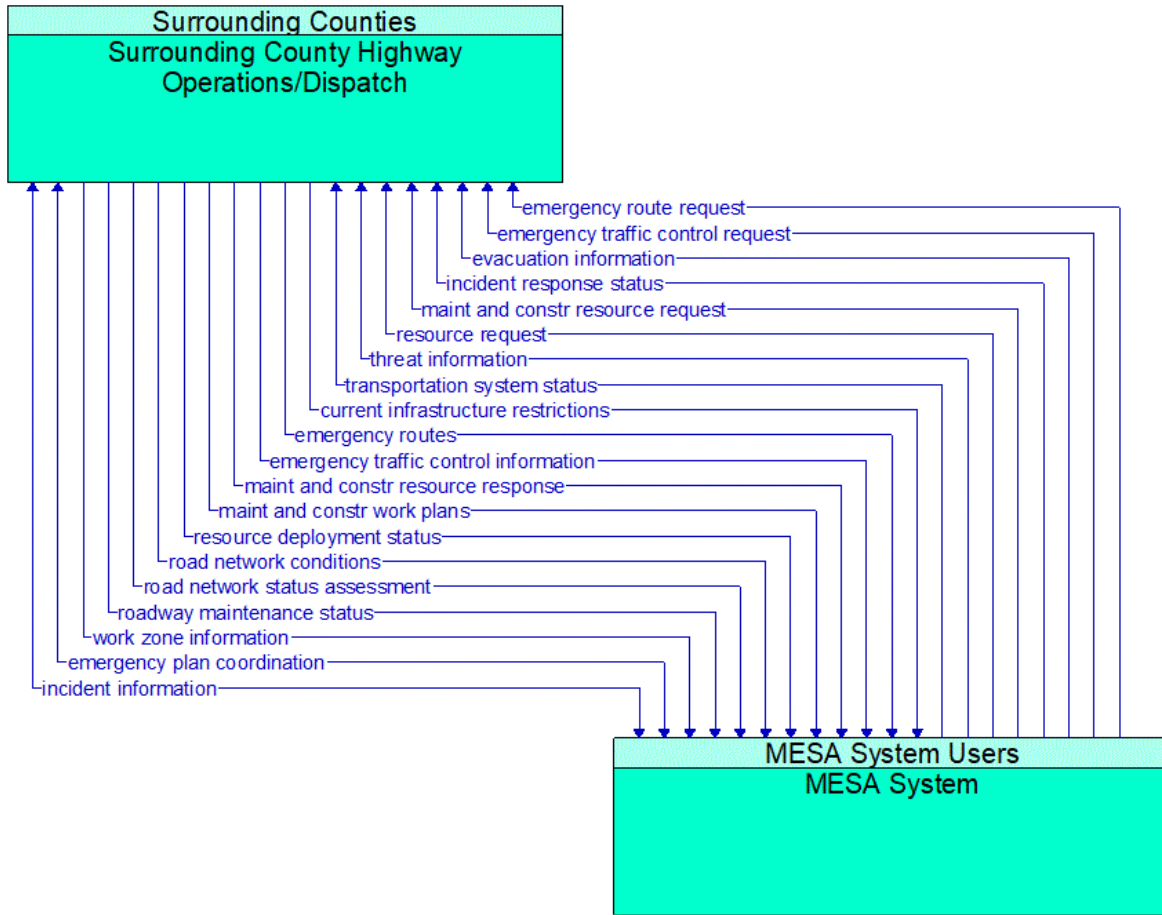


Figure 393: MESA System - Suburban Municipality Emergency Dispatch Interface



Existing

Figure 394: MESA System - Suburban Municipality Street Department Operations/Dispatch Interface



Existing

Figure 395: MESA System - Surrounding County Highway Operations/Dispatch Interface

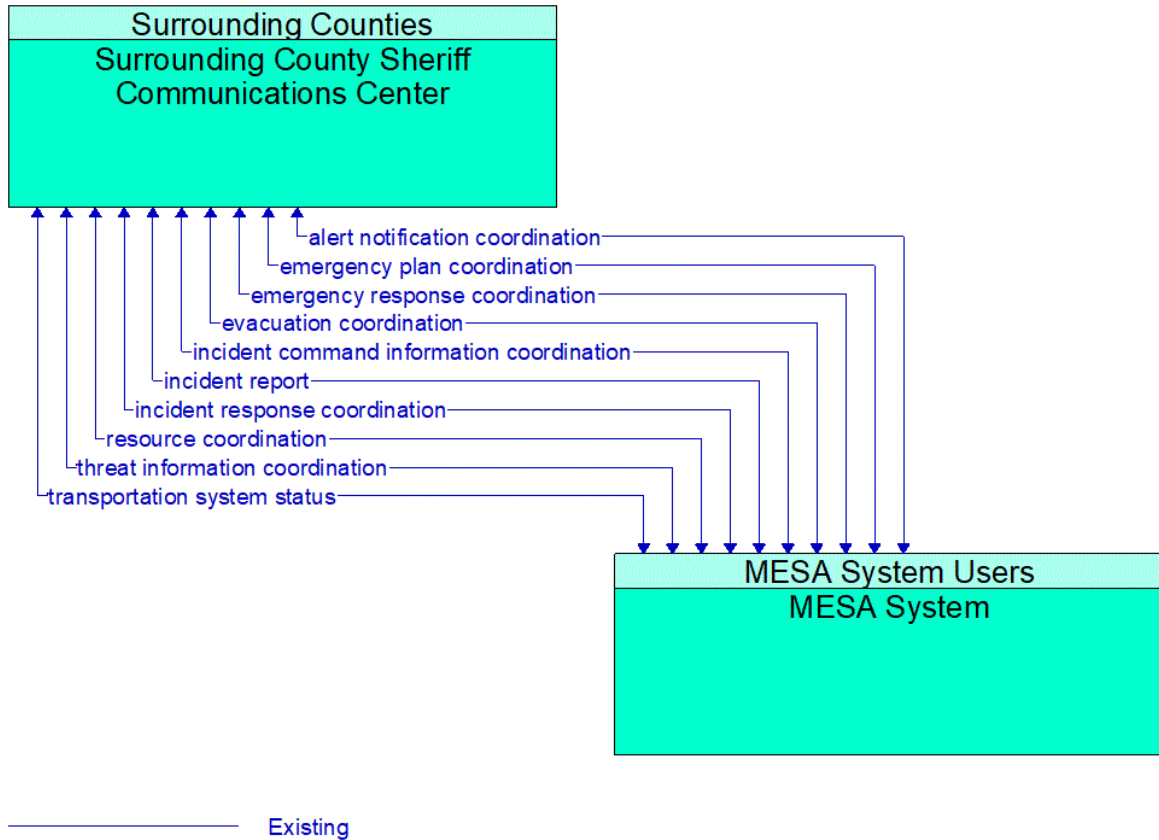


Figure 396: MESA System - Surrounding County Sheriff Communications Center Interface

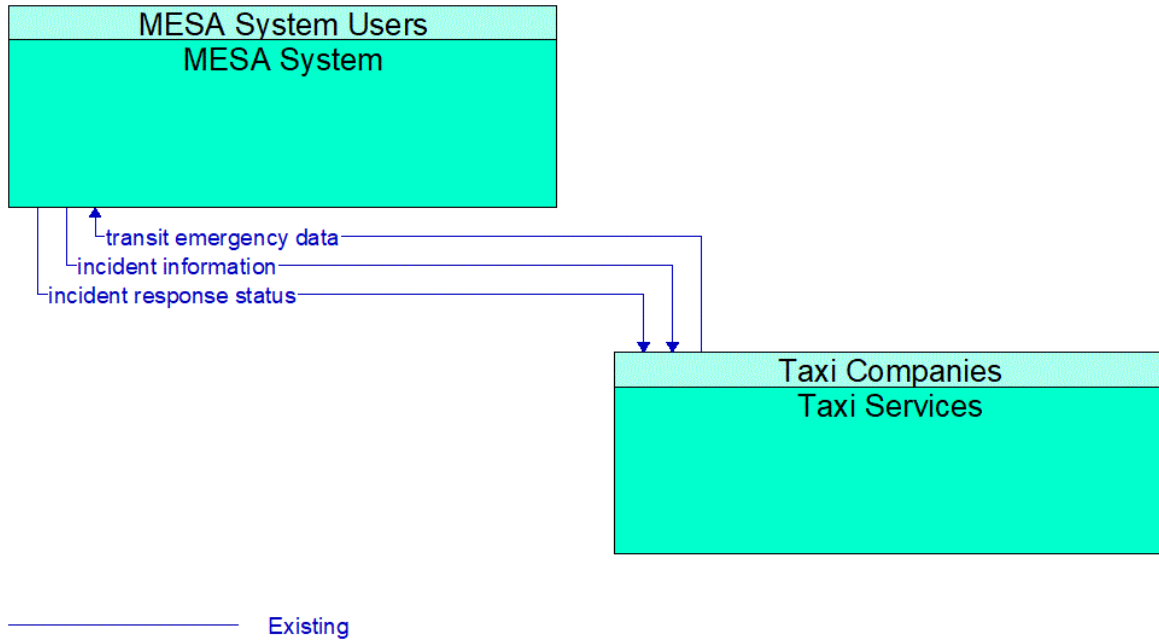
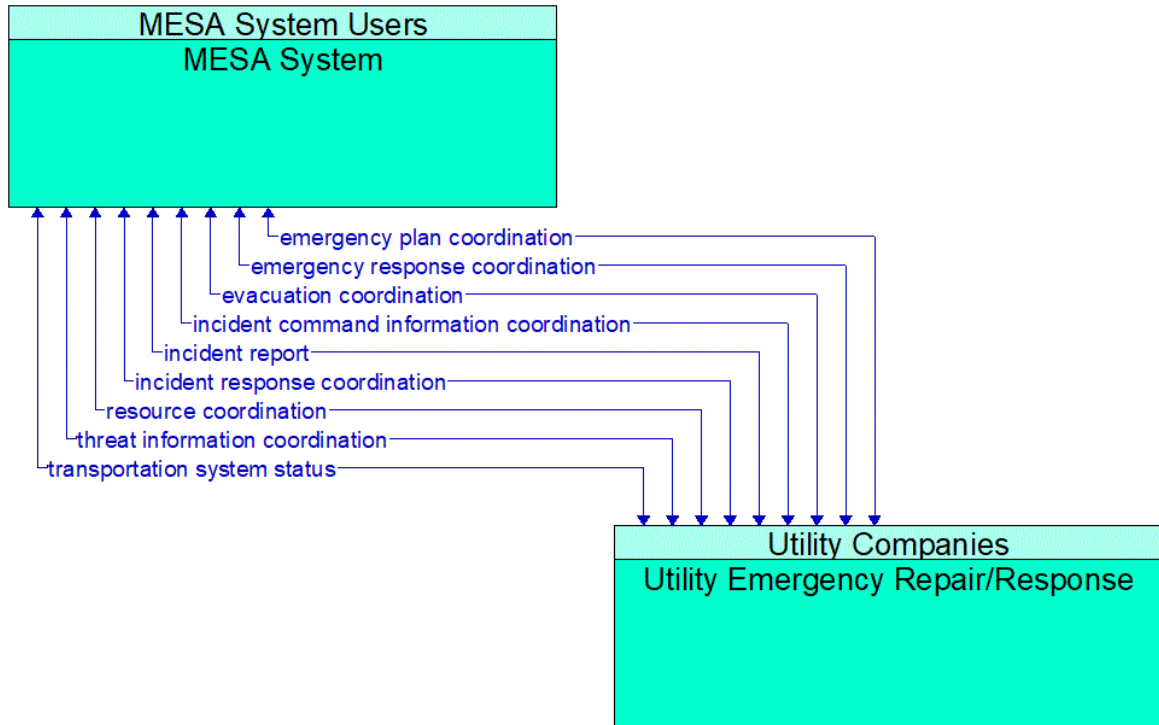


Figure 397: MESA System - Taxi Services Interface



Existing

Figure 398: MESA System - Utility Emergency Repair/Response Interface

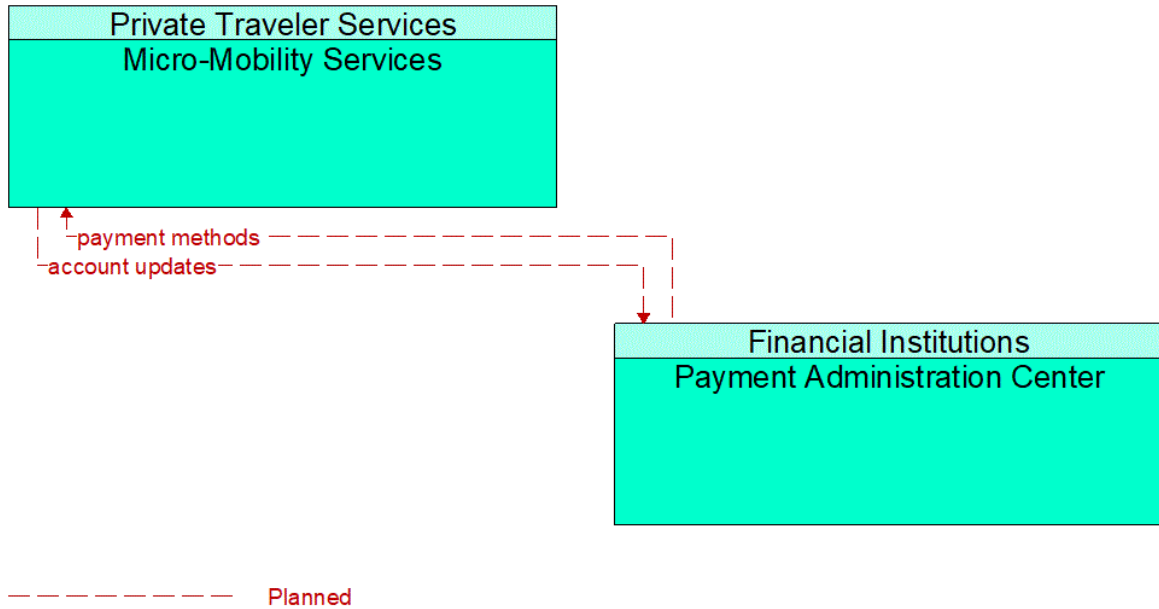


Figure 399: Micro-Mobility Services - Payment Administration Center Interface

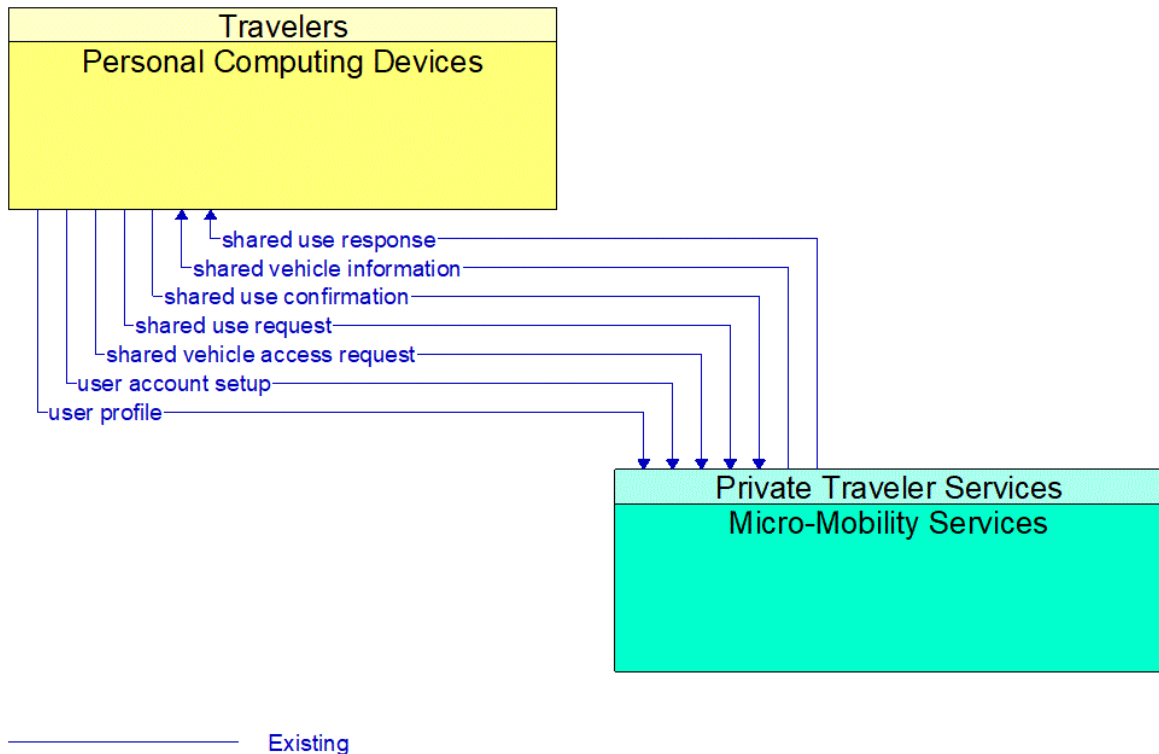


Figure 400: Micro-Mobility Services - Personal Computing Devices Interface

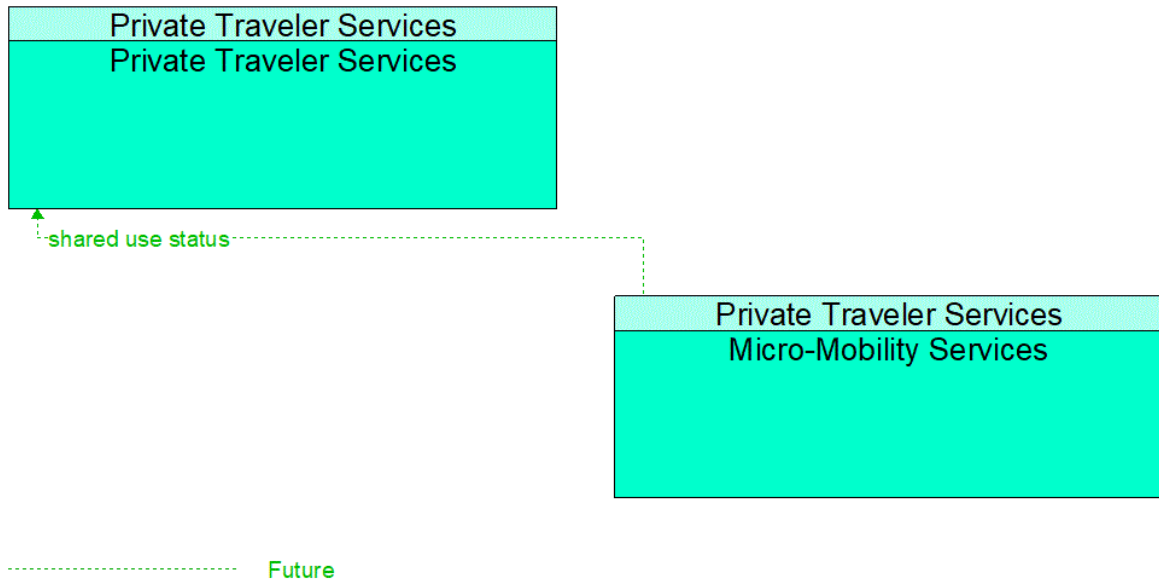


Figure 401: Micro-Mobility Services - Private Traveler Services Interface

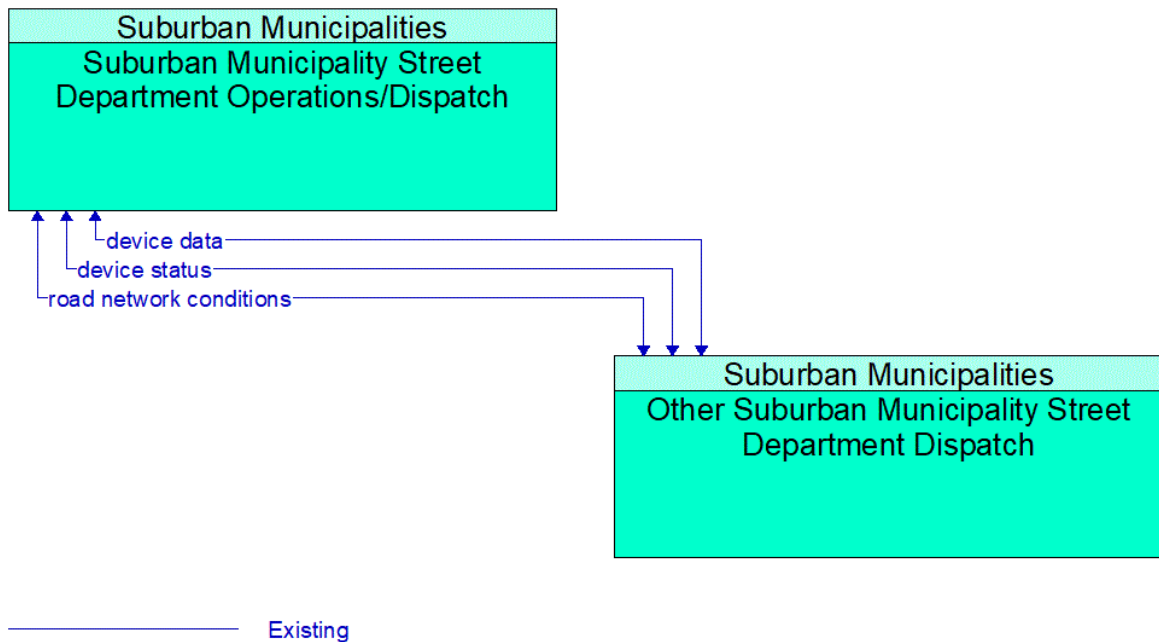


Figure 402: Other Suburban Municipality Street Department Dispatch - Suburban Municipality Street Department Operations/Dispatch Interface

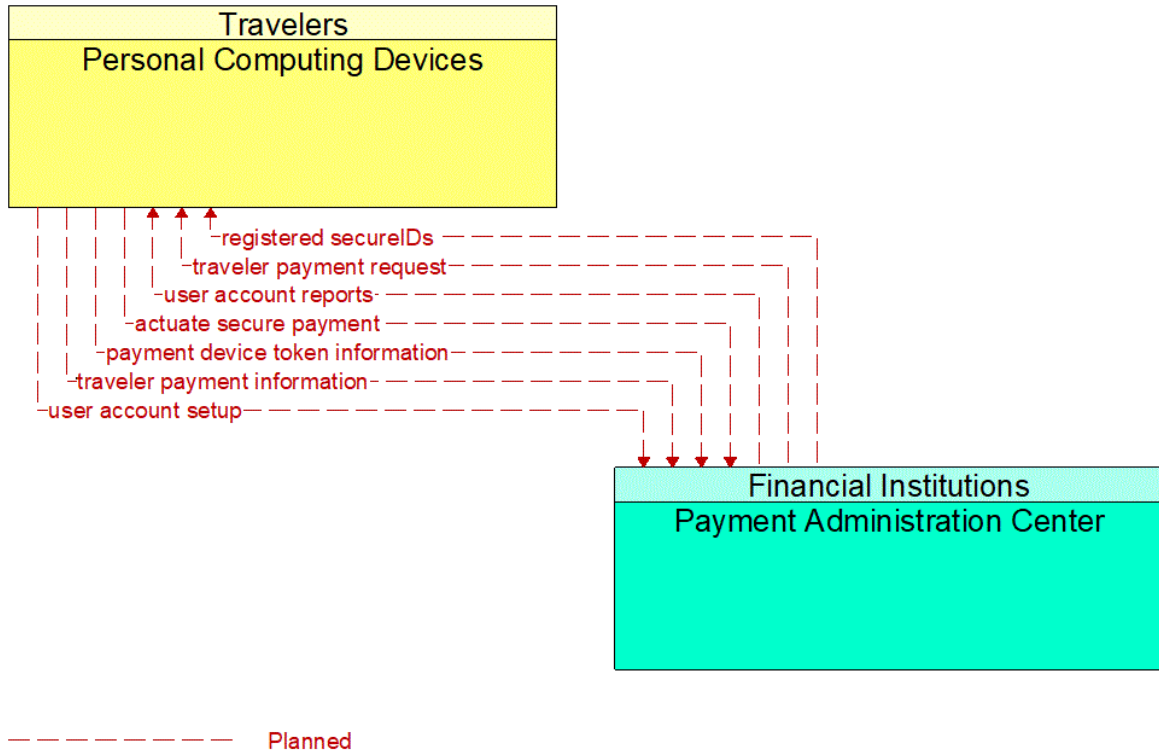


Figure 403: Payment Administration Center - Personal Computing Devices Interface

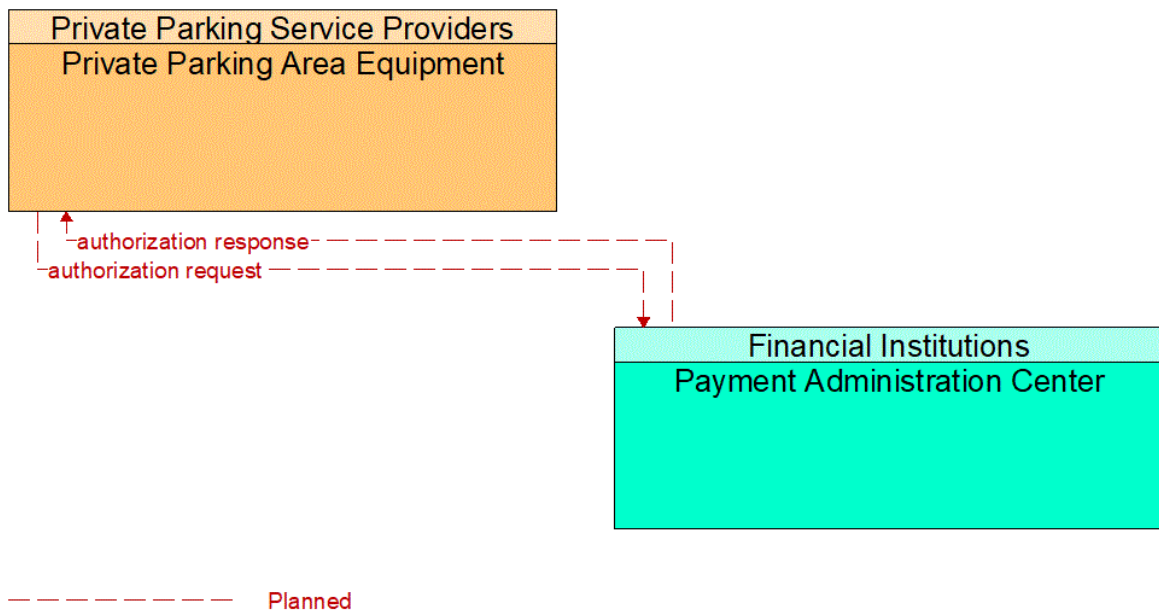


Figure 404: Payment Administration Center - Private Parking Area Equipment Interface

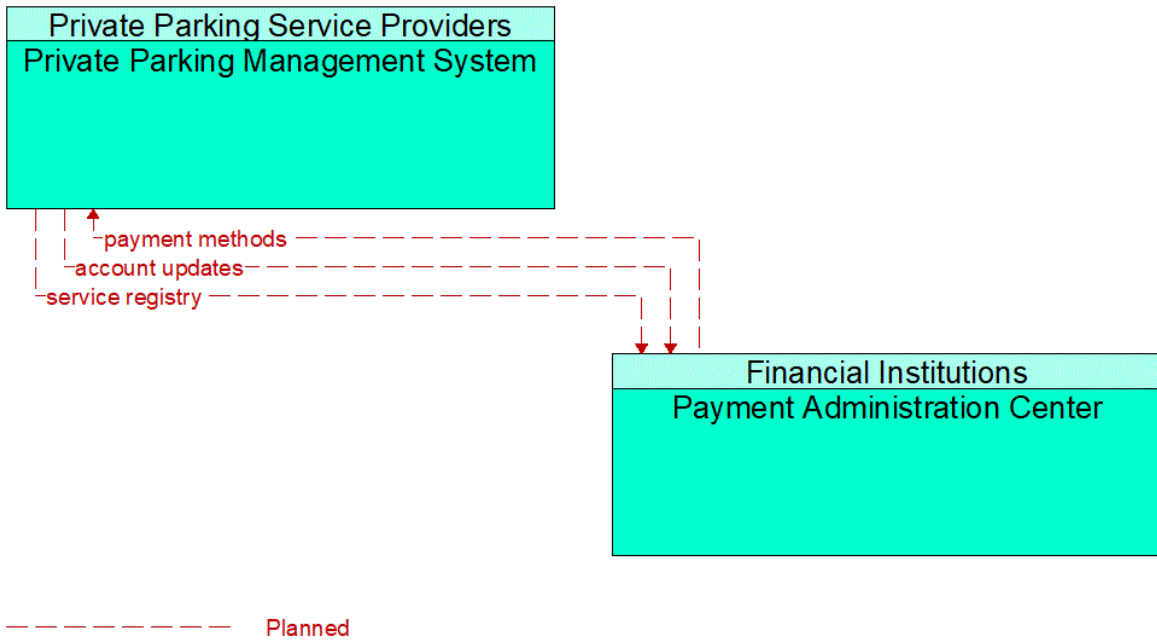


Figure 405: Payment Administration Center - Private Parking Management System Interface

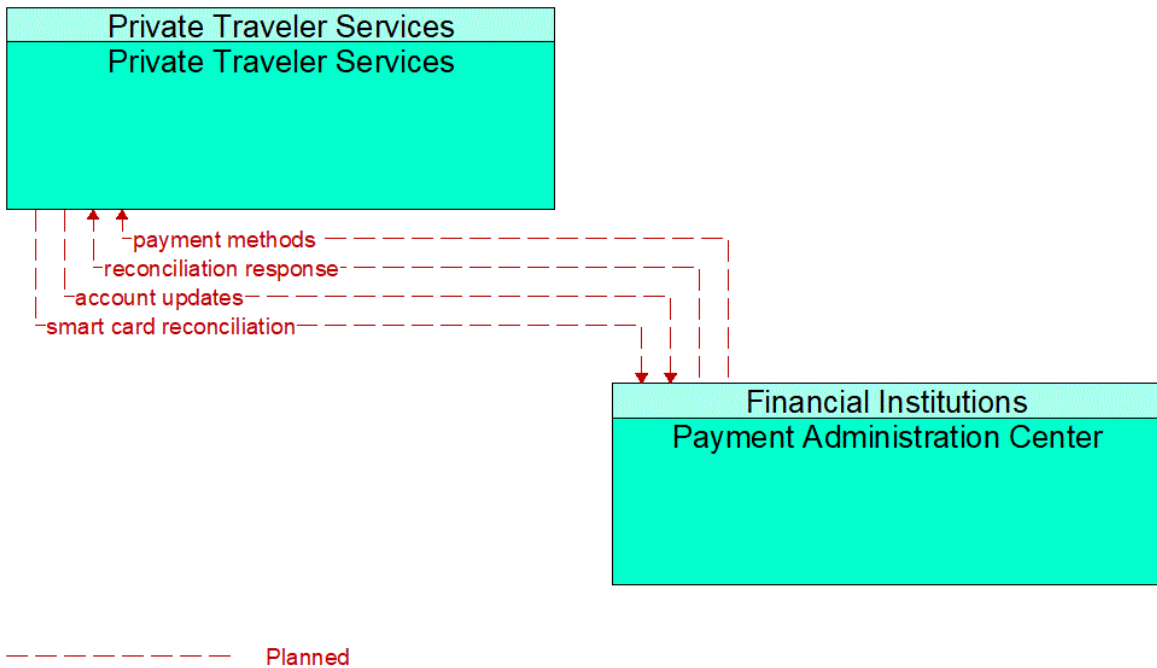


Figure 406: Payment Administration Center - Private Traveler Services Interface

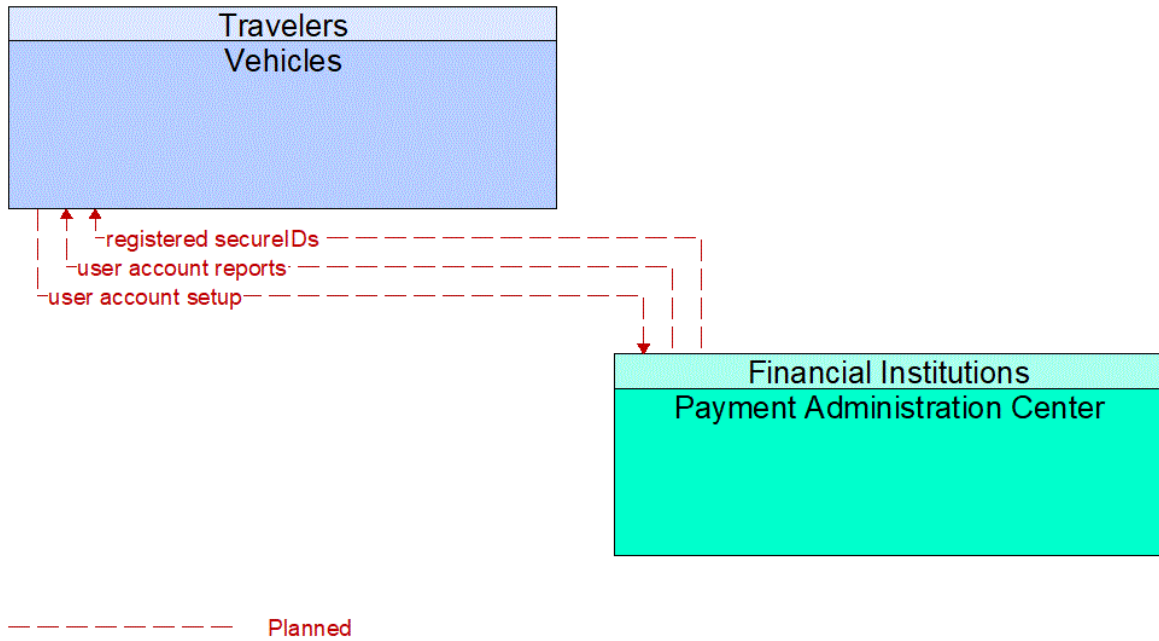


Figure 407: Payment Administration Center - Vehicles Interface

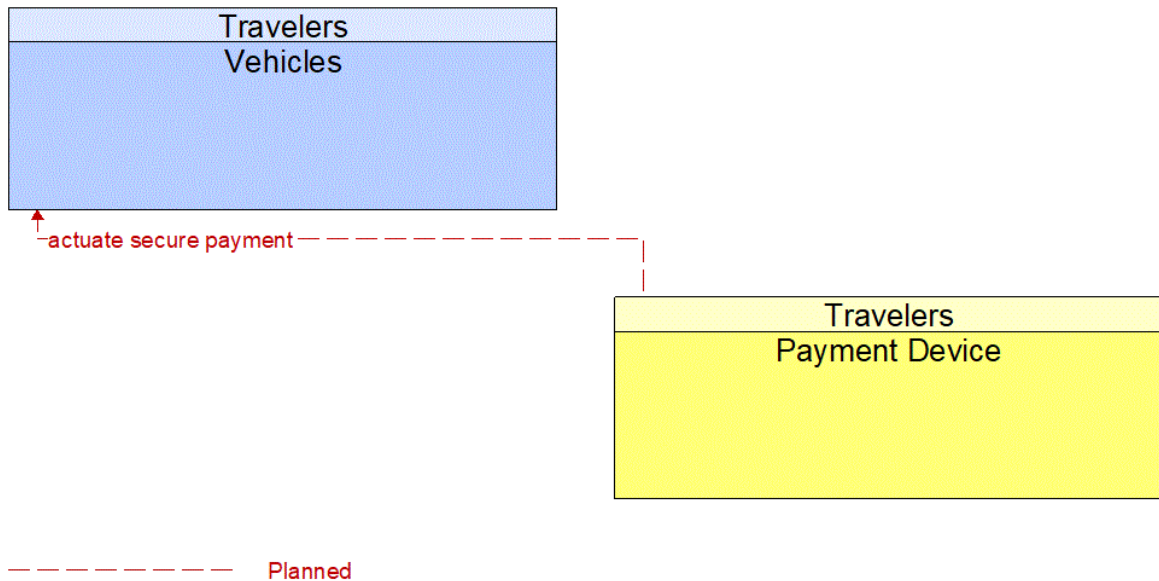


Figure 408: Payment Device - Vehicles Interface

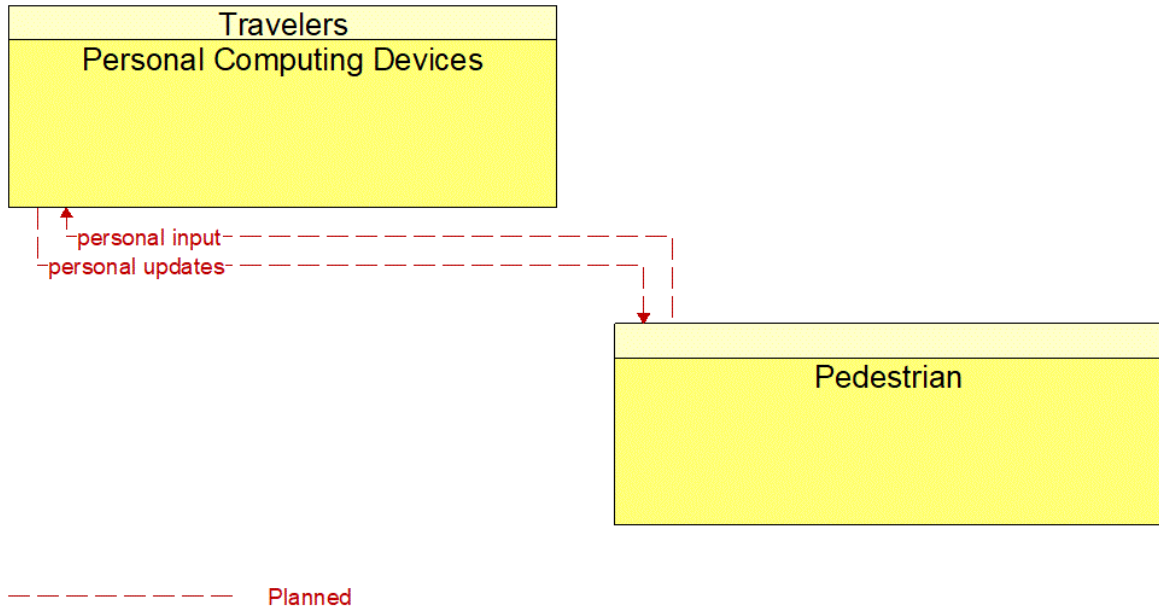


Figure 409: Pedestrian - Personal Computing Devices Interface

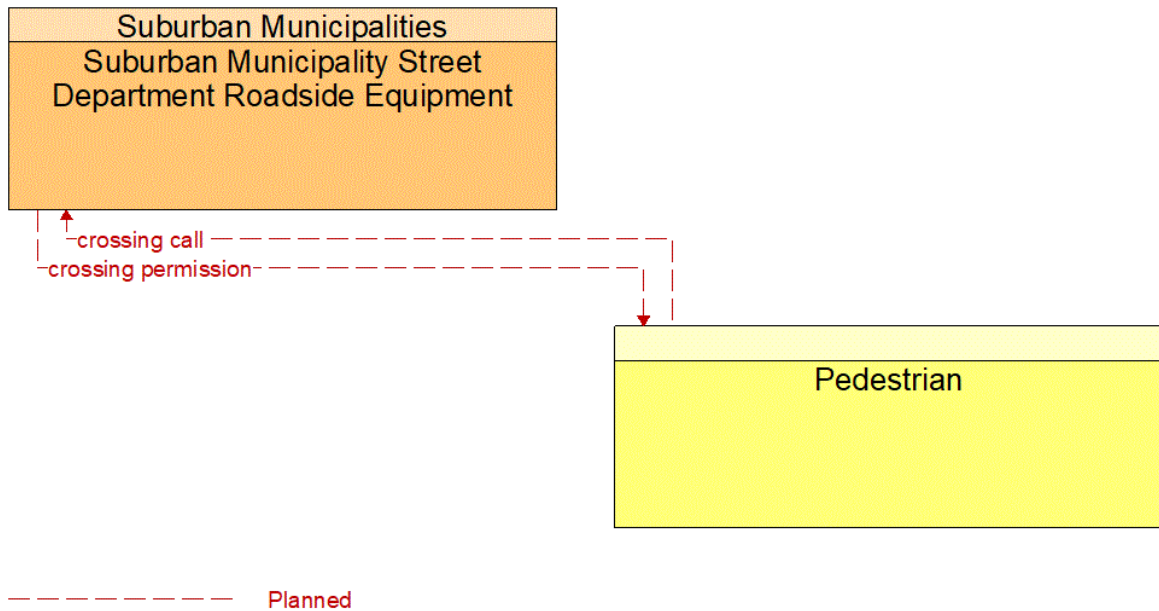


Figure 410: Pedestrian - Suburban Municipality Street Department Roadside Equipment Interface

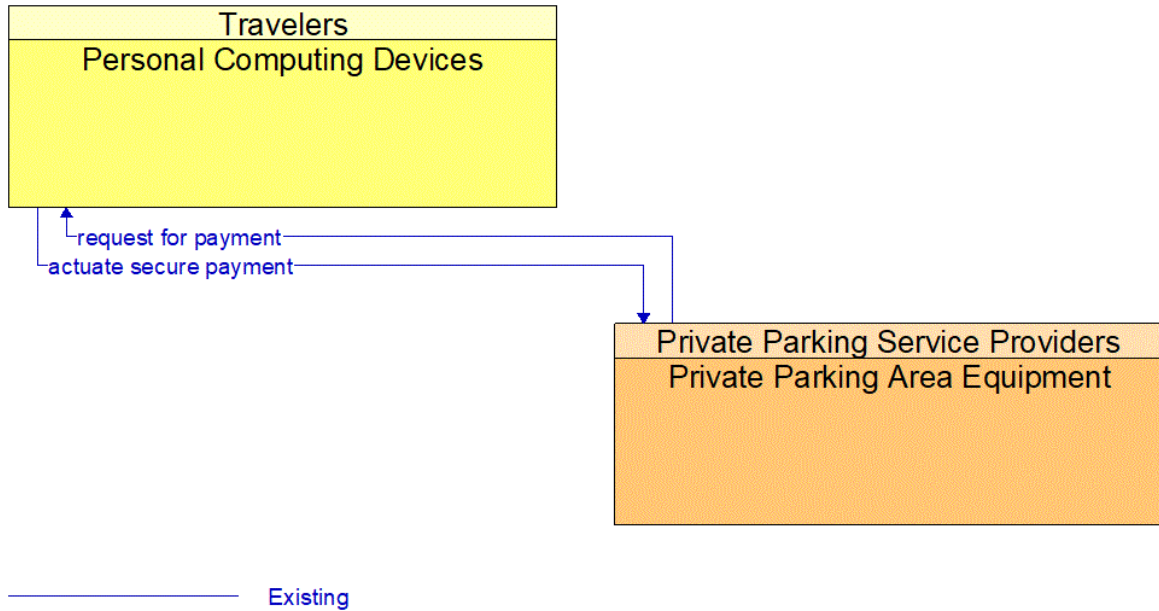


Figure 411: Personal Computing Devices - Private Parking Area Equipment Interface

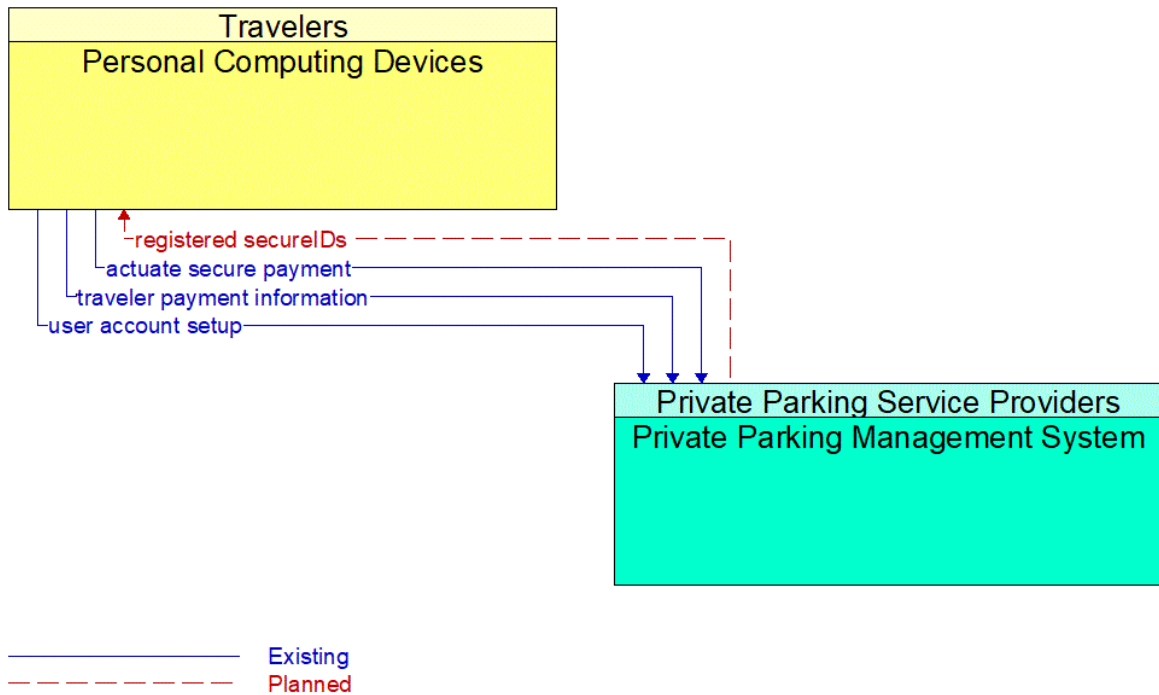


Figure 412: Personal Computing Devices - Private Parking Management System Interface

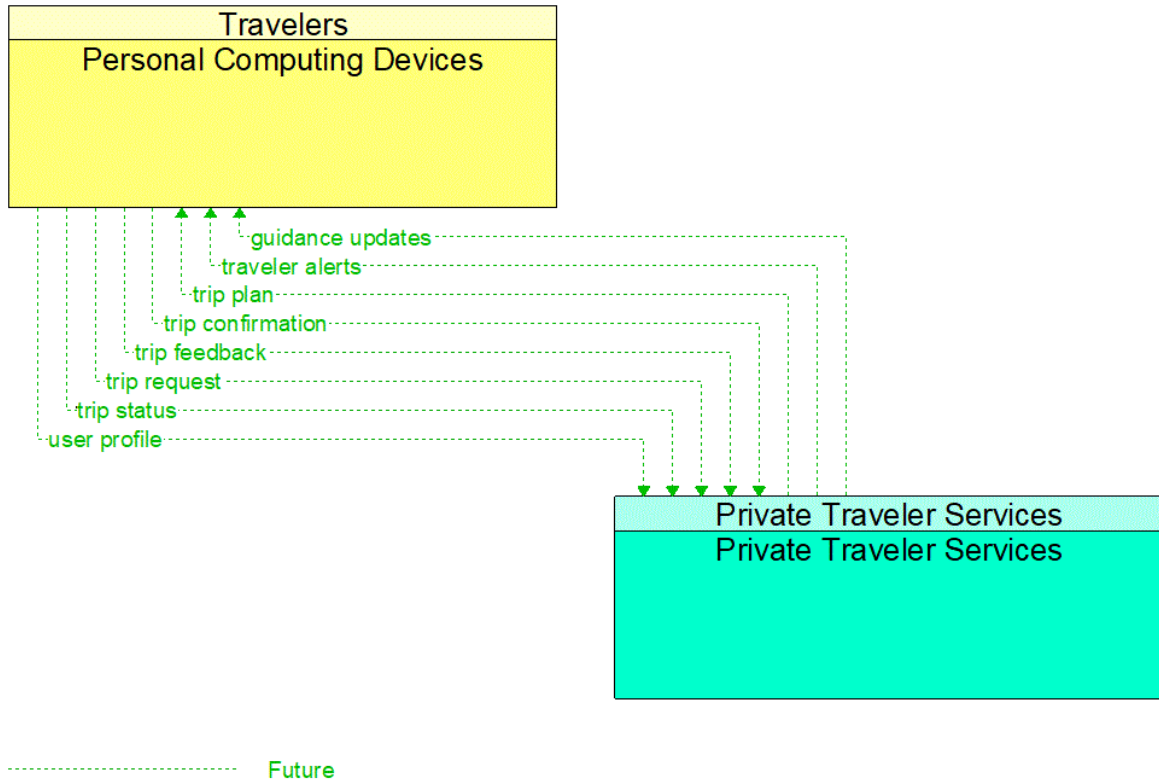


Figure 413: Personal Computing Devices - Private Traveler Services Interface

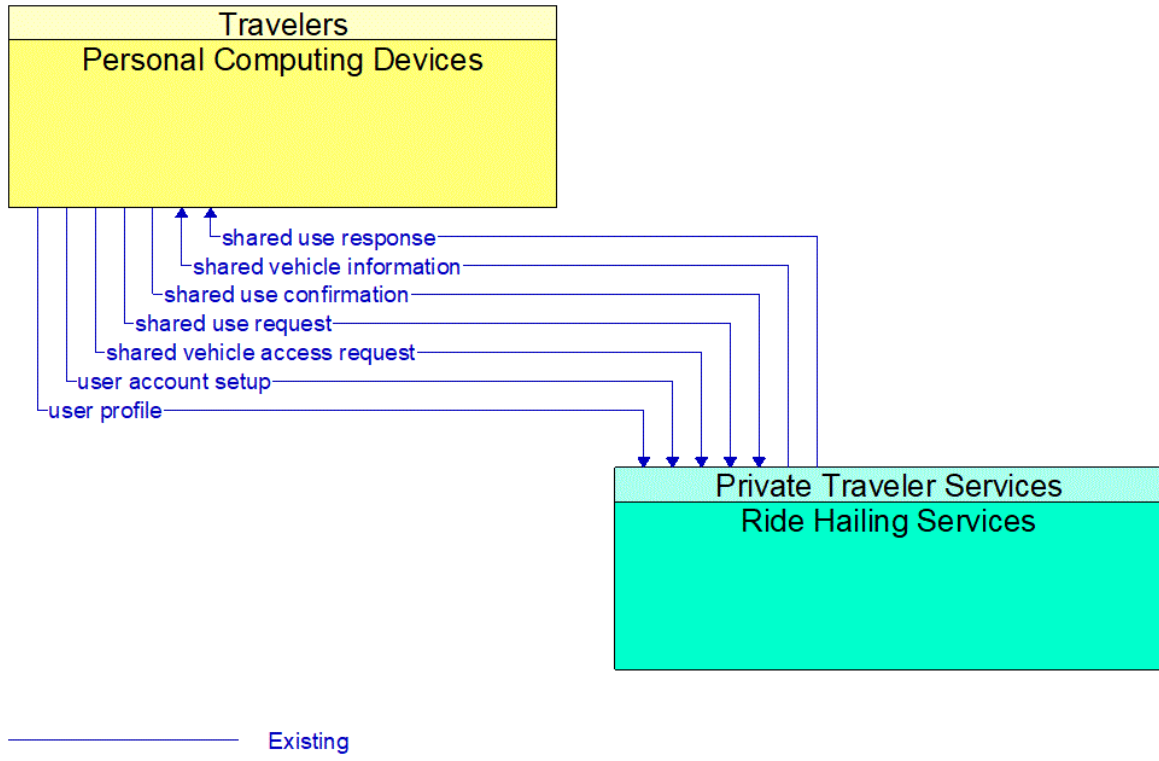


Figure 414: Personal Computing Devices - Ride Hailing Services Interface

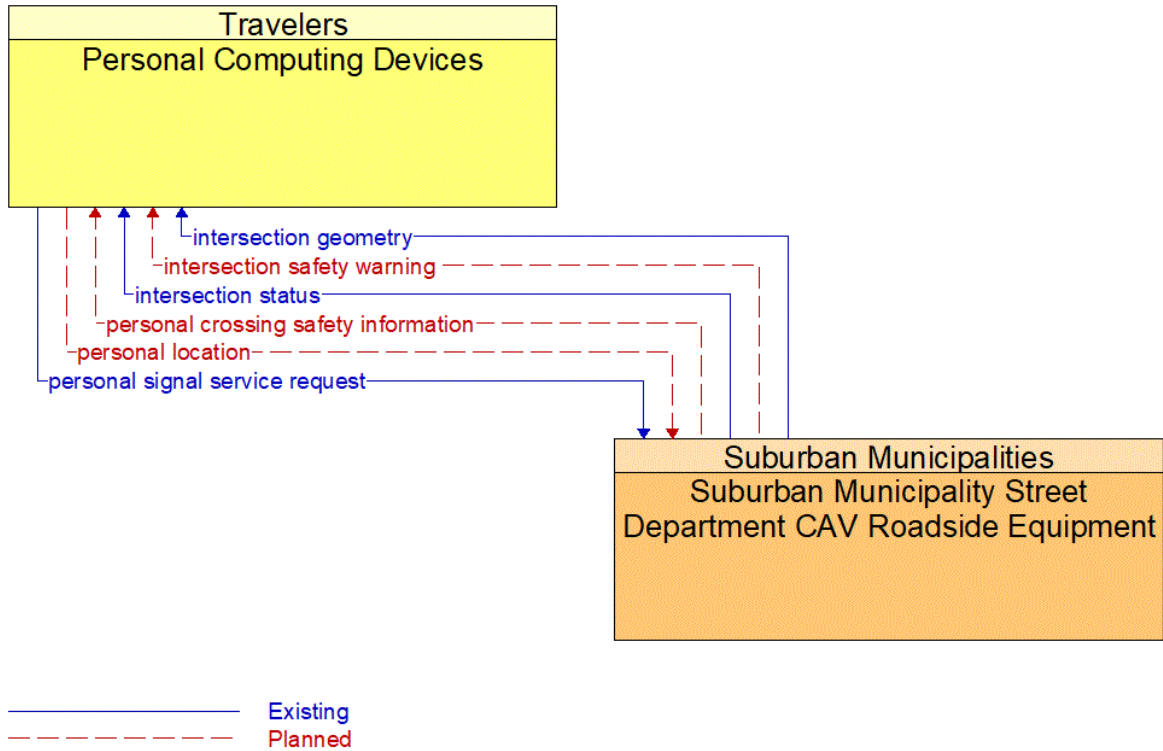


Figure 415: Personal Computing Devices - Suburban Municipality Street Department CAV Roadside Equipment Interface

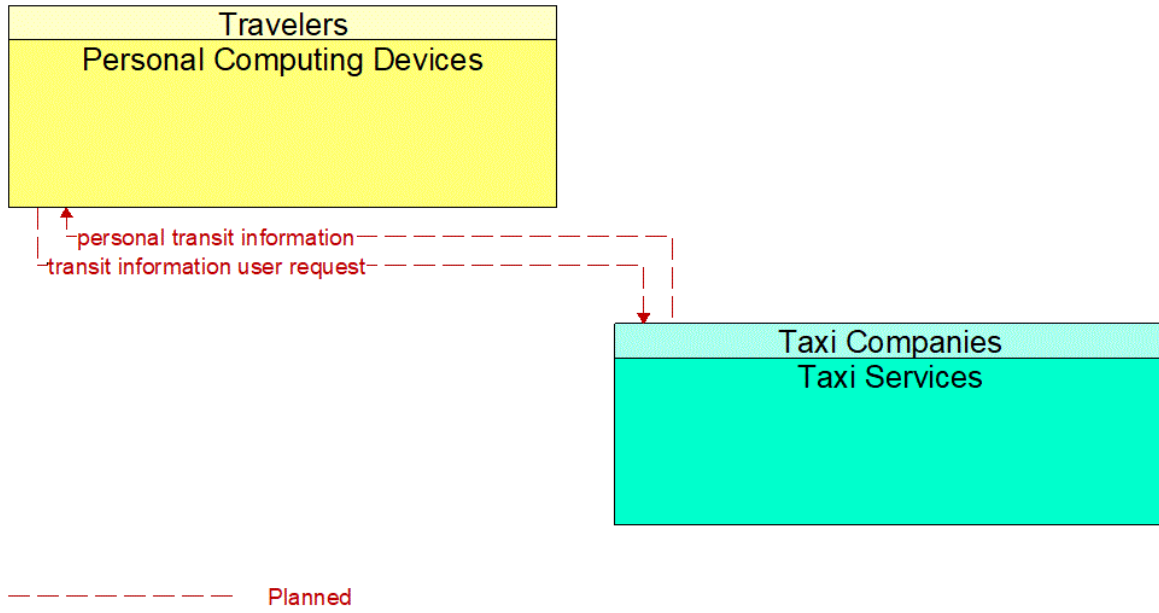


Figure 416: Personal Computing Devices - Taxi Services Interface

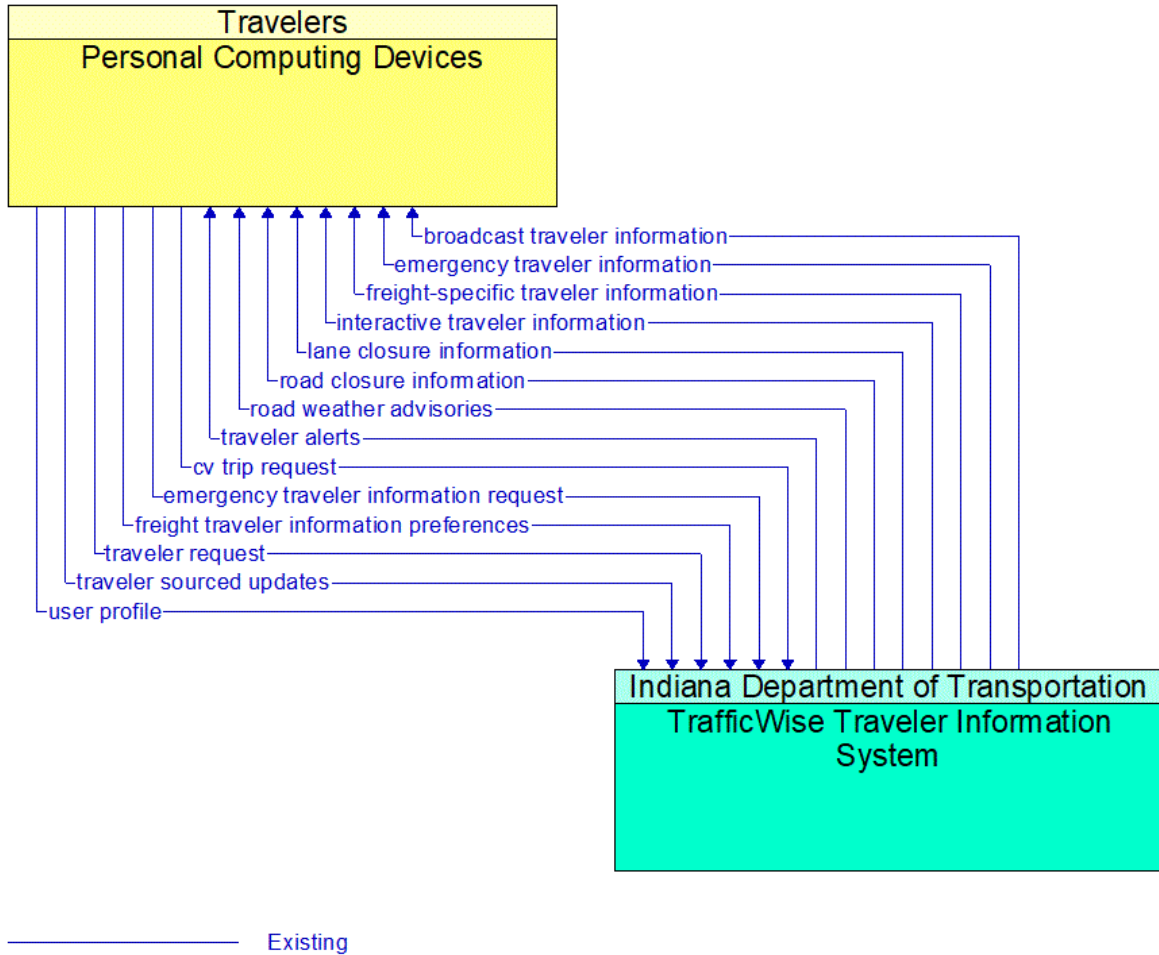


Figure 417: Personal Computing Devices - TrafficWise Traveler Information System Interface

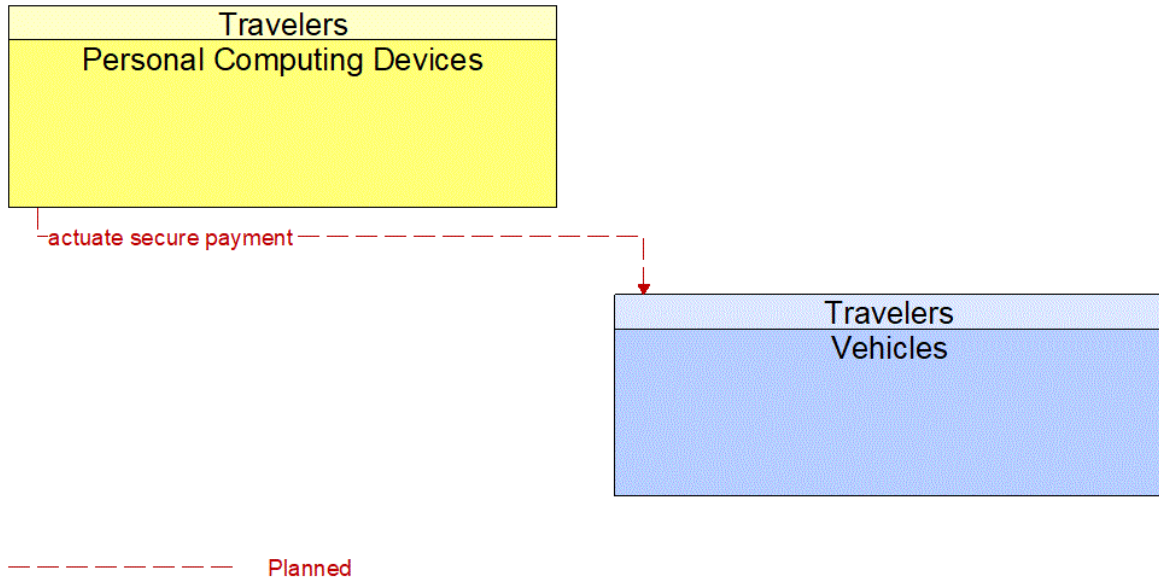


Figure 418: Personal Computing Devices - Vehicles Interface

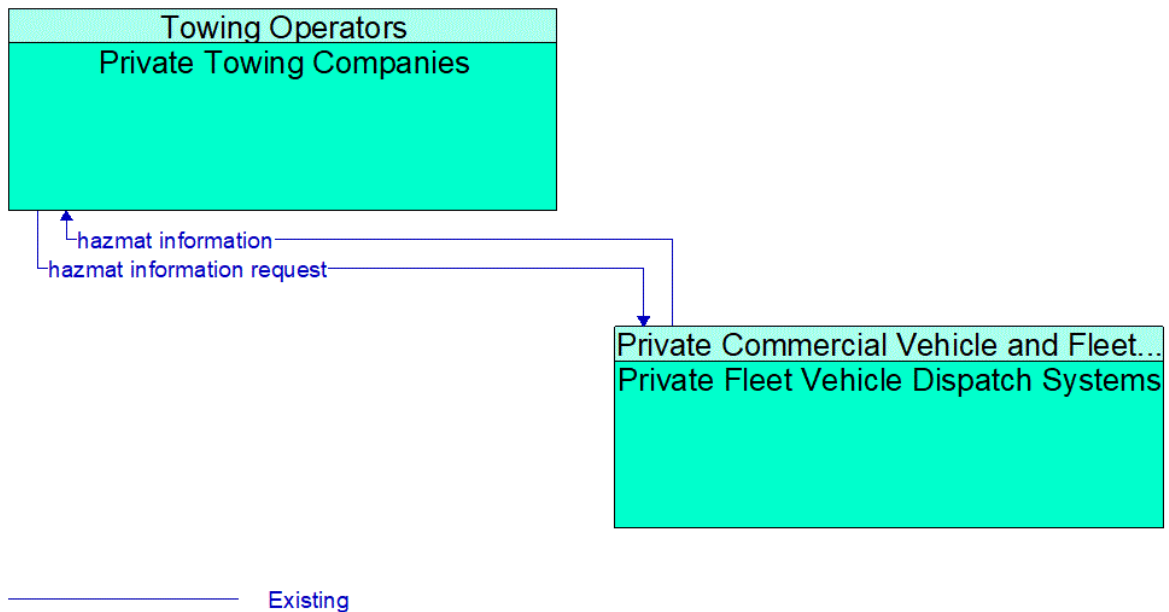


Figure 419: Private Fleet Vehicle Dispatch Systems - Private Towing Companies Interface

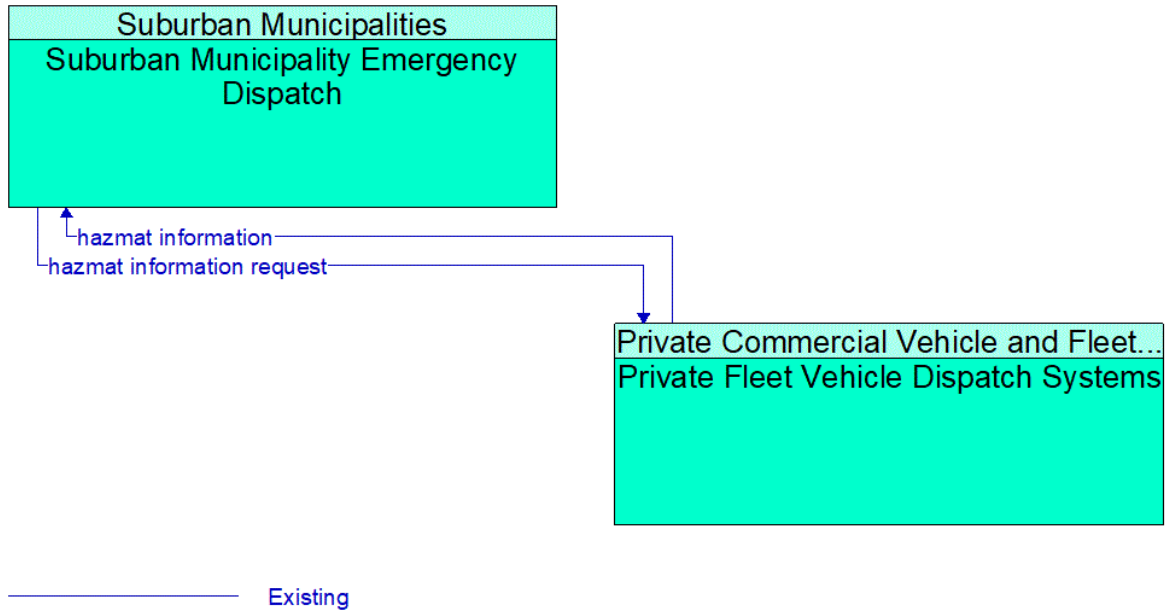


Figure 420: Private Fleet Vehicle Dispatch Systems - Suburban Municipality Emergency Dispatch Interface

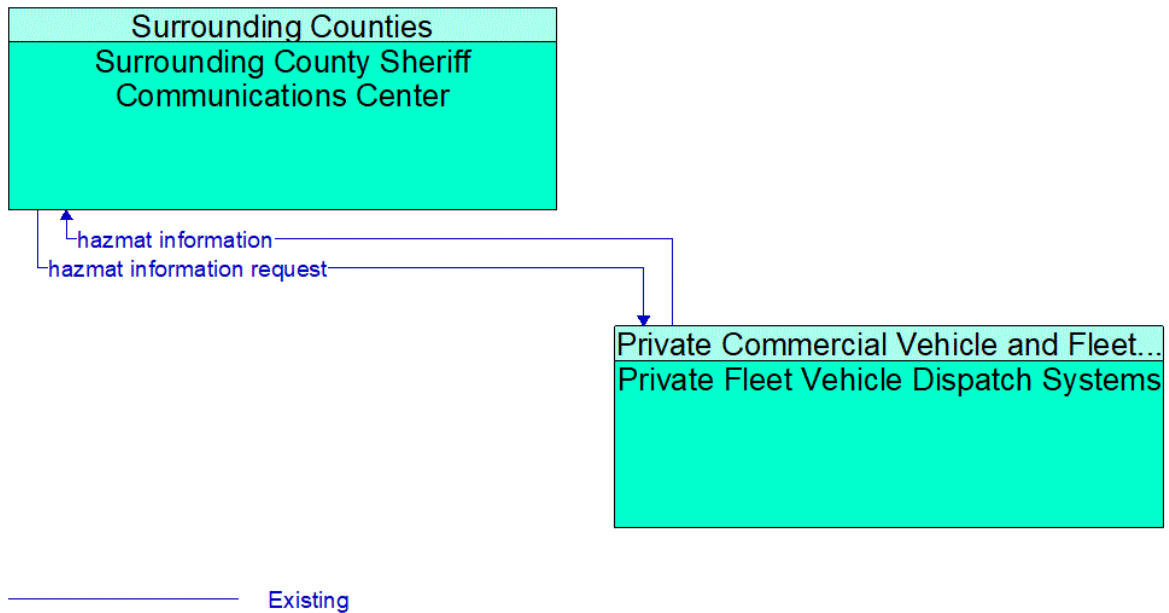


Figure 421: Private Fleet Vehicle Dispatch Systems - Surrounding County Sheriff Communications Center Interface

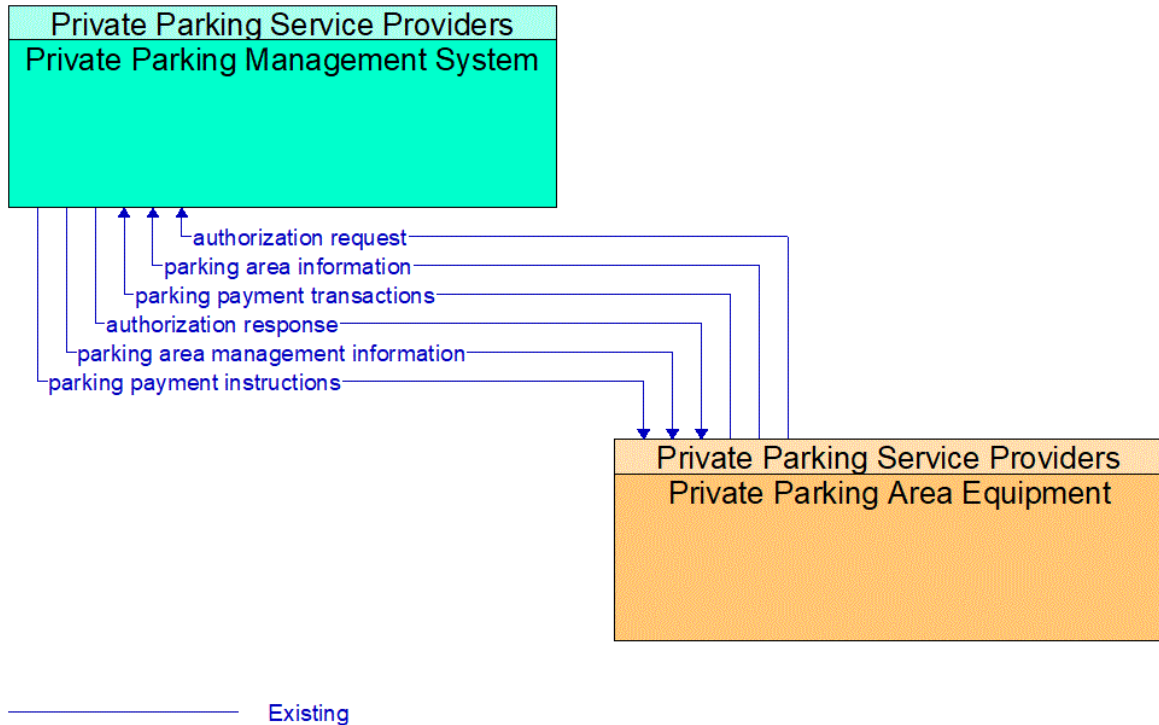


Figure 422: Private Parking Area Equipment - Private Parking Management System Interface

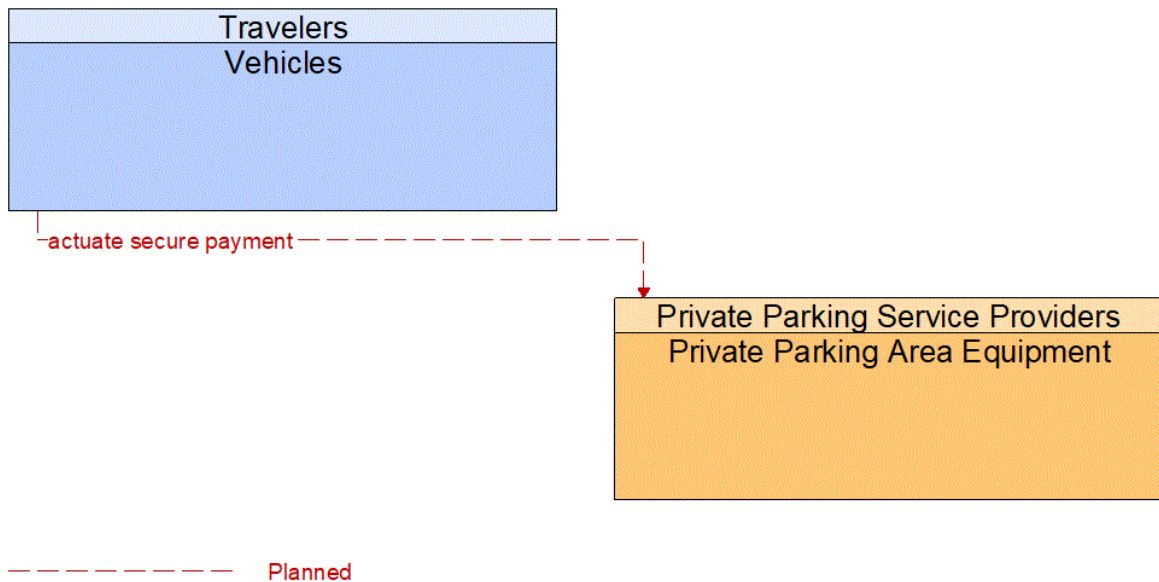


Figure 423: Private Parking Area Equipment - Vehicles Interface

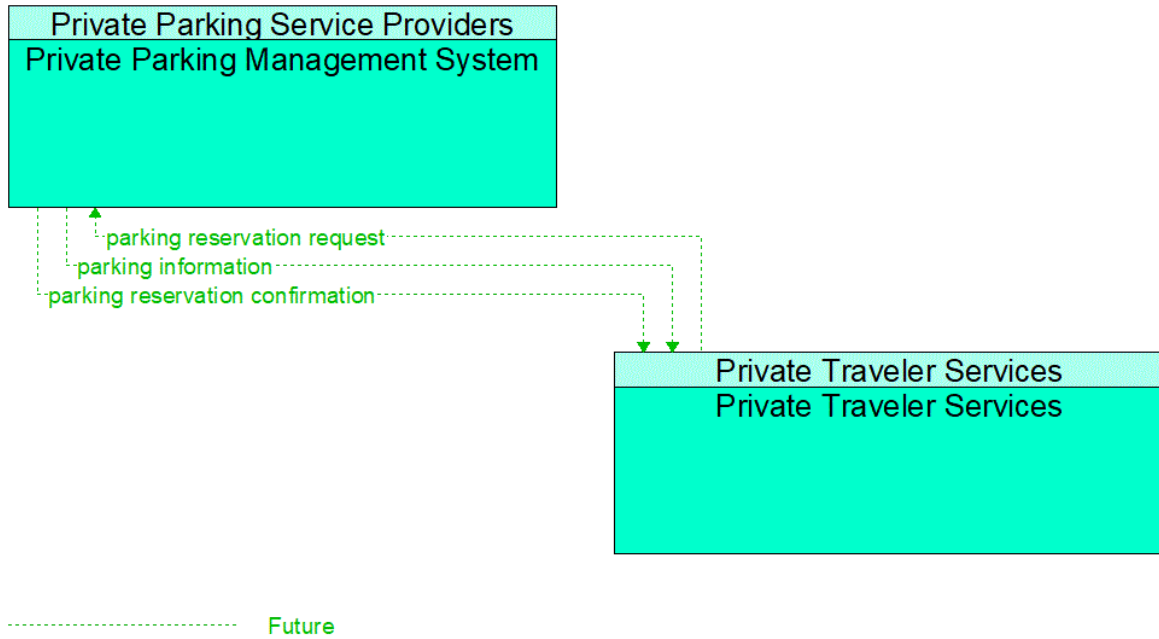
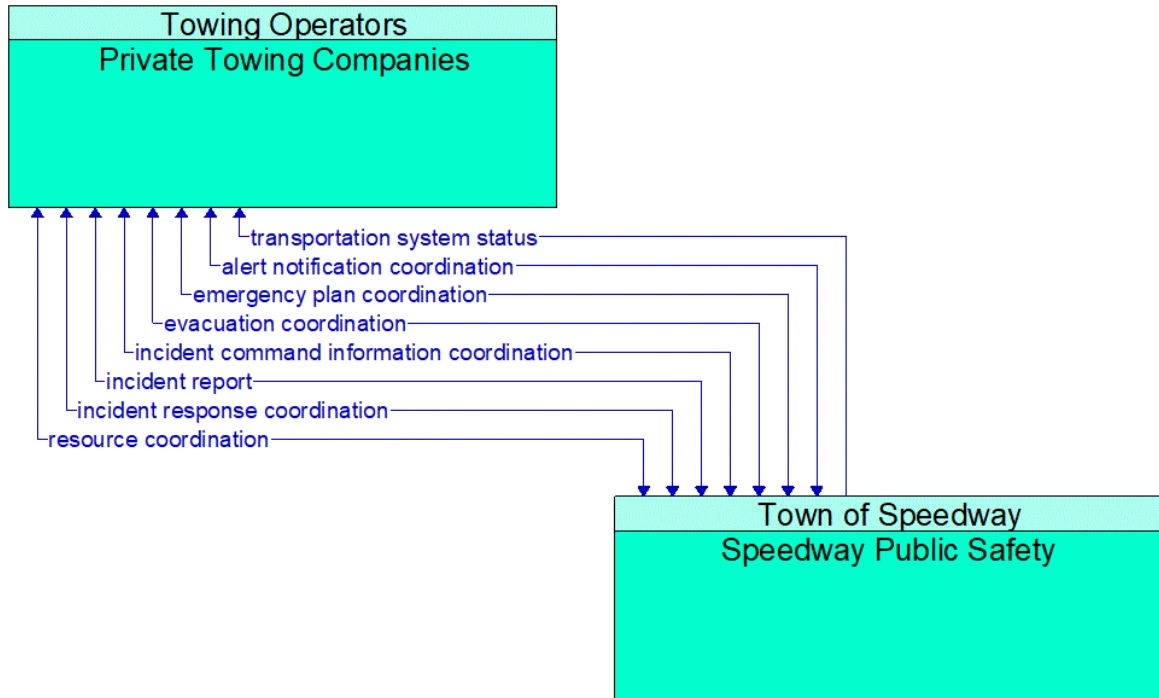


Figure 424: Private Parking Management System - Private Traveler Services Interface



Existing

Figure 425: Private Towing Companies - Speedway Public Safety Interface

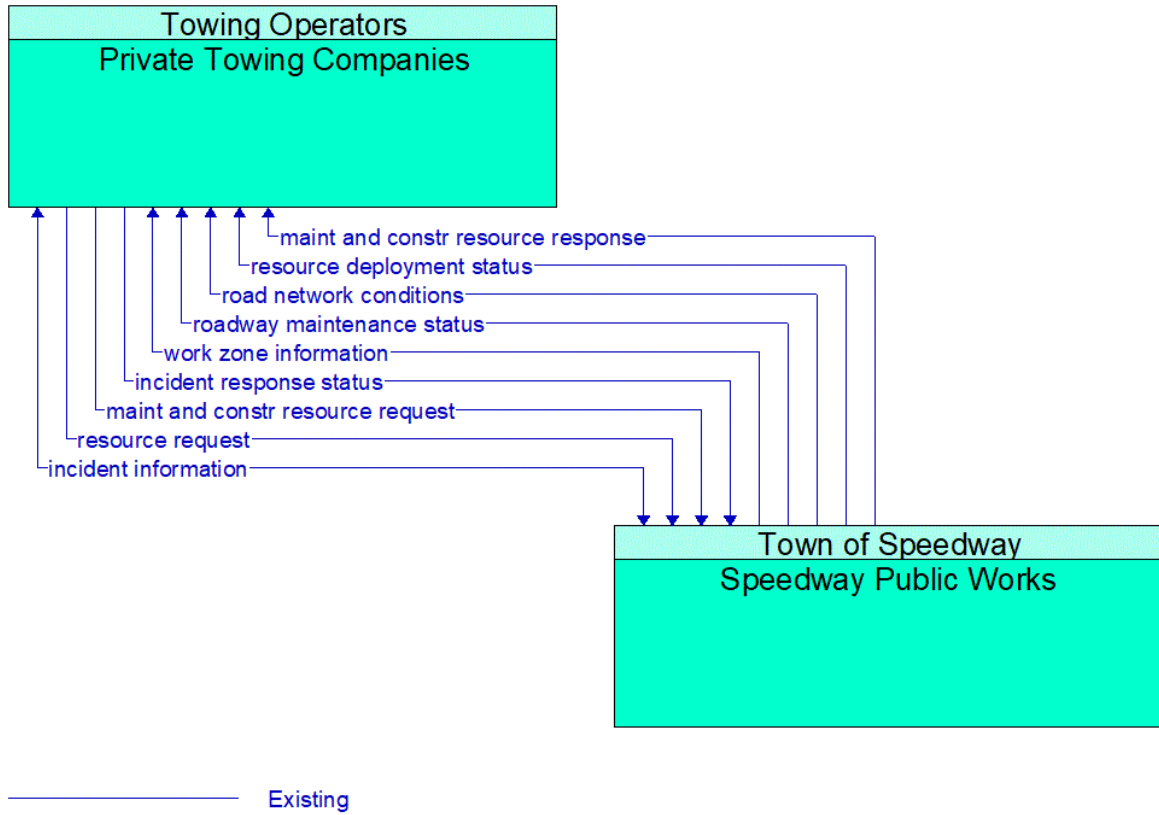


Figure 426: Private Towing Companies - Speedway Public Works Interface

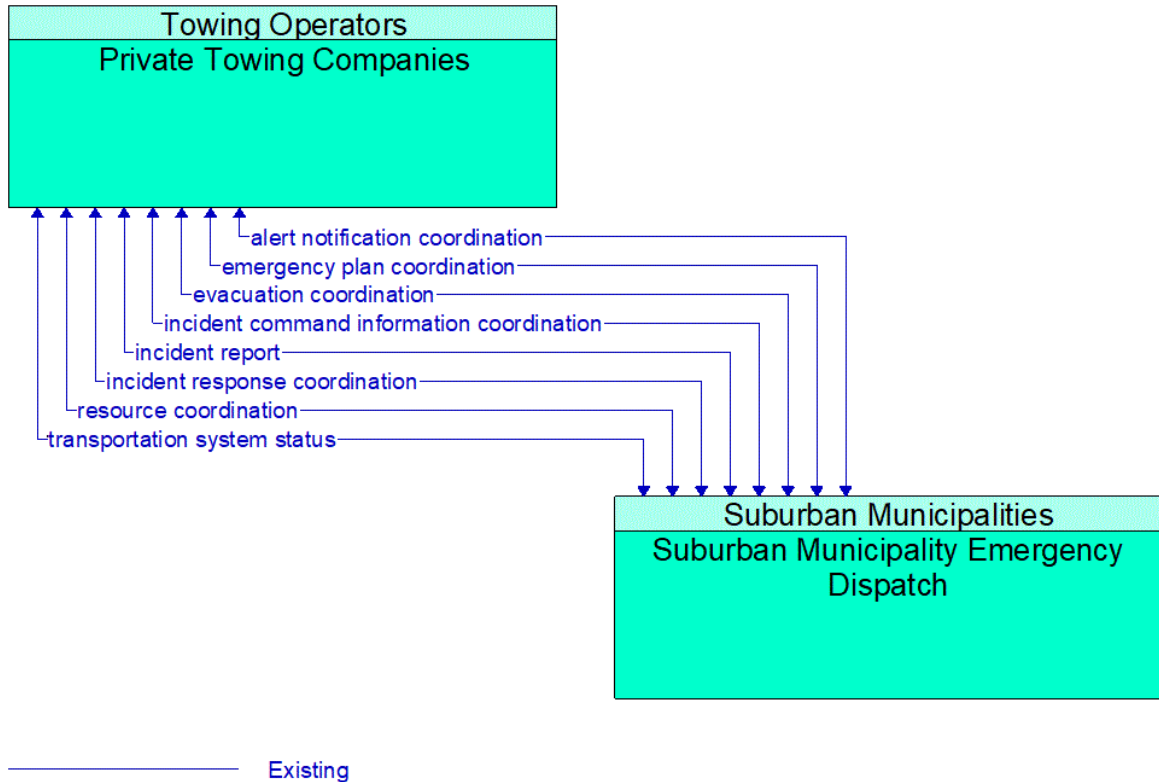
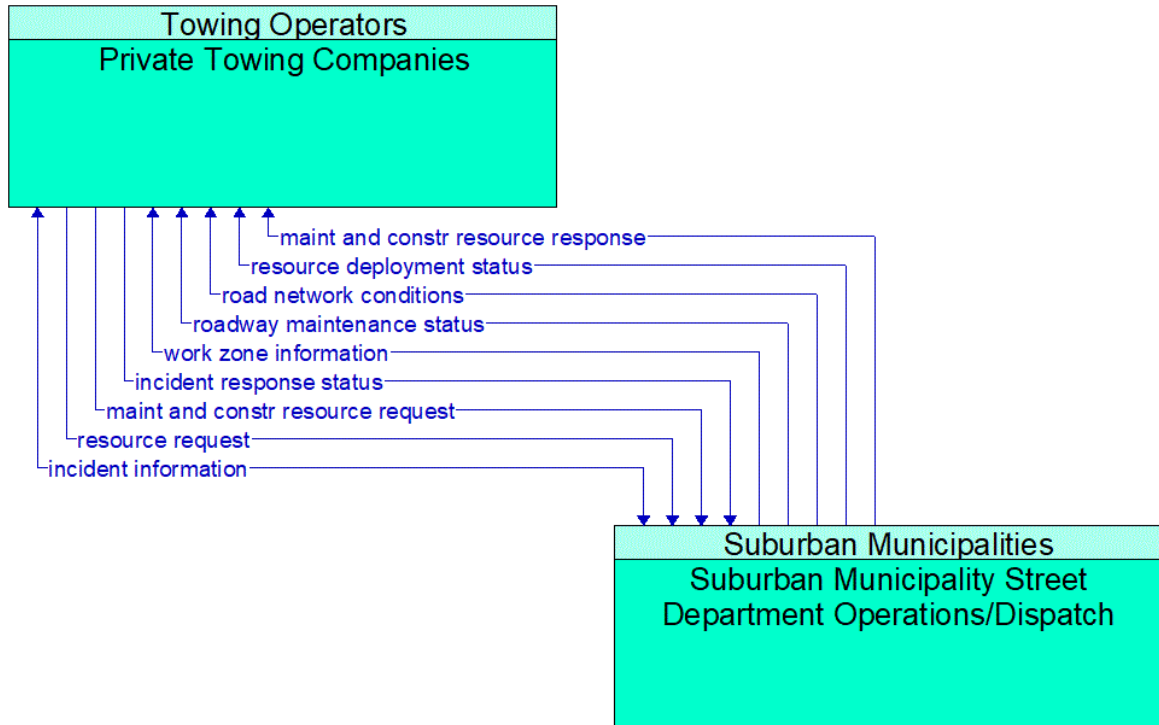


Figure 427: Private Towing Companies - Suburban Municipality Emergency Dispatch Interface



Existing

Figure 428: Private Towing Companies - Suburban Municipality Street Department Operations/Dispatch Interface

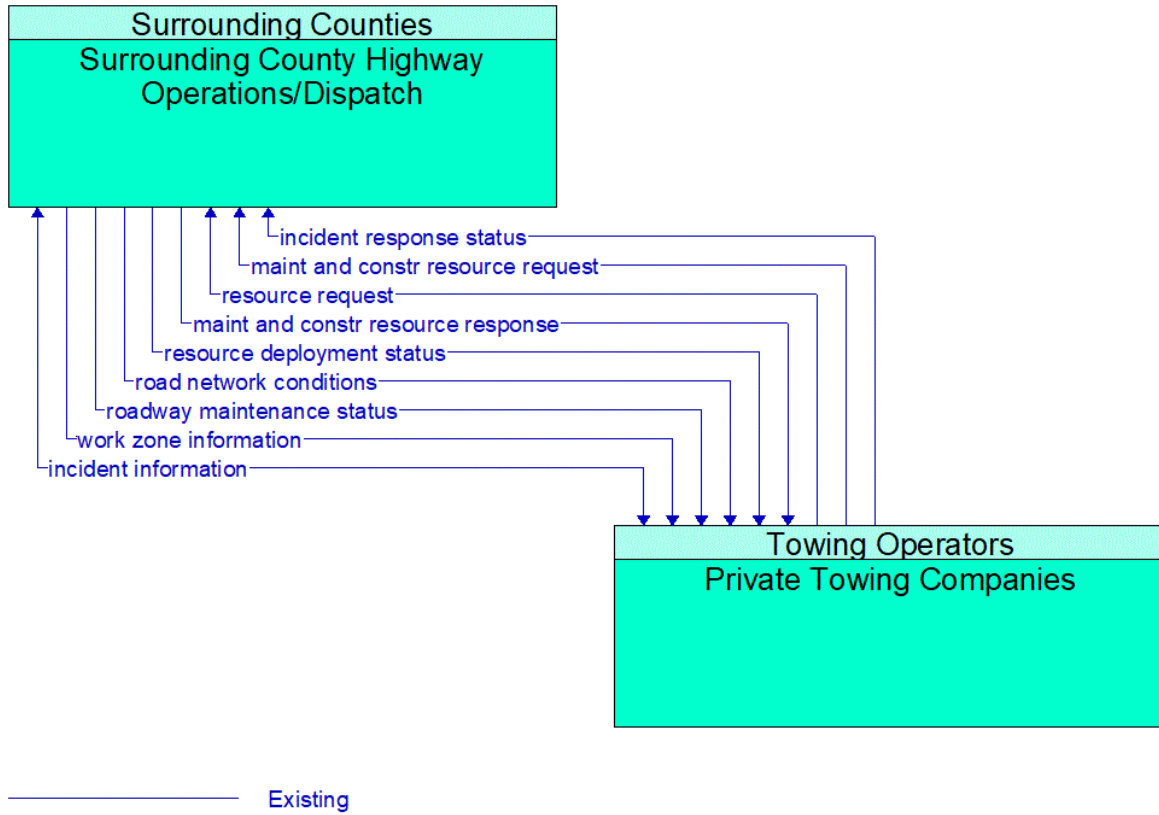


Figure 429: Private Towing Companies - Surrounding County Highway Operations/Dispatch Interface

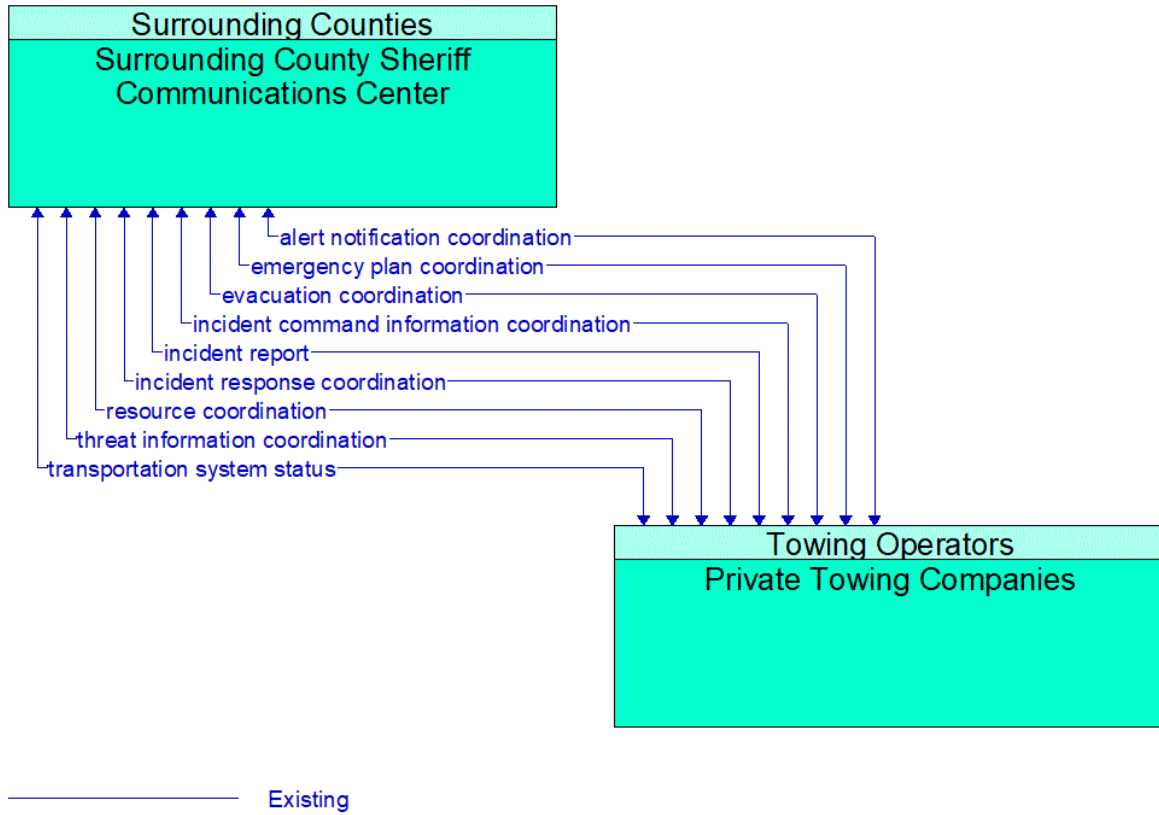


Figure 430: Private Towing Companies - Surrounding County Sheriff Communications Center Interface

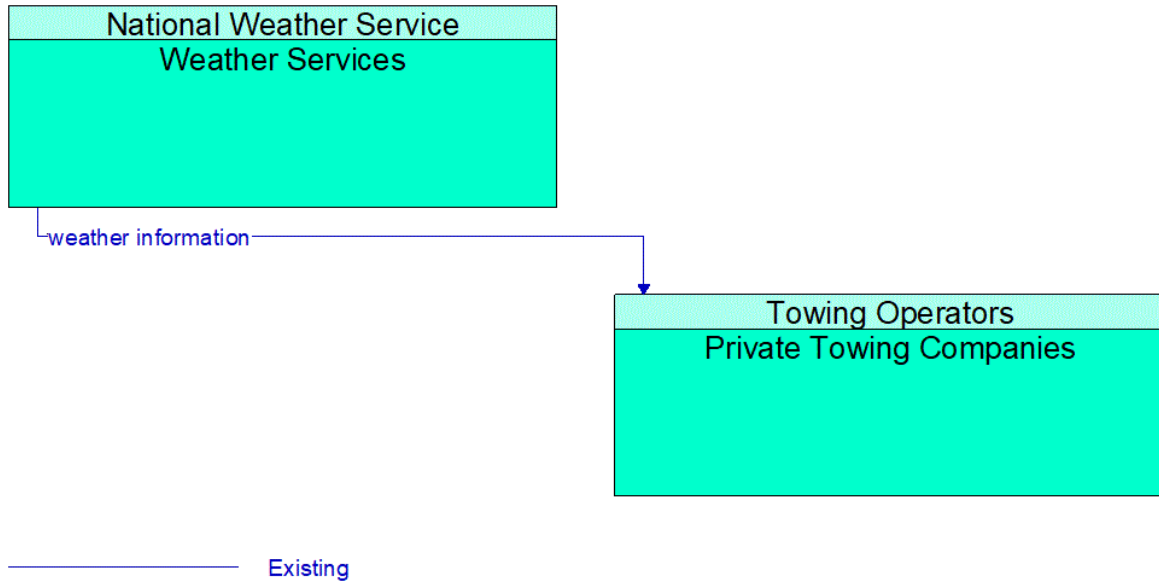


Figure 431: Private Towing Companies - Weather Services Interface

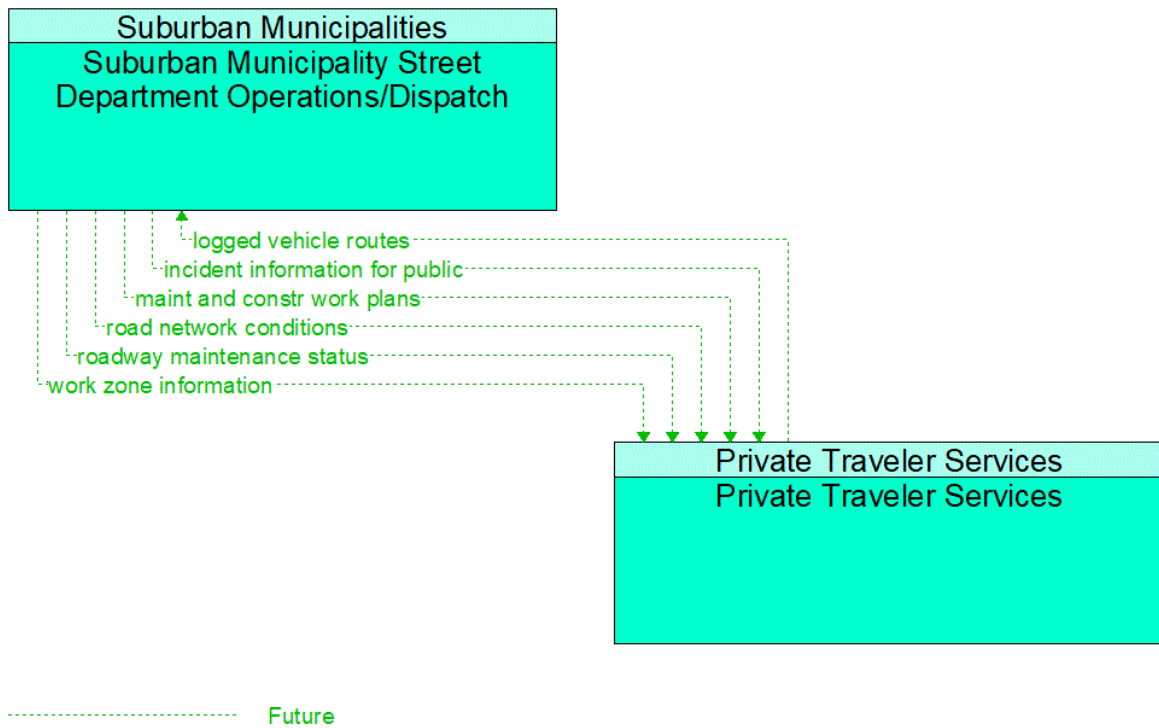


Figure 432: Private Traveler Services - Suburban Municipality Street Department Operations/Dispatch Interface

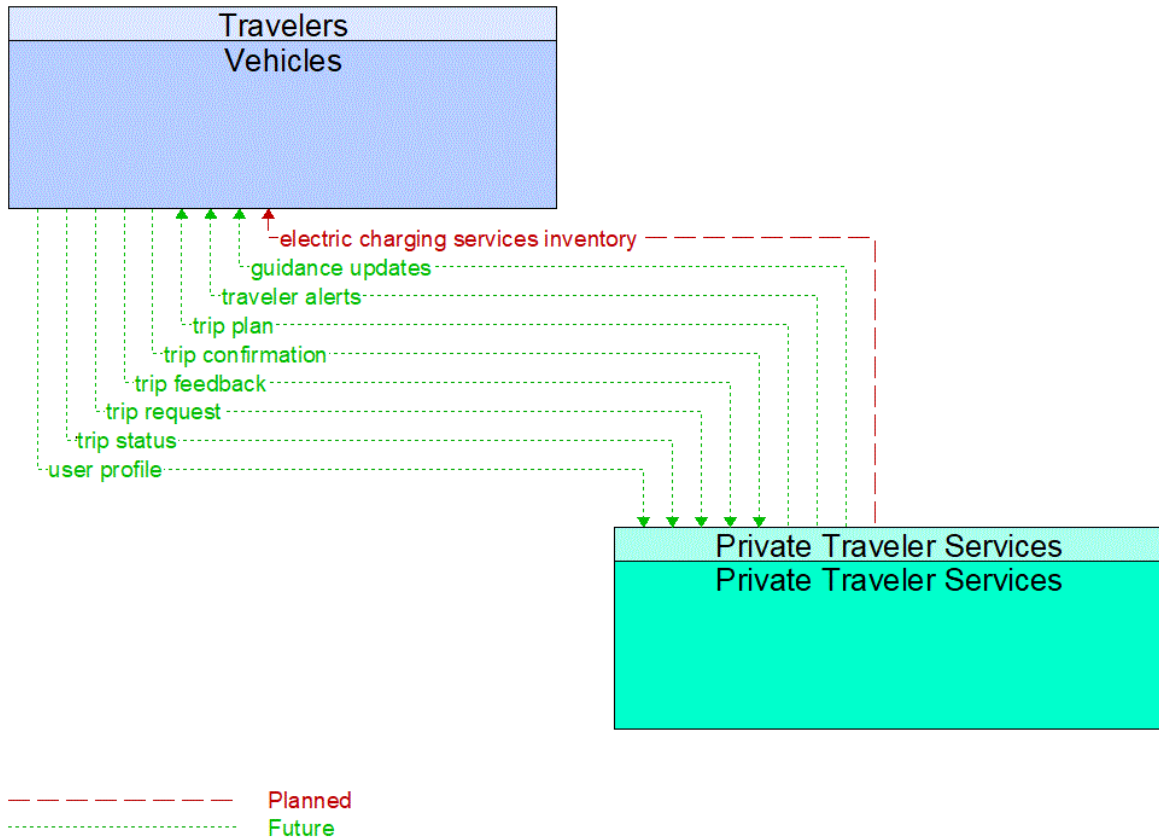
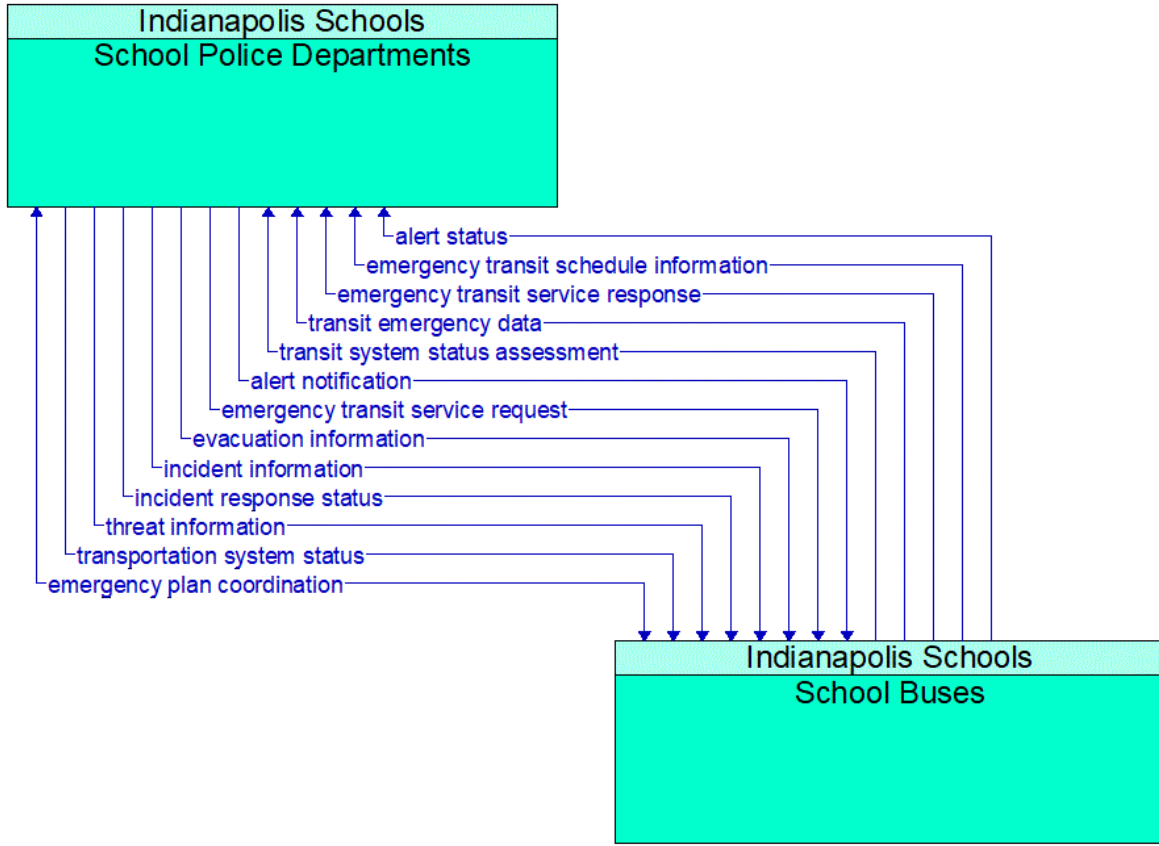


Figure 433: Private Traveler Services - Vehicles Interface



Existing

Figure 434: School Buses - School Police Departments Interface

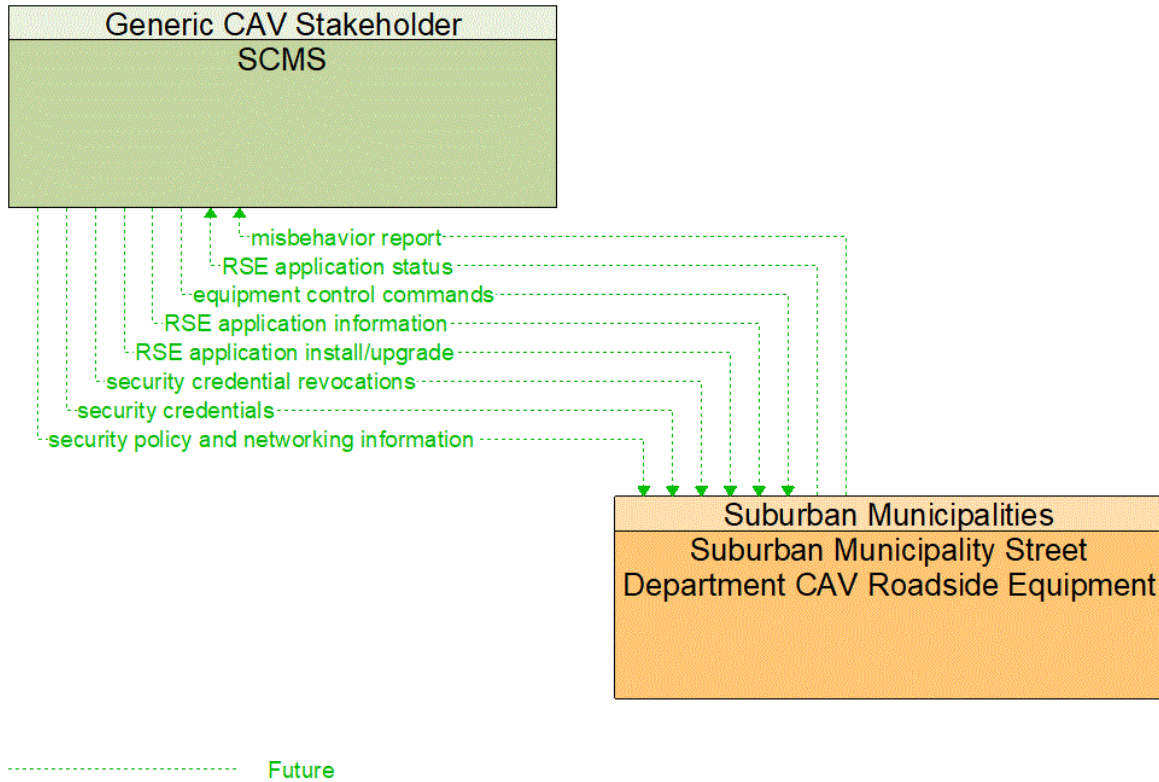


Figure 435: SCMS - Suburban Municipality Street Department CAV Roadside Equipment Interface

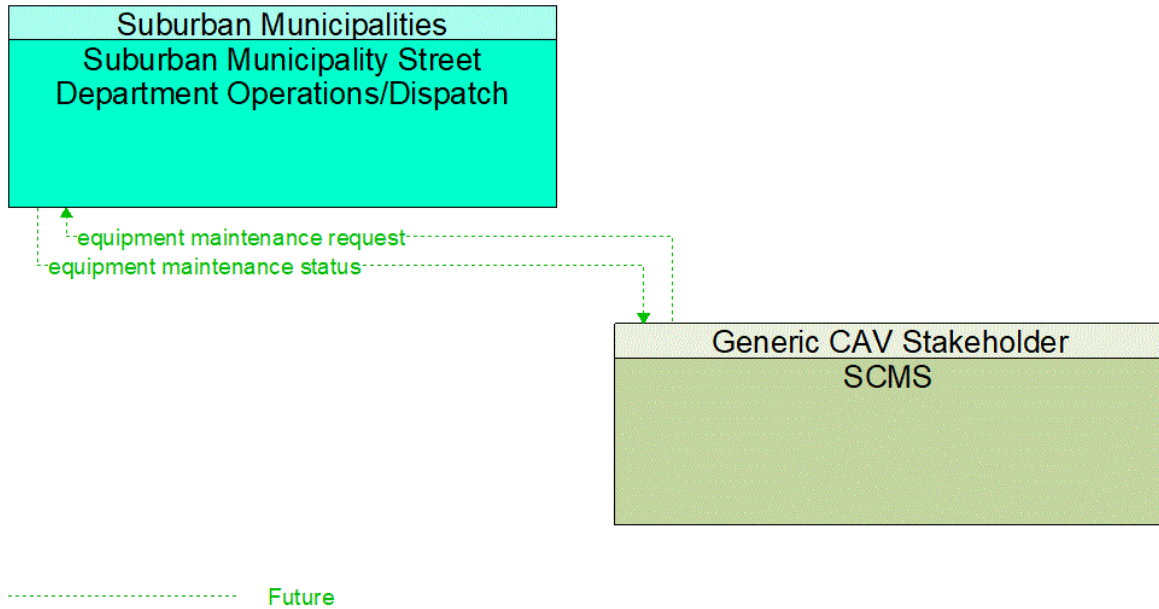


Figure 436: SCMS - Suburban Municipality Street Department Operations/Dispatch Interface

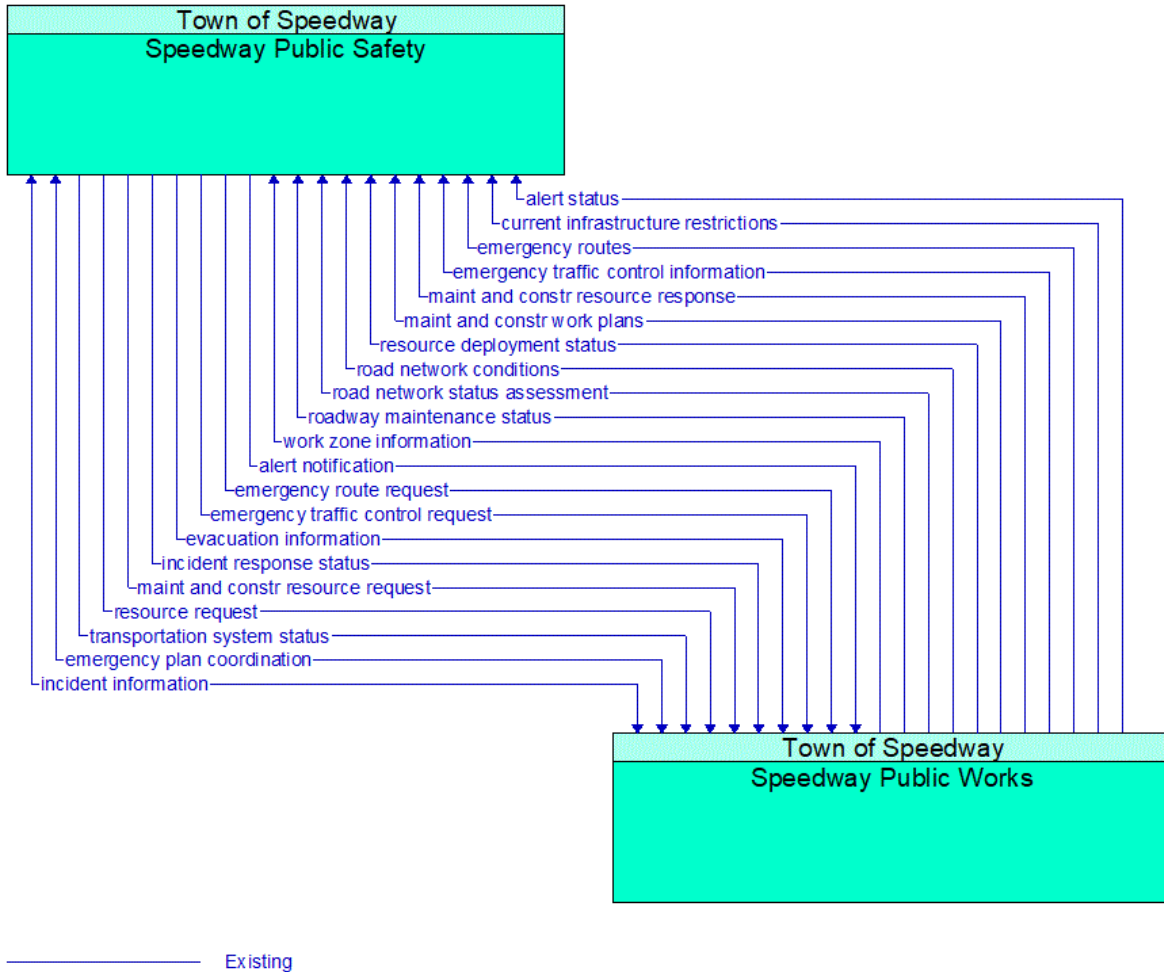


Figure 437: Speedway Public Safety - Speedway Public Works Interface

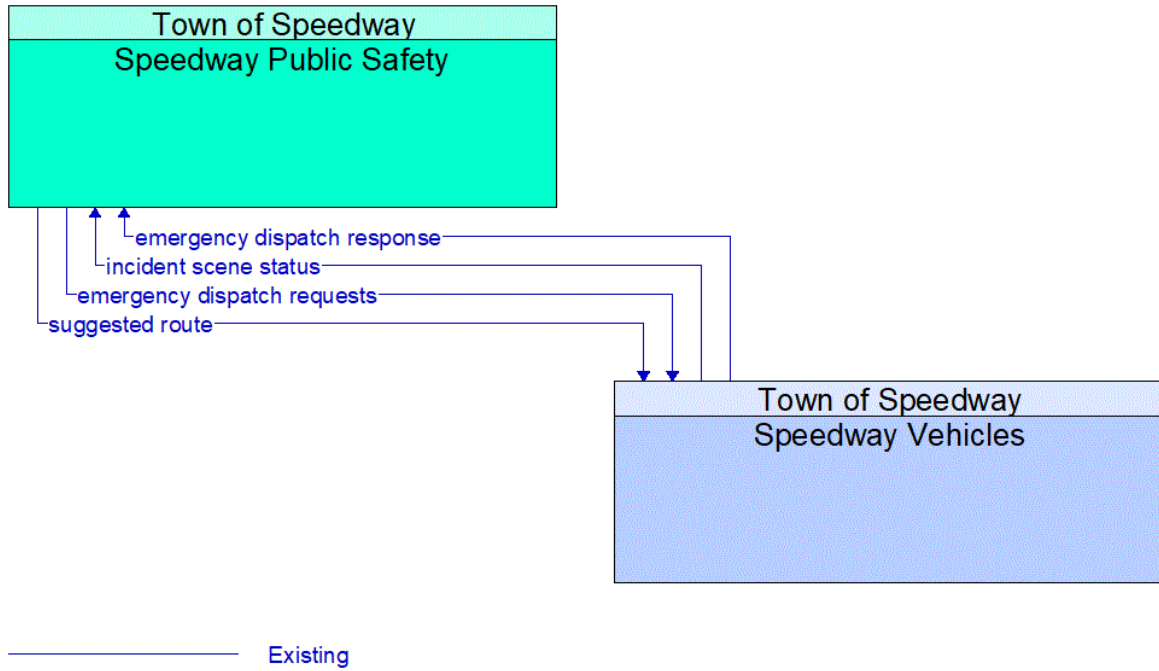
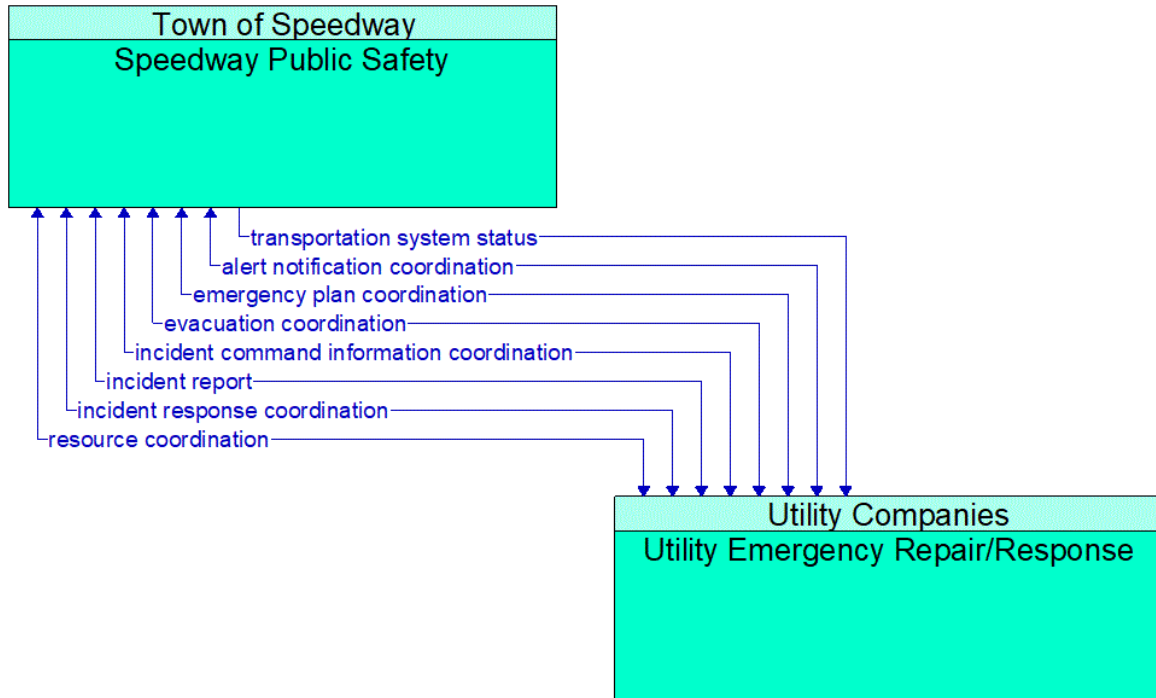
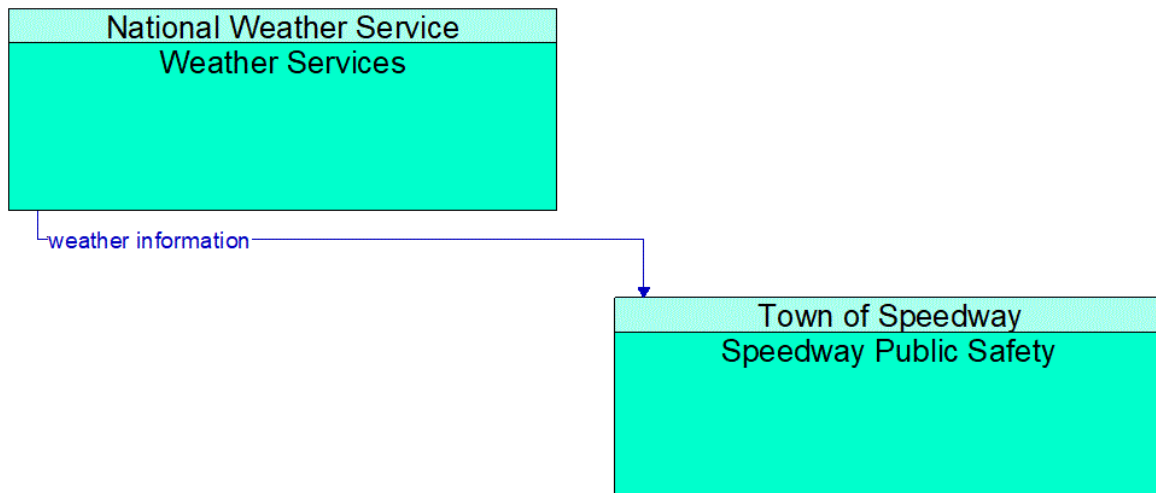


Figure 438: Speedway Public Safety - Speedway Vehicles Interface



Existing

Figure 439: Speedway Public Safety - Utility Emergency Repair/Response Interface



Existing

Figure 440: Speedway Public Safety - Weather Services Interface

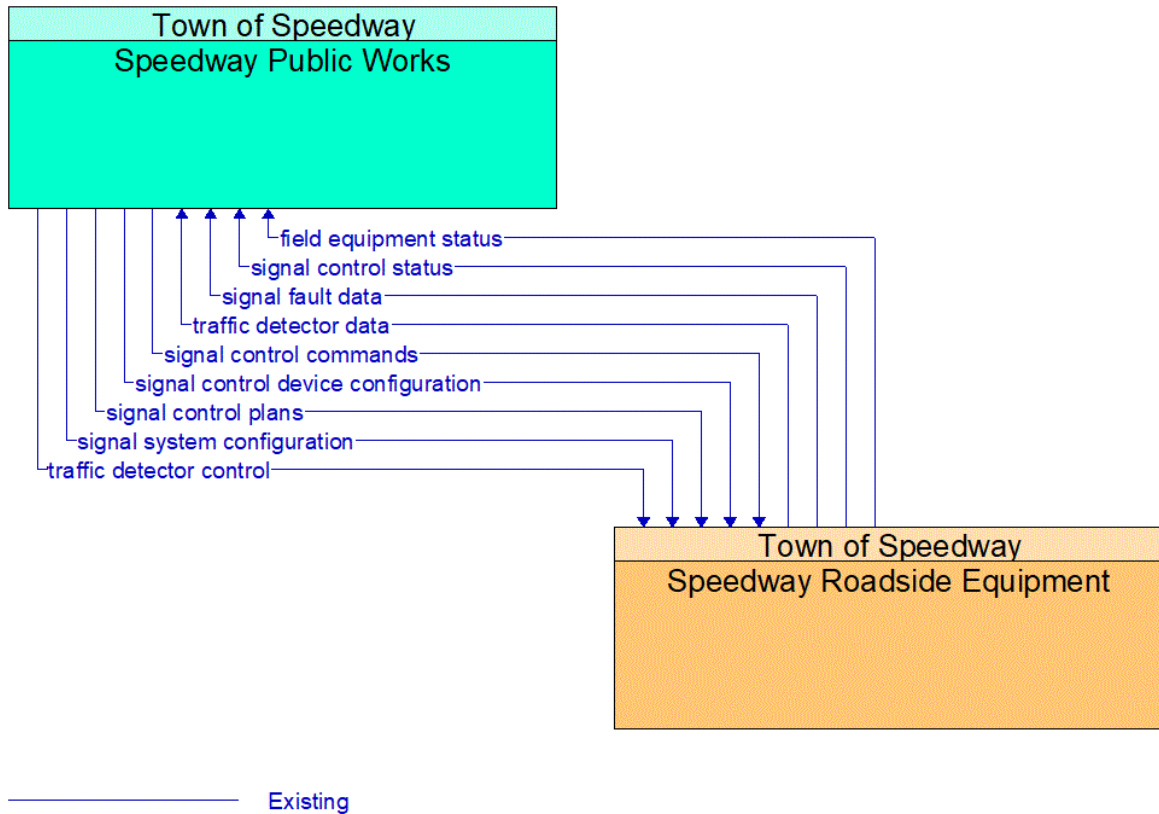


Figure 441: Speedway Public Works - Speedway Roadside Equipment Interface

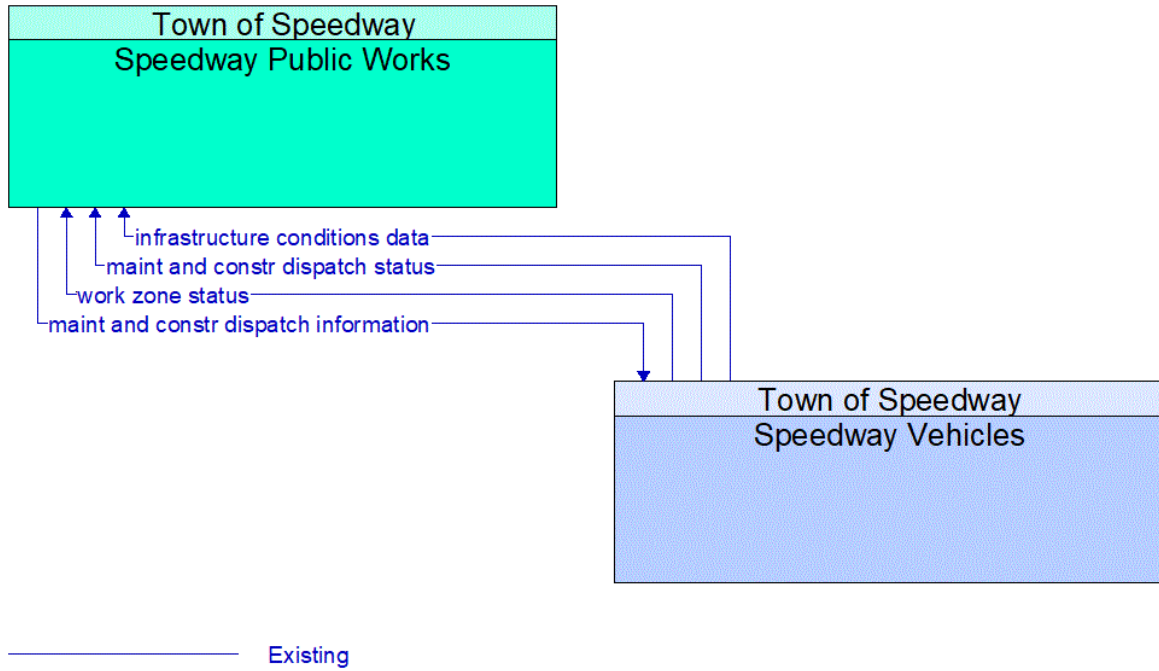


Figure 442: Speedway Public Works - Speedway Vehicles Interface

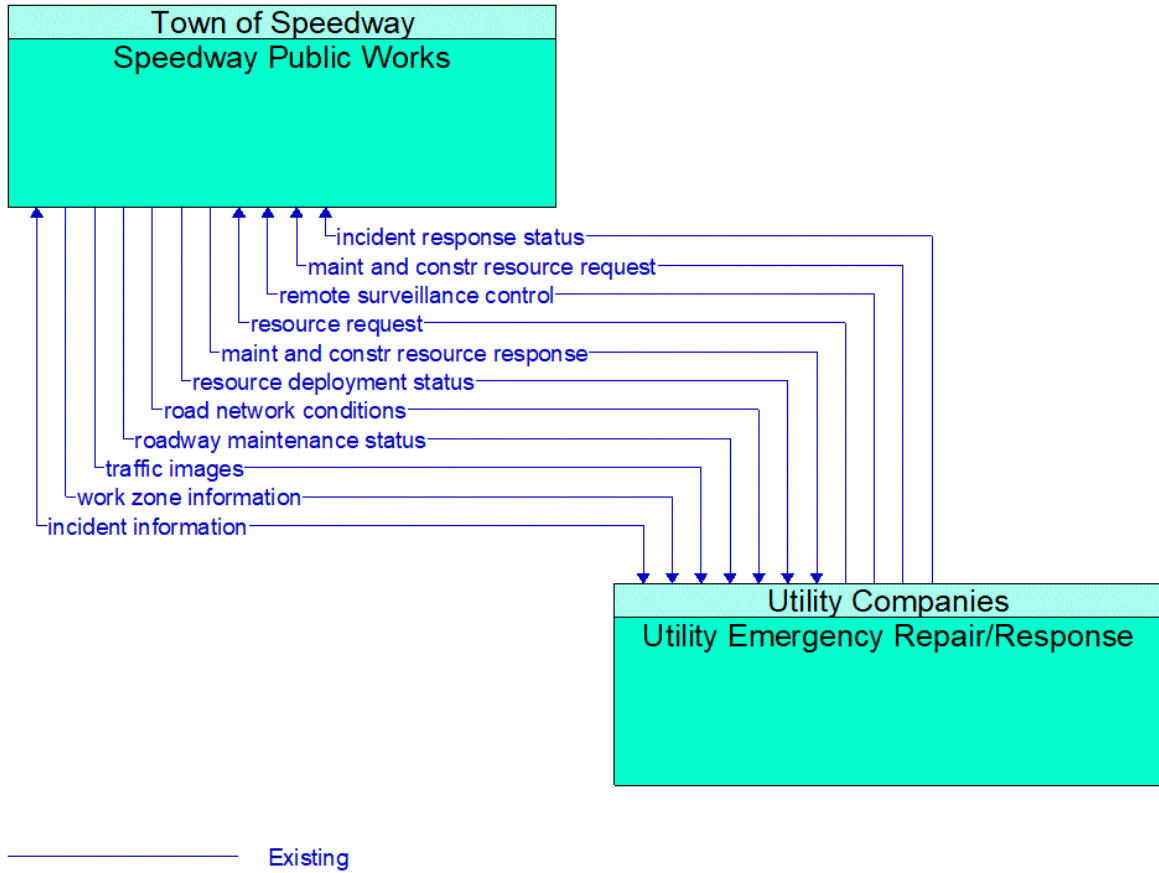


Figure 443: Speedway Public Works - Utility Emergency Repair/Response Interface

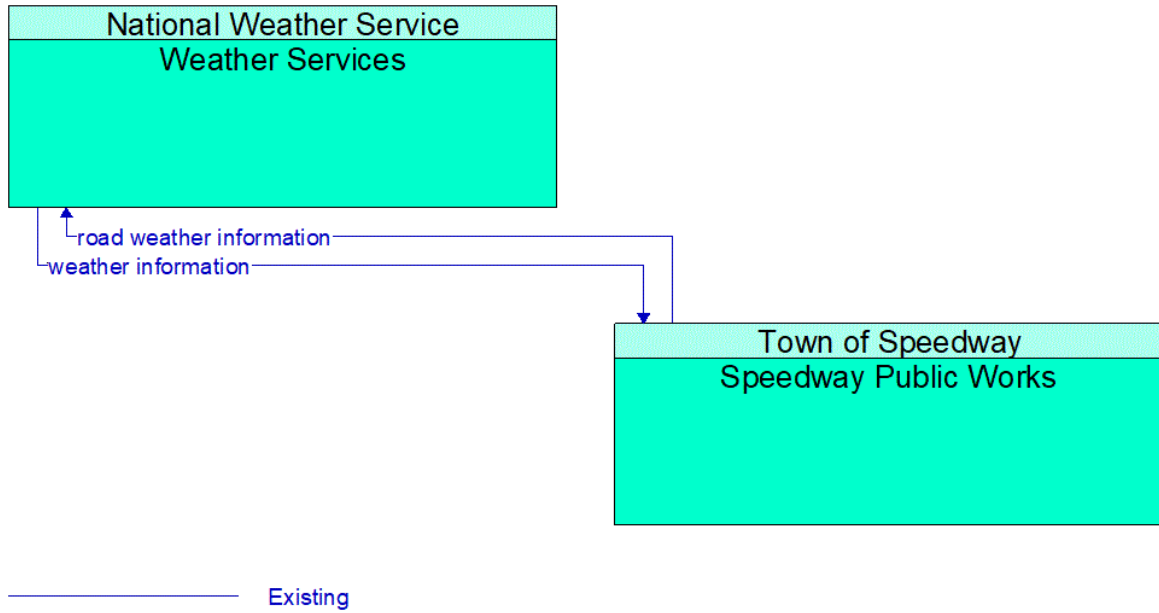


Figure 444: Speedway Public Works - Weather Services Interface

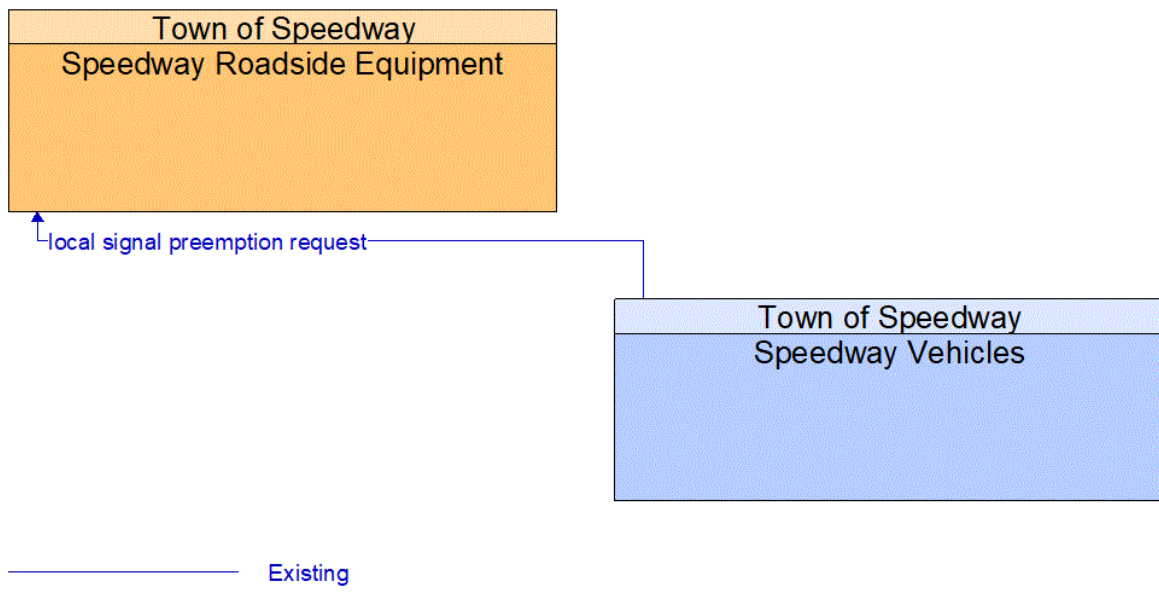


Figure 445: Speedway Roadside Equipment - Speedway Vehicles Interface

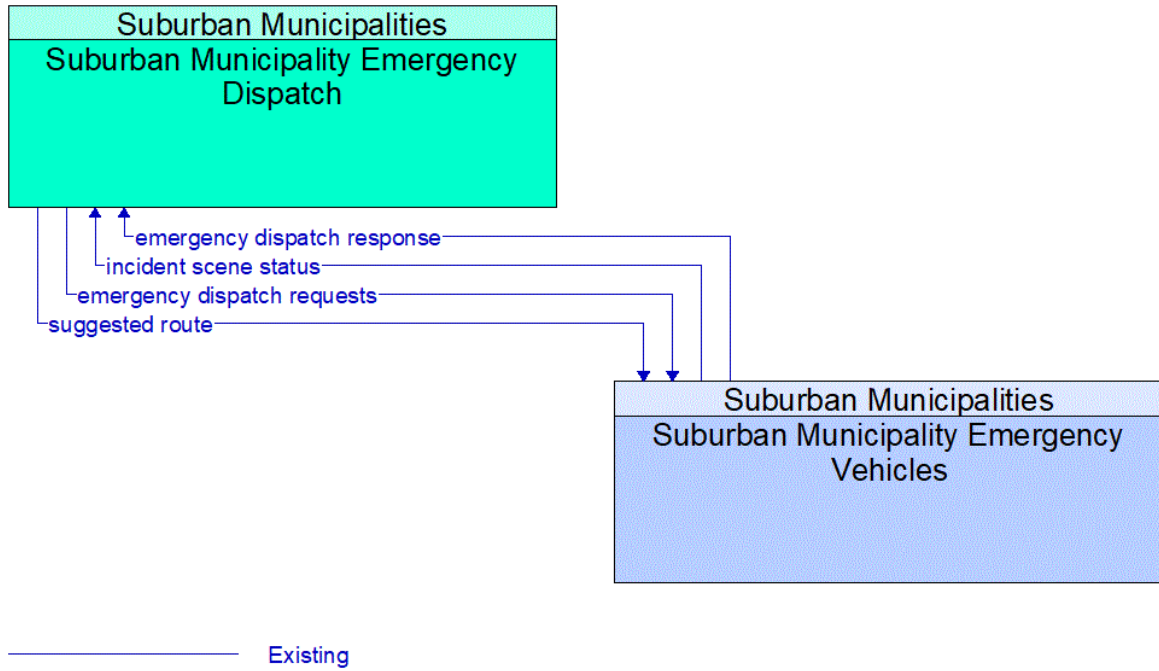


Figure 446: Suburban Municipality Emergency Dispatch - Suburban Municipality Emergency Vehicles Interface

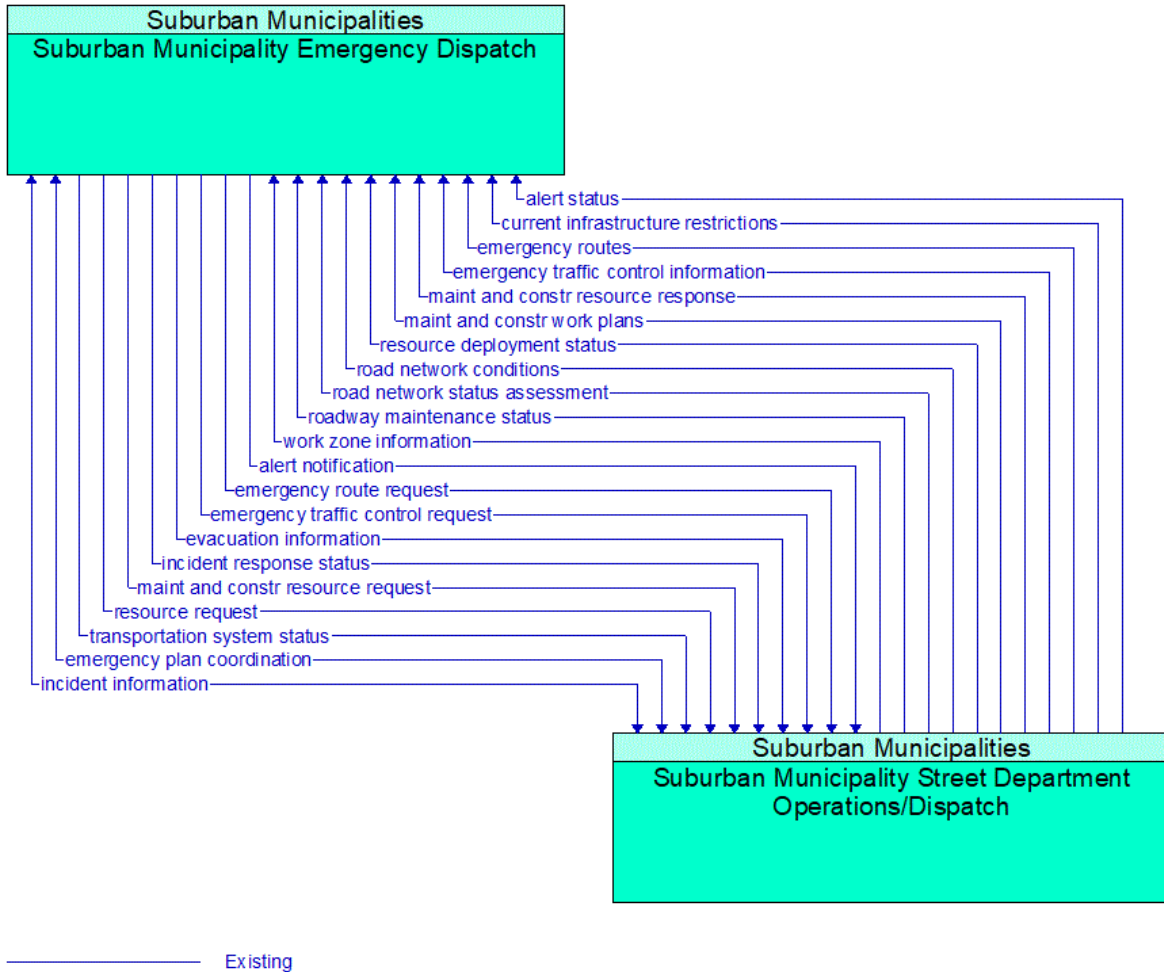


Figure 447: Suburban Municipality Emergency Dispatch - Suburban Municipality Street Department Operations/Dispatch Interface

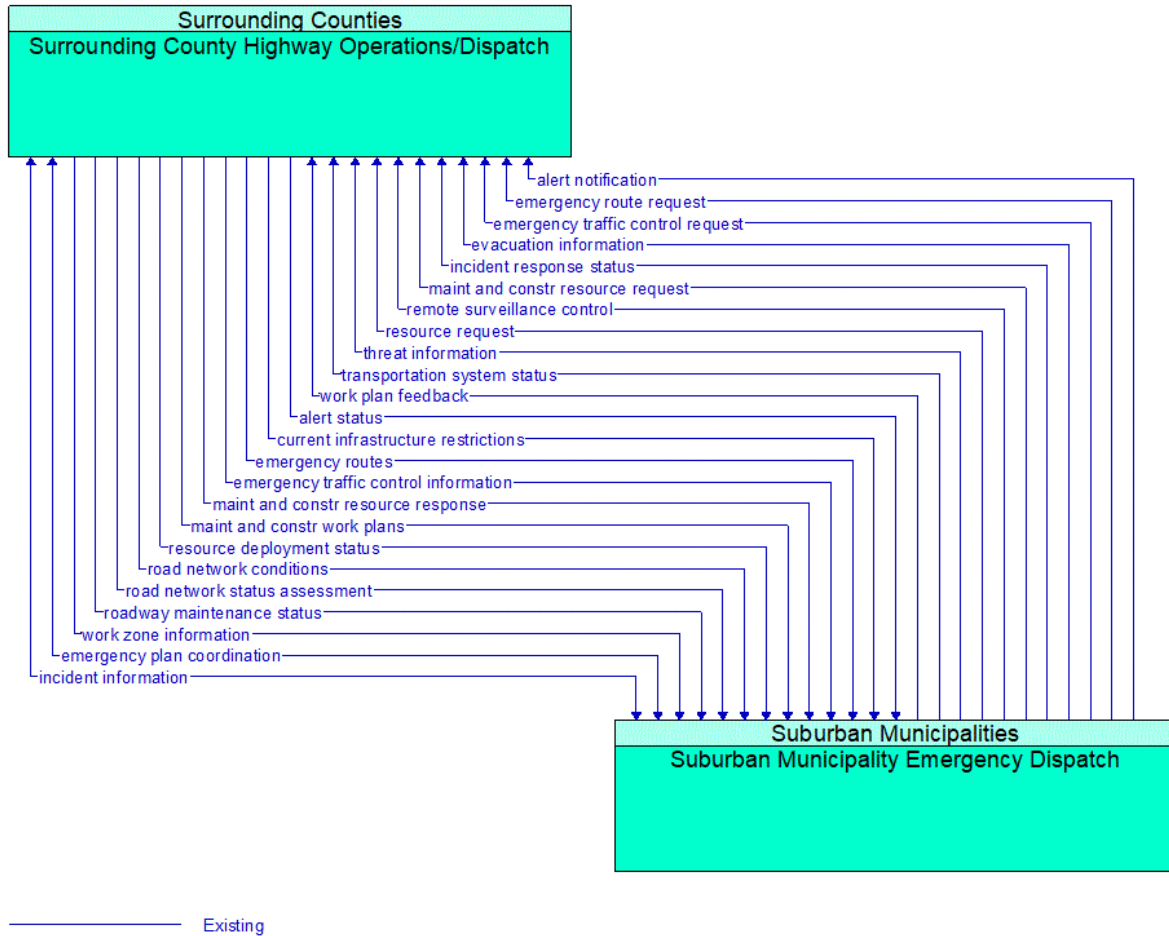
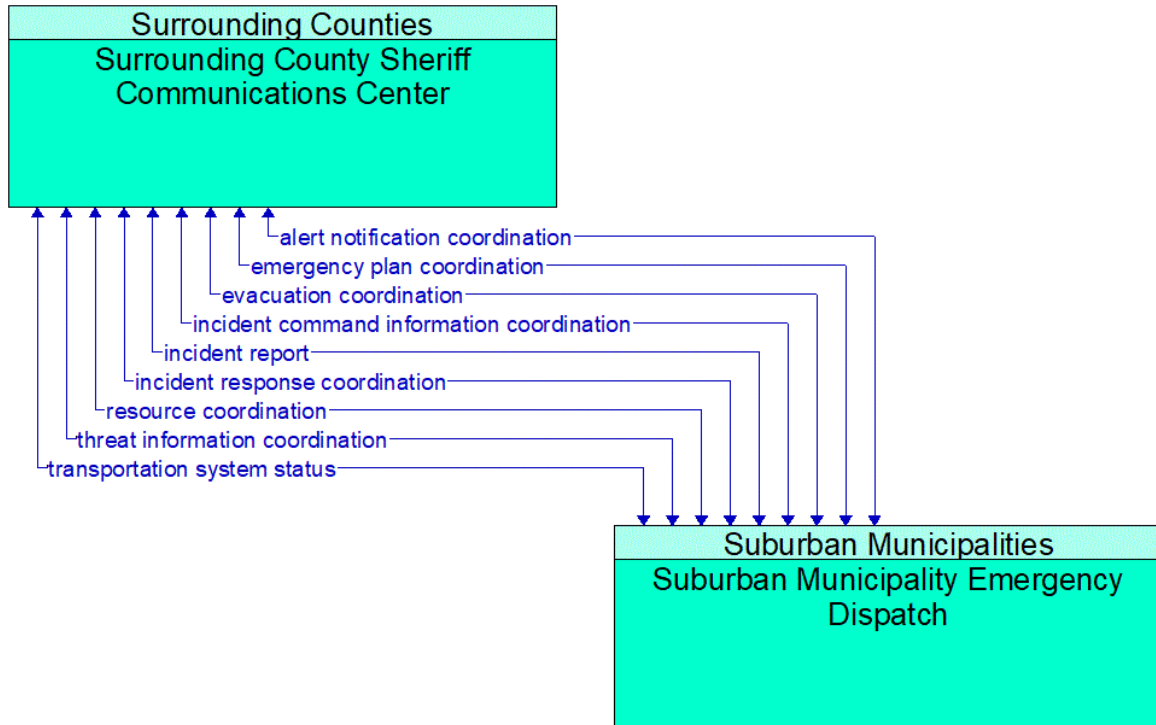


Figure 448: Suburban Municipality Emergency Dispatch - Surrounding County Highway Operations/Dispatch Interface



Existing

Figure 449: Suburban Municipality Emergency Dispatch - Surrounding County Sheriff Communications Center Interface

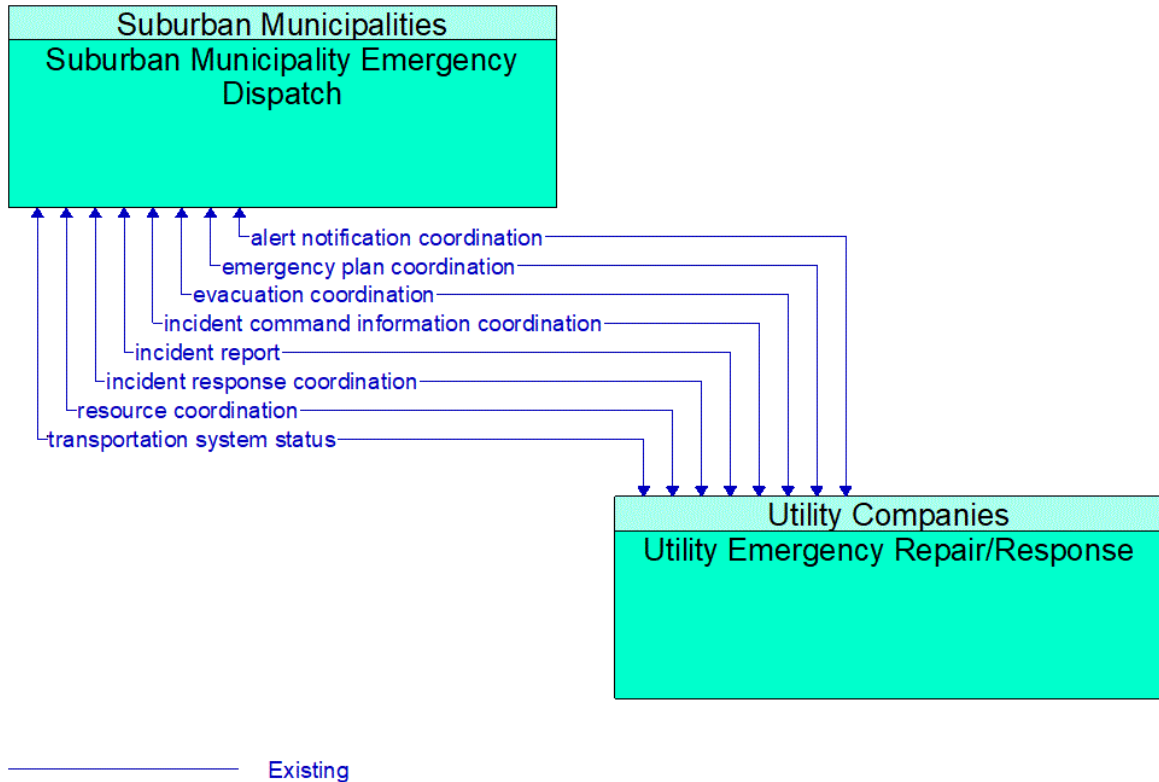


Figure 450: Suburban Municipality Emergency Dispatch - Utility Emergency Repair/Response Interface

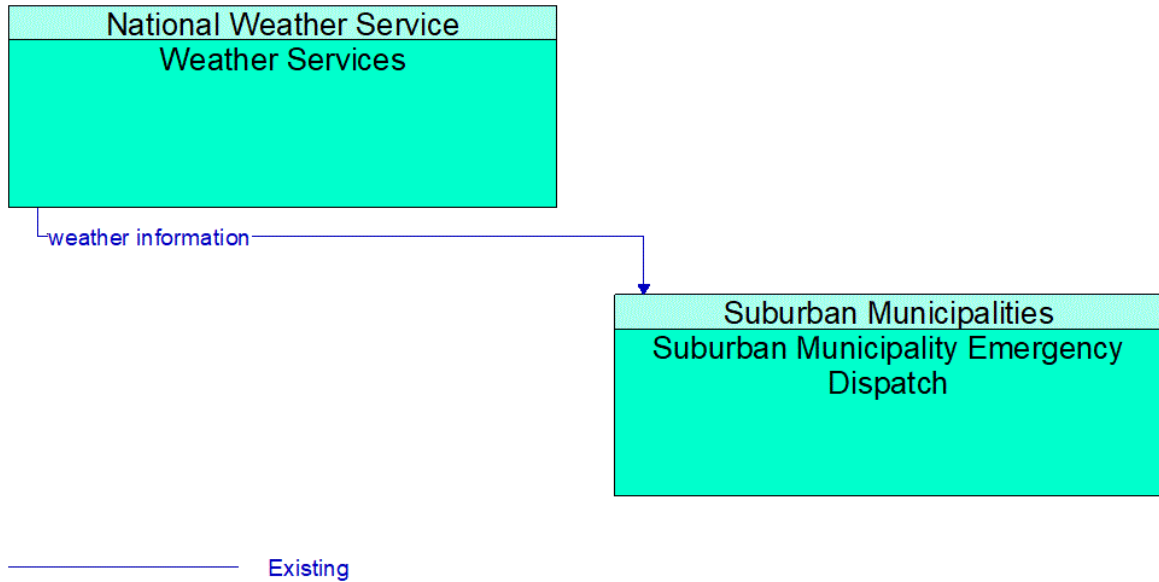


Figure 451: Suburban Municipality Emergency Dispatch - Weather Services Interface

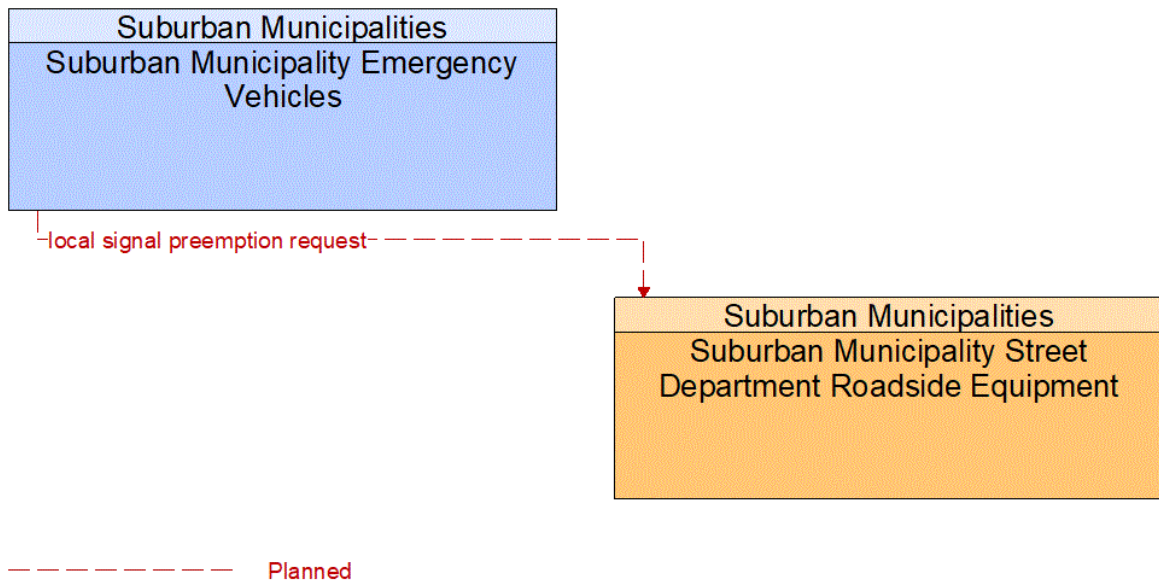


Figure 452: Suburban Municipality Emergency Vehicles - Suburban Municipality Street Department Roadside Equipment Interface

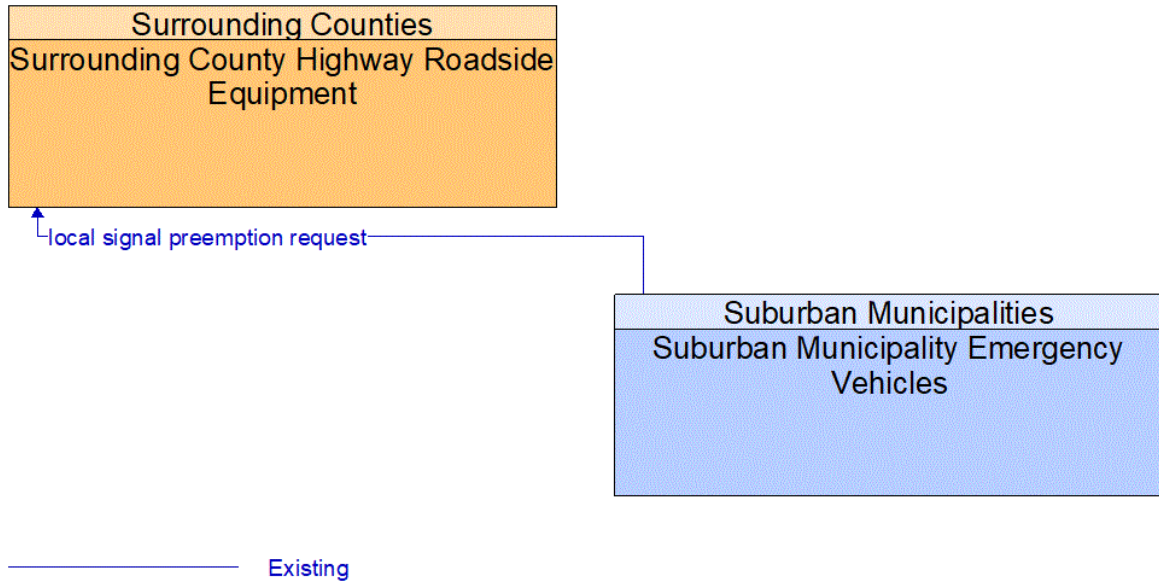


Figure 453: Suburban Municipality Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface

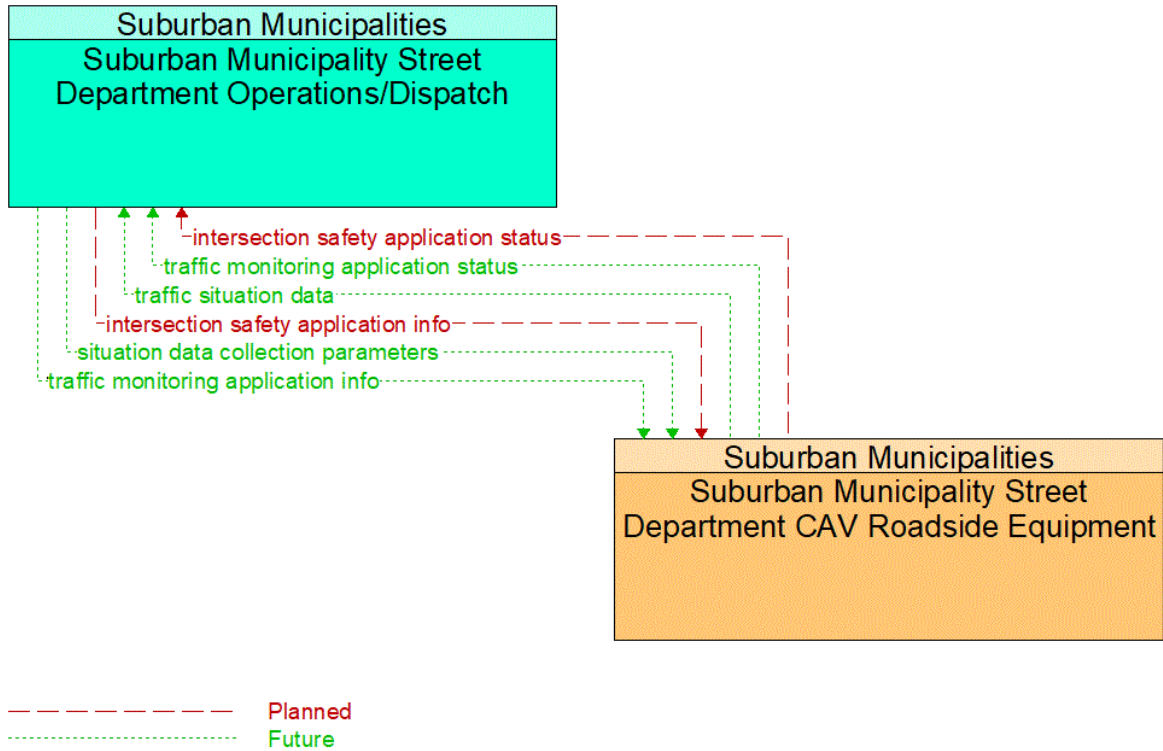


Figure 454: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Operations/Dispatch Interface

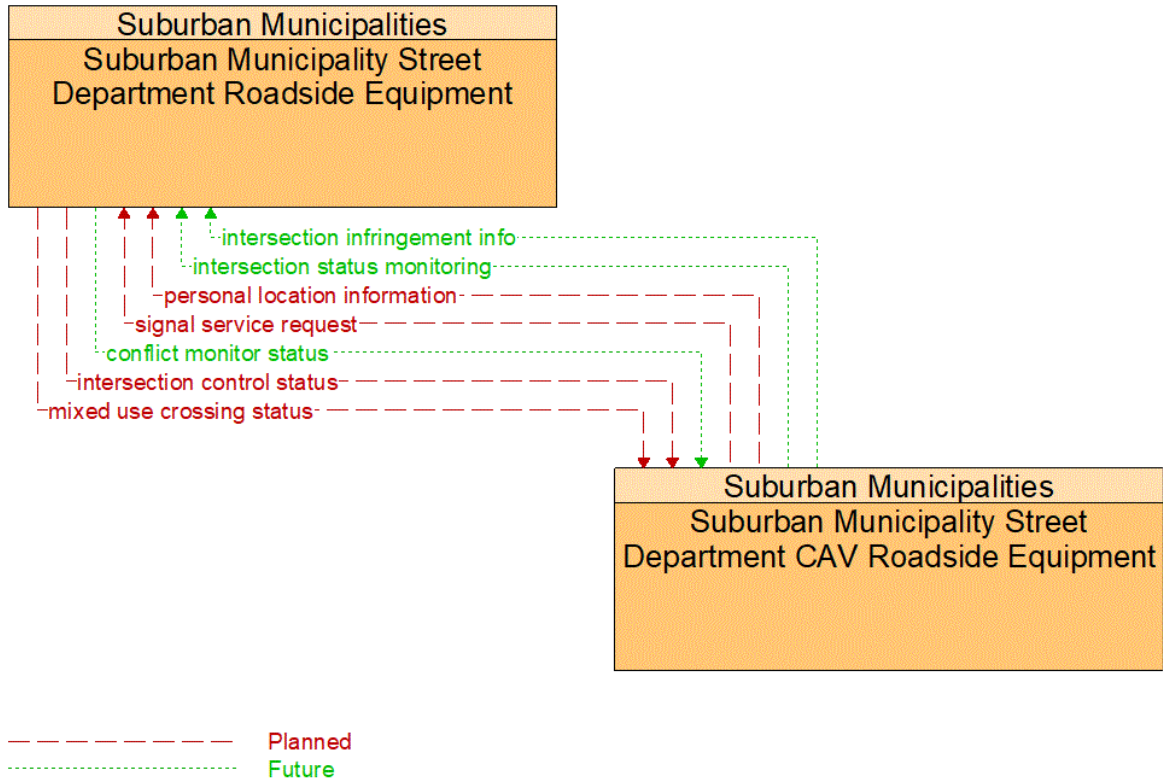


Figure 455: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Roadside Equipment Interface

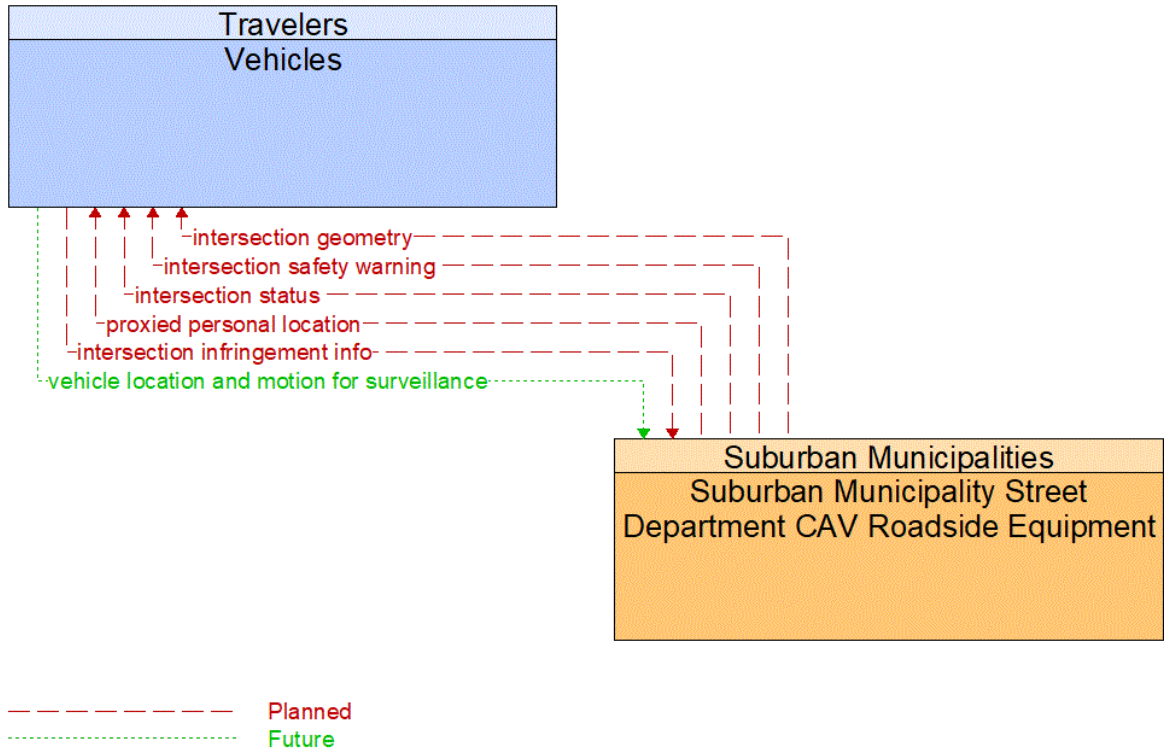


Figure 456: Suburban Municipality Street Department CAV Roadside Equipment - Vehicles Interface

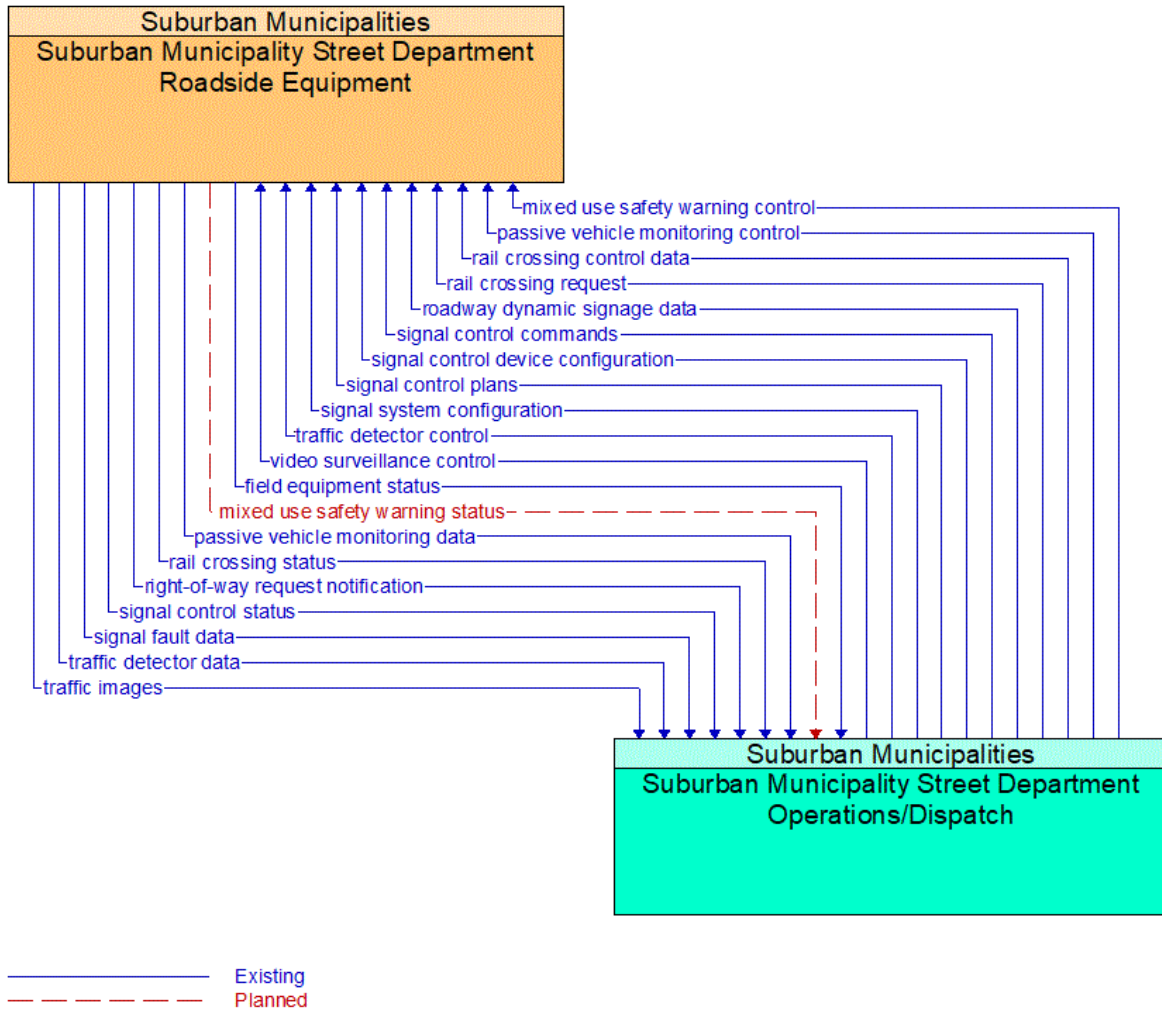


Figure 457: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Roadside Equipment Interface

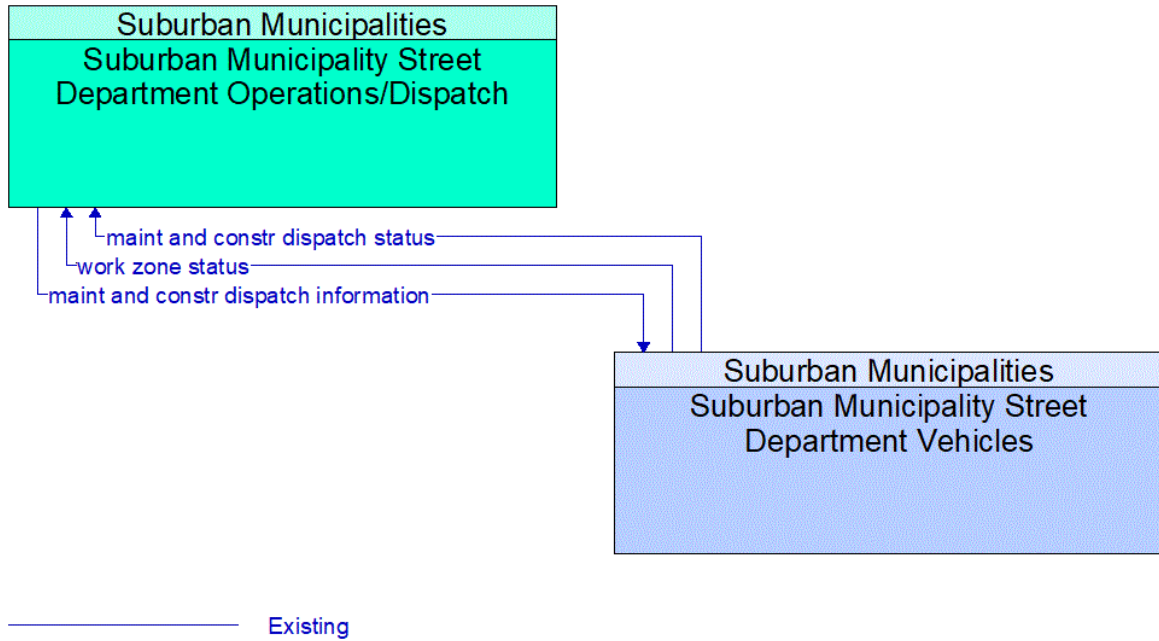


Figure 458: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Vehicles Interface

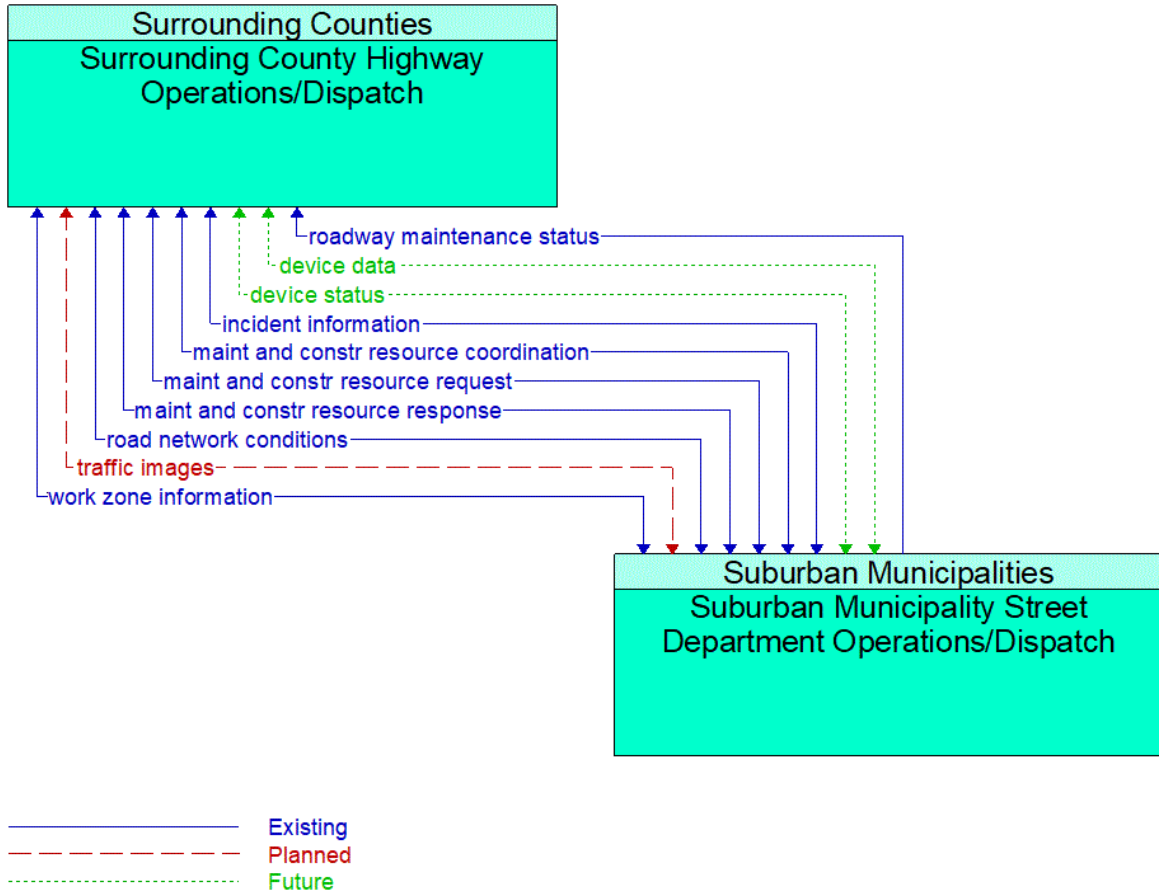


Figure 459: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Highway Operations/Dispatch Interface

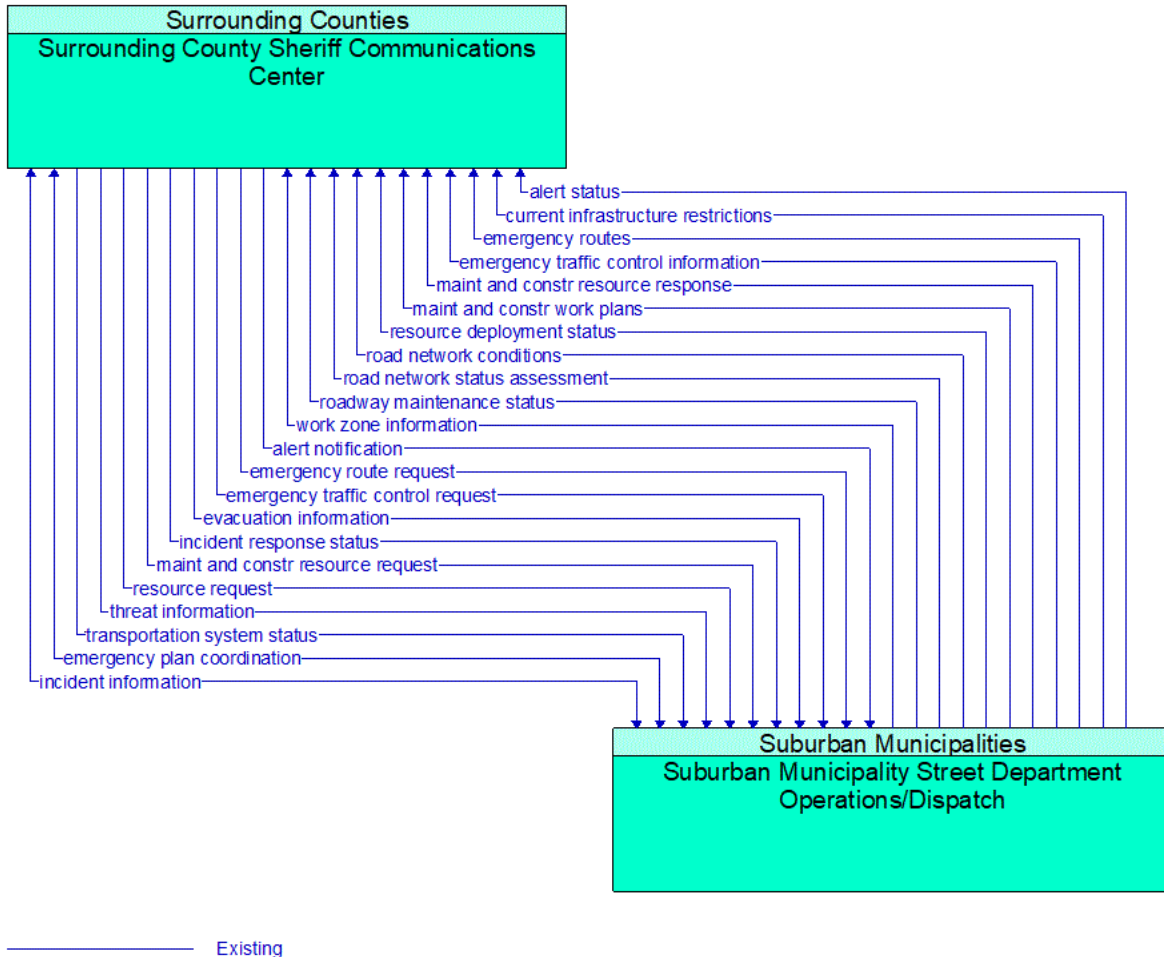


Figure 460: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Sheriff Communications Center Interface

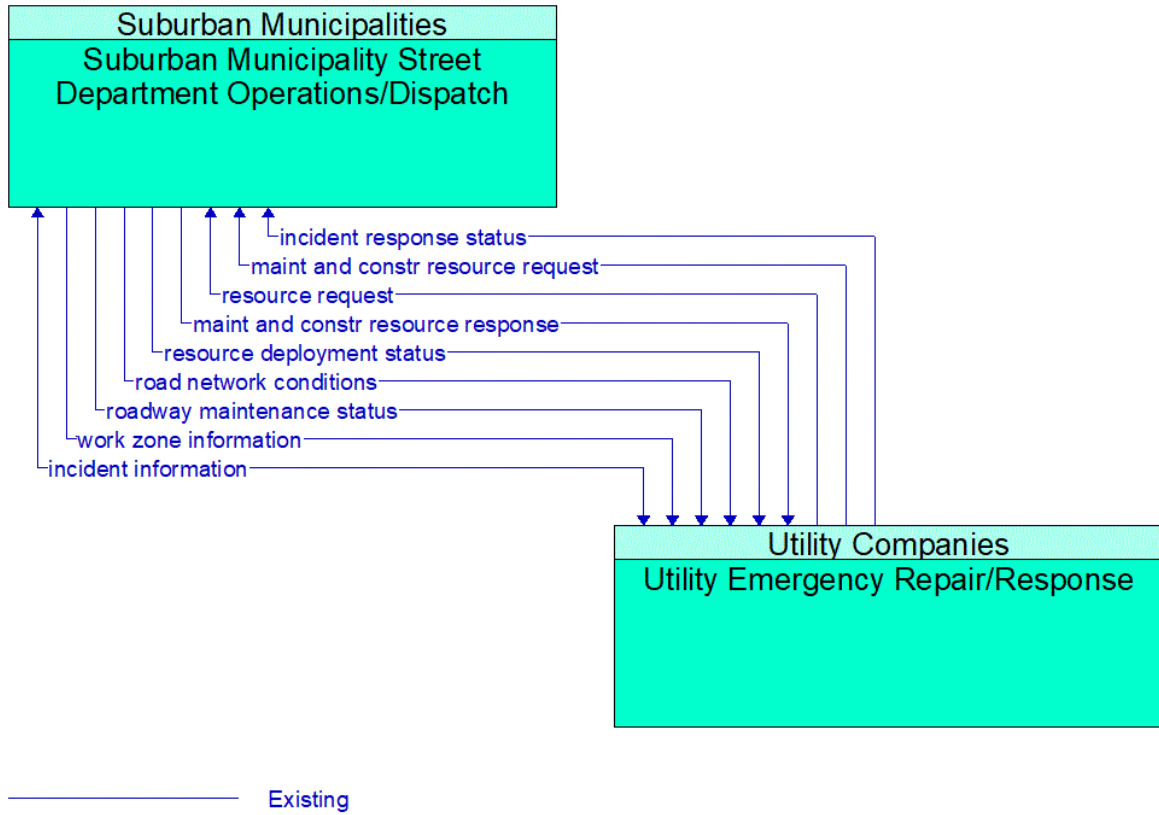


Figure 461: Suburban Municipality Street Department Operations/Dispatch - Utility Emergency Repair/Response Interface

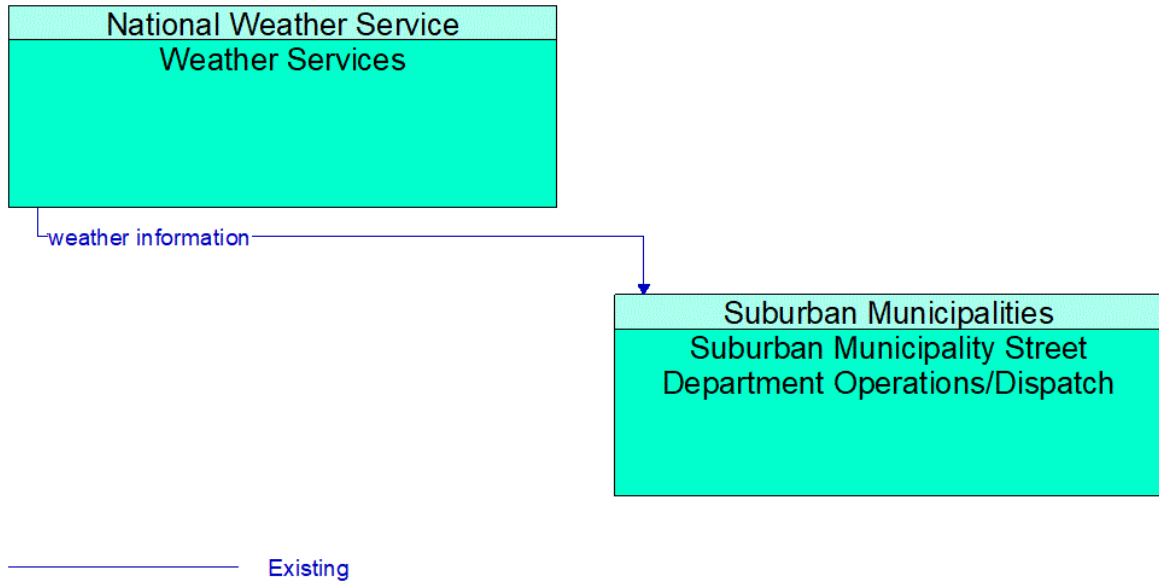


Figure 462: Suburban Municipality Street Department Operations/Dispatch - Weather Services Interface

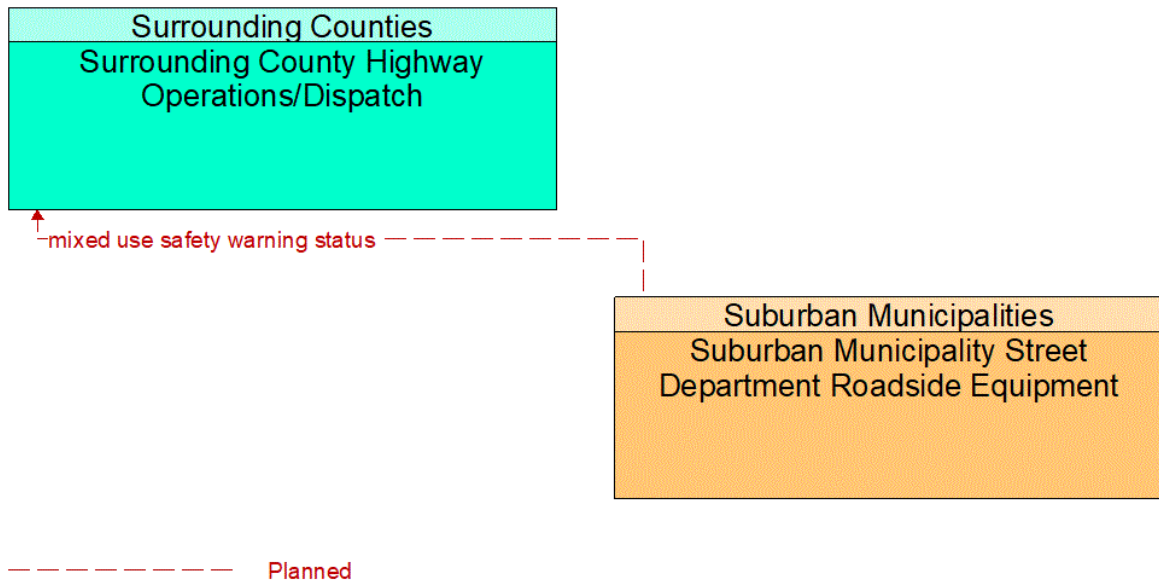


Figure 463: Suburban Municipality Street Department Roadside Equipment - Surrounding County Highway Operations/Dispatch Interface

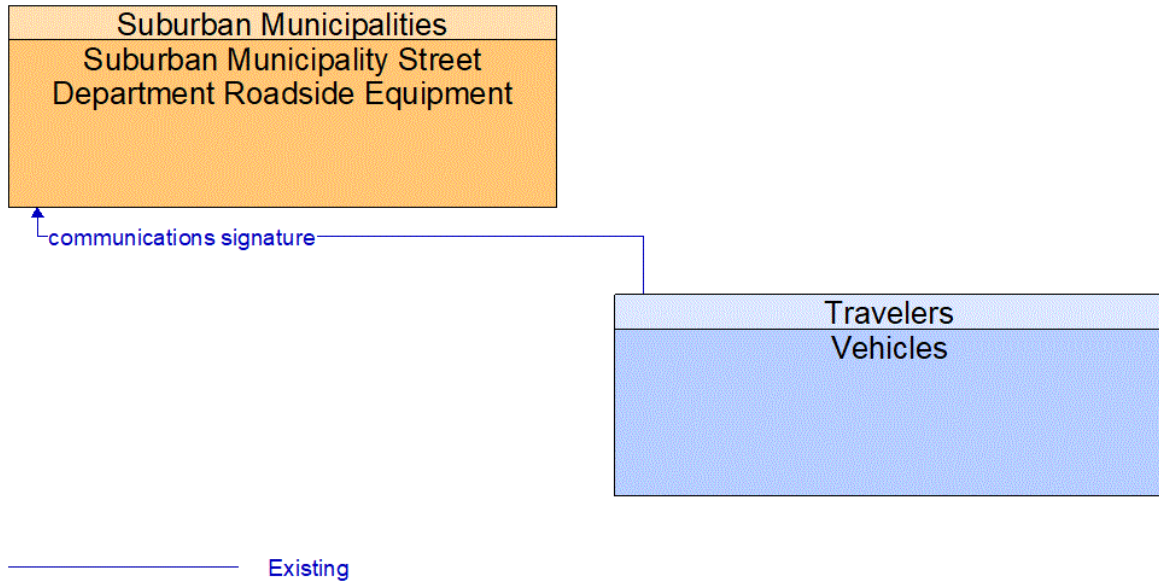


Figure 464: Suburban Municipality Street Department Roadside Equipment - Vehicles Interface

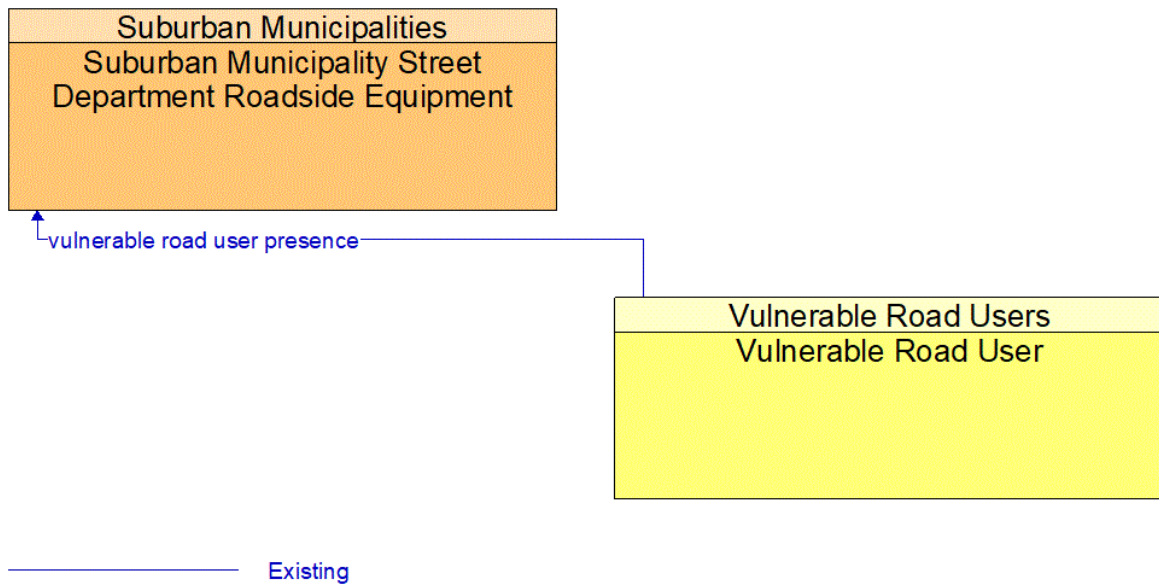
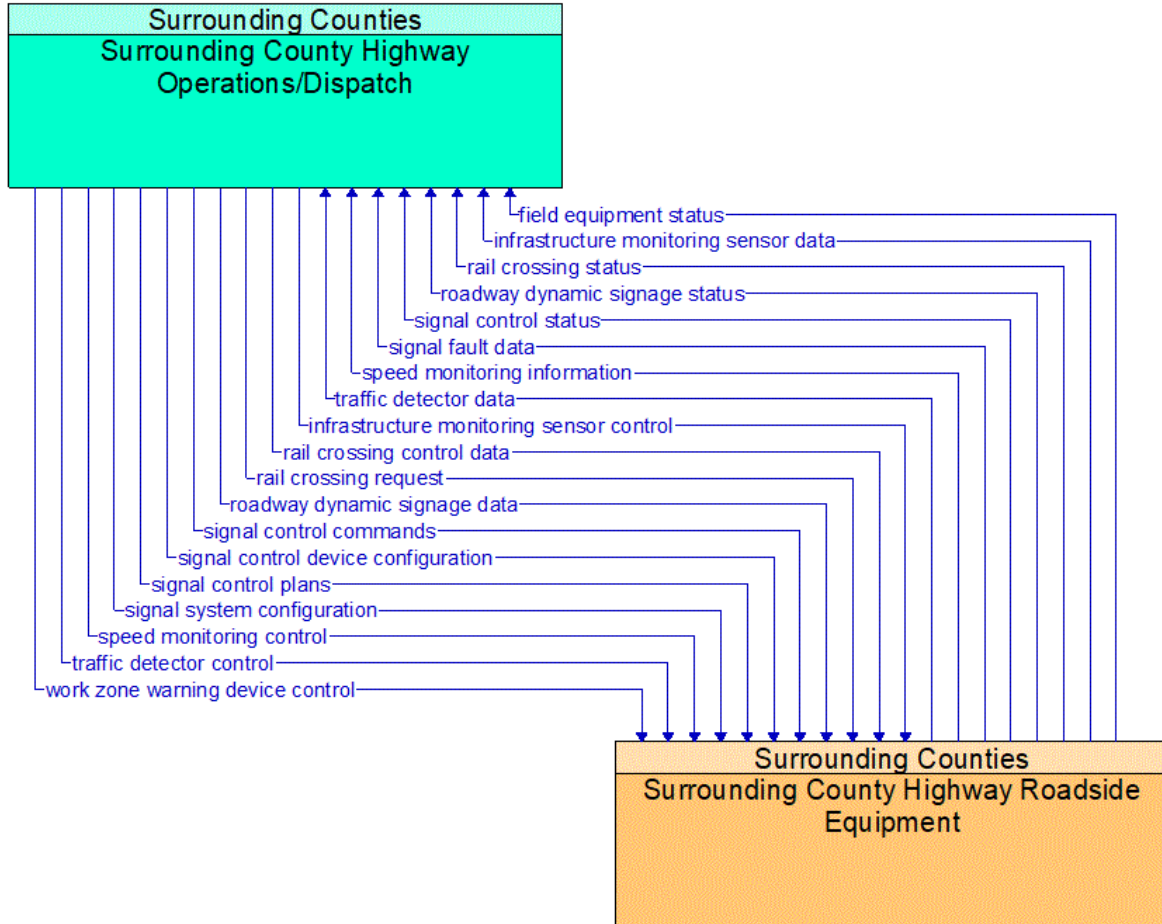


Figure 465: Suburban Municipality Street Department Roadside Equipment - Vulnerable Road User Interface



Existing

Figure 466: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Roadside Equipment Interface

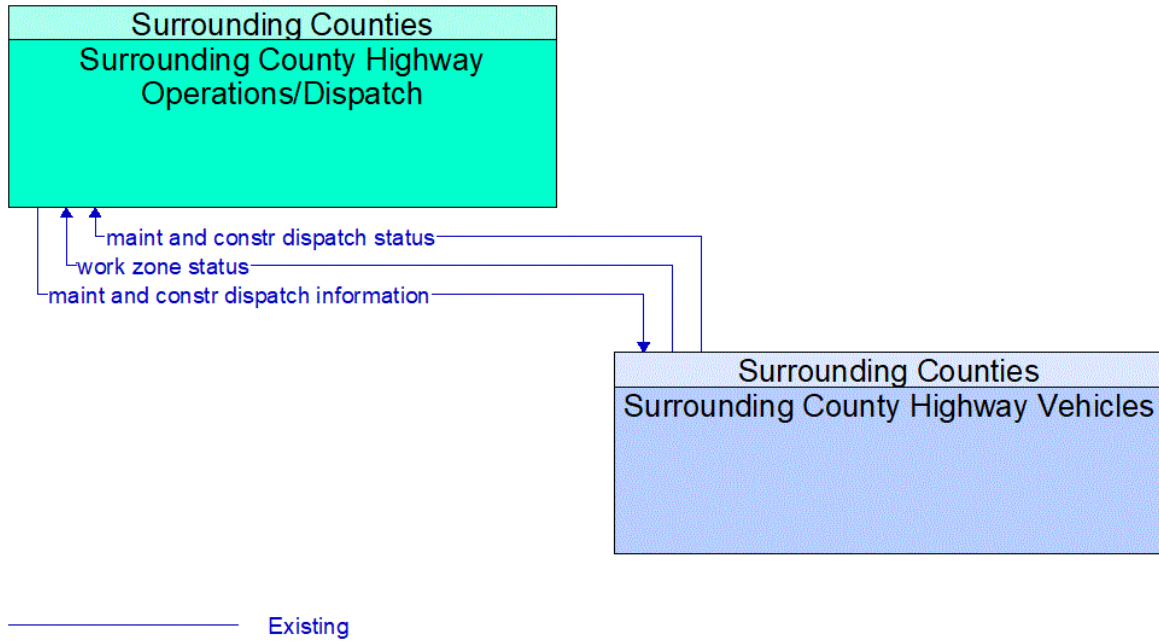


Figure 467: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Vehicles Interface

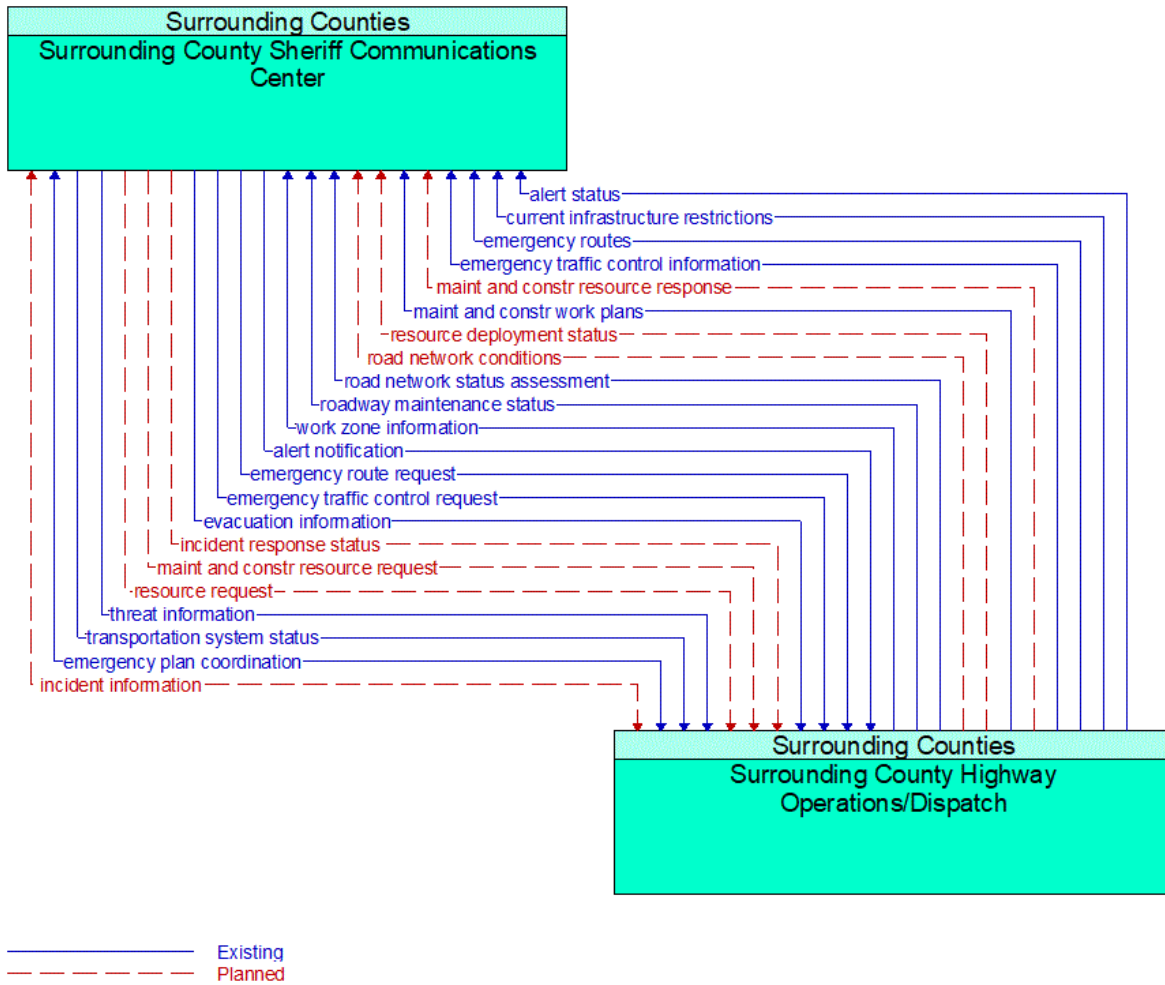
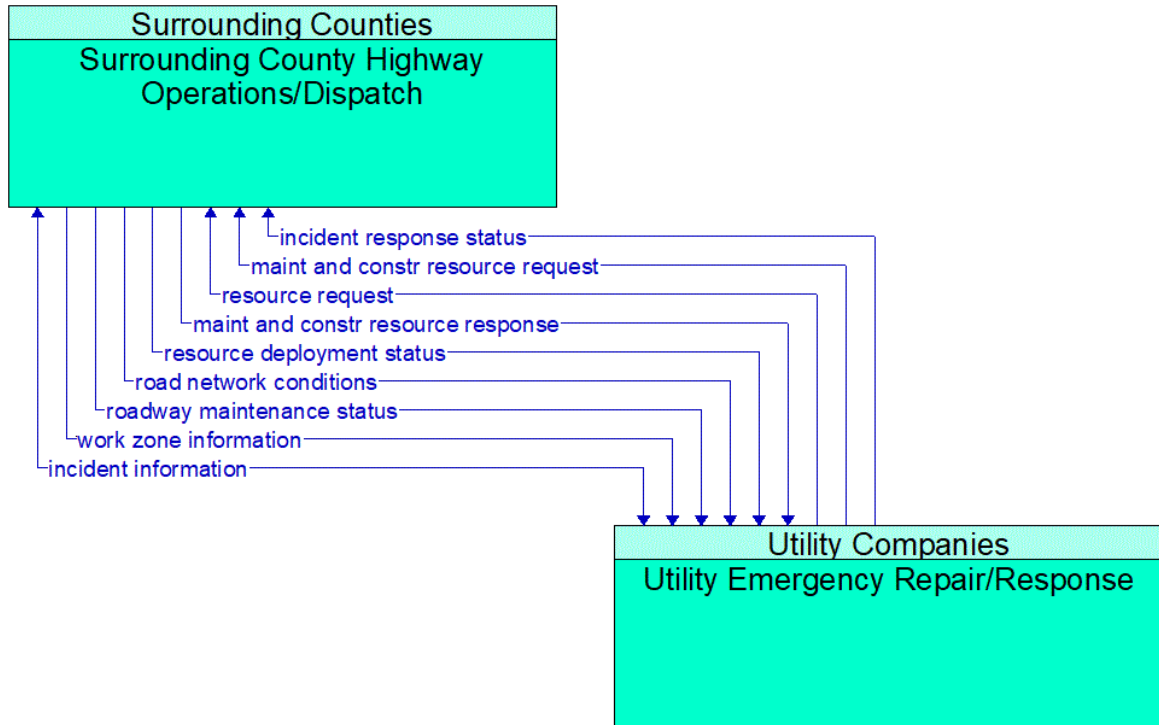


Figure 468: Surrounding County Highway Operations/Dispatch - Surrounding County Sheriff Communications Center Interface



Existing

Figure 469: Surrounding County Highway Operations/Dispatch - Utility Emergency Repair/Response Interface

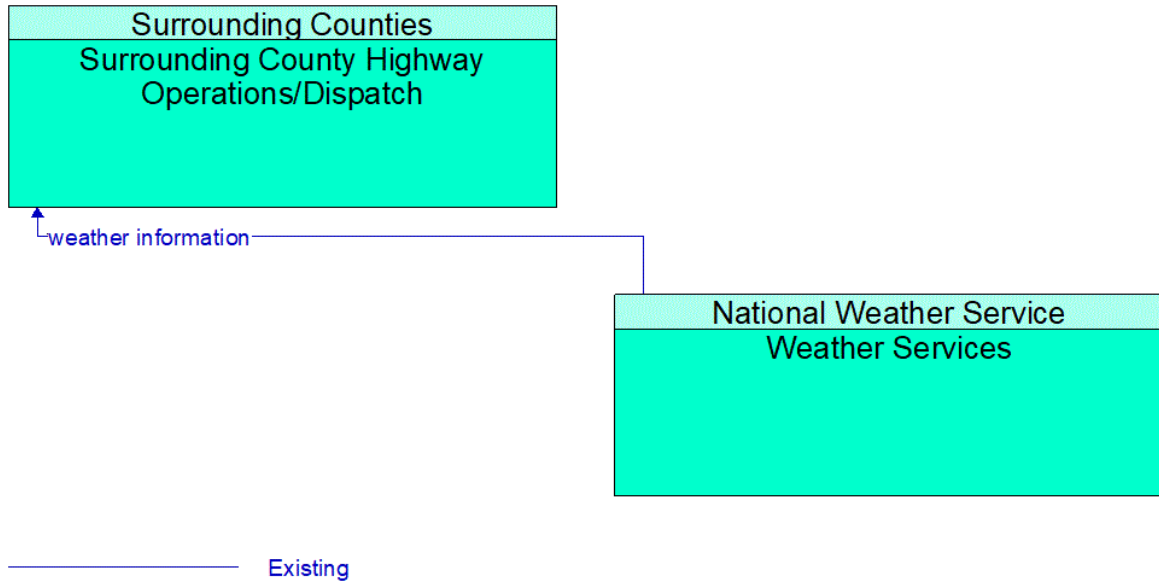


Figure 470: Surrounding County Highway Operations/Dispatch - Weather Services Interface

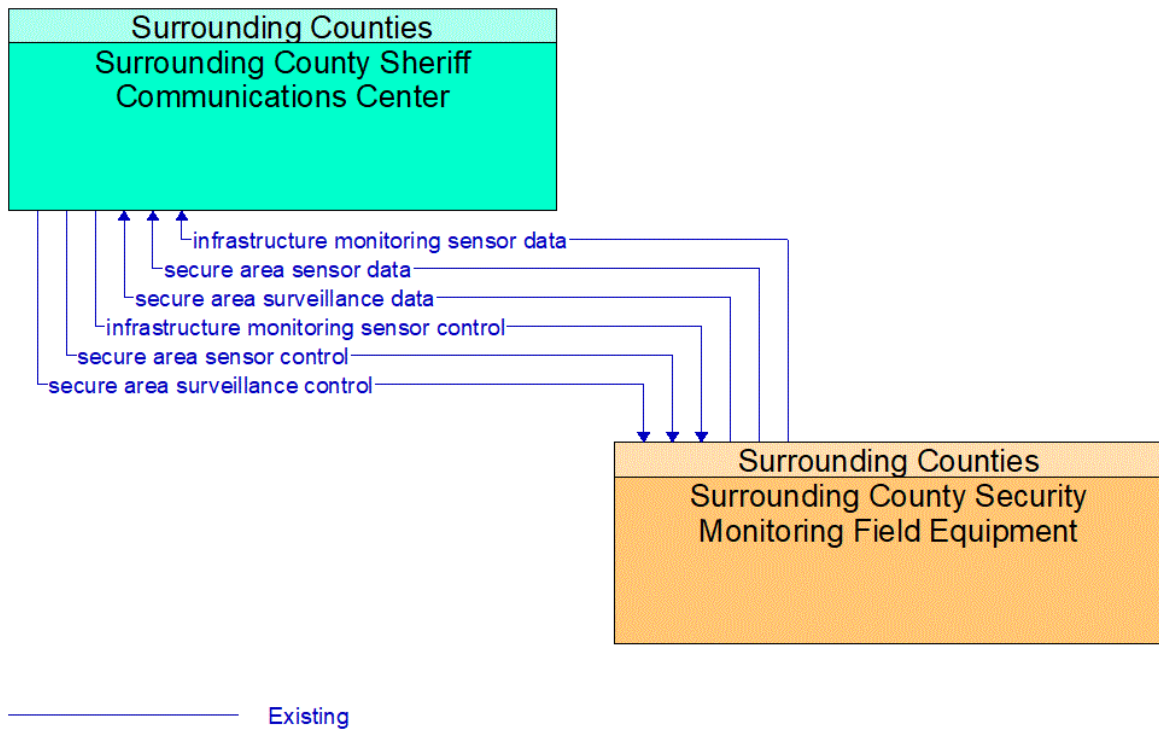


Figure 471: Surrounding County Security Monitoring Field Equipment - Surrounding County Sheriff Communications Center Interface

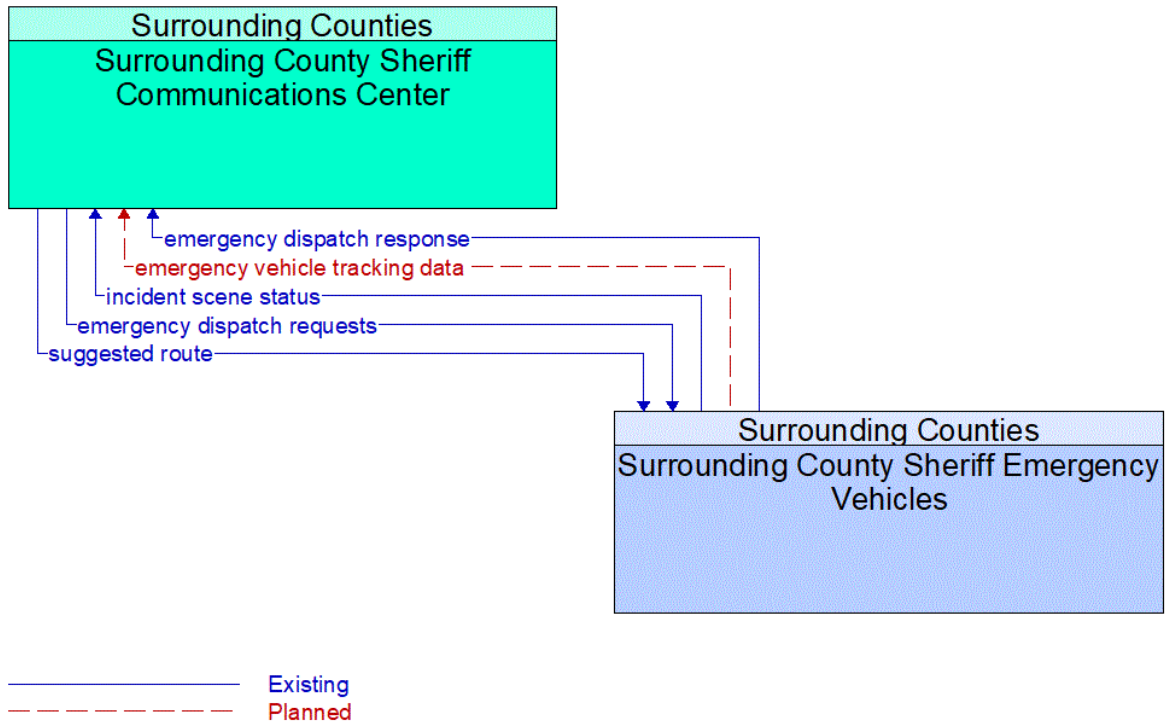
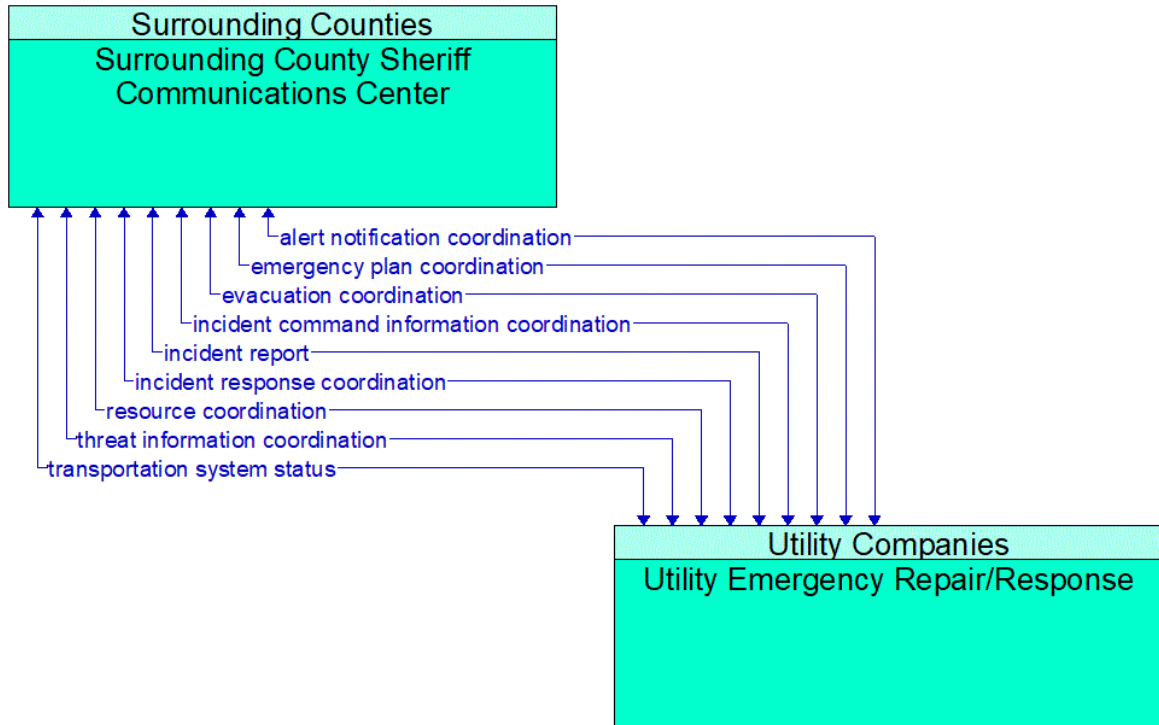


Figure 472: Surrounding County Sheriff Communications Center - Surrounding County Sheriff Emergency Vehicles Interface



Existing

Figure 473: Surrounding County Sheriff Communications Center - Utility Emergency Repair/Response Interface

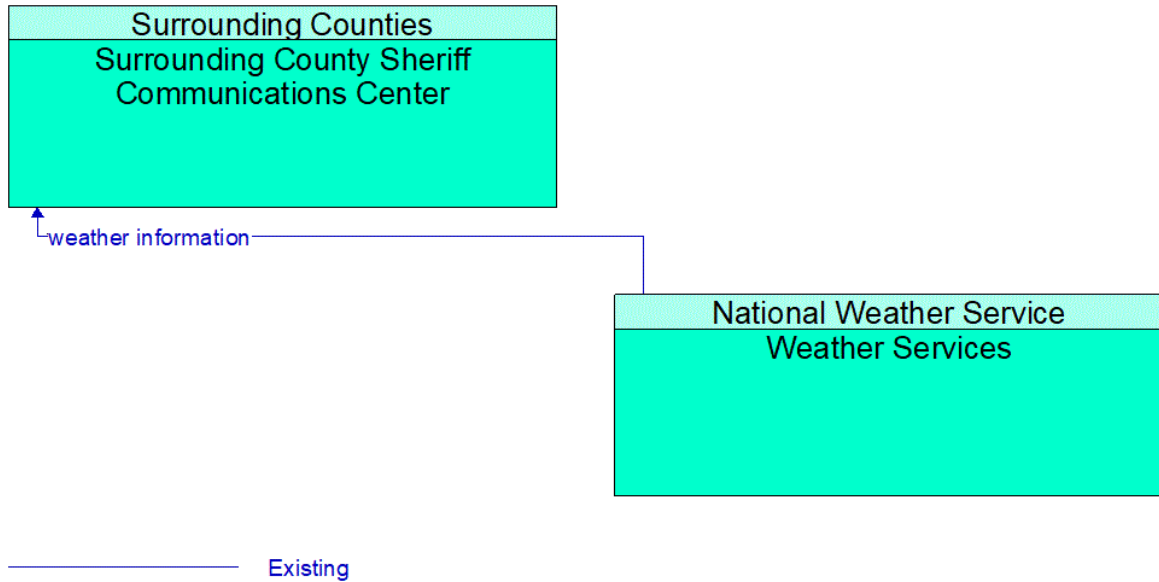


Figure 474: Surrounding County Sheriff Communications Center - Weather Services Interface

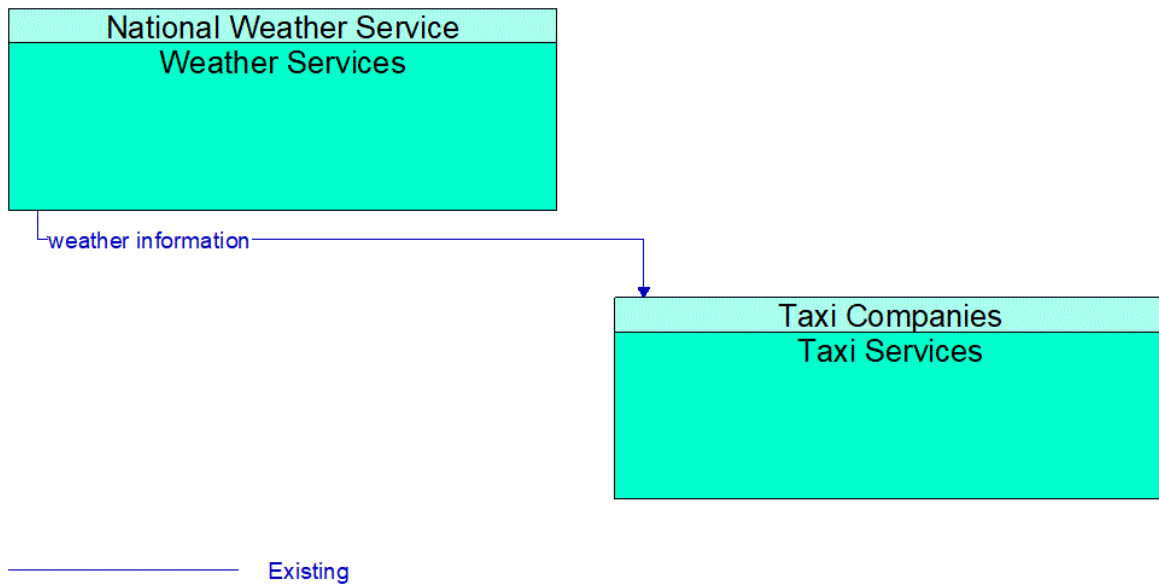


Figure 475: Taxi Services - Weather Services Interface

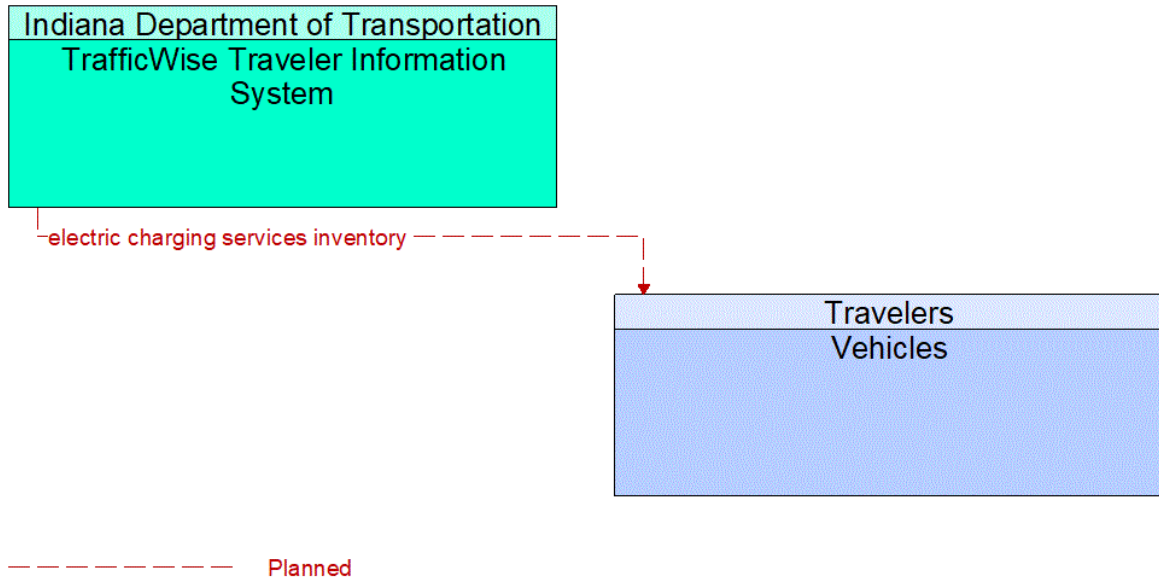


Figure 476: TrafficWise Traveler Information System - Vehicles Interface

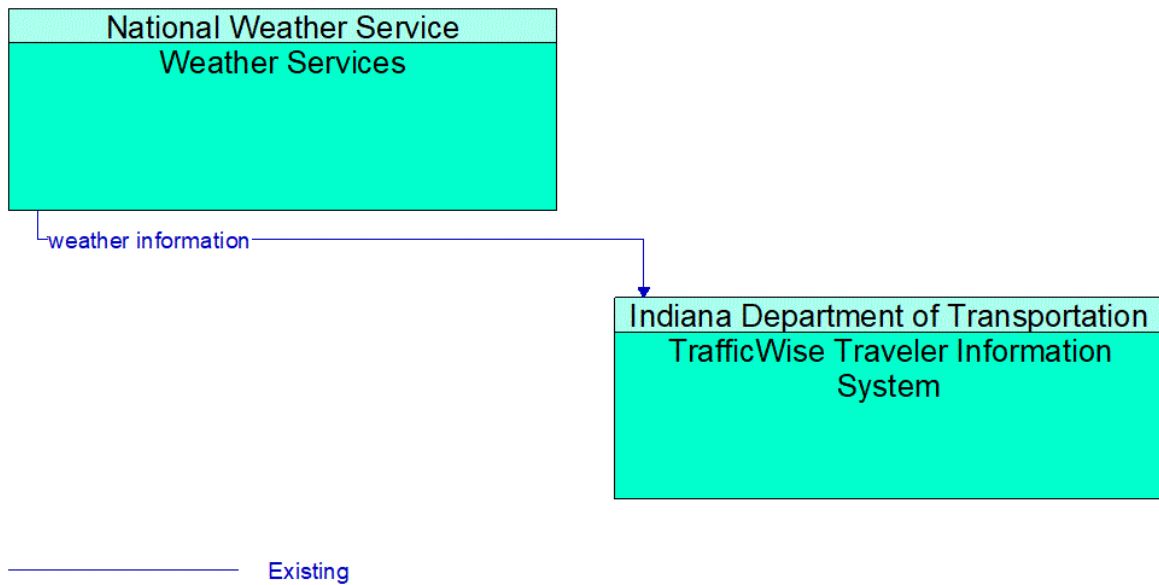


Figure 477: TrafficWise Traveler Information System - Weather Services Interface

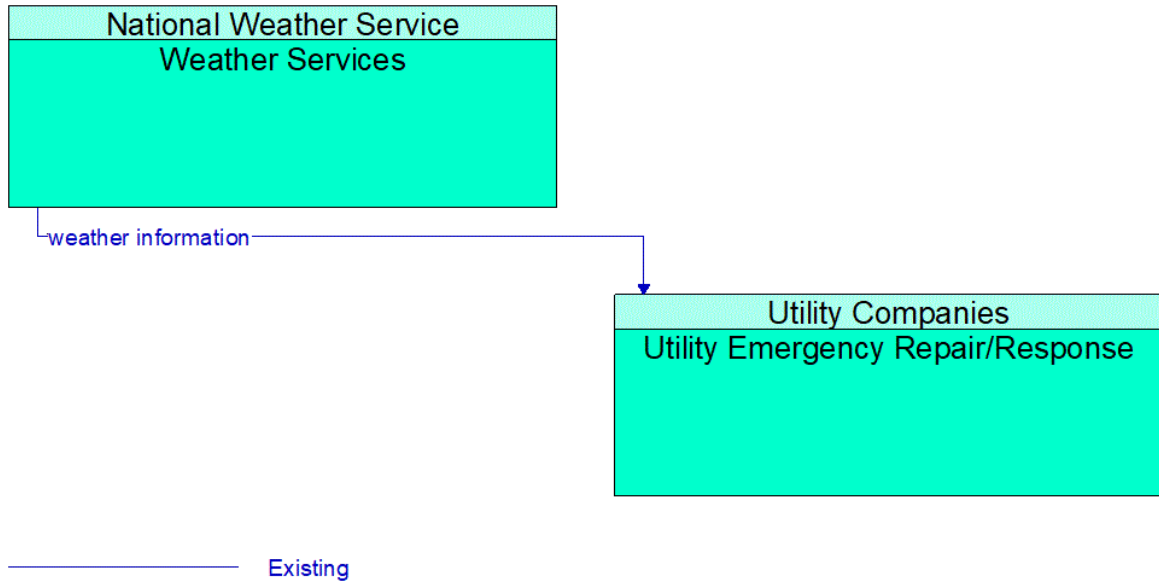


Figure 478: Utility Emergency Repair/Response - Weather Services Interface

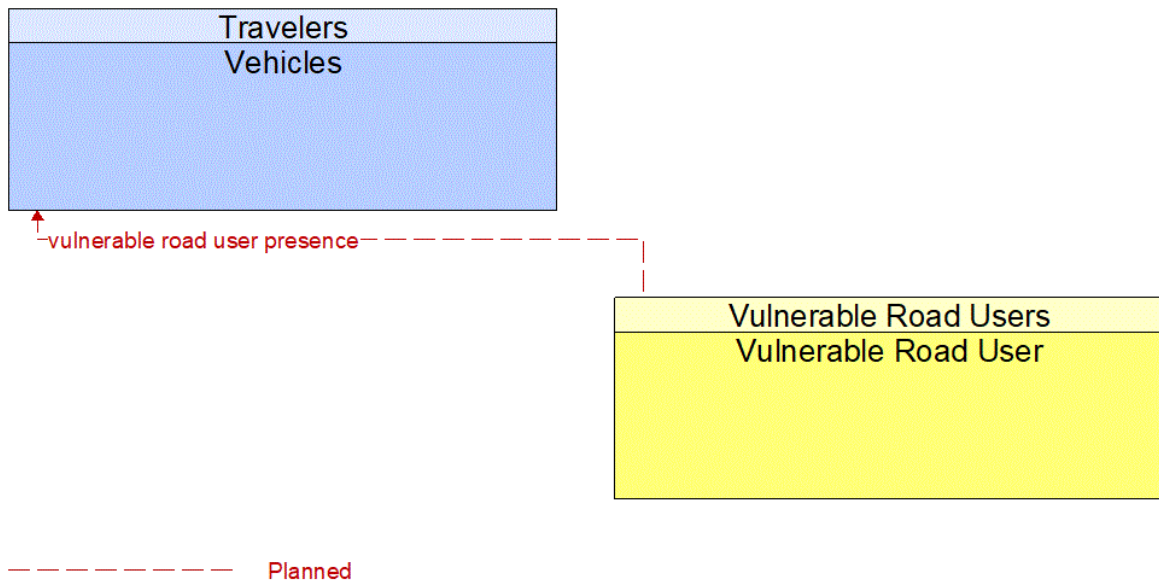
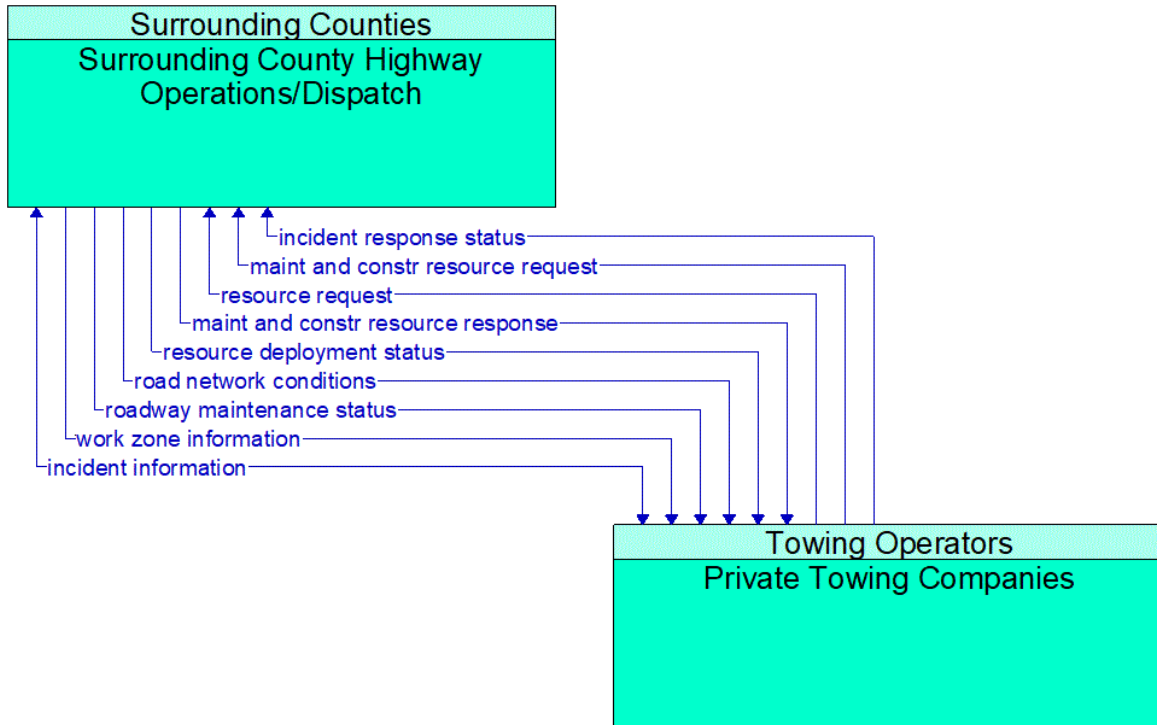
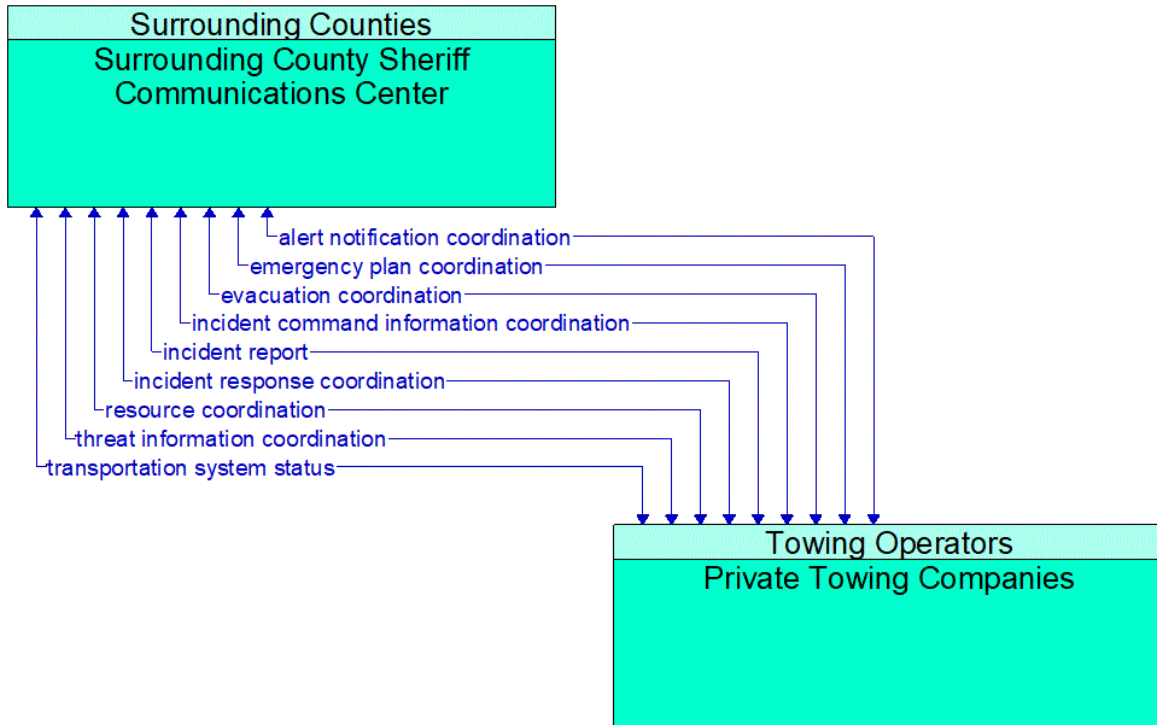


Figure 479: Vehicles - Vulnerable Road User Interface



Existing

Figure 480: Private Towing Companies - Surrounding County Highway Operations/Dispatch Interface



Existing

Figure 481: Private Towing Companies - Surrounding County Sheriff Communications Center Interface

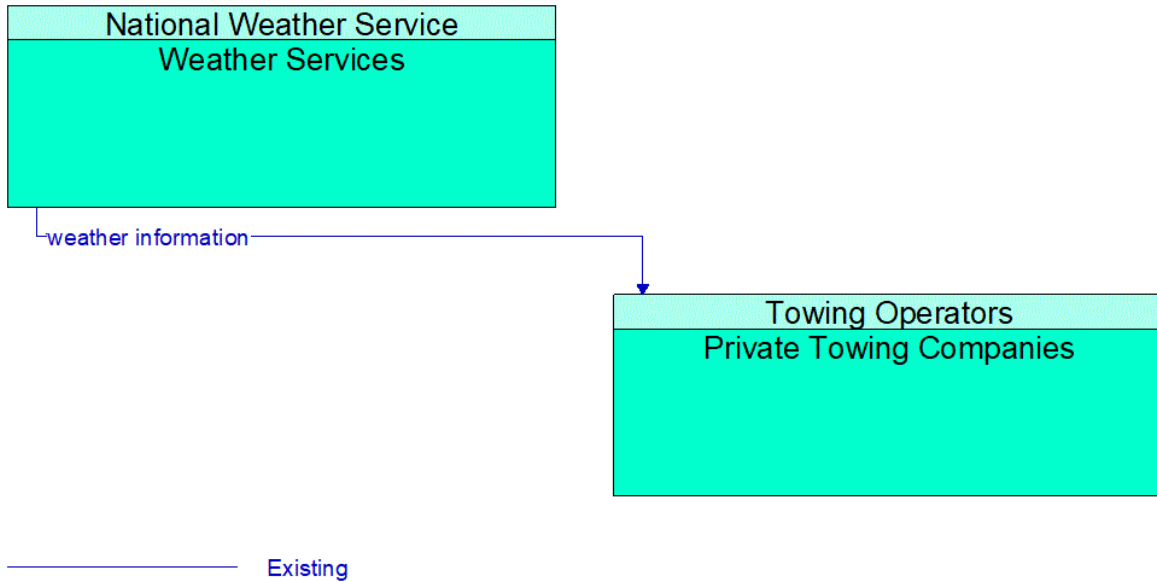


Figure 482: Private Towing Companies - Weather Services Interface

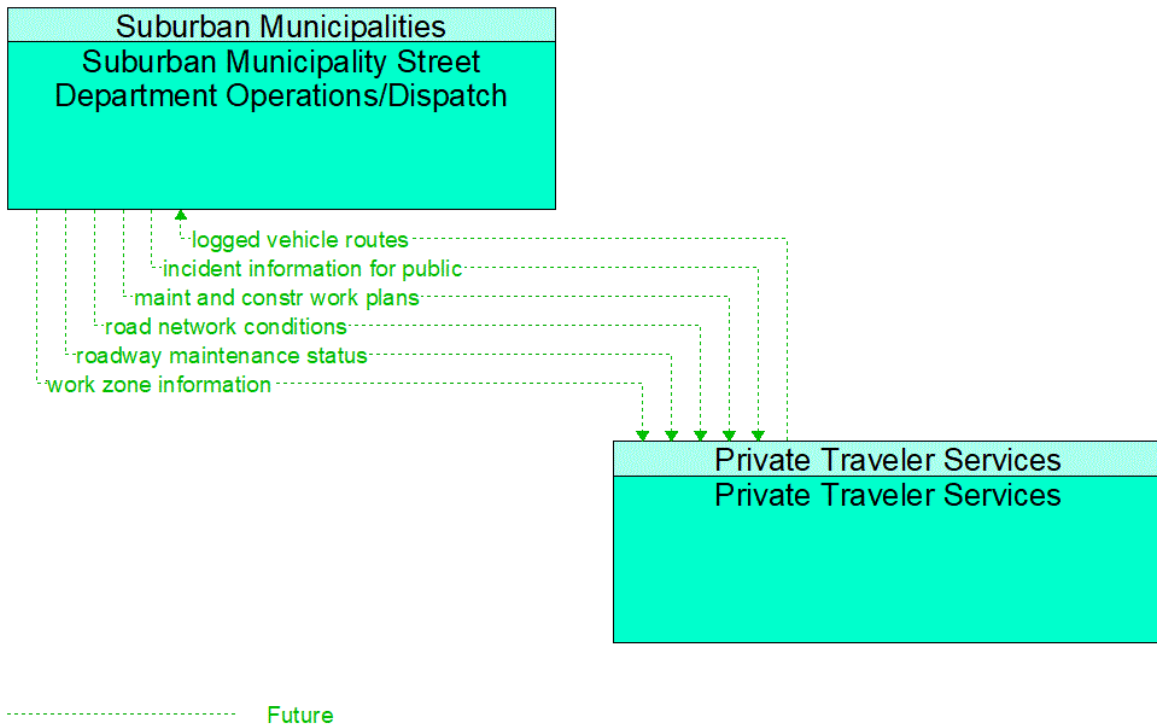


Figure 483: Private Traveler Services - Suburban Municipality Street Department Operations/Dispatch Interface

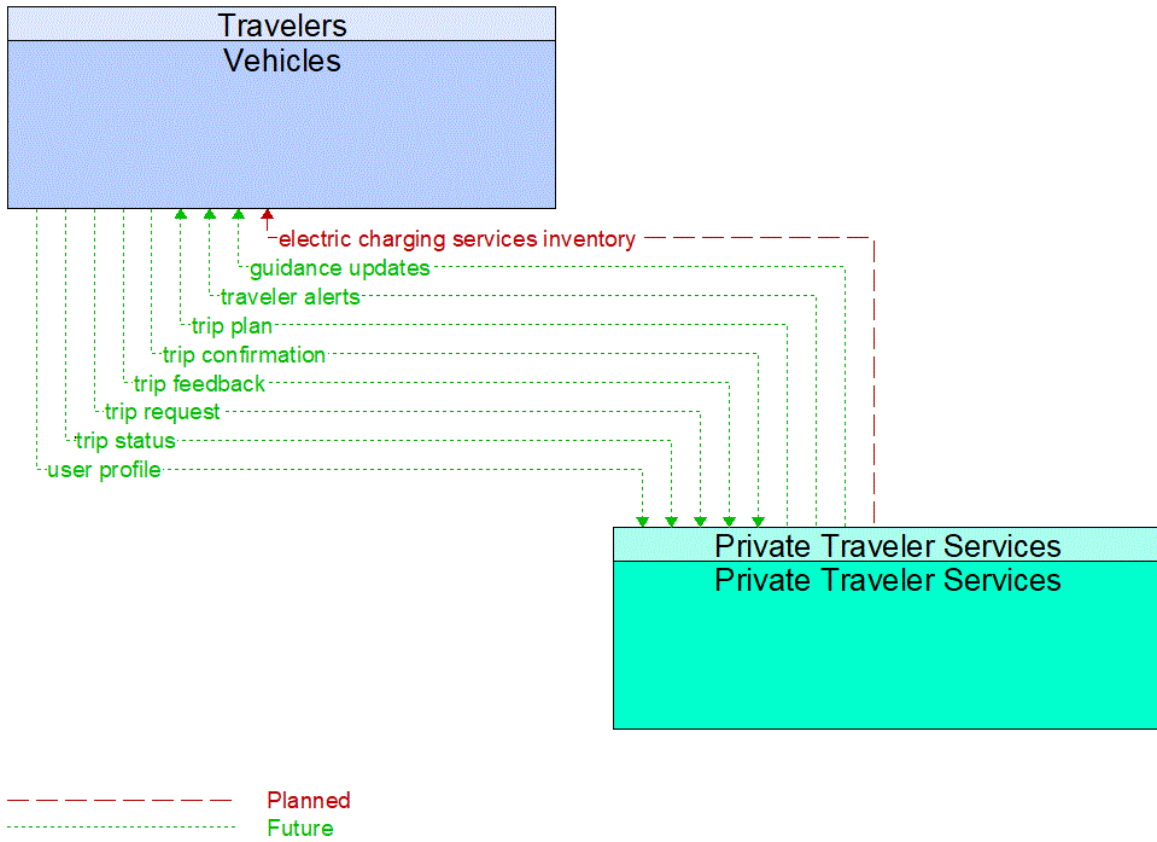


Figure 484: Private Traveler Services - Vehicles Interface

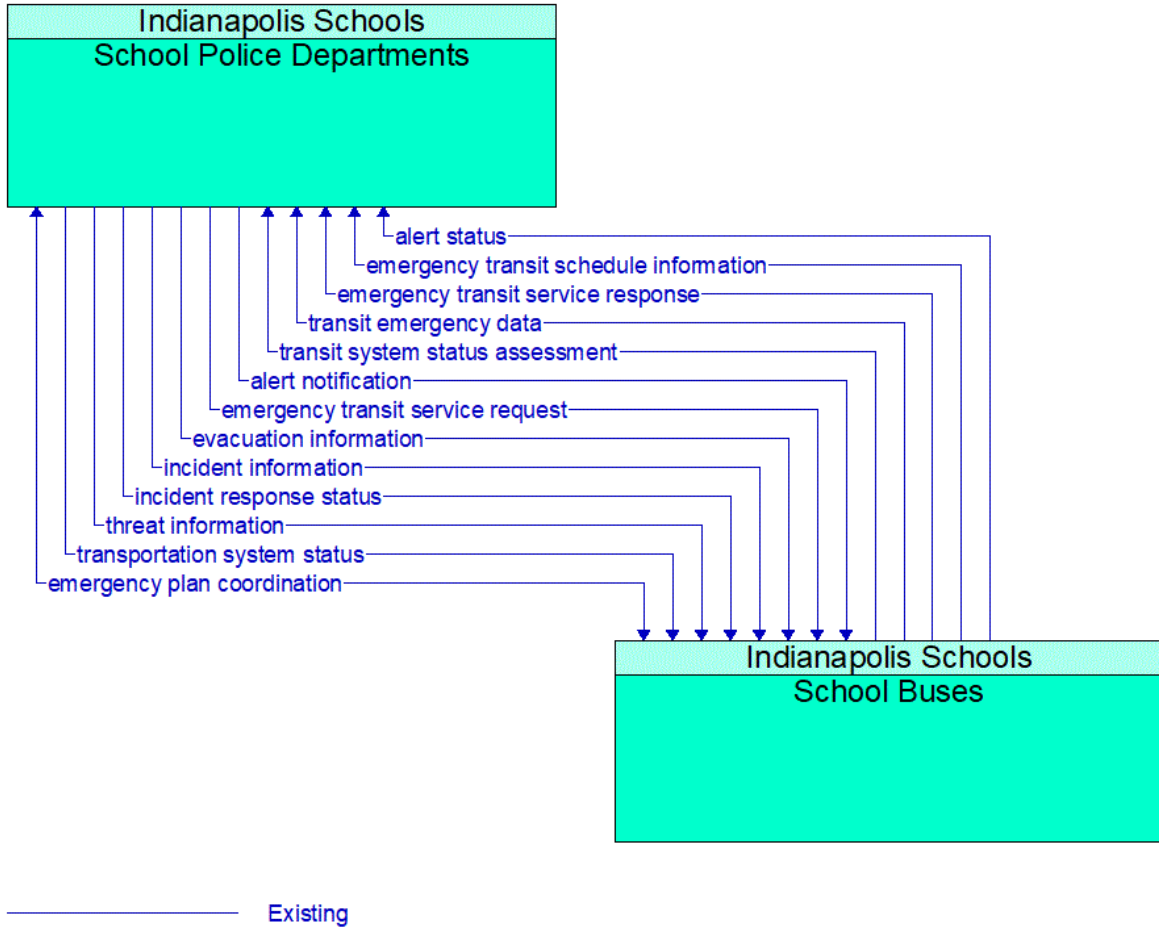


Figure 485: School Buses - School Police Departments Interface

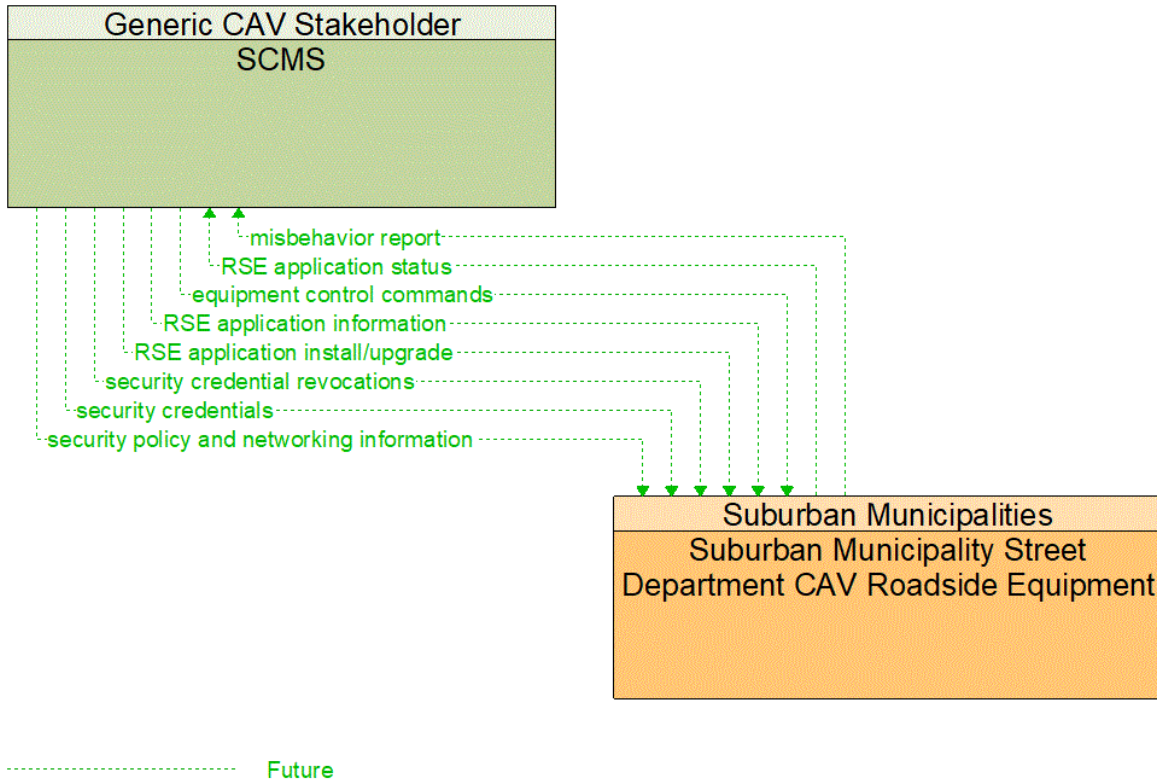


Figure 486: SCMS - Suburban Municipality Street Department CAV Roadside Equipment Interface

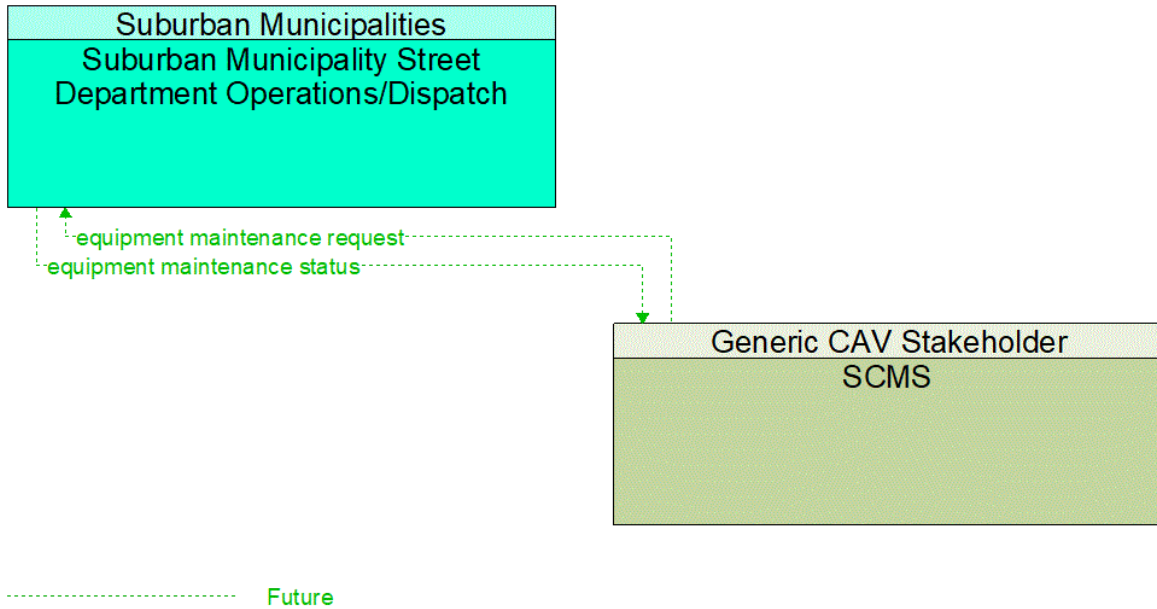


Figure 487: SCMS - Suburban Municipality Street Department Operations/Dispatch Interface

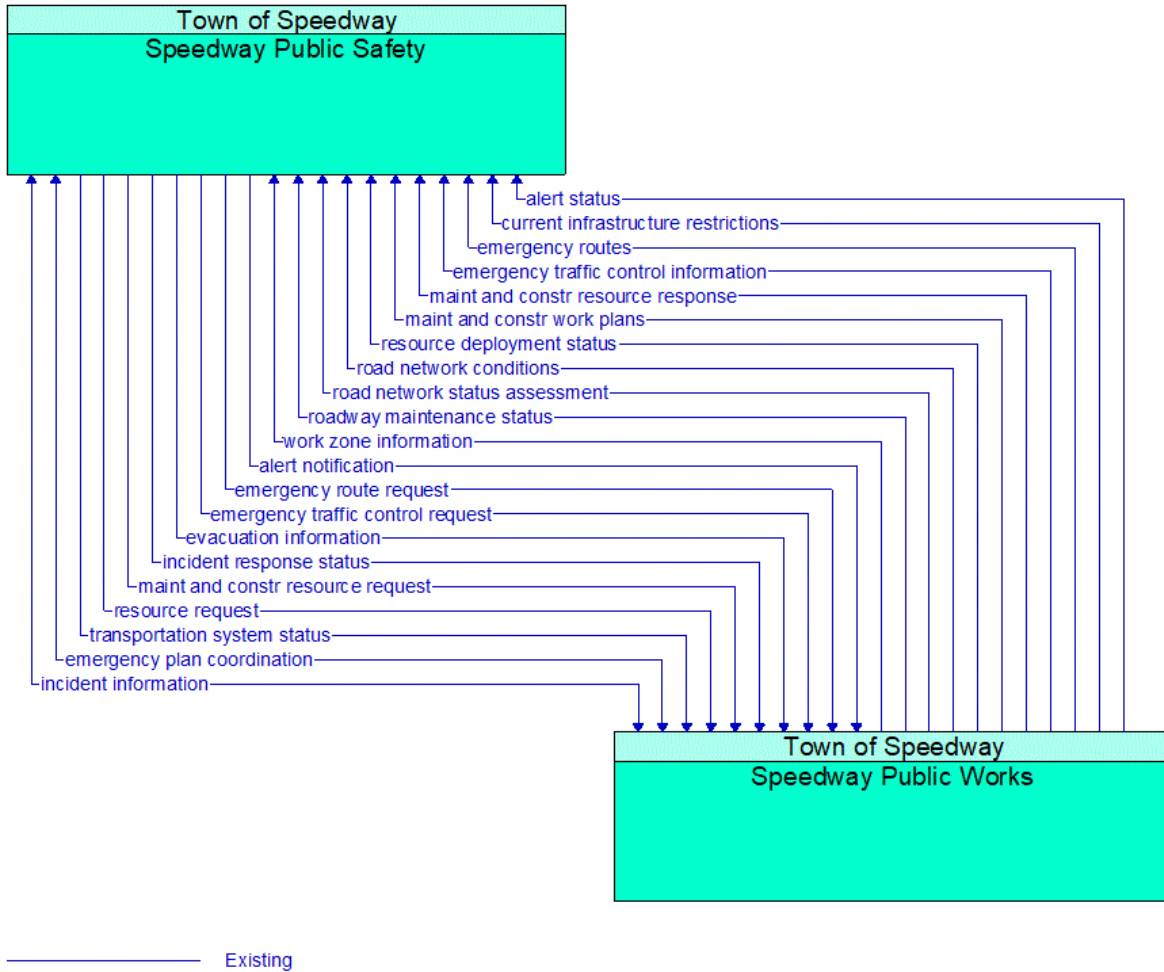


Figure 488: Speedway Public Safety - Speedway Public Works Interface

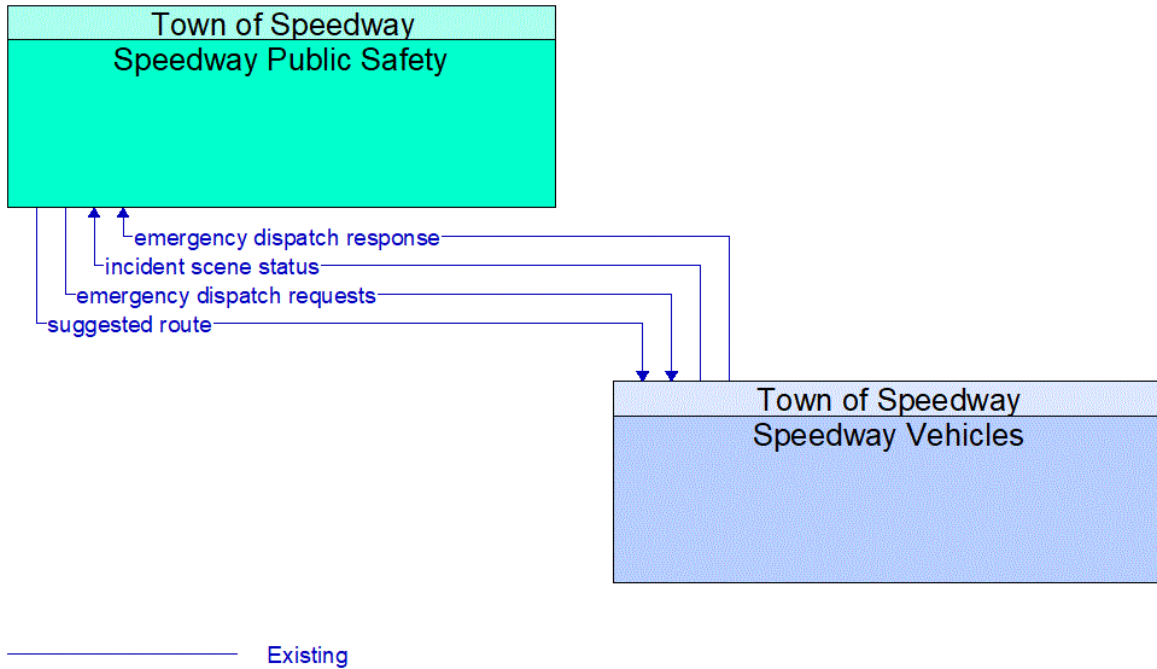
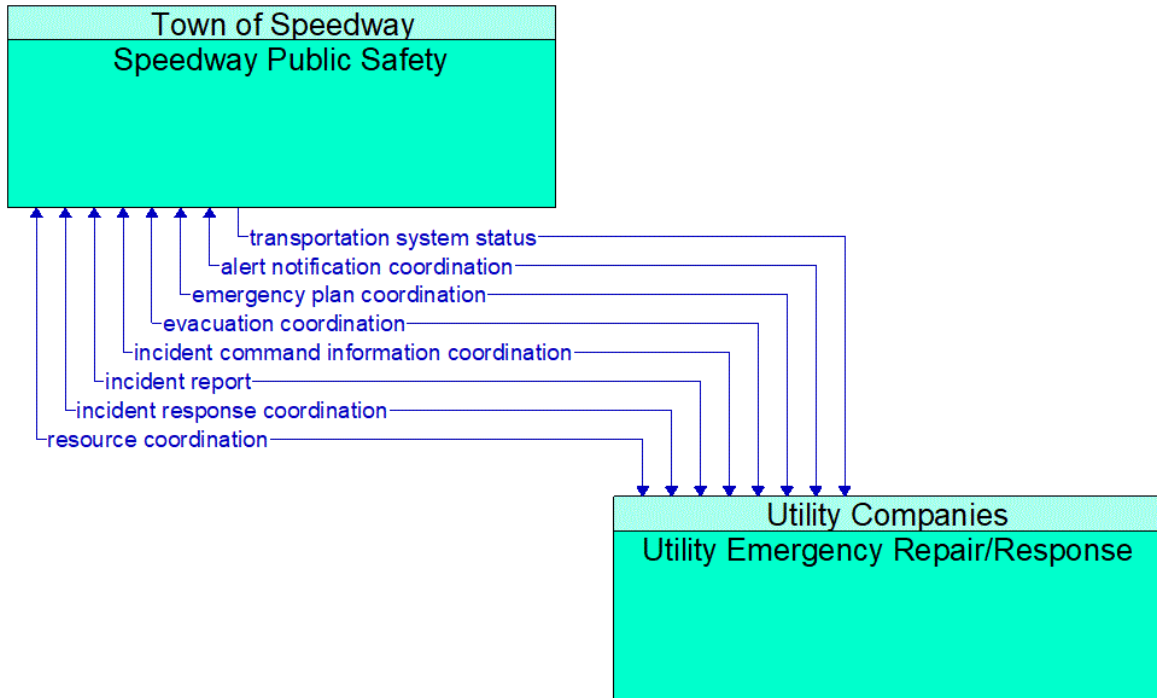
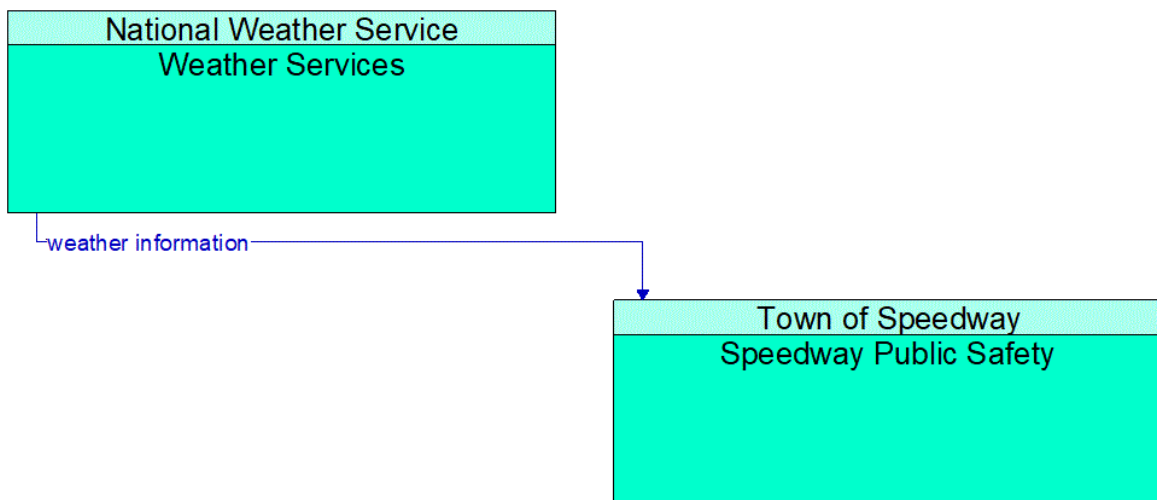


Figure 489: Speedway Public Safety - Speedway Vehicles Interface



Existing

Figure 490: Speedway Public Safety - Utility Emergency Repair/Response Interface



Existing

Figure 491: Speedway Public Safety - Weather Services Interface

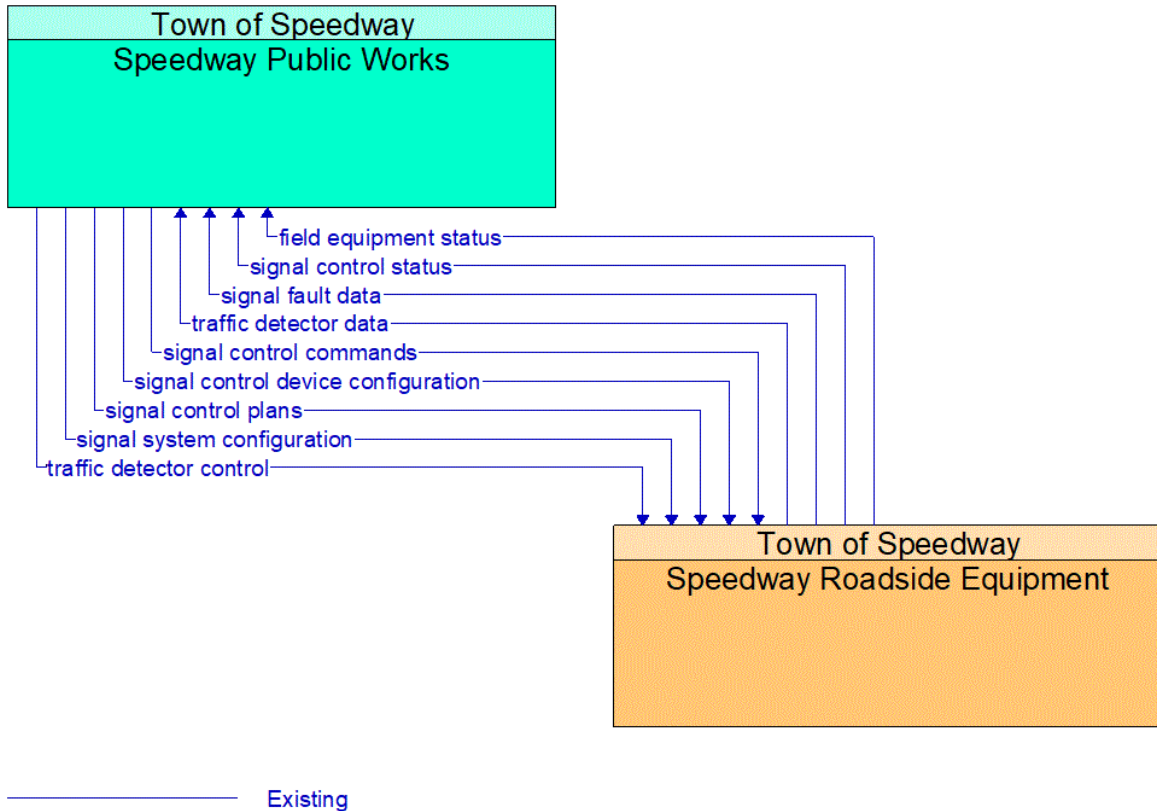


Figure 492: Speedway Public Works - Speedway Roadside Equipment Interface

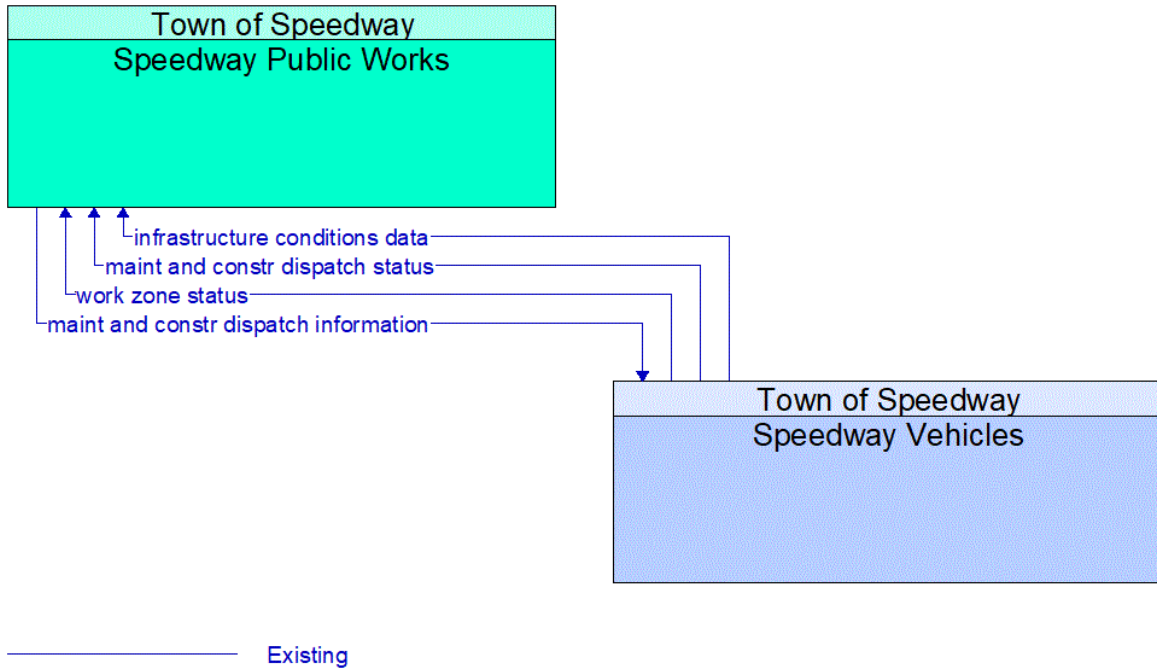


Figure 493: Speedway Public Works - Speedway Vehicles Interface

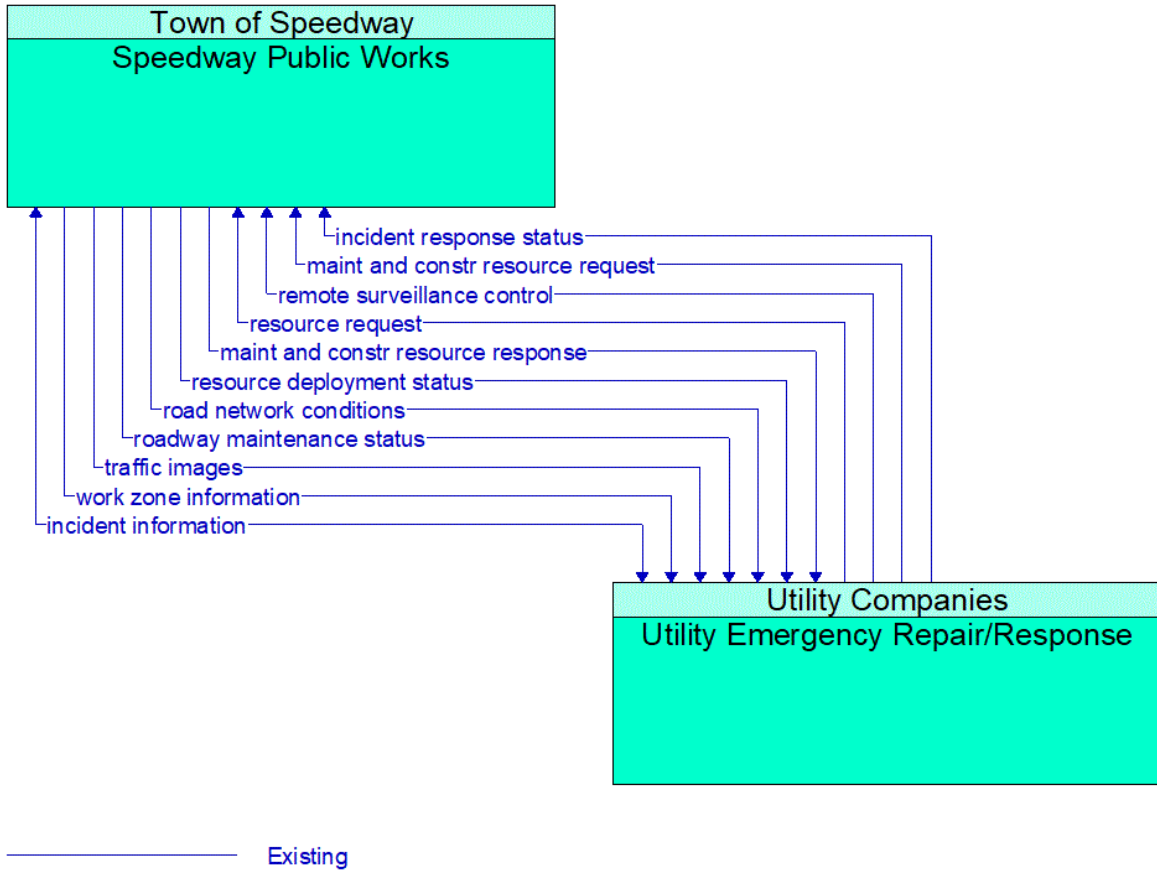


Figure 494: Speedway Public Works - Utility Emergency Repair/Response Interface

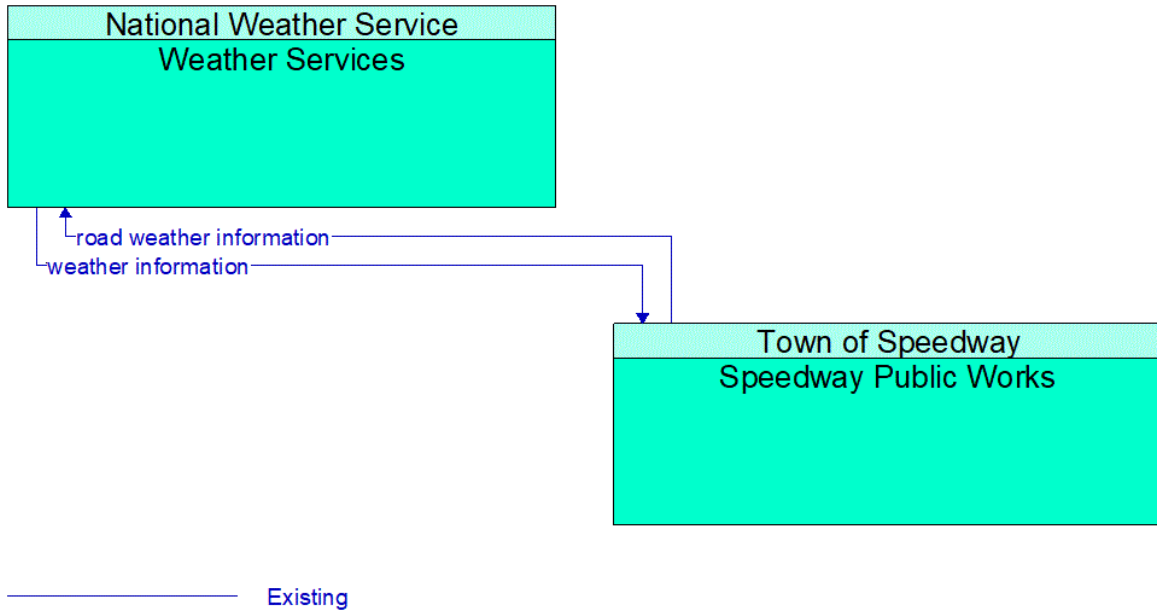


Figure 495: Speedway Public Works - Weather Services Interface

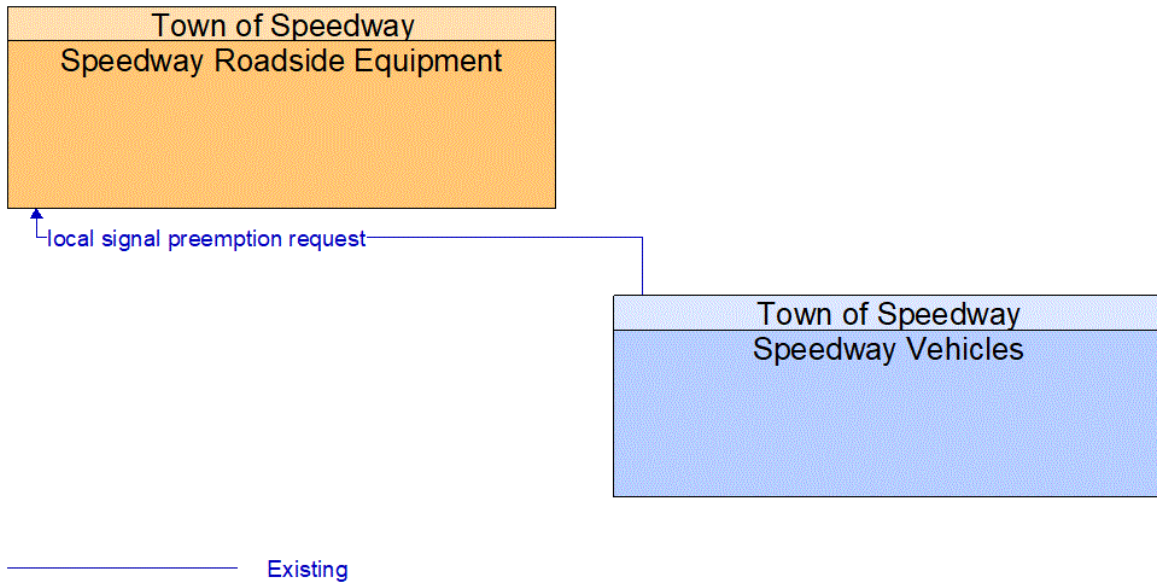


Figure 496: Speedway Roadside Equipment - Speedway Vehicles Interface

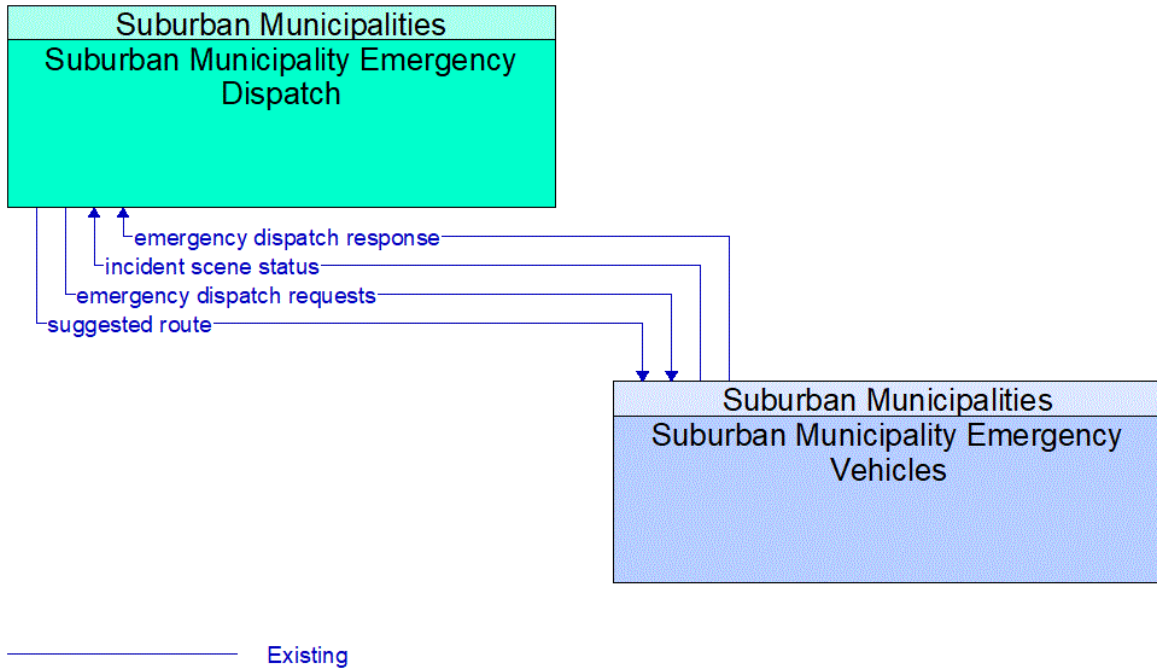


Figure 497: Suburban Municipality Emergency Dispatch - Suburban Municipality Emergency Vehicles Interface

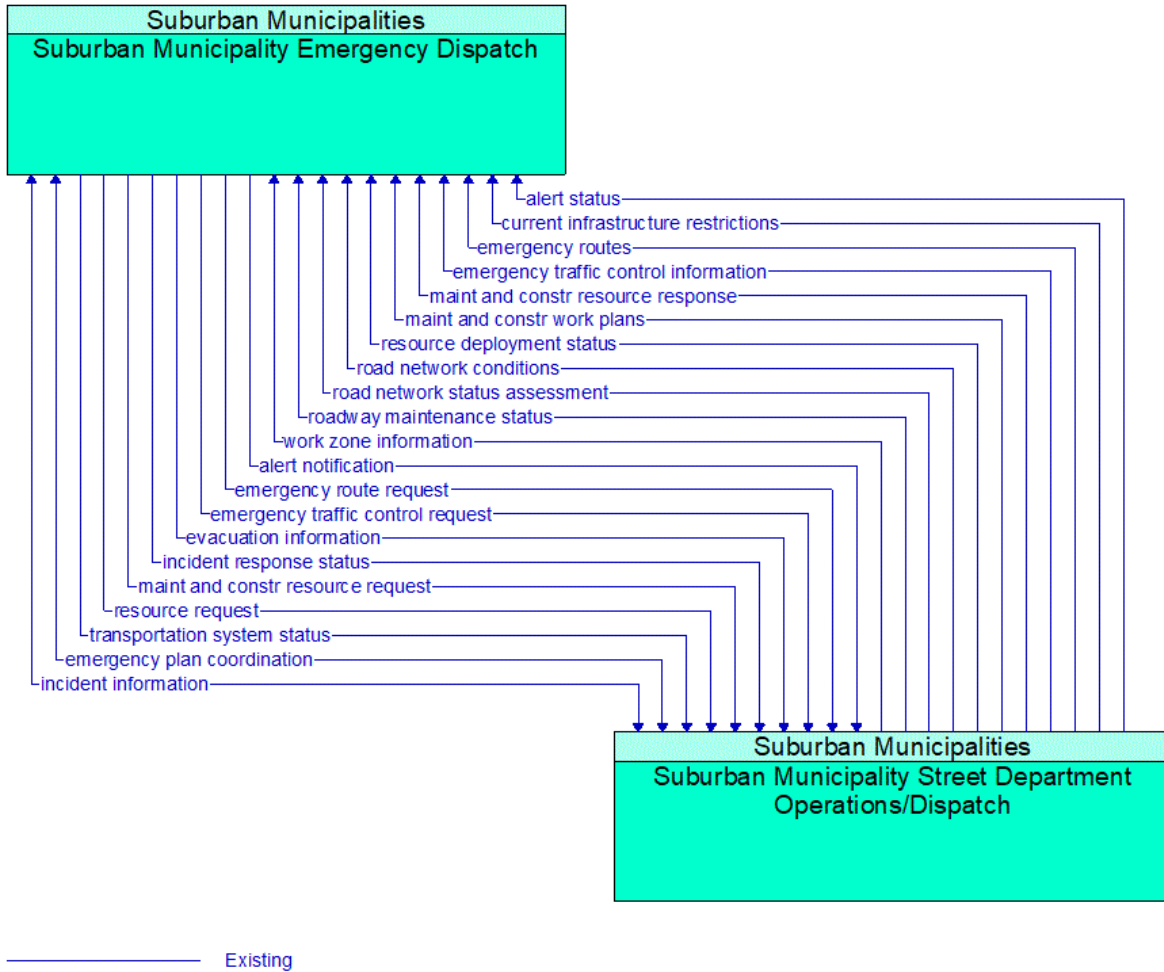


Figure 498: Suburban Municipality Emergency Dispatch - Suburban Municipality Street Department Operations/Dispatch Interface

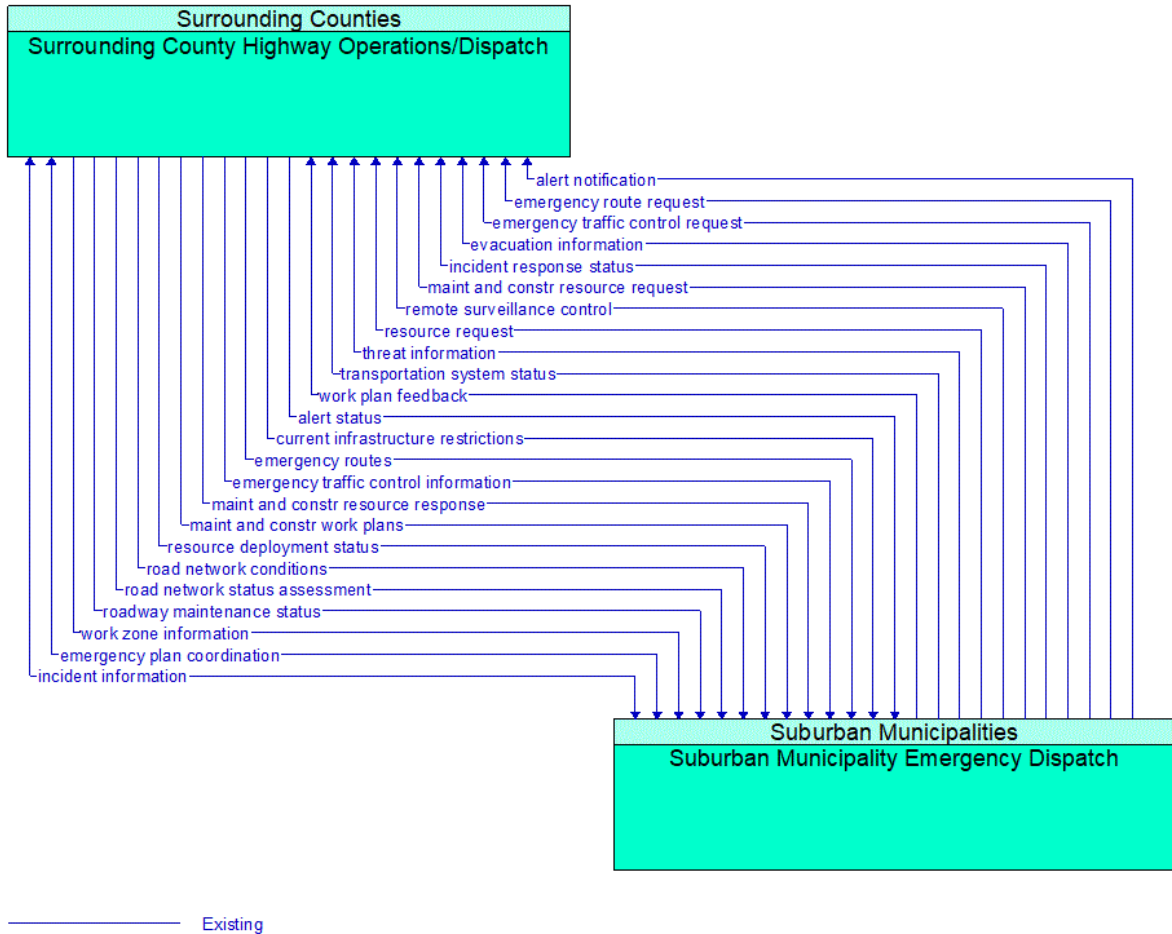


Figure 499: Suburban Municipality Emergency Dispatch - Surrounding County Highway Operations/Dispatch Interface

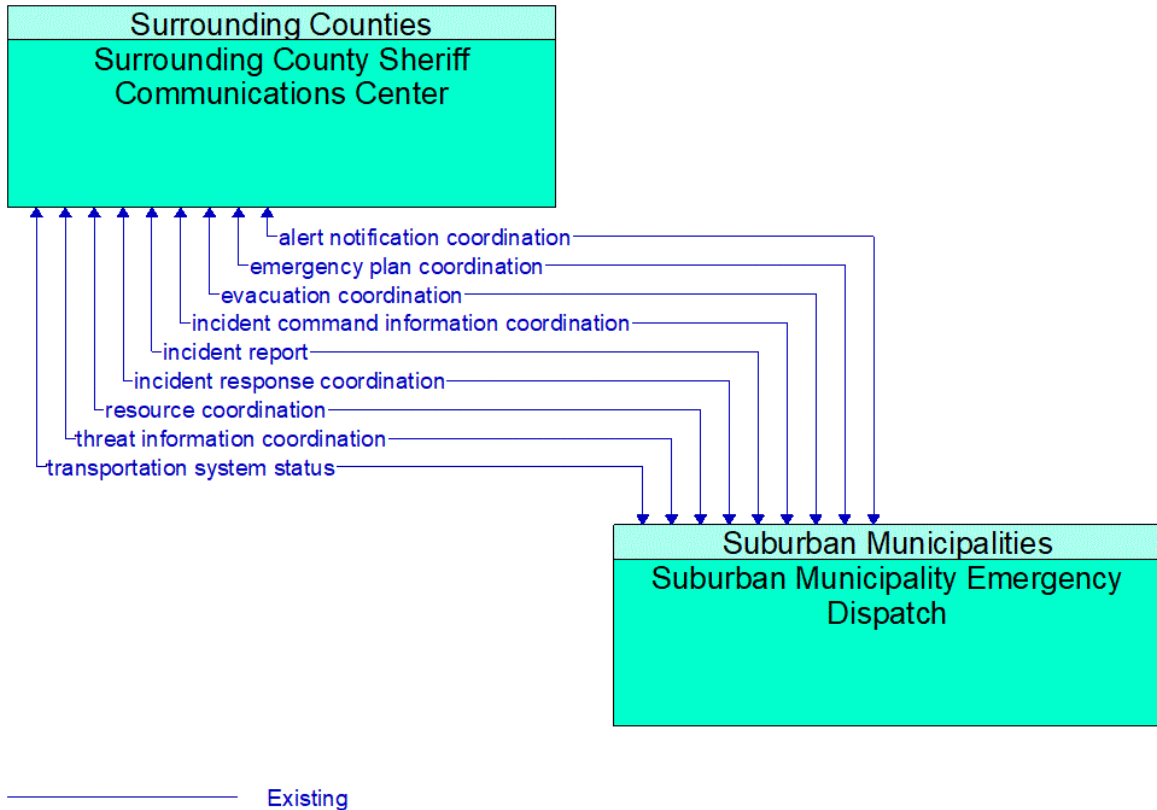
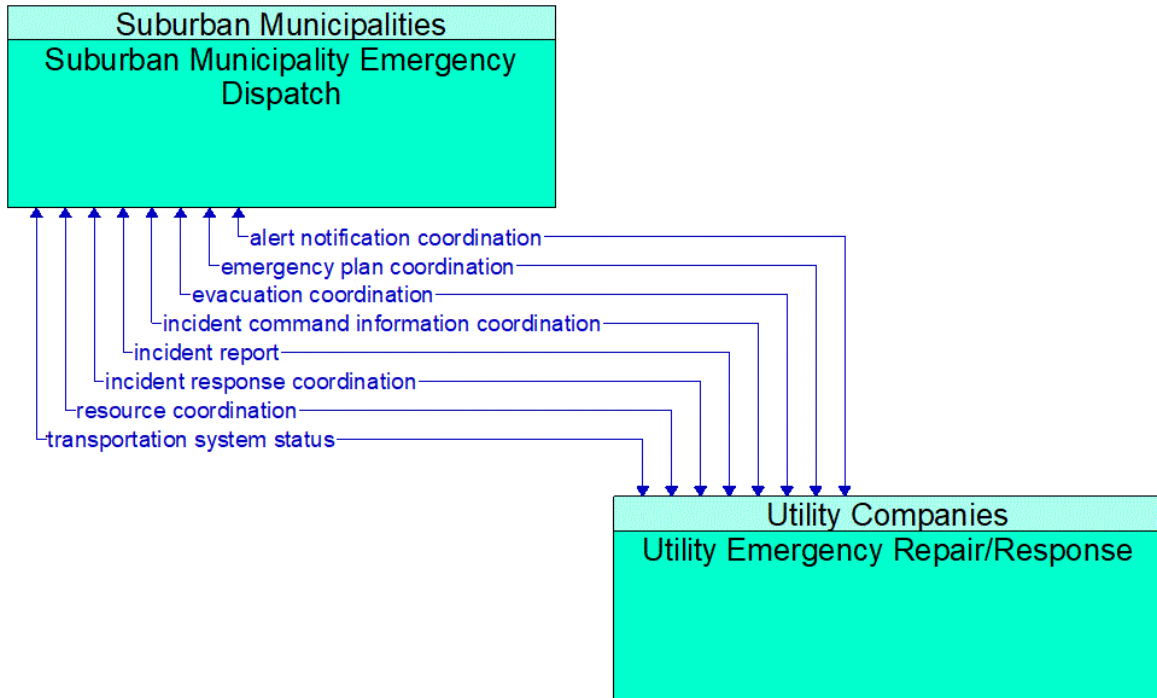


Figure 500: Suburban Municipality Emergency Dispatch - Surrounding County Sheriff Communications Center Interface



Existing

Figure 501: Suburban Municipality Emergency Dispatch - Utility Emergency Repair/Response Interface

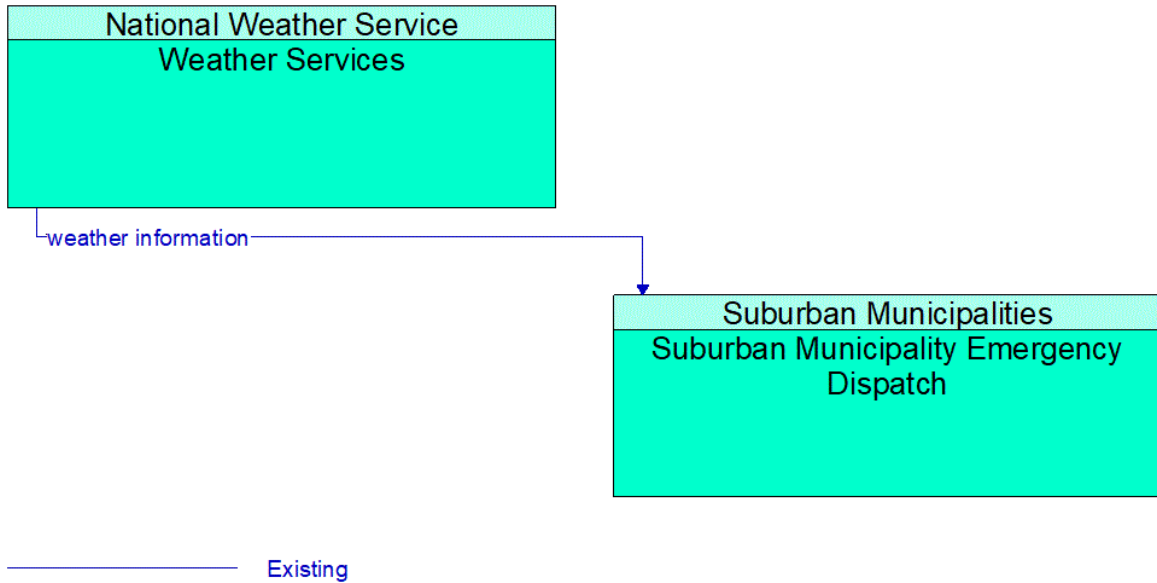


Figure 502: Suburban Municipality Emergency Dispatch - Weather Services Interface

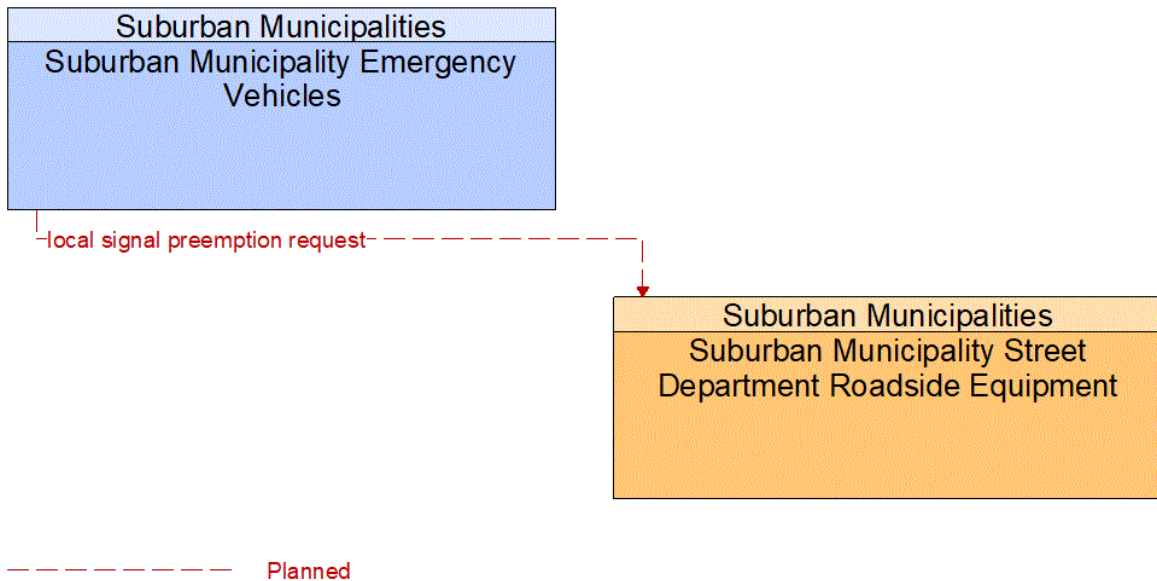


Figure 503: Suburban Municipality Emergency Vehicles - Suburban Municipality Street Department Roadside Equipment Interface

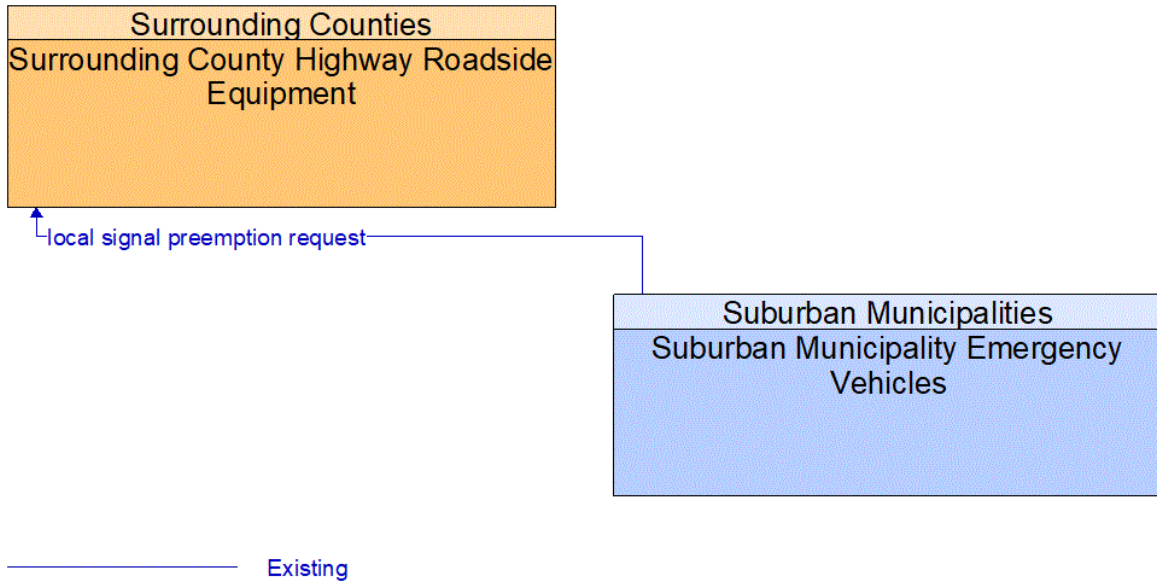


Figure 504: Suburban Municipality Emergency Vehicles - Surrounding County Highway Roadside Equipment Interface

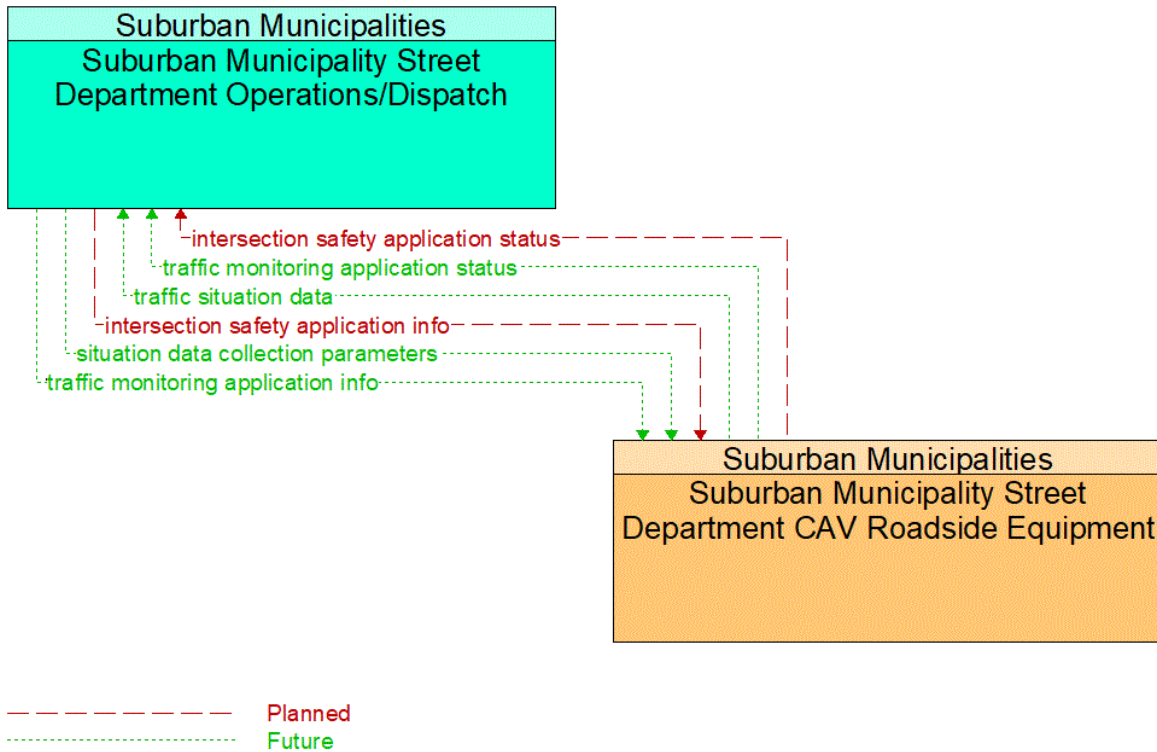


Figure 505: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Operations/Dispatch Interface

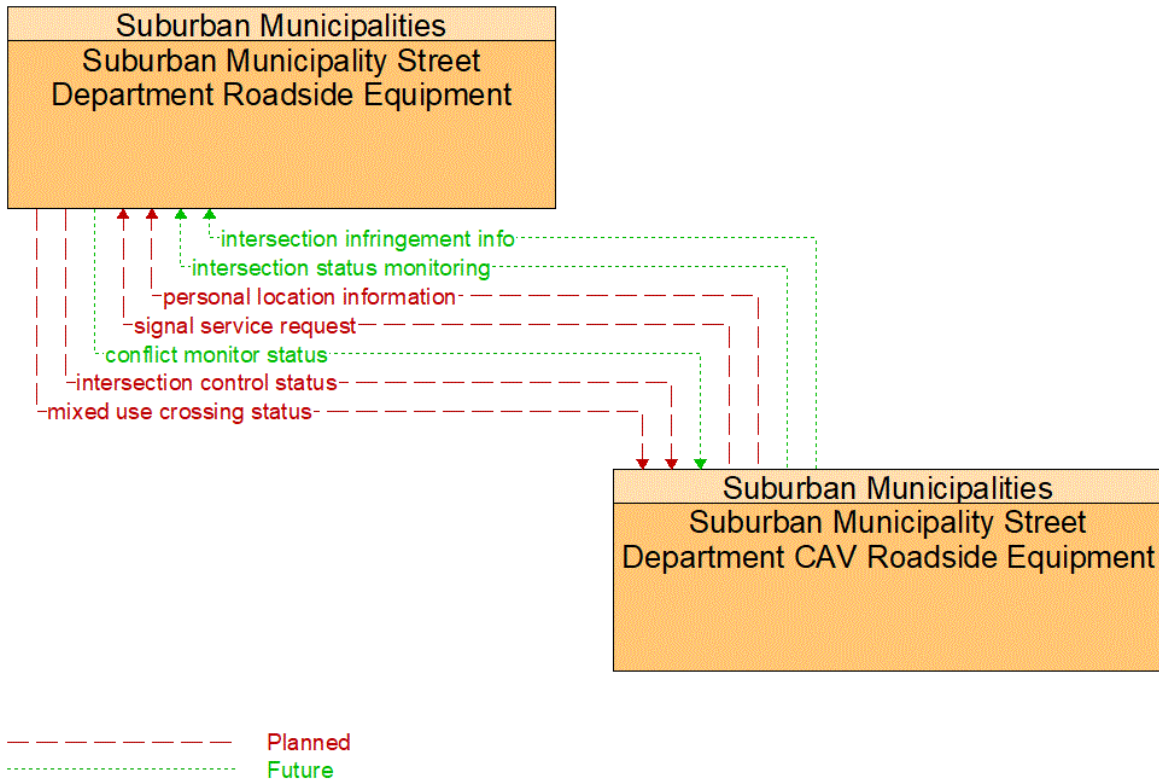


Figure 506: Suburban Municipality Street Department CAV Roadside Equipment - Suburban Municipality Street Department Roadside Equipment Interface

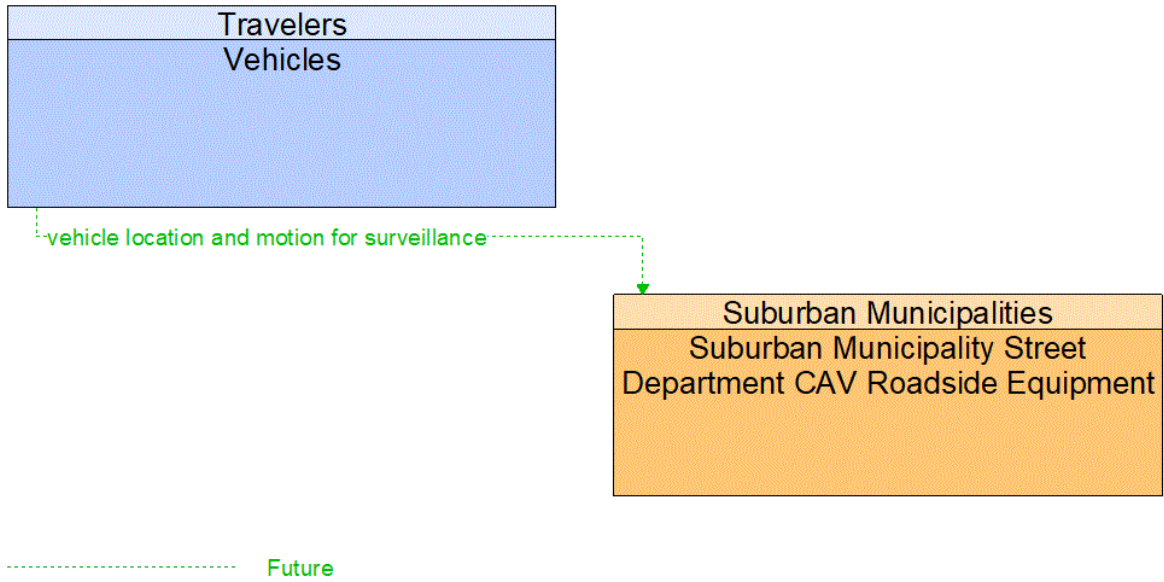


Figure 507: Suburban Municipality Street Department CAV Roadside Equipment - Vehicles Interface

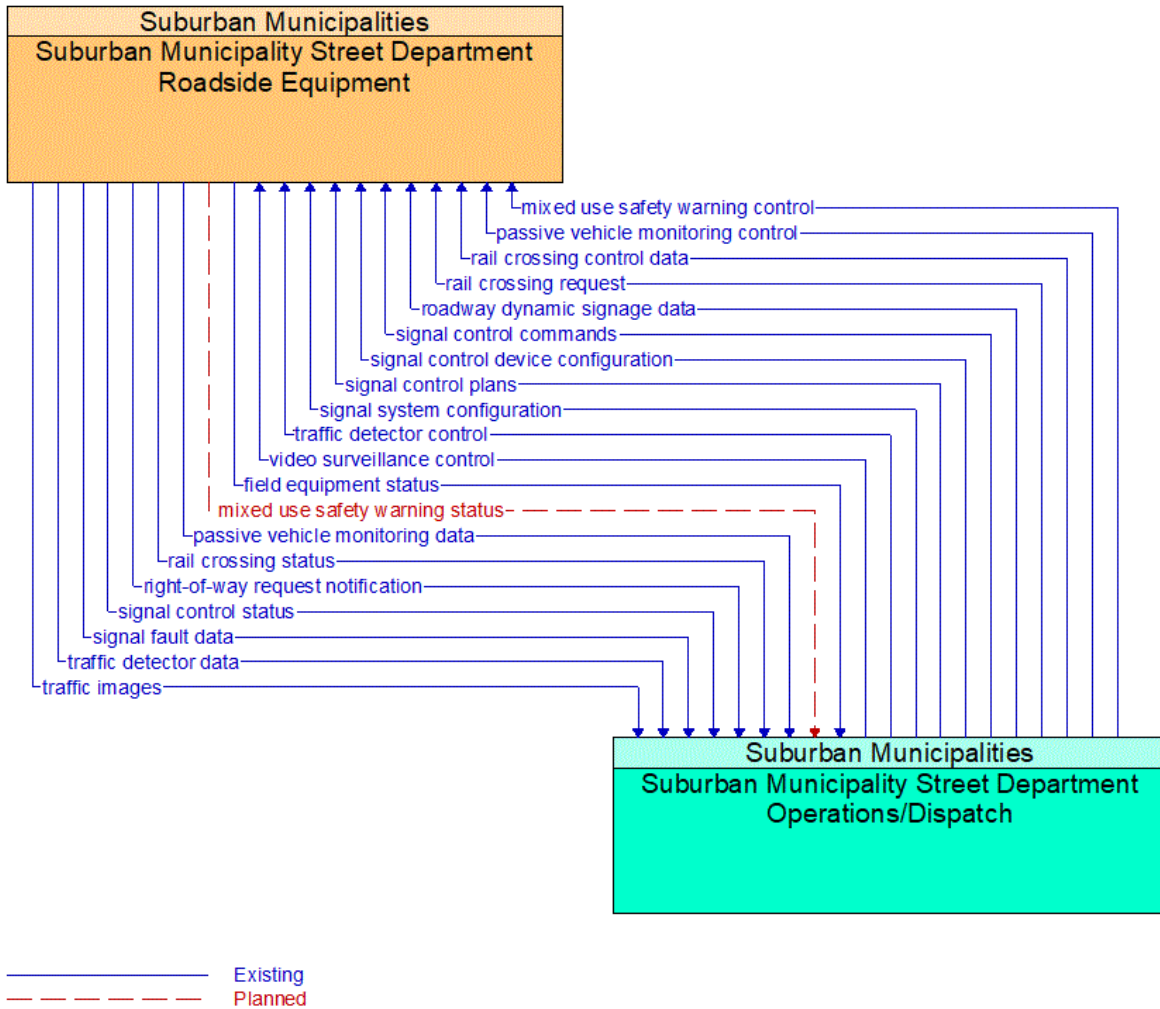


Figure 508: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Roadside Equipment Interface

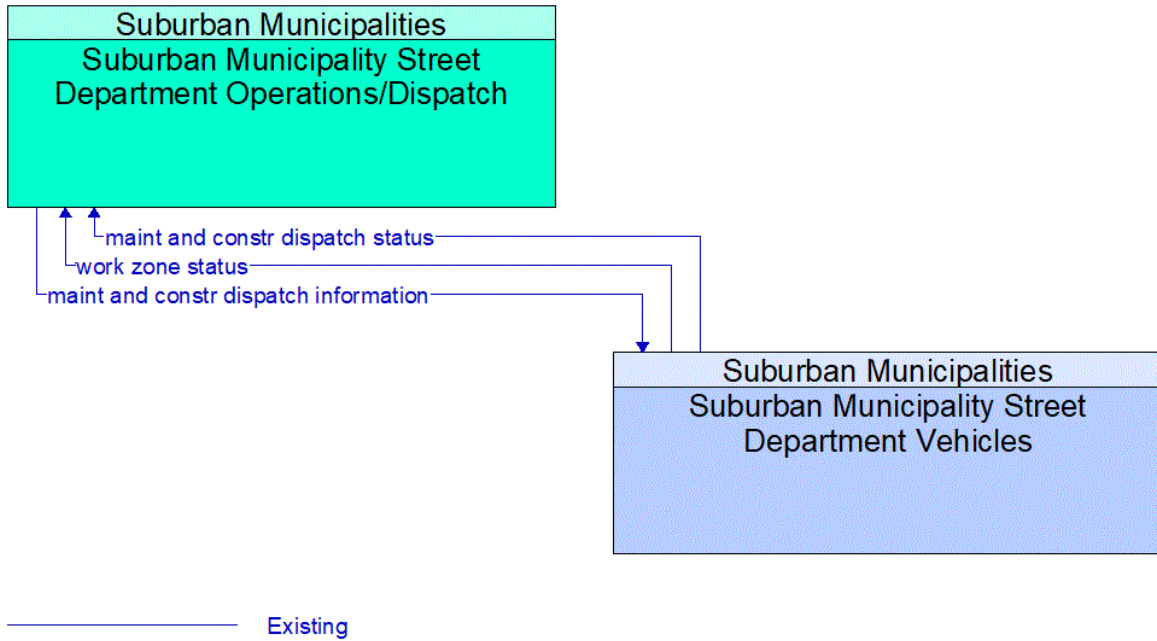


Figure 509: Suburban Municipality Street Department Operations/Dispatch - Suburban Municipality Street Department Vehicles Interface

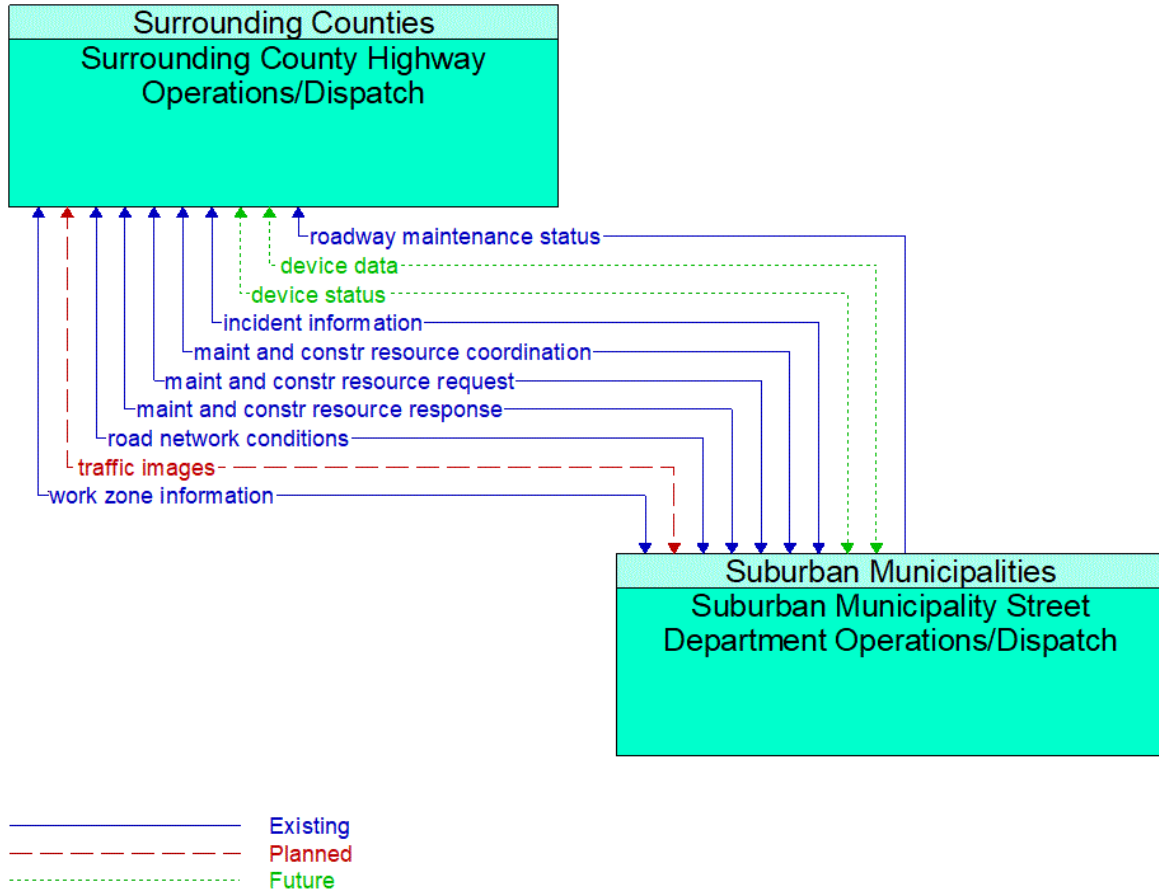


Figure 510: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Highway Operations/Dispatch Interface

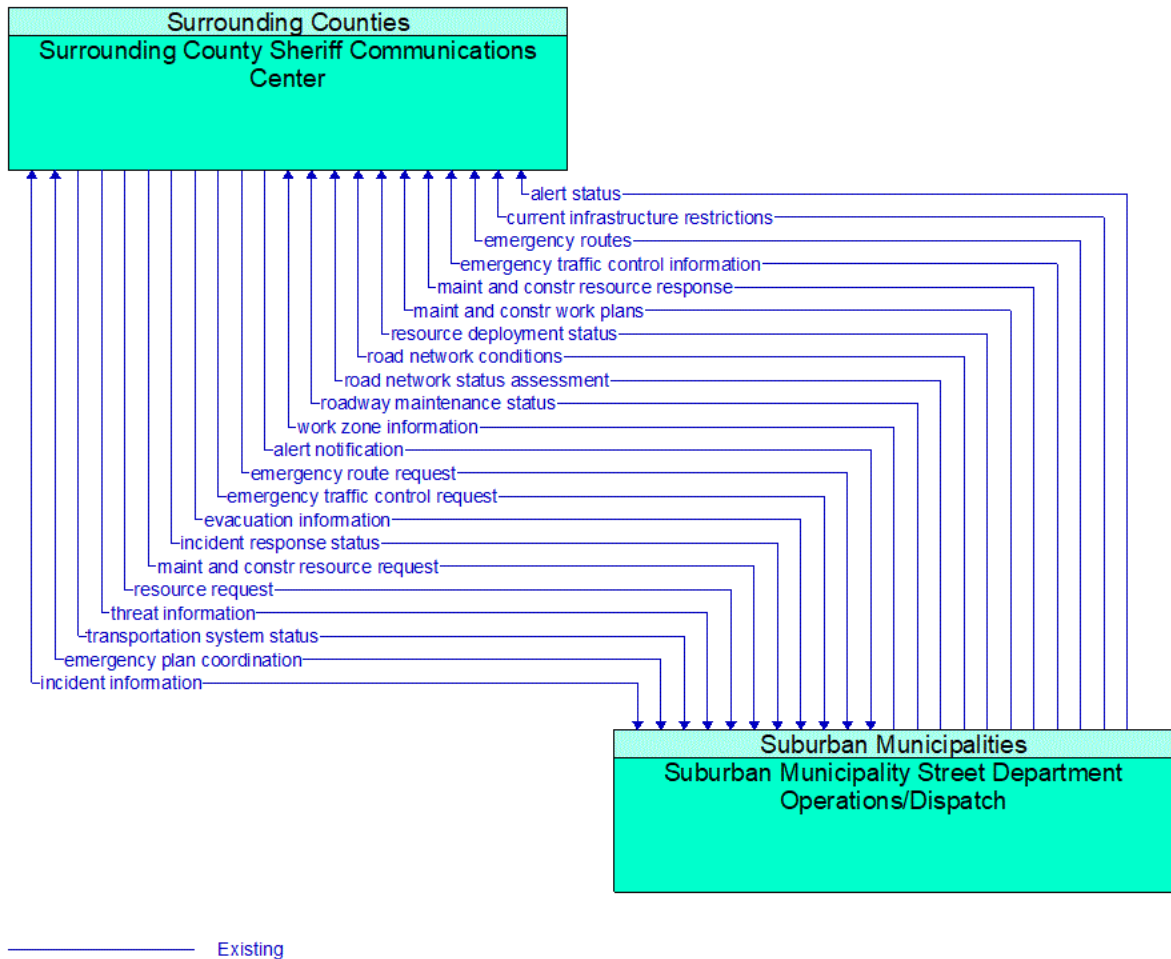
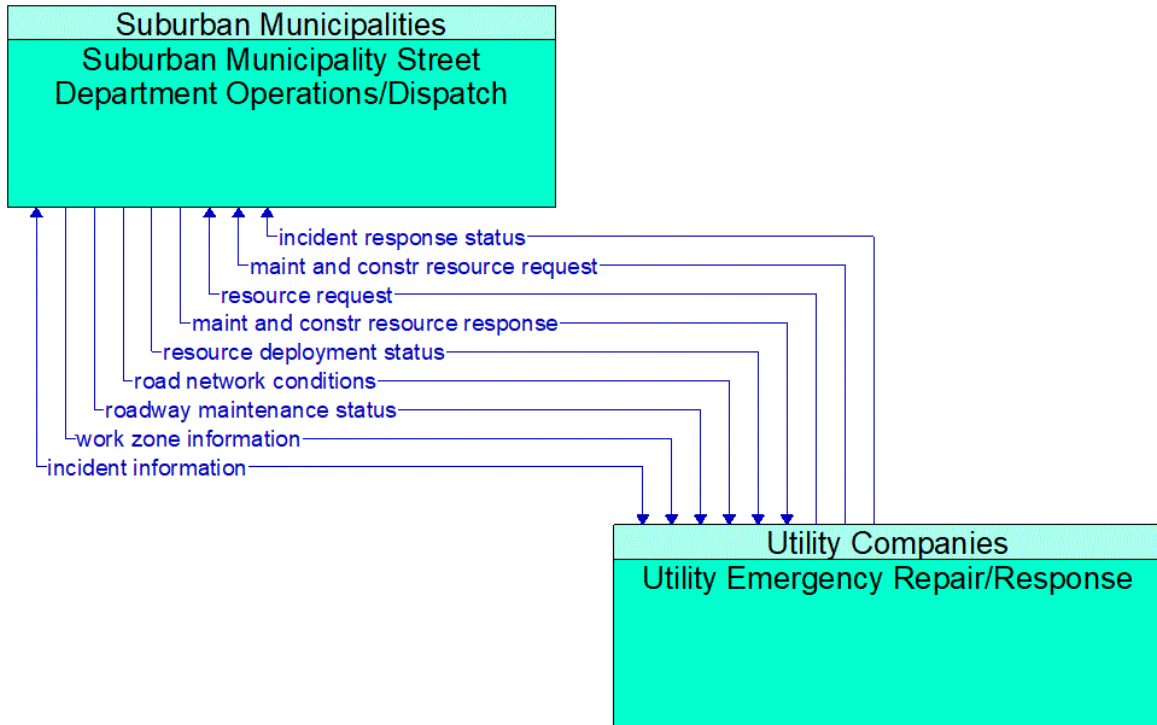


Figure 511: Suburban Municipality Street Department Operations/Dispatch - Surrounding County Sheriff Communications Center Interface



Existing

Figure 512: Suburban Municipality Street Department Operations/Dispatch - Utility Emergency Repair/Response Interface

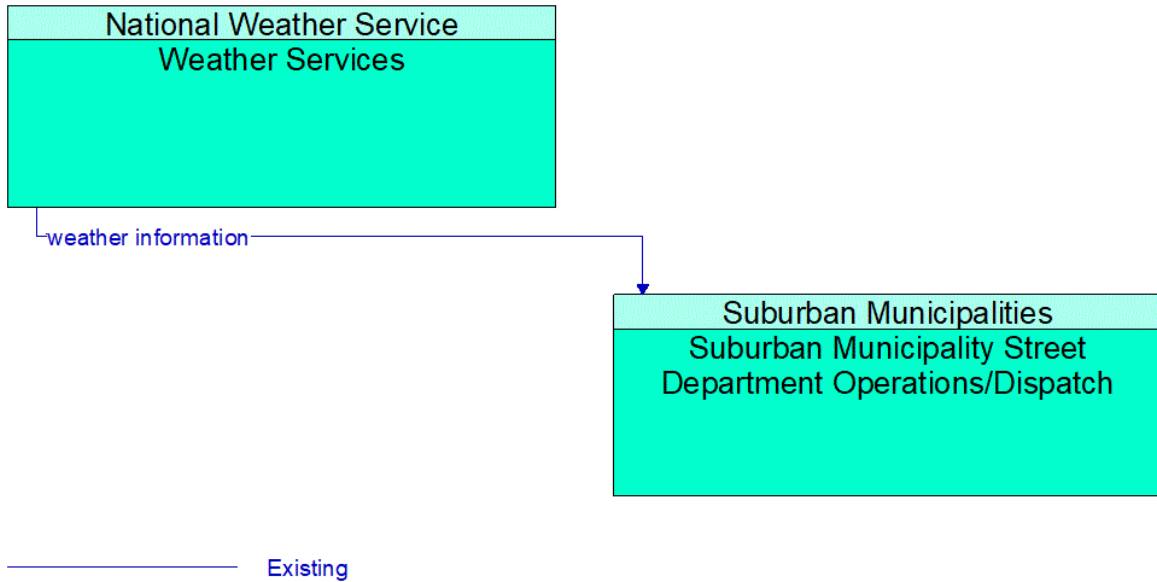


Figure 513: Suburban Municipality Street Department Operations/Dispatch - Weather Services Interface

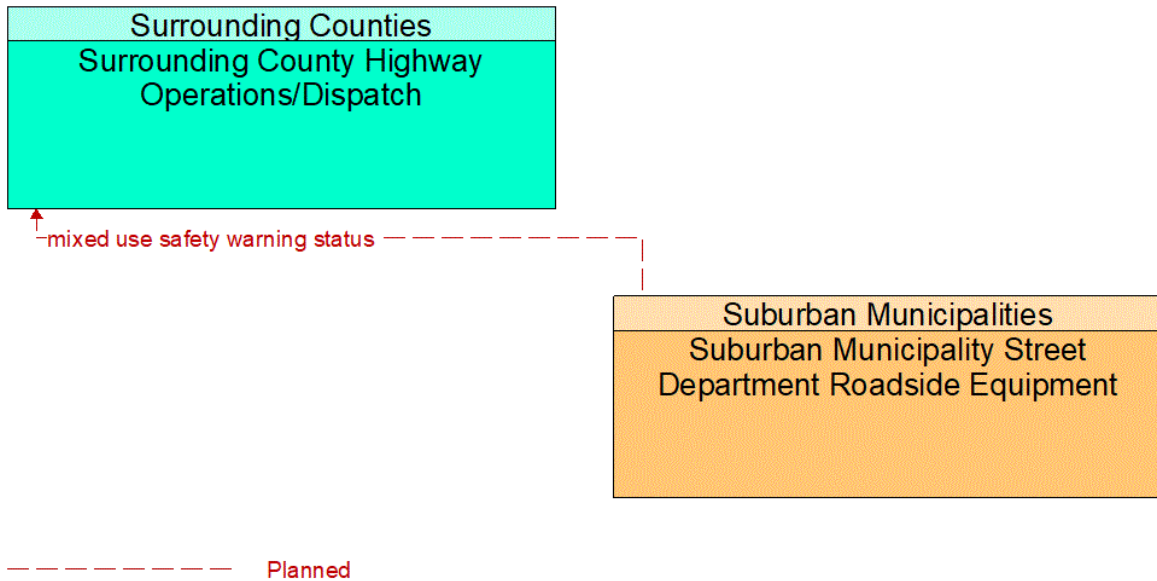


Figure 514: Suburban Municipality Street Department Roadside Equipment - Surrounding County Highway Operations/Dispatch Interface

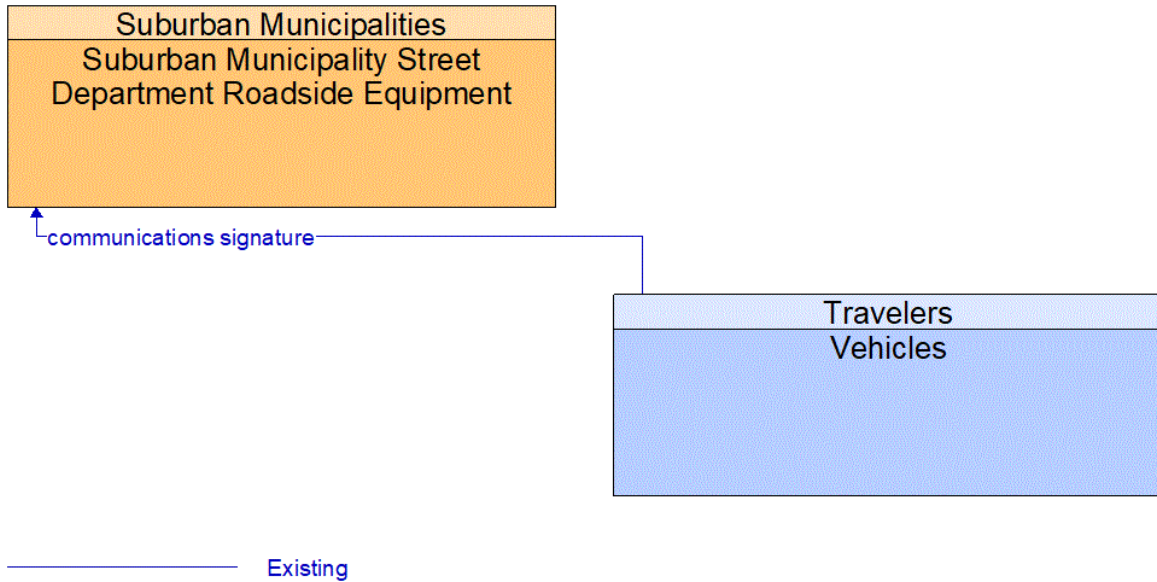


Figure 515: Suburban Municipality Street Department Roadside Equipment - Vehicles Interface

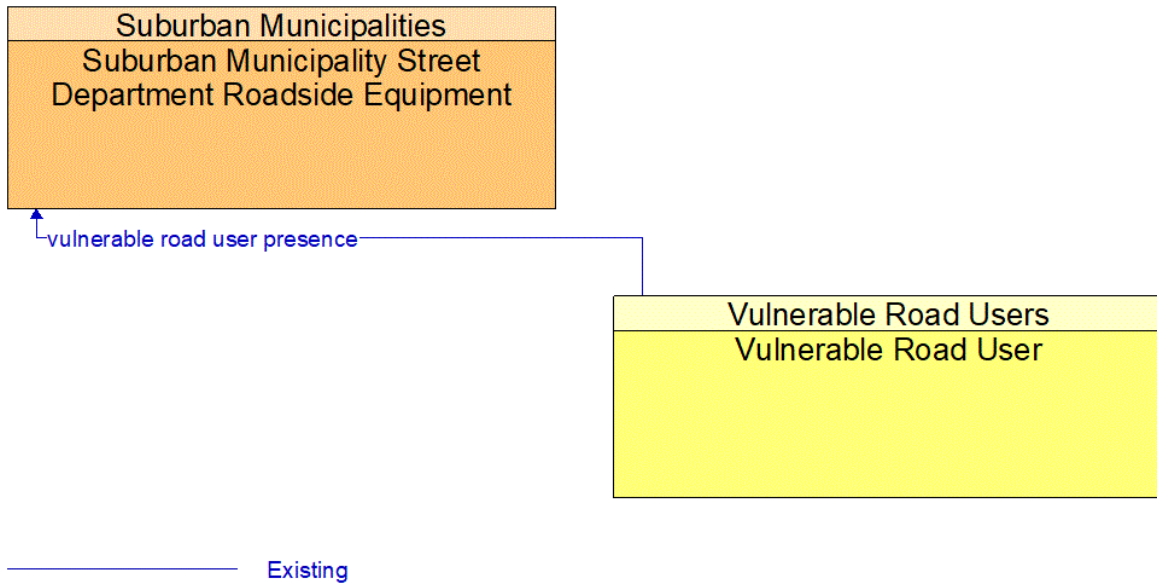
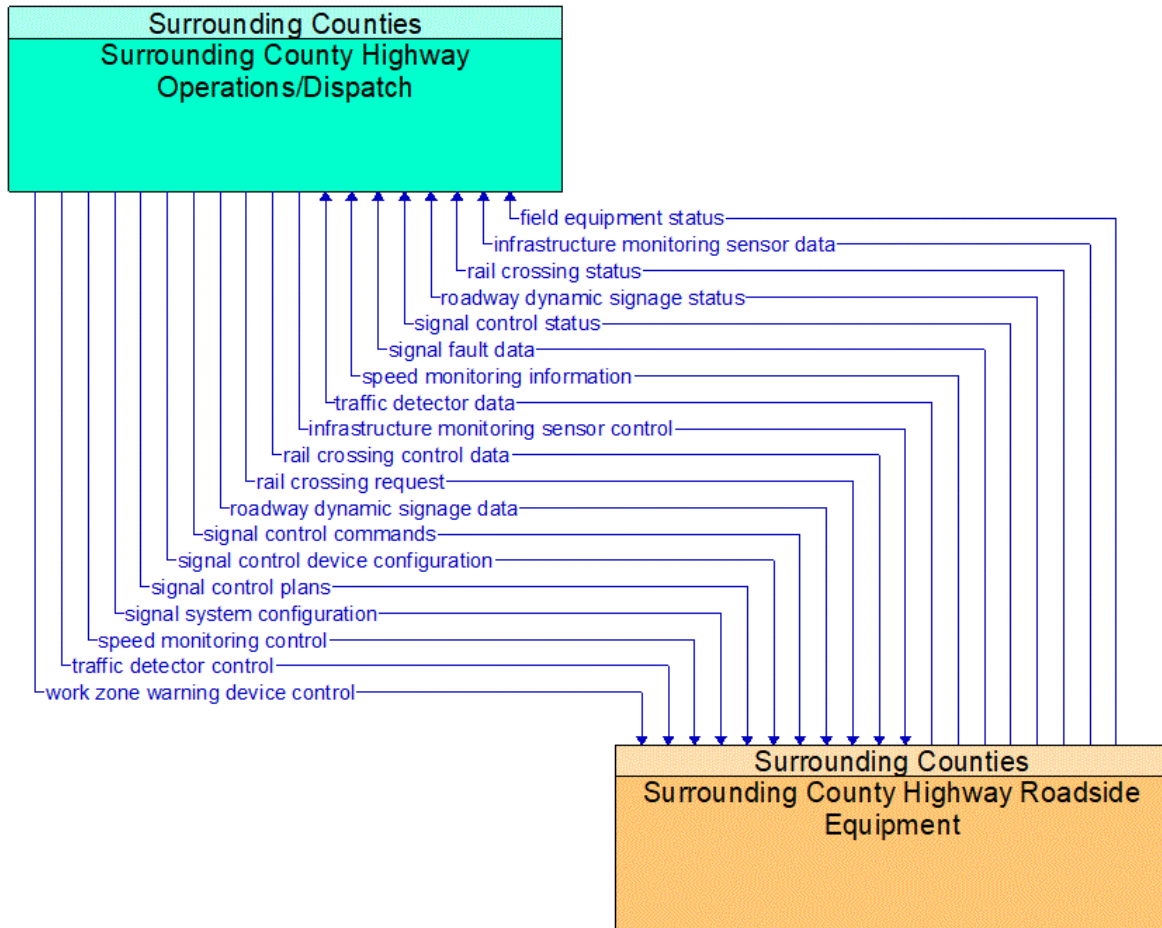


Figure 516: Suburban Municipality Street Department Roadside Equipment - Vulnerable Road User Interface



Existing

Figure 517: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Roadside Equipment Interface

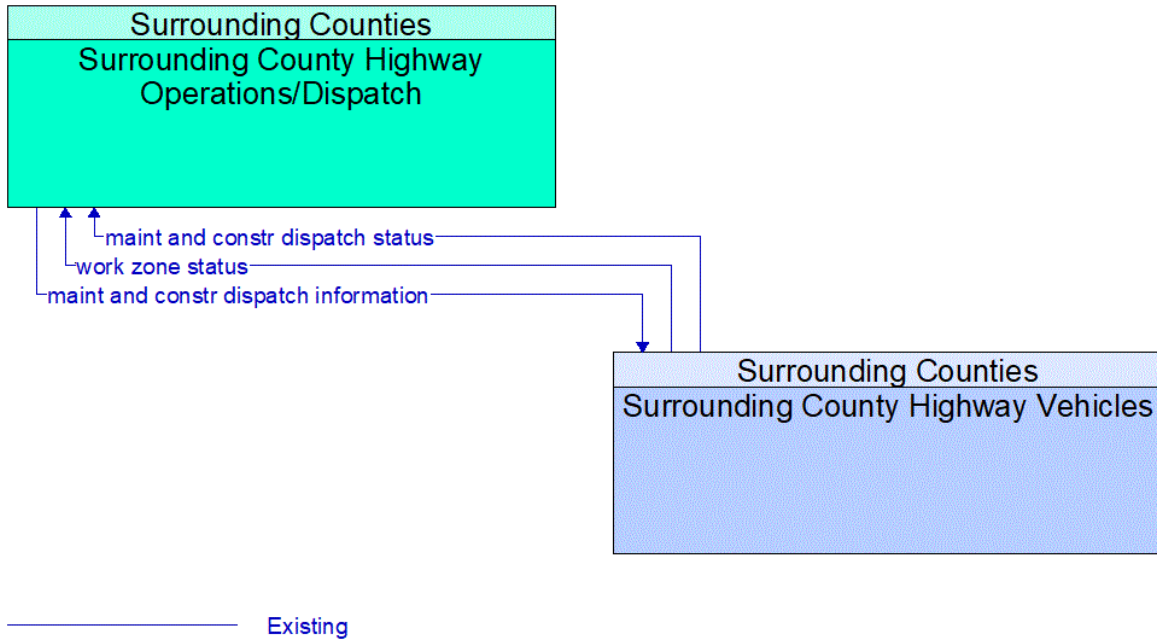


Figure 518: Surrounding County Highway Operations/Dispatch - Surrounding County Highway Vehicles Interface

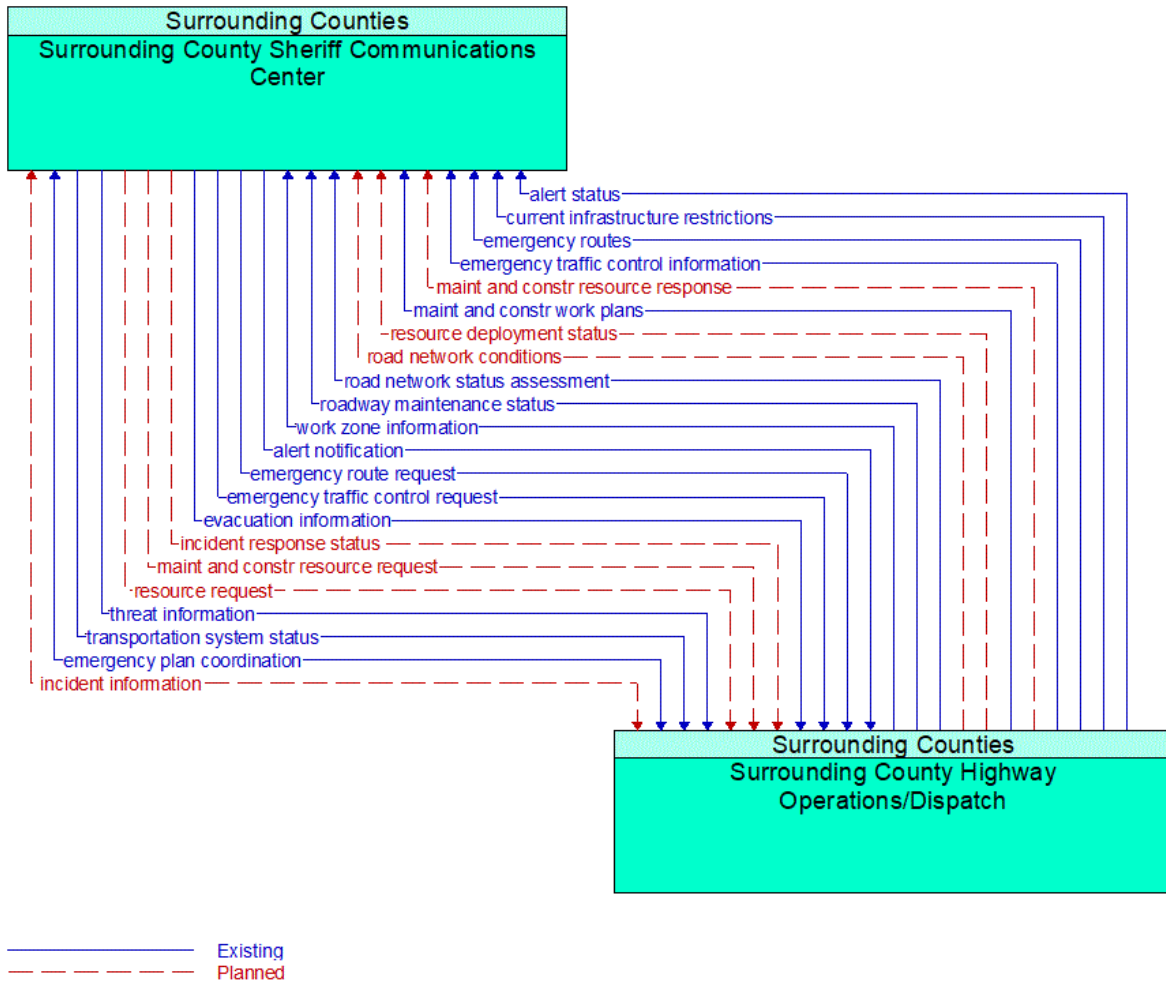
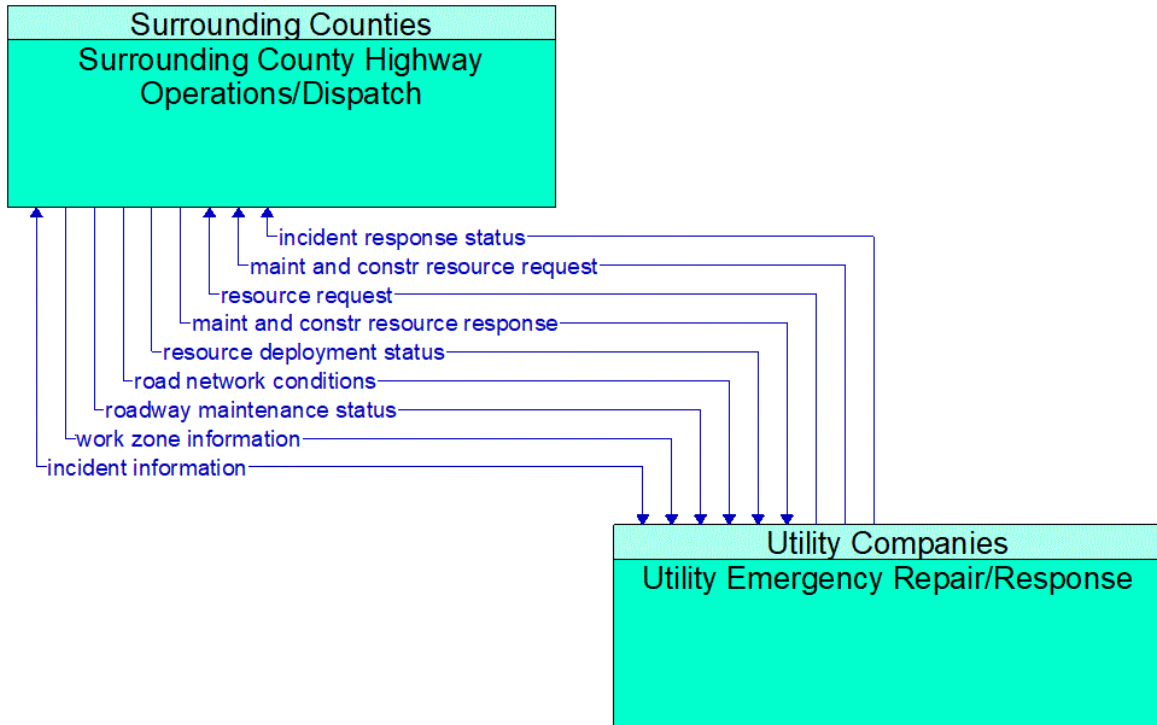


Figure 519: Surrounding County Highway Operations/Dispatch - Surrounding County Sheriff Communications Center Interface



Existing

Figure 520: Surrounding County Highway Operations/Dispatch - Utility Emergency Repair/Response Interface

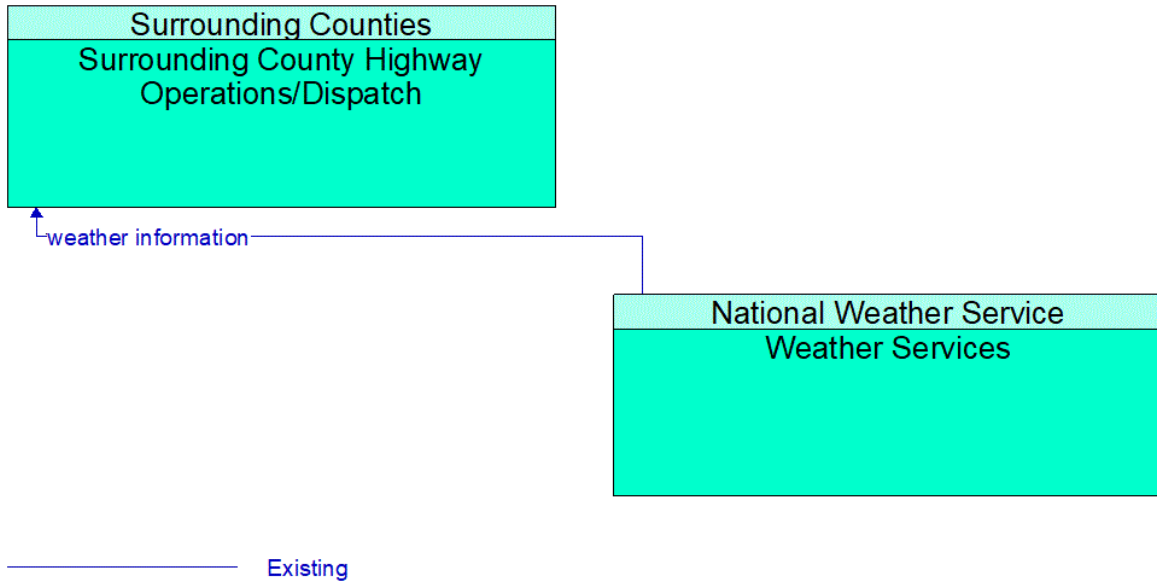


Figure 521: Surrounding County Highway Operations/Dispatch - Weather Services Interface

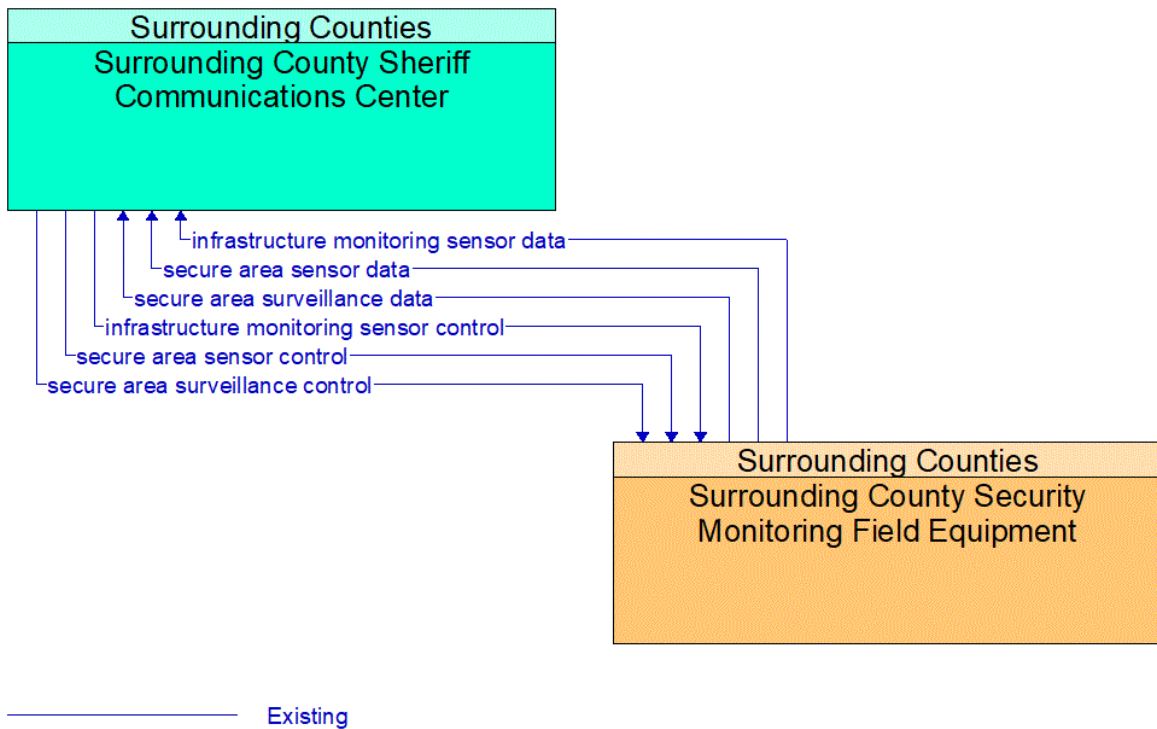


Figure 522: Surrounding County Security Monitoring Field Equipment - Surrounding County Sheriff Communications Center Interface

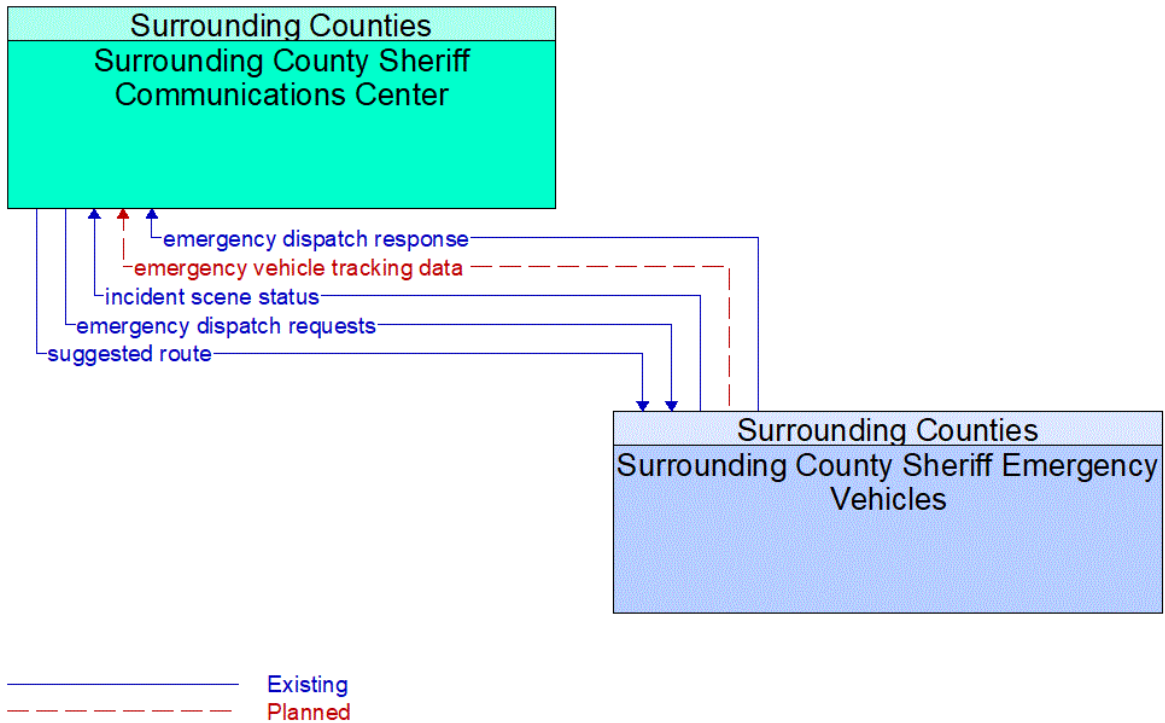
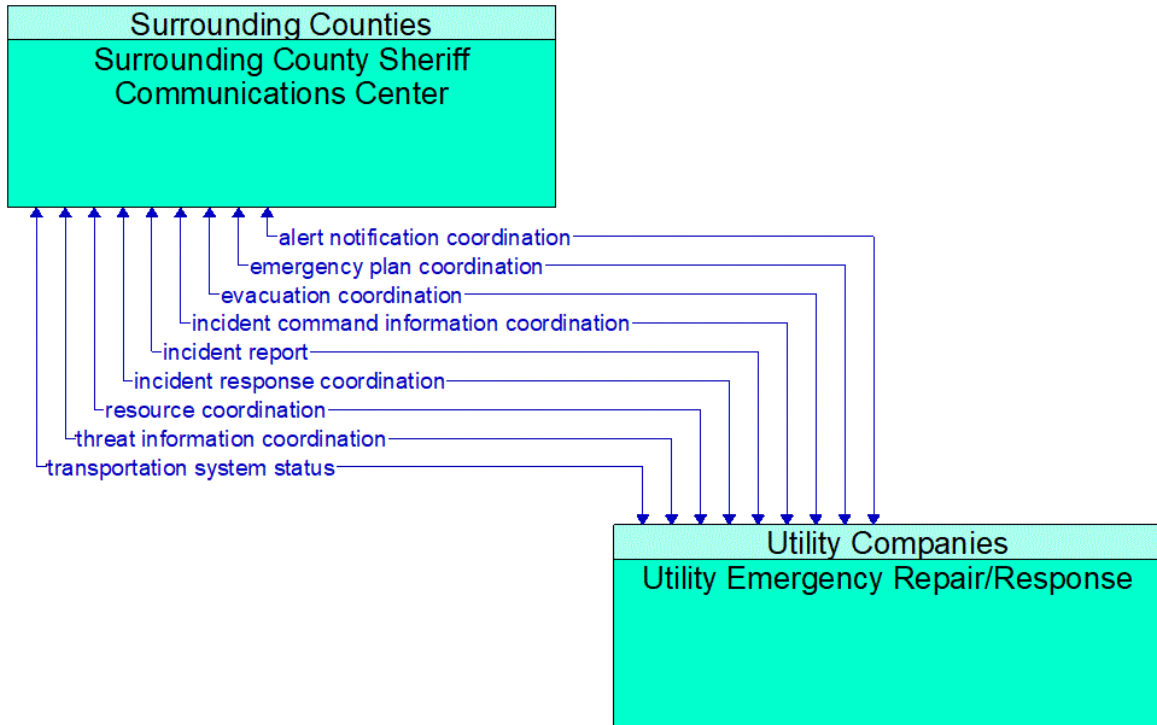


Figure 523: Surrounding County Sheriff Communications Center - Surrounding County Sheriff Emergency Vehicles Interface



Existing

Figure 524: Surrounding County Sheriff Communications Center - Utility Emergency Repair/Response Interface

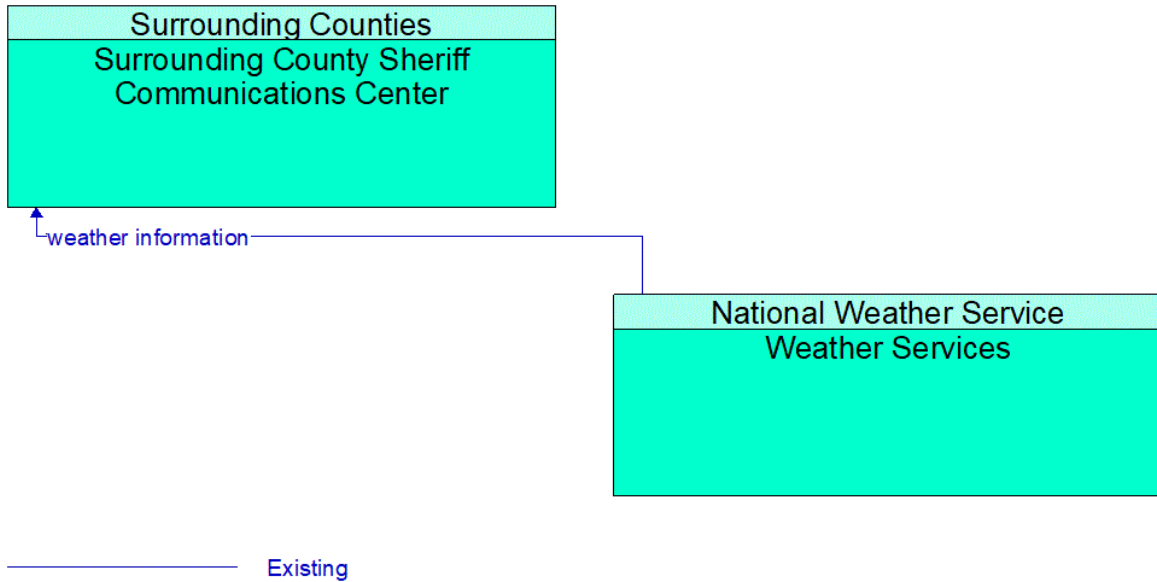


Figure 525: Surrounding County Sheriff Communications Center - Weather Services Interface

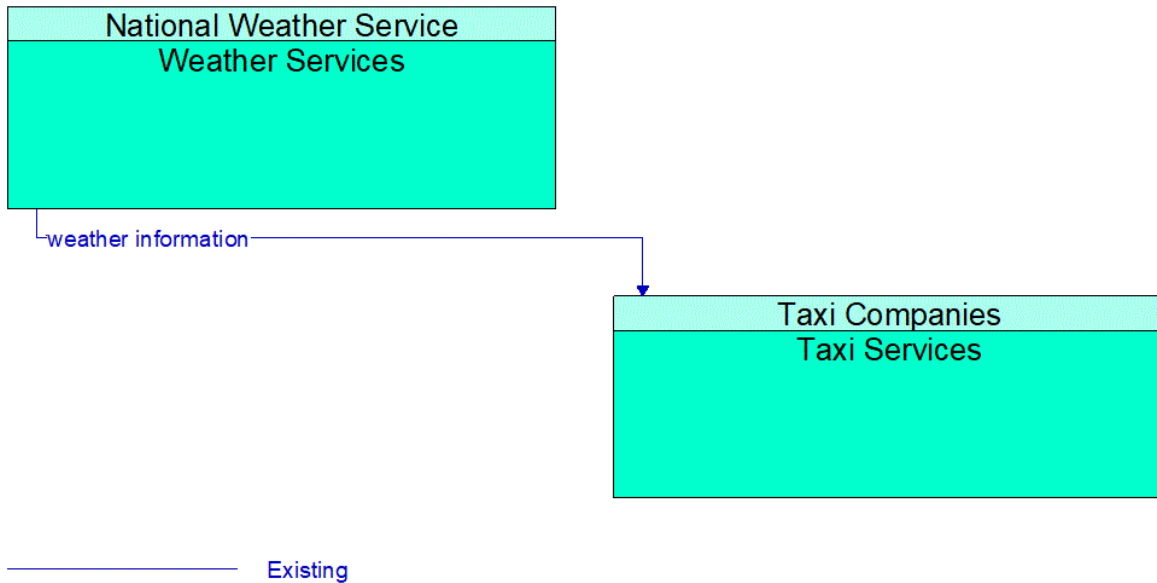


Figure 526: Taxi Services - Weather Services Interface

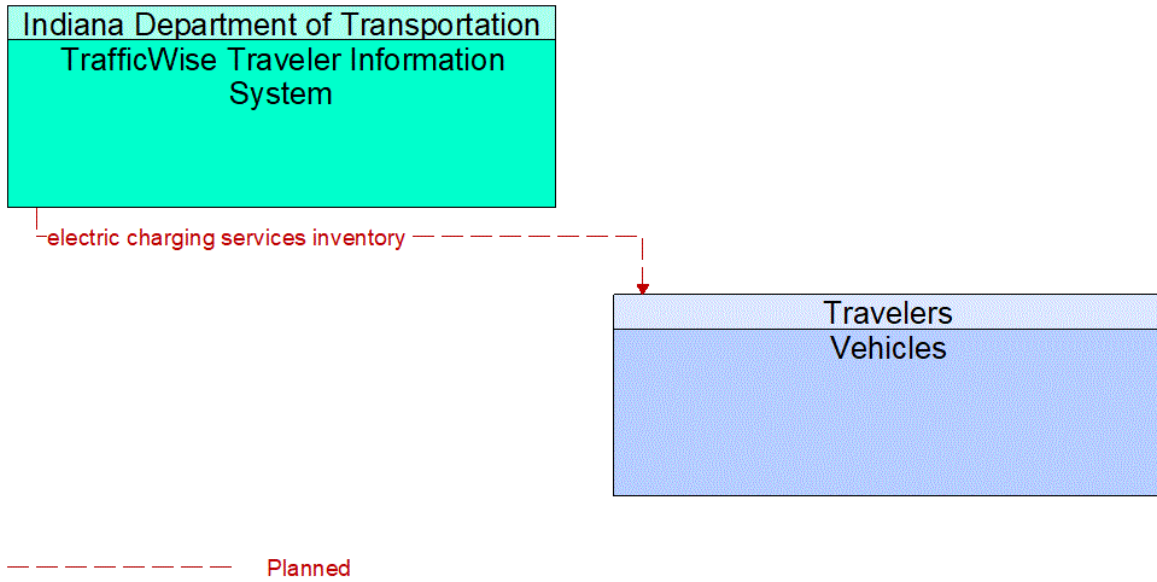


Figure 527: TrafficWise Traveler Information System - Vehicles Interface

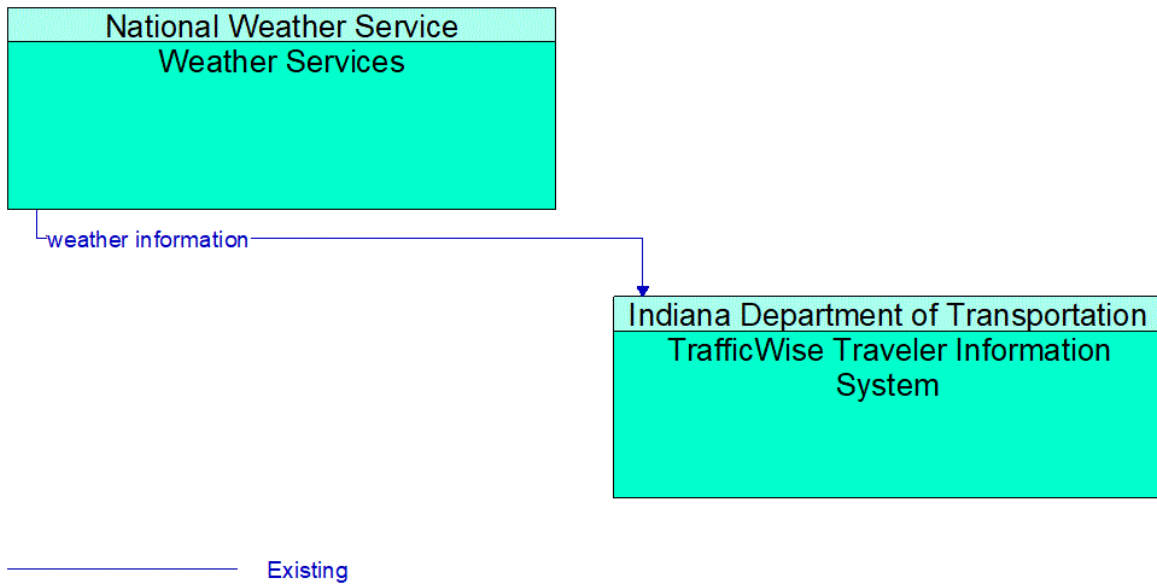


Figure 528: TrafficWise Traveler Information System - Weather Services Interface

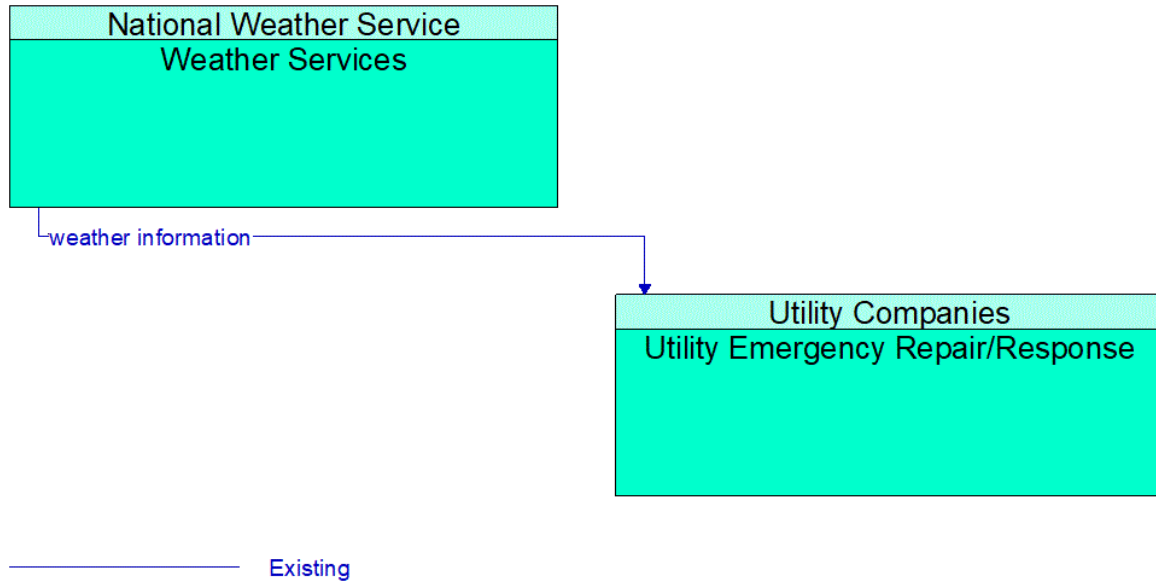


Figure 529: Utility Emergency Repair/Response - Weather Services Interface

Information Flow Definitions

Flow Name	Description	Communication Solution(s)
account updates	Updates to an account, such as purchases, uses, cancellation, secureID changes or similar material changes to account information.	(None-Data) - Secure Internet (ITS)
actuate secure payment	Initiation of a payment action, ideally based on an encrypted token or biometric marker. Such a payment action could be a simple validation that the secure token allows the user access to the travel resource, or it could be the initiation of a payment transaction.	
actuate secure payment	Initiation of a payment action, ideally based on an encrypted token or biometric marker. Such a payment action could be a simple validation that the secure token allows the user access to the travel resource, or it could be the initiation of a payment transaction.	(None-Data) - Guaranteed Secure Wireless Internet (ITS)
actuate secure payment	Initiation of a payment action, ideally based on an encrypted token or biometric marker. Such a payment action could be a simple validation that the secure token allows the user access to the travel resource, or it could be the initiation of a payment transaction.	US: WAVE Tolling - LTE-V2X TCP
air quality information	Aggregated region-wide measured air quality data and possible pollution incident information.	US: TMDD - NTCIP Messaging
air quality sensor data	Measured air quality data, including measured levels of atmospheric pollutants including ozone, particulate matter, carbon monoxide, and nitrogen oxides, and operational status of the sensors.	US: NTCIP Environmental Sensors - SNMPv3/TLS

Flow Name	Description	Communication Solution(s)
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.	US: TCIP - Secure Internet (ITS)
alarm acknowledge	Confirmation that alarm was received, instructions and additional information for the alarm initiator, and requests for additional information.	US: TCIP - Secure Wireless Internet (ITS)
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.	US: TCIP - Secure Internet (ITS)
alarm notification	Notification of activation of an audible or silent alarm by a traveler in a public area or by a transit vehicle operator using an on-board device.	US: TCIP - Secure Wireless Internet (ITS)
alert notification	Notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public. The flow identifies the alert originator, the nature of the emergency, the geographic area affected by the emergency, the effective time period, and information and instructions necessary for the public to respond to the alert. This flow may also identify specific information that should not be released to the public.	(None-Data) - Guaranteed Secure Internet (ITS)
alert notification coordination	Coordination of emergency alerts to be distributed to the public. This includes notification of a major emergency such as a natural or man-made disaster, civil emergency, or child abduction for distribution to the public and status of the public notification.	
alert status	Information indicating the current status of the emergency alert including identification of the traveler and driver information systems that are being used to provide the alert.	(None-Data) - Guaranteed Secure Internet (ITS)
alternate mode information	Schedule information for alternate mode transportation providers such as air, ferry, and passenger-carrying heavy rail. This also includes details of incidents and other service disruptions that have occurred in the alternative mode. This also includes measures of service demand that supports assessment of their impact on the road network.	US: ATIS - Secure Internet (ITS)
alternate mode service data	Detailed real-time schedule and other service information from alternate modes that supports coordination between modes to facilitate efficient transfer at connection points.	US: GTFS static - Secure Internet (ITS)
archive analysis requests	A user request that initiates data mining, analytical processing, aggregation or summarization, report formulation, or other advanced processing and analysis of archived data. The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.	US: ADMS - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
archive analysis results	Processed information products, supporting meta data, and any associated transaction information resulting from data mining, analytical processing, aggregation or summarization, report formulation, or other on-line processing and analysis of archived data.	US: ADMS - Secure Internet (ITS)
archive coordination	Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.	US: ADMS - Guaranteed Secure Internet (ITS)
archive request confirmation	Confirmation that an archive request has been received and processed with information on the disposition of the request.	(None-Data) - Secure Internet (ITS)
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.	
archive status	Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.	US: ADMS - Secure Internet (ITS)
archived data product requests	A user-specified request for archived data products (i.e., data, meta data, or data catalogs). The request also includes information that is used to identify and authenticate the user and support electronic payment requirements, if any.	US: ADMS - Secure Internet (ITS)
archived data products	Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.	US: ADMS - Secure Internet (ITS)
asset archive data	Information describing transportation assets including pavements, bridges, and all other infrastructure included in the transportation network. In addition, information can cover support assets (support equipment and systems, software, etc.). Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
asset inventory	Information on pavement, bridges, signs and other assets. This includes asset location, installation information, materials information, vendor/contractor information, current maintenance status, and a variety of other information (e.g., video logs) that define the transportation infrastructure.	(None-Data) - Secure Internet (ITS)
asset restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard height, width, and weight restrictions by facility as well as special restrictions such as spring weight restrictions and temporary bridge weight restrictions.	(None-Data) - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
asset status update	Changes to status of pavement, bridges, signs and other assets resulting from maintenance or construction activities or infrastructure monitoring. The updates may include changes in installation information, materials information, vendor/contractor information, condition, and current maintenance status. In addition to infrastructure asset updates, the information provided may also include status of the maintenance and construction support assets, including vehicle and equipment utilization and repair records.	(None-Data) - Secure Internet (ITS)
authorization request	Request to determine if a transportation user is authorized to use a particular transportation resource.	(None-Data) - Secure Internet (ITS)
authorization request	Request to determine if a transportation user is authorized to use a particular transportation resource.	(None-Data) - Secure Wireless Internet (ITS)
authorization response	Notification of status of authorization request.	(None-Data) - Secure Internet (ITS)
authorization response	Notification of status of authorization request.	(None-Data) - Secure Wireless Internet (ITS)
barrier system control	Information used to configure and control barrier systems that are represented by gates, barriers and other automated or remotely controlled systems used to manage entry to roadways.	(None-Data) - Secure Internet (ITS)
barrier system status	Current operating status of barrier systems. Barrier systems represent gates, barriers and other automated or remotely controlled systems used to manage entry to roadways. Status of the systems includes operating condition and current operational state.	(None-Data) - Secure Internet (ITS)
broadcast traveler information	General traveler information that contains traffic and road conditions, link travel times, incidents, advisories, restrictions, vehicle requirements, work zones, transit service information, weather information, parking information, and other related traveler information.	TPEG2 - Secure Internet (ITS)
broadcast traveler information	General traveler information that contains traffic and road conditions, link travel times, incidents, advisories, restrictions, vehicle requirements, work zones, transit service information, weather information, parking information, and other related traveler information.	TPEG2 - Wide Area Broadcast
communications signature	Communications from vehicle or personal devices that can be monitored by ITS field equipment to uniquely identify the device. This flow represents communications from devices (via Bluetooth or Wi-Fi) that may be monitored by ITS field equipment or any other passive or active communications from the device that can be used to identify the device. This flow specifically covers passive monitoring of device communications.	(Data Not Needed) - Bluetooth

Flow Name	Description	Communication Solution(s)
conflict monitor status	A control flow that supports failsafe operation in the event that a conflict is detected that requires the RSE to enter a failsafe operating mode for intersection management. Analogous to a traffic signal conflict monitor, this flow is issued when differences are detected between information provided to the vehicle for in-vehicle display and information displayed by field devices. It contains the details of differences that were found.	US: NTCIP Traffic Signal - SNMPv3/TLS
crossing call	Non-motorized user request to cross the roadway. This is an overt request from a pedestrian, micromobility vehicle user (e.g., cyclist), or other vulnerable road user. This overt request may be a physical button push or hovering or gesturing in the vicinity of the button that supports contactless activation.	
crossing permission	Information provided to guide and warn pedestrians, micromobility vehicle users (e.g., cyclists), and other crosswalk users. It includes crossing request acknowledgment, current crossing permission, crossing time remaining, and real-time warnings of safety threats.	
current charging status	Current charging status including current charge rate, estimated time to completion, and cost associated with the charge.	
current infrastructure restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.	US: WZDx - Guaranteed Secure Internet (ITS)
current infrastructure restrictions	Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions, and temporary facility restrictions that are imposed during maintenance and construction.	US: WZDx - Secure Internet (ITS)
data collection and monitoring control	Information used to configure and control data collection and monitoring systems.	US: NTCIP Data Collection - SNMPv3/TLS
demand response passenger and use data	Data collected on board a demand response vehicle relating to the picking up and discharging of passengers.	US: TCIP - Secure Wireless Internet (ITS)
demand responsive transit plan	Plan regarding overall demand responsive transit schedules and deployment.	US: TCIP - Secure Internet (ITS)
demand responsive transit request	Request for paratransit support.	US: TCIP - Secure Internet (ITS)
device control request	Request for device control action	US: TMDD - NTCIP Messaging

Flow Name	Description	Communication Solution(s)
device data	Data from detectors, environmental sensor stations, roadside equipment, and traffic control devices, including device inventory information.	US: TMDD - NTCIP Messaging
device status	Status information from devices	US: TMDD - NTCIP Messaging
electric charging reservation request	Reservation request for use of an electric charging station.	(None-Data) - Secure Internet (ITS)
electric charging services inventory	Information provided for electric charging stations identifying the location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure.	(None-Data) - Secure Wireless Internet (ITS)
electric charging station data	Information provided for electric charging stations to the management center identifying the location, operating status, current availability, no-shows, charging capacity, etc.	(None-Data) - Secure Internet (ITS)
electric charging station information	Information provided for electric charging stations identifying the location, operating hours, current availability, charging capacity and standards supported, access restrictions, and rates/fee structure.	(None-Data) - Secure Internet (ITS)
electric charging station management information	Parameters that support management of an electric charging station. Load balancing, Reservation requests, Hours of operation, display configuration (ads), rules and regulations, etc.	(None-Data) - Secure Internet (ITS)
electric charging utility info	Information about the status and health of the electric charging network from the utility's perspective, including any grid issues or outages that electric charging users should be aware of.	(None-Data) - Secure Internet (ITS)
electric service requests info	Information about the numbers and locations of requests for electric charging to enable the electric utility to plan and manage its grid resources.	(None-Data) - Secure Internet (ITS)
emergency acknowledge	Acknowledge request for emergency assistance and provide additional details regarding actions and verification requirements.	US: SAE J3067 (J2735 SE) - Secure Wireless Internet (ITS)
emergency archive data	Logged emergency information including information that characterizes identified incidents (routine highway incidents through disasters), corresponding incident response information, evacuation information, surveillance data, threat data, and resource information. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	
emergency dispatch requests	Emergency vehicle dispatch instructions including incident location and available information concerning the incident.	
emergency dispatch response	Request for additional emergency dispatch information and provision of en route status.	

Flow Name	Description	Communication Solution(s)
emergency notification	An emergency request for assistance that is automatically initiated by a vehicle or manually initiated by a vehicle occupant or a traveler (vulnerable road user) with a personal information device. The request includes call-back number, date, time, location, prevent vehicle heading, vehicle make, model, model year, and fuel type, and crash severity indicators. Crash severity indicators include: airbags deployed, number of impacts, crash delta velocity, principle direction of force, and rollover indication. In addition, seatbelt restraint use, number of occupants, occupant location, and intrusion may be included. For commercial vehicles, this flow may also include freight equipment type (box, flatbed, trailer, container, etc.), type of cargo (refrigerated, non-perishable, liquid, etc.), hazardous material data, quantity of cargo, and cargo permits as applicable (hazmat, special routing permissions).	US: SAE J3067 (J2735 SE) - Secure Wireless Internet (ITS)
emergency plan coordination	Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.	
emergency plan coordination	Information that supports coordination of emergency management plans, continuity of operations plans, emergency response and recovery plans, evacuation plans, and other emergency plans between agencies. This includes general plans that are coordinated prior to an incident and shorter duration tactical plans that are prepared during an incident.	(None-Data) - Guaranteed Secure Internet (ITS)
emergency response coordination	Emergency response procedures and current emergency response status that are shared between allied response agencies to support a coordinated response to emergencies. This flow provides current situation information, including a summary of emergency status	
emergency route request	Request for access routes for emergency response vehicles and equipment. This may be a request for ingress or egress routes or other emergency routes. It may also include a request for preemption/priority for the identified vehicle at all signalized intersections along the route.	(None-Data) - Guaranteed Secure Internet (ITS)
emergency routes	Suggested ingress and egress routes for access to and between the scene and staging areas or other specialized emergency access routes.	(None-Data) - Guaranteed Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
emergency traffic control information	Status of a special traffic control strategy or system activation implemented in response to an emergency traffic control request, a request for emergency access routes, a request for evacuation, a request to activate closure systems, a request to employ driver information systems to support public safety objectives, or other special requests. Identifies the selected traffic control strategy and system control status.	US: TMDD - NTCIP Messaging
emergency traffic control request	Special request to preempt the current traffic control strategy in effect at one or more signalized intersections or highway segments, activate traffic control and closure systems such as gates and barriers, activate safeguard systems, or use driver information systems. For example, this flow can request all signals to red-flash, request a progression of traffic control preemptions along an emergency vehicle route, request a specific evacuation traffic control plan, request activation of a road closure barrier system, or place a public safety or emergency-related message on a dynamic message sign.	US: TMDD - NTCIP Messaging
emergency transit schedule information	Information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.	US: GTFS real-time - Guaranteed Secure Internet (ITS)
emergency transit schedule information	Information on transit schedule and service changes that adapt the service to better meet needs of responders and the general public in an emergency situation, including special service schedules supporting evacuation.	US: GTFS real-time - Secure Internet (ITS)
emergency transit service request	Request to modify transit service and fare schedules to address emergencies, including requests for transit services to evacuate people from and/or deploy response agency personnel to an emergency scene. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of transit resources.	US: TCIP - Guaranteed Secure Internet (ITS)
emergency transit service response	Response indicating changes to transit service, fares, and/or restrictions that will be made and status of transit resources to be deployed to support emergency response and/or evacuation.	US: TCIP - Guaranteed Secure Internet (ITS)
emergency traveler information	Public notification of an emergency such as a natural or man-made disaster, civil emergency, or child abduction. This flow also includes evacuation information including evacuation instructions, evacuation zones, recommended evacuation times, tailored evacuation routes and destinations, traffic and road conditions along the evacuation routes, traveler services and shelter information, and reentry times and instructions.	(None-Data) - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
emergency traveler information	Public notification of an emergency such as a natural or man-made disaster, civil emergency, or child abduction. This flow also includes evacuation information including evacuation instructions, evacuation zones, recommended evacuation times, tailored evacuation routes and destinations, traffic and road conditions along the evacuation routes, traveler services and shelter information, and reentry times and instructions.	(None-Data) - Wide Area Broadcast
emergency traveler information	Public notification of an emergency such as a natural or man-made disaster, civil emergency, or child abduction. This flow also includes evacuation information including evacuation instructions, evacuation zones, recommended evacuation times, tailored evacuation routes and destinations, traffic and road conditions along the evacuation routes, traveler services and shelter information, and reentry times and instructions.	US: TMDD - NTCIP Messaging
emergency traveler information request	Request for alerts, evacuation information, and other emergency information provided to the traveling public.	(None-Data) - Secure Internet (ITS)
emergency traveler information request	Request for alerts, evacuation information, and other emergency information provided to the traveling public.	(None-Data) - Secure Wireless Internet (ITS)
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.	
emergency vehicle tracking data	The current location and operating status of the emergency vehicle.	US: SAE Other J2735 - Secure Wireless Internet (ITS)
emissions archive data	Air quality and vehicle emissions information that is collected by sensors or derived from models. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
emissions sensor control	Data used to configure and control vehicle emissions sensors.	(None-Data) - Secure Internet (ITS)
environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors and aggregated by the data collector. Attributes relating to the data collection (and aggregation) are also included.	
environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors and aggregated by the data collector. Attributes relating to the data collection (and aggregation) are also included.	US: TMDD - NTCIP Messaging

Flow Name	Description	Communication Solution(s)
environmental sensor control	Data used to configure and control environmental sensors.	US: NTCIP Environmental Sensors - SNMPv3/TLS
environmental sensor control	Data used to configure and control environmental sensors.	US: NTCIP Environmental Sensors - Wireless SNMPv3/TLS
environmental sensor data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by fixed and/or mobile environmental sensors. Operational status of the sensors is also included.	US: NTCIP Environmental Sensors - SNMPv3/TLS
equipment maintenance request	Identification of field equipment requiring repair and known information about the associated faults.	
equipment maintenance status	Current status of field equipment maintenance actions.	
evacuation coordination	Coordination of information regarding a pending or in-process evacuation. Includes evacuation zones, evacuation times, evacuation routes, forecast network conditions, and reentry times.	
evacuation information	Evacuation instructions and information including evacuation zones, evacuation times, and reentry times.	
evacuation information	Evacuation instructions and information including evacuation zones, evacuation times, and reentry times.	(None-Data) - Secure Internet (ITS)
event confirmation	Confirmation that special event details have been received and processed.	
event confirmation	Confirmation that special event details have been received and processed.	(None-Data) - Secure Internet (ITS)
event information	Special event information for travelers. This would include a broader array of information than the similar "event plans" that conveys only information necessary to support traffic management for the event.	(None-Data) - Secure Internet (ITS)
event plans	Plans for major events possibly impacting traffic.	
event plans	Plans for major events possibly impacting traffic.	(None-Data) - Secure Internet (ITS)
external reports	Traffic and incident information that is collected by the media through a variety of mechanisms (e.g., radio station call-in programs, air surveillance).	(None-Data) - Secure Internet (ITS)
fare and price information	Current transit, parking, and toll fee schedule information.	US: ATIS - Secure Internet (ITS)
fare collection data	Fare collection information including the summary of fare system data and financial payment transaction data.	US: TCIP - Secure Internet (ITS)
fare collection data	Fare collection information including the summary of fare system data and financial payment transaction data.	US: TCIP - Secure Wireless Internet (ITS)

Flow Name	Description	Communication Solution(s)
fare management information	Transit fare information and transaction data used to manage transit fare processing.	US: TCIP - Secure Wireless Internet (ITS)
field equipment status	Reports from field equipment (sensors, signals, signs, controllers, etc.) which indicate current operational status.	US: NTCIP Generic Device - SNMPv3/TLS
freight equipment information	Container, trailer, or chassis information regarding identity, type, location, brake wear data, mileage, seal #, seal type, door open/close status, chassis bare/covered status, tethered / untethered status, temperature, humidity, power, battery levels, brake wear data, and bill of lading/information regarding the cargo/content.	(None-Data) - Secure Wireless Internet (ITS)
guidance updates	Information provided to support route guidance that is responsive to current traffic and road conditions. This includes measures of link impedances/delays that can impact routing choices and routing alternatives.	Data for Distribution (TBD) - OMG DDS over Wireless
hazmat information	Information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.	US: SAE J3067 (J2735 SE) - Guaranteed Secure Internet (ITS)
hazmat information	Information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.	US: SAE J3067 (J2735 SE) - Guaranteed Secure Wireless Internet (ITS)
hazmat information request	Request for information about a particular hazmat load.	(None-Data) - Secure Internet (ITS)
hazmat notification	Information provided to emergency response organizations regarding a hazmat load including when cargo sensors detect an issue with the load such as a release of hazardous material. This information will include sensor information, vehicle identification, and carrier identification.	US: SAE J3067 (J2735 SE) - Guaranteed Secure Wireless Internet (ITS)
incident command information coordination	Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information that enables emergency or maintenance personnel in the field to implement an effective, safe incident response.	

Flow Name	Description	Communication Solution(s)
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response. This also includes special events, closures, and other planned events that may impact the transportation system.	
incident information	Notification of existence of incident and expected severity, location, time and nature of incident. As additional information is gathered and the incident evolves, updated incident information is provided. Incidents include any event that impacts transportation system operation ranging from routine incidents (e.g., disabled vehicle at the side of the road) through large-scale natural or human-caused disasters that involve loss of life, injuries, extensive property damage, and multi-jurisdictional response. This also includes special events, closures, and other planned events that may impact the transportation system.	US: TMDD - NTCIP Messaging
incident information for media	Report of current desensitized incident information prepared for public dissemination through the media.	
incident information for public	Report of current desensitized incident information prepared for public dissemination.	US: TMDD - NTCIP Messaging
incident report	Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.	
incident response coordination	Incident response procedures and current incident response status that are shared between allied response agencies to support a coordinated response to incidents. This flow provides current situation information, including a summary of incident status and its impact on the transportation system and other infrastructure, and current and planned response activities. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.	
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.	

Flow Name	Description	Communication Solution(s)
incident response status	Status of the current incident response including a summary of incident status and its impact on the transportation system, traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides), and current and planned response activities.	(None-Data) - Secure Internet (ITS)
incident scene status	Information gathered at the incident site that more completely characterizes the incident and provides current incident response status.	
infrastructure conditions data	Current condition of pavement, bridges, culverts, signs, and other roadway infrastructure as measured by on-board sensors or read from infrastructure-based sensors. The data may include raw data or images (e.g., photo logs) that indicate the current status of the infrastructure.	(None-Data) - Secure Wireless Internet (ITS)
infrastructure monitoring sensor control	Data used to configure and control infrastructure monitoring sensors.	(None-Data) - Local Unicast Wireless (1609.2)
infrastructure monitoring sensor control	Data used to configure and control infrastructure monitoring sensors.	(None-Data) - Secure Internet (ITS)
infrastructure monitoring sensor data	Data read from infrastructure-based sensors that monitor the condition or integrity of transportation infrastructure including bridges, tunnels, interchanges, pavement, culverts, signs, transit rail or guideway, and other roadway infrastructure. Includes sensor data and the operational status of the sensors.	(None-Data) - Local Unicast Wireless (1609.2)
infrastructure monitoring sensor data	Data read from infrastructure-based sensors that monitor the condition or integrity of transportation infrastructure including bridges, tunnels, interchanges, pavement, culverts, signs, transit rail or guideway, and other roadway infrastructure. Includes sensor data and the operational status of the sensors.	(None-Data) - Secure Internet (ITS)
interactive traveler information	Traveler information provided in response to a traveler request. The provided information includes traffic and road conditions, advisories, incidents, restrictions, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.	US: ATIS - Secure Internet (ITS)
interactive traveler information	Traveler information provided in response to a traveler request. The provided information includes traffic and road conditions, advisories, incidents, restrictions, payment information, transit services, parking information, weather information, and other travel-related data updates and confirmations.	US: ATIS - Secure Wireless Internet (ITS)
intersection control status	Status data provided by the traffic signal controller including phase information, alarm status, and priority/preempt status.	US: NTCIP Traffic Signal - SNMPv3/TLS

Flow Name	Description	Communication Solution(s)
intersection geometry	The physical geometry of an intersection covering the location and width of each approaching lane, egress lane, and valid paths between approaches and egresses. This flow also defines the location of stop lines, cross walks, specific traffic law restrictions for the intersection (e.g., turning movement restrictions), and other elements that support calculation of a safe and legal vehicle path through the intersection.	US: SAE Other J2735 - Secure Internet (ITS)
intersection geometry	The physical geometry of an intersection covering the location and width of each approaching lane, egress lane, and valid paths between approaches and egresses. This flow also defines the location of stop lines, cross walks, specific traffic law restrictions for the intersection (e.g., turning movement restrictions), and other elements that support calculation of a safe and legal vehicle path through the intersection.	US: SAE Signal Control Messages - Local Unicast Wireless (1609.2)
intersection geometry	The physical geometry of an intersection covering the location and width of each approaching lane, egress lane, and valid paths between approaches and egresses. This flow also defines the location of stop lines, cross walks, specific traffic law restrictions for the intersection (e.g., turning movement restrictions), and other elements that support calculation of a safe and legal vehicle path through the intersection.	US: SAE Signal Control Messages - LTE-V2X WSMP
intersection infringement info	Vehicle path information sent by a vehicle that is performing an unpermitted movement at an intersection such as a stop sign violation or running a red light. This also includes information about possible conflicts with other road users in the vehicle's path, including a range of uncontrolled intersection scenarios that could be covered by this flow. This flow does not include permanent ids; only temporary ones that allow monitoring of the vehicle as it moves across the intersection.	(None-Data) - Secure Internet (ITS)
intersection infringement info	Vehicle path information sent by a vehicle that is performing an unpermitted movement at an intersection such as a stop sign violation or running a red light. This also includes information about possible conflicts with other road users in the vehicle's path, including a range of uncontrolled intersection scenarios that could be covered by this flow. This flow does not include permanent ids; only temporary ones that allow monitoring of the vehicle as it moves across the intersection.	US: SAE LTE-V2X BSM - LTE-V2X WSMP
intersection safety application info	Intersection and device configuration data, including intersection geometry, and warning parameters and thresholds. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	(None-Data) - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
intersection safety application status	Infrastructure safety application status reported by the RSE. This includes current operational state and status of the RSE and a record of intersection safety issues identified and alerts and warnings issued.	(None-Data) - Secure Internet (ITS)
intersection safety warning	A warning of an imminent unsafe vehicle infringement at an intersection that may endanger other vehicles or pedestrians. This allows vehicles approaching the intersection to be warned in the event of an imminent red light or stop sign violation or potential infringement on an occupied crosswalk. All connected vehicles and personal devices near the intersection receive the warning.	US: SAE Other J2735 - LTE-V2X IPv6
intersection safety warning	A warning of an imminent unsafe vehicle infringement at an intersection that may endanger other vehicles or pedestrians. This allows vehicles approaching the intersection to be warned in the event of an imminent red light or stop sign violation or potential infringement on an occupied crosswalk. All connected vehicles and personal devices near the intersection receive the warning.	US: SAE Other J2735 - LTE-V2X WSMP
intersection status	Current signal phase and timing information for all lanes at a signalized intersection. This flow identifies active lanes and lanes that are being stopped and specifies the length of time that the current state will persist for each lane. It also identifies signal priority and preemption status and pedestrian crossing status information where applicable.	US: SAE Signal Control Messages - LTE-V2X WSMP
intersection status monitoring	Current signal phase and timing information for all lanes at a signalized intersection. This flow represents monitoring of communications by a receiver at the intersection to support monitoring for conflicts between actual signal states and RSE communications about those states.	US: SAE Other J2735 - Secure Internet (ITS)
local signal preemption request	Direct control signal or message to a signalized intersection that results in preemption of the current control plan and grants right-of-way to the requesting vehicle.	US: SAE Signal Preemption - LTE-V2X TCP
local signal priority request	Request from a vehicle to a signalized intersection for priority at that intersection. This flow also allows the vehicle to cancel a priority request (for example, when the vehicle clears the intersection).	US: SAE Signal Preemption - LTE-V2X TCP
logged vehicle routes	Anticipated route information for guided vehicles, special vehicles (e.g., oversize vehicles) or groups of vehicles (e.g., governor's motorcade) that may require changes in traffic control strategy.	(None-Data) - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
maint and constr archive data	Information describing road construction and maintenance activities identifying the type of activity, the work performed, and work zone information including work zone configuration and safety (e.g., a record of intrusions and vehicle speeds) information. For construction activities, this information also includes a description of the completed infrastructure, including as-built plans as applicable. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
maint and constr dispatch information	Information used to dispatch maintenance and construction vehicles, equipment, and crews and information used to keep work zone crews informed. This information includes routing information, traffic information, road restrictions, incident information, environmental information, decision support information, maintenance schedule data, dispatch instructions, personnel assignments, alert notifications, and corrective actions.	(None-Data) - Secure Wireless Internet (ITS)
maint and constr dispatch status	Current maintenance and construction status including work data, operator status, crew status, and equipment status.	(None-Data) - Secure Wireless Internet (ITS)
maint and constr resource coordination	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.	(None-Data) - Secure Internet (ITS)
maint and constr resource request	Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response. The request may poll for resource availability or request pre-staging, staging, or immediate dispatch of resources.	(None-Data) - Secure Internet (ITS)
maint and constr resource response	Current status of maintenance and construction resources including availability and deployment status. General resource inventory information covering vehicles, equipment, materials, and people and specific resource deployment status may be included.	(None-Data) - Secure Internet (ITS)
maint and constr vehicle conditions	Vehicle diagnostics information that is collected, filtered, and selectively reported by a maintenance and construction vehicle. The information includes engine temperature, mileage, tire wear, brake wear, belt wear, and any warnings or alarms concerning the operational condition of the vehicle and ancillary equipment.	(None-Data) - Secure Wireless Internet (ITS)
maint and constr vehicle location data	The current location and related status (e.g., direction and speed) of the maintenance/construction vehicle.	(None-Data) - Secure Wireless Internet (ITS)

Flow Name	Description	Communication Solution(s)
maint and constr vehicle operational data	Data that describes the maintenance and construction activity performed by the vehicle. Operational data includes materials usage (amount stored and current application rate), operational state of the maintenance equipment (e.g., blade up/down, spreader pattern), vehicle safety status, and other measures associated with the operation of a maintenance, construction, or other special purpose vehicle. Operational data may include basic operational status of the vehicle equipment or a more precise record of the work performed (e.g., application of crack sealant with precise locations and application characteristics).	US: NTCIP Environmental Sensors - Wireless SNMPv3/TLS
maint and constr vehicle system control	Configure and control data that supports remote control of on-board maintenance and construction vehicle systems and field equipment that is remotely controlled by the vehicle. For example, the data can be used to adjust material application rates and spread patterns.	US: NTCIP Environmental Sensors - Wireless SNMPv3/TLS
maint and constr work plans	Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.	US: WZDx - Guaranteed Secure Internet (ITS)
maintenance and repair needs	Recommended strategies and schedules for maintenance of the transportation infrastructure.	(None-Data) - Secure Internet (ITS)
map update notification	Notification of maintenance, construction, and other activities that will result in medium to long term changes to road location and configuration that may impact navigable maps. This flow includes the timing of the changes and precise enumeration of the location and configuration changes. It also includes updated static speed limits (perhaps other regulatory rules/signage - no U turns, etc.) and default travel times.	(None-Data) - Secure Internet (ITS)
map updates	Map update that could include a new underlying static or real-time map or map layer(s) update. Map layers can include highways, major roads, streets, public transport routes, topography, points of interest, and regulatory information including turn restrictions and speed limits.	(None-Data) - Secure Internet (ITS)
meter control	Control of meter to modify reporting data and intervals, and to enable controls over meter use, which could include current limits.	(None-Data) - Secure Internet (ITS)
meter data	Report of energy consumption, voltage levels, current, power factor and similar diagnostic and monitoring information.	(None-Data) - Secure Internet (ITS)
misbehavior report	Notification of potential security issues encountered in processing messages, including message authentication or integrity failures, plausibility failures, or other issues appropriate to the CCMS' misbehavior policies.	US: Misbehavior reporting - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
mixed use crossing status	Current pedestrian and other mixed use crossing information including an indication of whether the call button has been activated, the current state of the mixed use crossing signal, and information indicating whether non-motorized users are currently occupying the cross walk.	US: NTCIP Traffic Signal - SNMPv3/TLS
mixed use safety warning control	Configuration and control of equipment that monitors and manages mixed use crossings and provides visual displays and warnings to drivers when non-motorized users are occupying a cross walk or other mixed use path crossing.	US: NTCIP Traffic Signal - SNMPv3/TLS
mixed use safety warning status	Current operational status and state of pedestrian crossings and other mixed use path crossing warning systems.	US: NTCIP Traffic Signal - SNMPv3/TLS
parking archive data	Data used to analyze and monitor trends in parking demand, pricing, and operational actions. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
parking information	General parking information and status, including current parking availability, parking pricing, and parking space availability information, including features like number and type of electric charging spots.	US: ATIS - Secure Internet (ITS)
parking information	General parking information and status, including current parking availability, parking pricing, and parking space availability information, including features like number and type of electric charging spots.	US: CDS - Secure Internet (ITS)
parking payment instructions	Information provided to configure and support parking payment operations including pricing information, user account information, and operational parameters used to control equipment that controls access, collects payment, and detects and processes violations.	(None-Data) - Secure Internet (ITS)
parking payment transactions	Detailed list of parking payment transactions including violations. Each transaction includes the date/time, vehicle/customer, and transaction amount. Additional information is included to support delayed payment and violation processing.	(None-Data) - Secure Internet (ITS)
parking reservation confirmation	Confirmation for parking reservation.	(None-Data) - Secure Internet (ITS)
parking reservation request	Reservation request for parking including special requests and needs such as disabled space access, electric vehicle charging, etc.	(None-Data) - Secure Internet (ITS)
parking traffic information	Instructions for operation of local parking facilities to support regional traffic management objectives (e.g., which parking lot exits to use). Also, includes inputs from traffic sensors to monitor parking queues and support more effective management of parking entrances and exits.	(None-Data) - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
passive vehicle monitoring control	Control commands used to control detection systems that rely on infrastructure-based identification of individual vehicles to measure travel times and other related measures by identifying the same vehicle at different points in the network. Related technologies include Bluetooth readers and license plate recognition systems.	(None-Data) - Secure Internet (ITS)
passive vehicle monitoring data	Time stamped identifiers that identify the vehicles that have passed through a detection zone.	(None-Data) - Secure Internet (ITS)
payment device information	Traveler payment information such as card number and previous transactions.	
payment device token information	Request for a digital token that can be associated with a credit card number.	
payment device update	Information updated concerning traveler's personal data including name, address, user account information, trip records, and profile data.	
payment methods	A list of valid payment methods.	(None-Data) - Secure Internet (ITS)
personal crossing safety information	Current crossing status including permission to cross, crossing time remaining, and warnings in the event that a vehicle reports an imminent intersection infringement that may impact non-motorized users including pedestrians and cyclists.	US: SAE Signal Control Messages - WAVE WSMP
personal input	User input to a personal device. This flow may request traveler information, request right of way, summon assistance, make a reservation, or request any other traveler service. This flow also establishes the settings that tailor each application to suit the user's needs.	
personal location	The current location (latitude, longitude, and elevation) reported by the personal information or safety device	US: SAE VRU Messages - WAVE WSMP
personal location information	Pedestrian, bicyclist, and other non-motorized user locations at an intersection as detected and reported by an RSE.	(None-Data) - Secure Internet (ITS)
personal signal service request	A request for right of way from a personal device that indicates the type of traveler (pedestrian, special needs pedestrian, bicyclist, etc.), anticipated time of arrival, travel path, and crossing duration.	US: SAE Other J2735 - Local Unicast Wireless (1609.2)
personal transit information	General and personalized transit information for a particular fixed route, flexible route, or paratransit system.	US: GTFS - Secure Wireless Internet (ITS)
personal updates	Personal information, alerts, and warnings provided to pedestrians, micromobility vehicle (MMV) users, work crew members, and other individuals in a mixed use area. This includes visual, audio, and haptic outputs that may be customized to support individual needs.	
personnel monitoring	Sensed presence of personnel within a work zone or incident scene that is monitored to enhance safety in work areas proximate to moving traffic.	

Flow Name	Description	Communication Solution(s)
proxied personal location	Relay of pedestrian, bicyclist, and other non-motorized user locations at an intersection. This relay or rebroadcast of personal locations supports coordination between motorized and non-motorized users that do not have interoperable communications capability.	(None-Data) - LTE-V2X WSMP
public health request	Request for specific information or recommended response concerning an emergency involving biological or other medically related emergency.	
public health response	Specific information or recommendation on how to treat or respond to an emergency involving biological or other medically related emergency.	
qualified environmental conditions data	Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) that has had quality checks performed on it and has been formatted and consolidated by the Clarus system. Attributes relating to the data collection (and aggregation) are also included.	
rail crossing control data	Data required for HRI information transmitted at railroad grade crossings and within railroad operations.	(None-Data) - Secure Internet (ITS)
rail crossing request	A request for highway-rail intersection status or a specific control request intended to modify HRI operation.	(None-Data) - Secure Internet (ITS)
rail crossing status	Status of the highway-rail intersection equipment including both the current state or mode of operation and the current equipment condition.	(None-Data) - Secure Internet (ITS)
rail incident response status	Status of the rail system's response to current incidents.	
reconciliation response	Response indicating that reconciliation of charges using a smart card have been processed.	
registered secureIDs	Cryptographically protected identifier indicating that the user associated with the identifier is entitled to use a particular service.	(None-Data) - Secure Wireless Internet (ITS)
remote surveillance control	The control commands used to remotely operate another center's sensors or surveillance equipment so that roadside surveillance assets can be shared by more than one agency.	US: TMDD - NTCIP Messaging
request for enforcement	Request for traffic enforcement of speed limits, lane controls, etc. on a roadway including in a work zone or other special situations.	(None-Data) - Secure Internet (ITS)
request for payment	Request to deduct cost of service from user's payment account.	
resource coordination	Coordination of resource inventory information, specific resource status information, resource prioritization and reallocation between jurisdictions, and specific requests for resources and responses that service those requests.	

Flow Name	Description	Communication Solution(s)
resource deployment status	Status of resource deployment identifying the resources (vehicles, equipment, materials, and personnel) available and their current status. General resource inventory information and specific status of deployed resources may be included.	(None-Data) - Secure Internet (ITS)
resource request	A request for resources to implement special traffic control measures, assist in clean up, verify an incident, etc. The request may poll for resource availability or request pre-staging, staging, or immediate deployment of resources. Resources may be explicitly requested or a service may be requested and the specific resource deployment may be determined by the responding agency.	(None-Data) - Secure Internet (ITS)
reversible lane control	Control of automated reversible lane configuration and driver information systems.	(None-Data) - Secure Internet (ITS)
reversible lane status	Current reversible lane status including traffic sensor and surveillance data and the operational status and mode of the reversible lane control equipment.	(None-Data) - Secure Internet (ITS)
right-of-way request notification	Notice that a request has occurred for signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.	US: NTCIP Signal Priority - SNMPv3/TLS
road network conditions	Current and forecasted traffic information, road and weather conditions, and other road network status. Either raw data, processed data, or some combination of both may be provided by this flow. Information on diversions and alternate routes, closures, and special traffic restrictions (lane/shoulder use, weight restrictions, width restrictions, HOV requirements) in effect is included.	US: TMDD - NTCIP Messaging
road network environmental situation data	Aggregated environmental situation data collected from vehicles and other sources for the road network. Aggregated information would include measured air temperature, exterior light status, wiper status, sun sensor status, rain sensor status, traction control status, ALB status, and other collected vehicle system status and sensor information for the region.	(None-Data) - Secure Internet (ITS)
road network status assessment	Assessment of damage sustained by the road network including location and extent of the damage, estimate of remaining capacity, required closures, alternate routes, necessary restrictions, and time frame for repair and recovery.	(None-Data) - Guaranteed Secure Internet (ITS)
road weather information	Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.	
road weather information	Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.	US: TMDD - NTCIP Messaging

Flow Name	Description	Communication Solution(s)
roadside archive data	A broad set of data derived from roadside sensors that includes current traffic conditions, environmental conditions, and any other data that can be directly collected by roadside sensors. This data also indicates the status of the sensors and reports of any identified sensor faults.	US: NTCIP Data Collection - SNMPv3/TLS
roadway dynamic signage data	Information used to initialize, configure, and control dynamic message signs. This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these devices.	US: NTCIP Message Sign - SNMPv3/TLS
roadway dynamic signage data	Information used to initialize, configure, and control dynamic message signs. This flow can provide message content and delivery attributes, local message store maintenance requests, control mode commands, status queries, and all other commands and associated parameters that support remote management of these devices.	US: NTCIP Message Sign - Wireless SNMPv3/TLS
roadway dynamic signage status	Current operating status of dynamic message signs.	US: NTCIP Message Sign - SNMPv3/TLS
roadway dynamic signage status	Current operating status of dynamic message signs.	US: NTCIP Message Sign - Wireless SNMPv3/TLS
roadway geometry	The physical geometry of a road segment that specifies the location and width of each lane, including normal lanes as well as special lanes for pedestrians and bicycles, transit vehicles, and trains. This flow also may include the curvature, grade, and superelevation or banking of the road segment.	US: SAE Lane-Level Mapping - Secure Internet (ITS)
roadway maintenance status	Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).	(None-Data) - Secure Internet (ITS)
roadway treatment system control	Control data for remotely located, automated devices, that treat the road surface (e.g., de-icing applications).	US: NTCIP Environmental Sensors - SNMPv3/TLS
roadway treatment system status	Current operational status of automated roadway treatment devices (e.g., anti-icing systems).	US: NTCIP Environmental Sensors - SNMPv3/TLS
RSE application status	Monitoring of RSE application status including current mode, operational status, and configuration settings. It includes the status of installed applications and the application-specific data provided by the RSE.	(None-Data) - Secure Internet (ITS)
safeguard system control	Data that controls safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.).	(None-Data) - Guaranteed Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
safeguard system status	Current operating status of safeguard systems (remotely controlled equipment used to mitigate the impact of incidents on transportation infrastructure, such as blast shields, exhaust systems, etc.). Status of the systems includes operating condition and current operational state.	(None-Data) - Secure Internet (ITS)
secure area sensor control	Information used to configure and control threat sensors (e.g., thermal, acoustic, radiological, chemical), object, motion and intrusion detection sensors. The provided information controls sensor data collection, aggregation, filtering, and other local processing.	(None-Data) - Secure Internet (ITS)
secure area sensor control	Information used to configure and control threat sensors (e.g., thermal, acoustic, radiological, chemical), object, motion and intrusion detection sensors. The provided information controls sensor data collection, aggregation, filtering, and other local processing.	(None-Data) - Secure Wireless Internet (ITS)
secure area sensor data	Data provided by threat sensors (e.g., thermal, acoustic, radiological, chemical), and intrusion, motion, and object detection sensors in secure areas indicating the sensor's operational status, raw and processed sensor data, and alarm indicators when a threat has been detected.	(None-Data) - Secure Internet (ITS)
secure area sensor data	Data provided by threat sensors (e.g., thermal, acoustic, radiological, chemical), and intrusion, motion, and object detection sensors in secure areas indicating the sensor's operational status, raw and processed sensor data, and alarm indicators when a threat has been detected.	(None-Data) - Secure Wireless Internet (ITS)
secure area surveillance control	Information used to configure and control audio and video surveillance systems used for transportation infrastructure security in secure areas. The provided information controls surveillance data collection, aggregation, filtering, and other local processing.	(None-Data) - Secure Internet (ITS)
secure area surveillance control	Information used to configure and control audio and video surveillance systems used for transportation infrastructure security in secure areas. The provided information controls surveillance data collection, aggregation, filtering, and other local processing.	(None-Data) - Secure Wireless Internet (ITS)
secure area surveillance data	Data collected from surveillance systems used to monitor secure areas. Includes video, audio, processed surveillance data, equipment operational status, and alarm indicators when a threat has been detected.	(None-Data) - Secure Internet (ITS)
secure area surveillance data	Data collected from surveillance systems used to monitor secure areas. Includes video, audio, processed surveillance data, equipment operational status, and alarm indicators when a threat has been detected.	(None-Data) - Secure Wireless Internet (ITS)
service registry	Catalogue of products and values, access rights and related information.	Parking - Secure Internet (ITS)
service registry	Catalogue of products and values, access rights and related information.	US: GTFS static - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
shared use status	Status of usage by shared use providers. Includes asset inventory and status. Could also include information on specific travelers to support multimodal trip planning.	US: MDS - Secure Internet (ITS)
shoulder management control	Information used to configure and control systems that allow use of a shoulder as a lane for vehicular traffic.	(None-Data) - Secure Internet (ITS)
shoulder management information	System status including current operational state, violations and logged information.	(None-Data) - Secure Internet (ITS)
signal control commands	Control of traffic signal controllers or field masters including clock synchronization.	US: NTCIP Signal System Masters - SNMPv3/TLS
signal control device configuration	Data used to configure traffic signal control equipment including local controllers and system masters.	US: NTCIP Signal System Masters - SNMPv3/TLS
signal control plans	Traffic signal timing parameters including minimum green time and interval durations for basic operation and cycle length, splits, offset, phase sequence, etc. for coordinated systems.	US: NTCIP Signal System Masters - SNMPv3/TLS
signal control status	Operational and status data of traffic signal control equipment including operating condition and current indications.	US: NTCIP Traffic Signal - SNMPv3/TLS
signal fault data	Faults reported by traffic signal control equipment.	US: NTCIP Signal System Masters - SNMPv3/TLS
signal priority status	In response to a request for signal priority, this flow indicates the status of the priority or preemption request.	US: SAE Signal Preemption - LTE-V2X TCP
signal service request	A call for service or extension for a signal control phase that is issued by the RSE for connected vehicles approaching an intersection and/or pedestrians at a crosswalk. This flow identifies the desired phase and service time.	US: NTCIP Signal Priority - SNMPv3/TLS
signal system configuration	Data used to configure traffic signal systems including configuring control sections and mode of operation (time based or traffic responsive).	US: NTCIP Signal System Masters - SNMPv3/TLS
smart card reconciliation	Detailed list of charges of the form charge/transport provider, taken from a smart card that need to be applied to the listed providers.	
speed monitoring control	Information used to configure and control automated speed monitoring, speed warning, and speed enforcement systems.	US: NTCIP Warning Device - SNMPv3/TLS
speed monitoring information	System status including current operational state and logged information including measured speeds, warning messages displayed, and violation records.	US: NTCIP Warning Device - SNMPv3/TLS
suggested route	Suggested route for a dispatched emergency or maintenance vehicle that may reflect current network conditions and the additional routing options available to en route emergency or maintenance vehicles that are not available to the general public.	

Flow Name	Description	Communication Solution(s)
threat data for analysis	Data from surveillance or sensor equipment in secure areas provided for further analysis.	
threat information	Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc).	(None-Data) - Guaranteed Secure Internet (ITS)
threat information coordination	Sensor, surveillance, and threat data including raw and processed data that is collected by sensor and surveillance equipment located in secure areas.	
threat support data	Information provided to help receiving agency identify possible threats, including biometric image processing support data.	
traffic archive data	Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
traffic control priority request	Request for signal priority at one or more intersections along a particular route.	US: TCIP - Secure Internet (ITS)
traffic control priority status	Status of signal priority request functions at the roadside (e.g., enabled or disabled).	US: TCIP - Secure Internet (ITS)
traffic detector control	Information used to configure and control traffic detector systems such as inductive loop detectors and machine vision sensors.	US: NTCIP Transportation Sensors - SNMPv3/TLS
traffic detector data	Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents). This flow includes the traffic data and the operational status of the traffic detectors	US: NTCIP Transportation Sensors - SNMPv3/TLS
traffic images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images. Meta data that describes the images is contained in another flow.	
traffic information for media	Report of traffic conditions including traffic incident reports for public dissemination through the media. The reports may also include information on diversions and alternate routes, closures, and special traffic restrictions in effect.	US: ATIS - Secure Internet (ITS)
traffic metering control	Control commands and operating parameters for ramp meters, interchange meters, mainline meters, and other systems equipment associated with roadway metering operations.	US: NTCIP Ramp Meters - SNMPv3/TLS
traffic metering status	Current operational status and operating parameters for ramp meters, interchange meters, mainline meters and other control equipment associated with roadway metering operations.	US: NTCIP Ramp Meters - SNMPv3/TLS

Flow Name	Description	Communication Solution(s)
traffic monitoring application info	Traffic monitoring application parameters and thresholds that control the filtering, aggregation, and range of measures that are collected, derived, and reported. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	(None-Data) - Secure Internet (ITS)
traffic monitoring application status	Traffic monitoring application status reported by the RSE. This includes current operational state and status of the RSE and a record of system operation.	(None-Data) - Secure Internet (ITS)
traffic situation data	Current, aggregate traffic data collected from connected vehicles that can be used to supplement or replace information collected by roadside traffic detectors. It includes raw and/or processed reported vehicle speeds, counts, and other derived measures. Raw and/or filtered vehicle control events may also be included to support incident detection.	US: NTCIP Transportation Sensors - SNMPv3/TLS
transit alternate mode information	Transit schedule information provided for coordination at transit interchange points with alternate modes.	US: GTFS static - Secure Internet (ITS)
transit and fare schedules	Transit service information including routes, schedules, and fare information. This also includes on-demand service information.	US: GTFS static - Secure Internet (ITS)
transit and fare schedules	Transit service information including routes, schedules, and fare information. This also includes on-demand service information.	US: TOMP - Secure Internet (ITS)
transit emergency data	Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.	(None-Data) - Guaranteed Secure Internet (ITS)
transit fare information	Information provided by transit management that supports fare payment transactions.	US: GTFS static - Secure Internet (ITS)
transit incident information	Information on transit incidents that impact transit services for public dissemination.	US: GTFS real-time - Secure Internet (ITS)
transit information user request	Request for special transit routing, real-time schedule information, and availability information.	(None-Data) - Secure Internet (ITS)
transit information user request	Request for special transit routing, real-time schedule information, and availability information.	(None-Data) - Secure Wireless Internet (ITS)
transit schedule adherence information	Dynamic transit schedule adherence and transit vehicle location information.	US: GTFS real-time - Secure Internet (ITS)
transit schedule information	Current and projected transit schedule information used to initialize the transit vehicle with a vehicle assignment, monitor schedule performance, and develop corrective actions on-board.	US: GTFS static - Secure Wireless Internet (ITS)
transit service information	Transit service information including routes, schedules, and fare information as well as dynamic transit schedule adherence and transit vehicle location information.	US: TCIP - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
transit service information	Transit service information including routes, schedules, and fare information as well as dynamic transit schedule adherence and transit vehicle location information.	US: TOMP - Secure Internet (ITS)
transit system data	Current transit system operations information indicating current transit routes and fares, the level of service on each route, and the progress of individual vehicles along their routes for use in forecasting demand and estimating current transportation network performance.	US: GTFS - Secure Internet (ITS)
transit system status assessment	Assessment of damage sustained by the public transportation system including location and extent of the damage, current operational status including an estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.	(None-Data) - Secure Internet (ITS)
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.	US: GTFS - Secure Internet (ITS)
transit traveler information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, alerts and advisories, and general transit service information.	US: GTFS - Secure Wireless Internet (ITS)
transit traveler request	Request by a Transit traveler to summon assistance, request transit information, or request any other transit services.	(None-Data) - Secure Wireless Internet (ITS)
transit trip plan	An origin-destination transit trip that may involve multiple modes and connections.	US: TOMP - Secure Internet (ITS)
transit trip request	Request for a transit trip plan that is responsive to traveler requirements such as schedule, cost, or duration.	US: TOMP - Secure Internet (ITS)
transit vehicle conditions	Operating conditions of transit vehicle (e.g., engine running, oil pressure, fuel level and usage). It includes status of other on-board systems including user displays, passenger counters, and security systems. This overall status information is also collected from unused (out of service) vehicles.	US: TCIP - Secure Wireless Internet (ITS)
transit vehicle loading data	Data collected on board the transit vehicle relating to passenger boarding and alighting.	US: TCIP - Secure Wireless Internet (ITS)
transit vehicle location data	Current transit vehicle location and related operational conditions data provided by a transit vehicle.	US: GTFS real-time - Secure Wireless Internet (ITS)
transit vehicle operator authentication information	Information regarding on-board transit operator authentication	(None-Data) - Guaranteed Secure Wireless Internet (ITS)
transit vehicle operator authentication update	Results of authentication process or update of on-board authentication database.	(None-Data) - Guaranteed Secure Wireless Internet (ITS)

Flow Name	Description	Communication Solution(s)
transit vehicle operator information	Transit service instructions, wide area alerts, traffic information, road conditions, and other information for both transit and paratransit operators.	US: TCIP - Secure Wireless Internet (ITS)
transit vehicle schedule performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.	US: GTFS real-time - Secure Wireless Internet (ITS)
transportation operational strategies	Operational strategies for each operating agency in a transportation corridor, downtown area, or other travel-impacted area, providing an integrated operations strategy for the freeways, tollways, arterials, transit services, parking facilities, and other transportation-related facilities in the area. These strategies can include dynamic adjustments to transit fares and tolls, parking fees and restrictions, dynamic lane restriction changes, and other active demand management strategies.	(None-Data) - Secure Internet (ITS)
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.	
transportation system status	Current status and condition of transportation infrastructure (e.g., tunnels, bridges, interchanges, TMC offices, maintenance facilities). In case of disaster or major incident, this flow provides an assessment of damage sustained by the surface transportation system including location and extent of the damage, estimate of remaining capacity and necessary restrictions, and time frame for repair and recovery.	(None-Data) - Secure Internet (ITS)
transportation weather information	Current and forecast road conditions and weather information (e.g., surface condition, flooding, wind advisories, visibility, etc.) associated with the transportation network. This information is of a resolution, timeliness, and accuracy to be useful in transportation decision making.	US: TMDD - NTCIP Messaging
travel services information	Travel service information and reservations for tourist attractions, lodging, dining, service stations, emergency services, and other services and businesses of interest to the traveler.	US: ATIS - Secure Wireless Internet (ITS)
travel services request	Request for travel service information including tourist attractions, lodging, restaurants, electric vehicle charging, service stations, and emergency services. The request identifies the type of service, the area of interest, optional reservation request information, parameters that are used to prioritize or filter the returned information, and sorting preferences.	US: ATIS - Secure Wireless Internet (ITS)

Flow Name	Description	Communication Solution(s)
traveler alerts	Traveler information alerts reporting congestion, incidents, adverse road or weather conditions, restrictions, vehicle requirements, parking availability, transit service delays or interruptions, and other information that may impact the traveler. Relevant alerts are provided based on traveler-supplied profile information including trip characteristics and preferences.	US: ATIS - Wide Area Broadcast
traveler archive data	Data associated with traveler information services including service requests, facility usage, rideshare, routing, and traveler payment transaction data. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	US: ADMS - Secure Internet (ITS)
traveler information for media	General traveler information regarding incidents, unusual traffic conditions, transit issues, or other advisory information that has been desensitized and provided to the media.	US: ATIS - Secure Internet (ITS)
traveler payment information	Information provided for payment of road use charges, tolls or parking fees including identification that can be used to identify the payment account or source and related vehicle and service information that are used to determine the type and price of service requested. The information exchange normally supports an account debit to pay fees, but an account credit may be initiated where pricing strategies include incentives.	(None-Data) - Secure Wireless Internet (ITS)
traveler payment request	Request for information supporting payments. For fee structures that include incentives, the request may support either an account debit or an account credit or reimbursement.	(None-Data) - Secure Wireless Internet (ITS)
traveler request	A request for traveler information including traffic, transit, toll, parking, road weather conditions, event, and passenger rail information. The request identifies the type of information, the area of interest, parameters that are used to prioritize or filter the returned information, and sorting preferences.	US: ATIS - Secure Internet (ITS)
traveler request	A request for traveler information including traffic, transit, toll, parking, road weather conditions, event, and passenger rail information. The request identifies the type of information, the area of interest, parameters that are used to prioritize or filter the returned information, and sorting preferences.	US: ATIS - Secure Wireless Internet (ITS)
trip confirmation	Acknowledgement by the driver/traveler of acceptance of a trip plan with associated personal and payment information required to confirm reservations. Conversely, this flow may also reject the proposed trip plan. Confirmations include the selected route and subsequent trip confirmation messages will be issued for route changes.	US: TOMP - Secure Internet (ITS)

Flow Name	Description	Communication Solution(s)
trip confirmation	Acknowledgement by the driver/traveler of acceptance of a trip plan with associated personal and payment information required to confirm reservations. Conversely, this flow may also reject the proposed trip plan. Confirmations include the selected route and subsequent trip confirmation messages will be issued for route changes.	US: TOMP - Secure Wireless Internet (ITS)
trip feedback	Information provided during or at the conclusion of a trip that supports performance monitoring and system optimization. Information provided may include a record of the trip including HOV/HOT lane usage and user provided feedback at the conclusion of the trip.	(None-Data) - Secure Wireless Internet (ITS)
trip plan	A travel itinerary covering single or multimodal travel. The itinerary identifies a route and associated traveler information and instructions identifying recommended trip modes (including indoor and outdoor wayfinding) and transfer information, ride sharing options, and transit and parking reservation information. This flow also includes intermediate information that is provided as the trip plan is interactively created, including identification of alternatives, requests for additional information as well as amenities along the trip.	US: ATIS - Secure Internet (ITS)
trip plan	A travel itinerary covering single or multimodal travel. The itinerary identifies a route and associated traveler information and instructions identifying recommended trip modes (including indoor and outdoor wayfinding) and transfer information, ride sharing options, and transit and parking reservation information. This flow also includes intermediate information that is provided as the trip plan is interactively created, including identification of alternatives, requests for additional information as well as amenities along the trip.	US: ATIS - Secure Wireless Internet (ITS)
trip request	Request for trip planning services that identifies the trip origin, destination(s), timing, preferences, and constraints. The request may also include the requestor's location or a request for transit and parking reservations, electric charging station access, and ridesharing options associated with the trip. The trip request also covers requests to revise a previously planned trip and interim updates that are provided as the trip is interactively planned.	US: ATIS - Secure Internet (ITS)
trip request	Request for trip planning services that identifies the trip origin, destination(s), timing, preferences, and constraints. The request may also include the requestor's location or a request for transit and parking reservations, electric charging station access, and ridesharing options associated with the trip. The trip request also covers requests to revise a previously planned trip and interim updates that are provided as the trip is interactively planned.	US: ATIS - Secure Wireless Internet (ITS)

Flow Name	Description	Communication Solution(s)
trip status	Current location of traveler in the context of a pre-established trip; may include traveler-provided modifications to that route.	(None-Data) - Secure Wireless Internet (ITS)
usage and billing info	Account, usage, charging, limits and similar information relevant to electric utility billing.	
user account reports	Reports on services offered/provided and associated charges.	(None-Data) - Secure Wireless Internet (ITS)
user account setup	Billing information, vehicle information (or registration information), and requests for reports. Also includes subsequent account changes.	(None-Data) - Secure Wireless Internet (ITS)
user profile	Information provided to register for a travel service and create a user account. The provided information includes personal identification, traveler preferences (e.g., travel mode, micro-mobility options, accessibility needs, and assistance needs), priorities for the preferences, device information, a user ID and password, and information to support payment transactions, if applicable.	(None-Data) - Secure Wireless Internet (ITS)
variable speed limit control	Information used to configure and control variable speed limit systems including the equipment used to provide current speed limits and other information to drivers.	US: NTCIP Message Sign - SNMPv3/TLS
variable speed limit status	Current operating status of the variable speed limit systems including the state of the equipment.	US: NTCIP Message Sign - SNMPv3/TLS
vehicle charging profile	Vehicle information provided to an electric charging station including the operational status of the electrical system, the charging capacity for the vehicle, and % charge complete.	
vehicle emissions data	Measured emissions of specific vehicles comprised of exhaust pollutants including hydrocarbons, carbon monoxide, and nitrogen oxides.	(None-Data) - Secure Internet (ITS)
vehicle location data for mapping	Aggregate vehicle location data collected to support map data creation and refinement.	(None-Data) - Secure Internet (ITS)
vehicle signage application info	In-vehicle signing application configuration data and messaging parameters. This flow provides a list of regulatory, warning, and information messages to be displayed and parameters that support scheduling and prioritizing messages to be issued to passing vehicles. This flow also supports remote control of the application so the application can be taken offline, reset, or restarted.	(None-Data) - Secure Internet (ITS)
vehicle signage application status	In-vehicle signing application status reported by the RSE. This includes current operational state and status of the RSE and a log of messages sent to passing vehicles.	(None-Data) - Secure Internet (ITS)
video surveillance control	Information used to configure and control video surveillance systems.	US: NTCIP Video Switches - SNMPv3/TLS

Flow Name	Description	Communication Solution(s)
violation notification	Notification to enforcement agency of detected traffic violations. This notification identifies the vehicle and documents the infraction date, time, and location, the violation, and associated information that documents the violation. For example, for a speed violation, this flow includes the measured speed and current posted speed limit.	(None-Data) - Secure Internet (ITS)
vulnerable road user presence	Detection of pedestrians, cyclists, and other vulnerable road users. This detection is based on physical characteristics of the user and their conveyance, which may be enhanced by design and materials that facilitate sensor-based detection and tracking of vulnerable road users.	
weather archive data	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.) as well as qualified environmental sensor data. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.	
weather information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).	
wide area air quality data	Region-wide air quality data reported by subregions. Includes current data and forecasts.	(None-Data) - Secure Internet (ITS)
work plan coordination	Coordination of work plan schedules and activities between maintenance and construction organizations or systems. This information includes the work plan schedules and comments and suggested changes that are exchanged as work plans are coordinated and finalized.	(None-Data) - Secure Internet (ITS)