

March 2005

# ITS ARCHITECTURE

## for Metropolitan Sioux City Area

### TECHNICAL APPENDIX



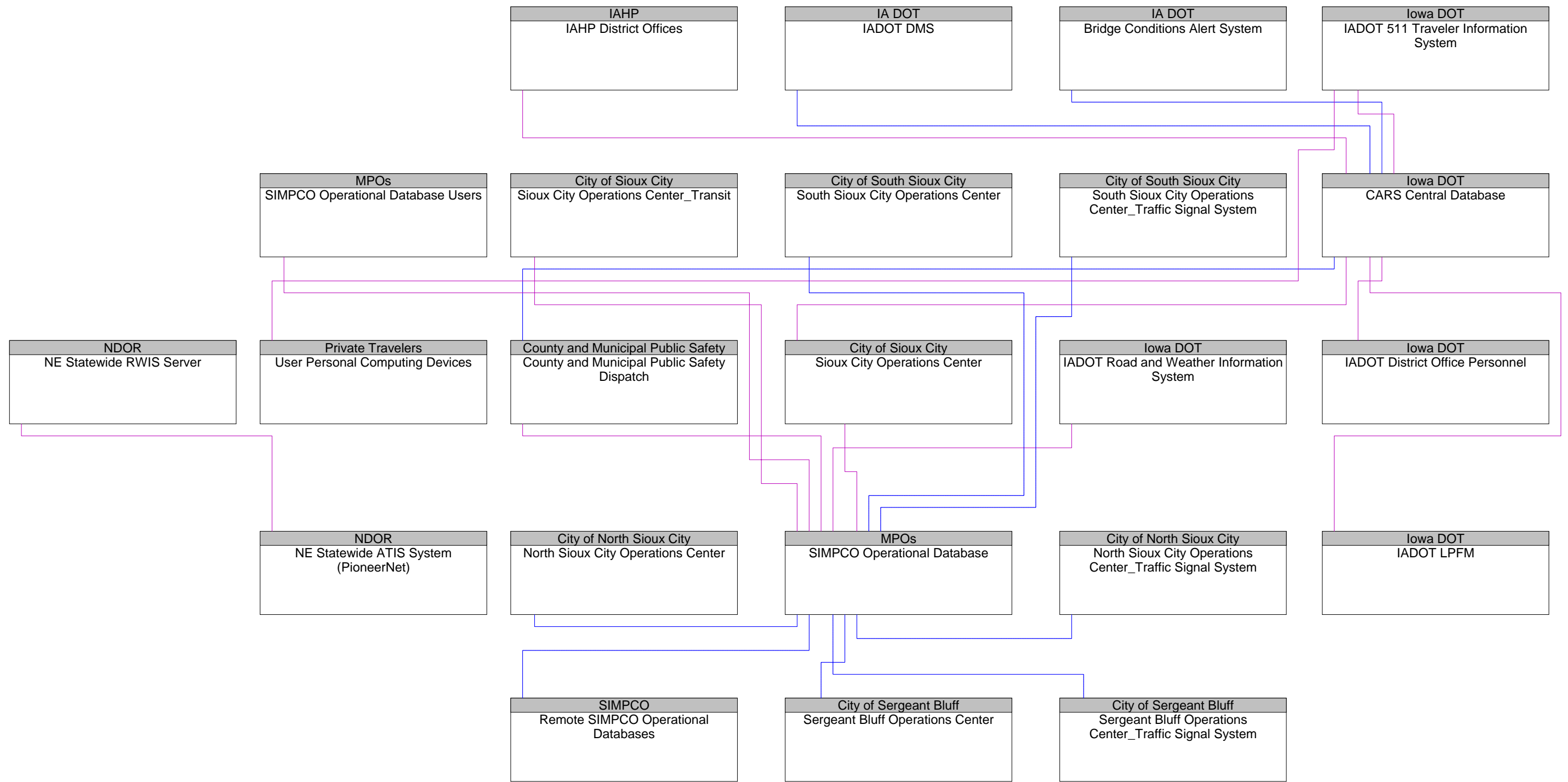
CONSULTING GROUP, INC.

# **APPENDIX A:**

# **ARCHITECTURE DIAGRAMS**

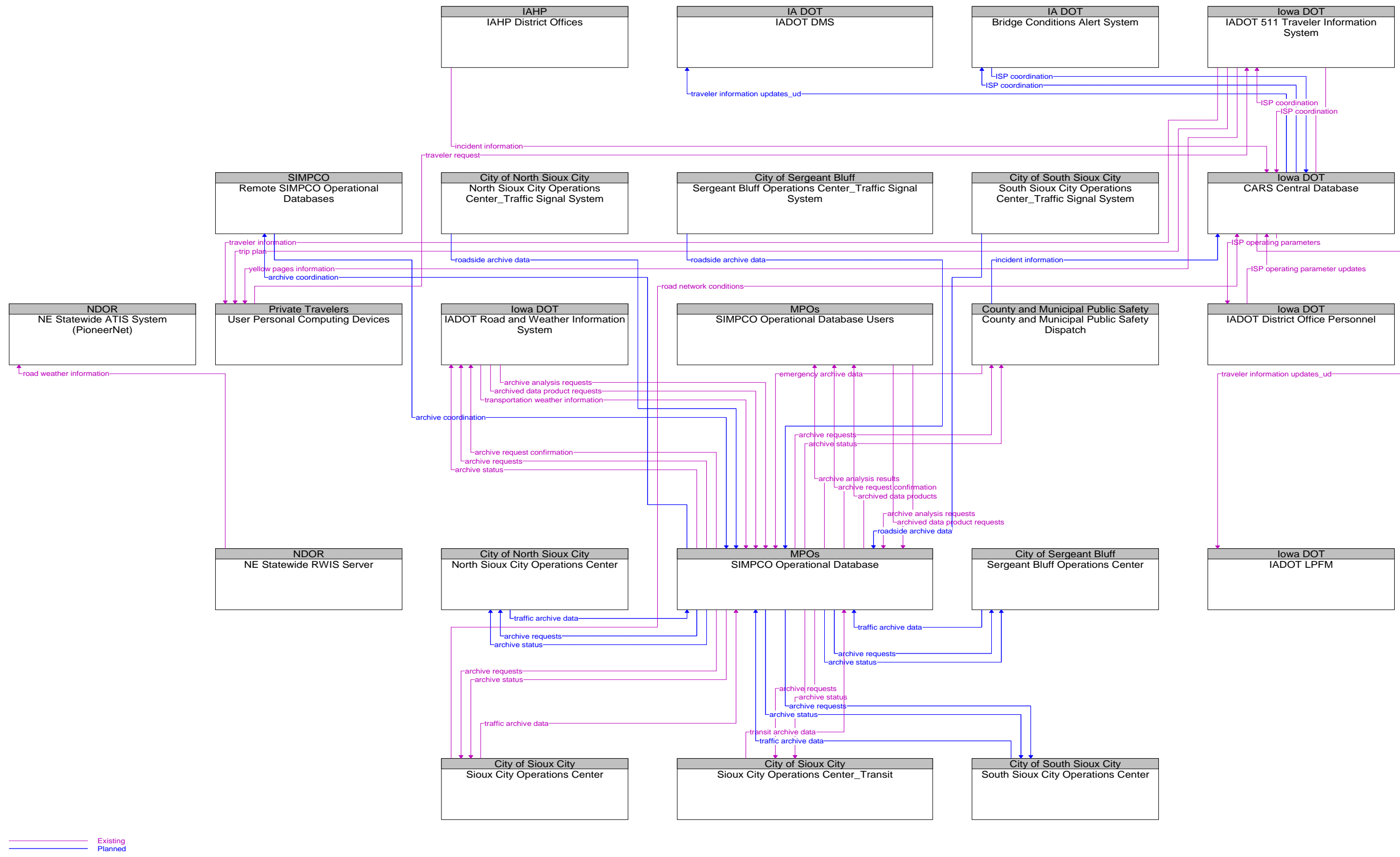
# **Archive Elements**

Figure A1 – Top-Level Interconnect Diagram (Archive Elements)



Existing  
Planned

Figure A2 – Architecture Flow Diagram (Archive Elements)



## **County Elements**

Figure A3 – Top-Level Interconnect Diagram (County Elements)

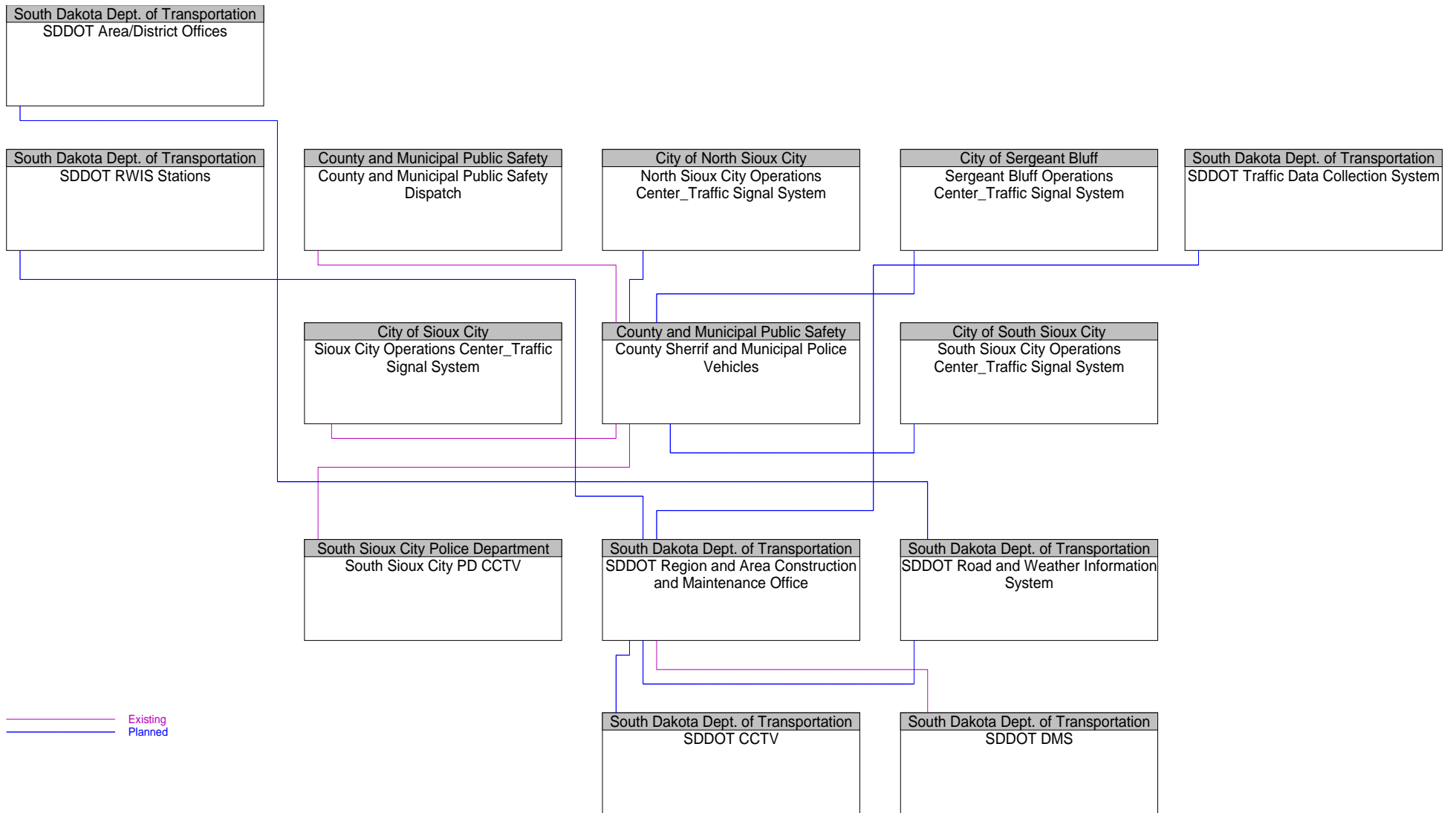
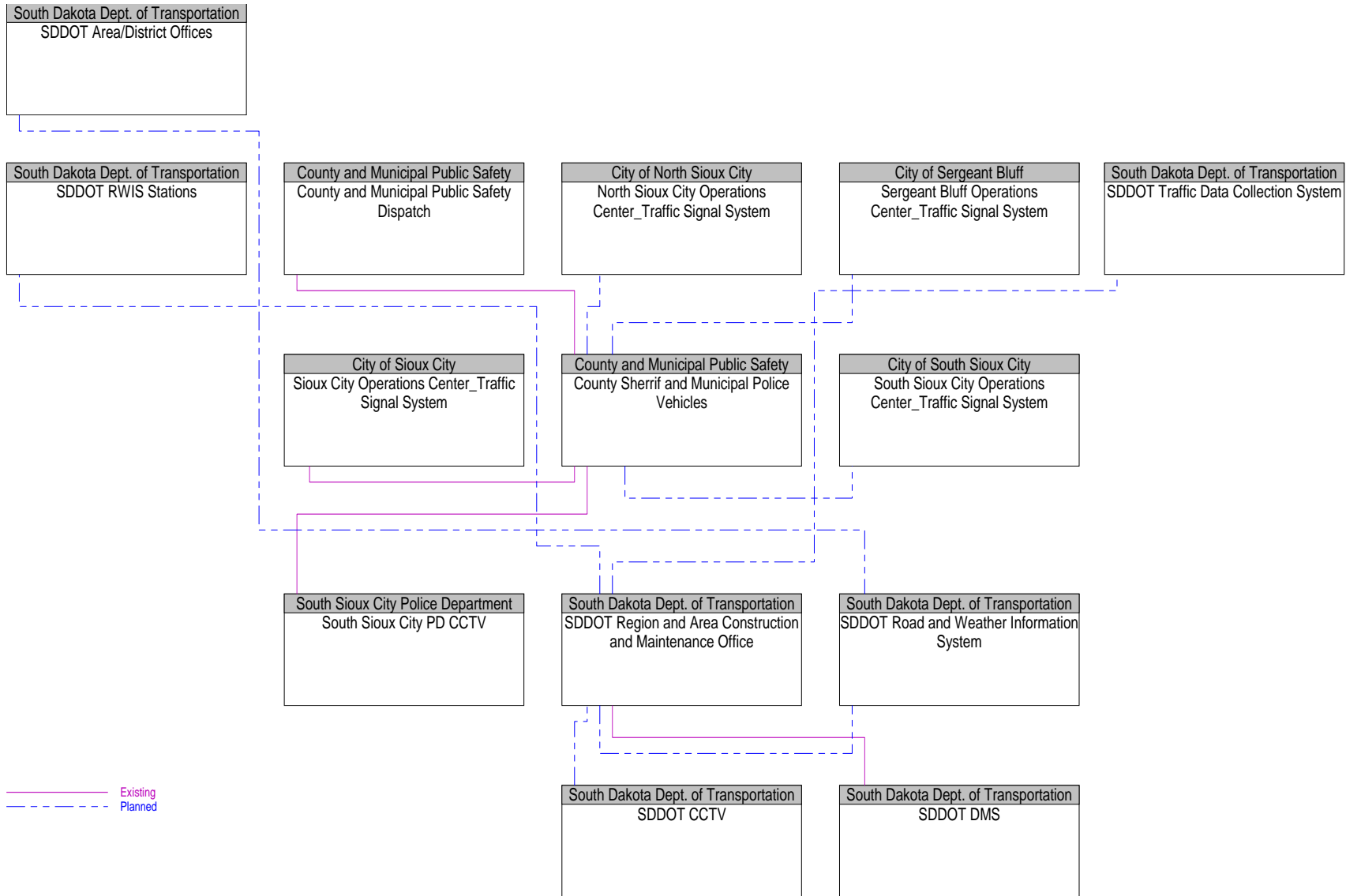


Figure A4 – Architecture Flow Diagram (County Elements)





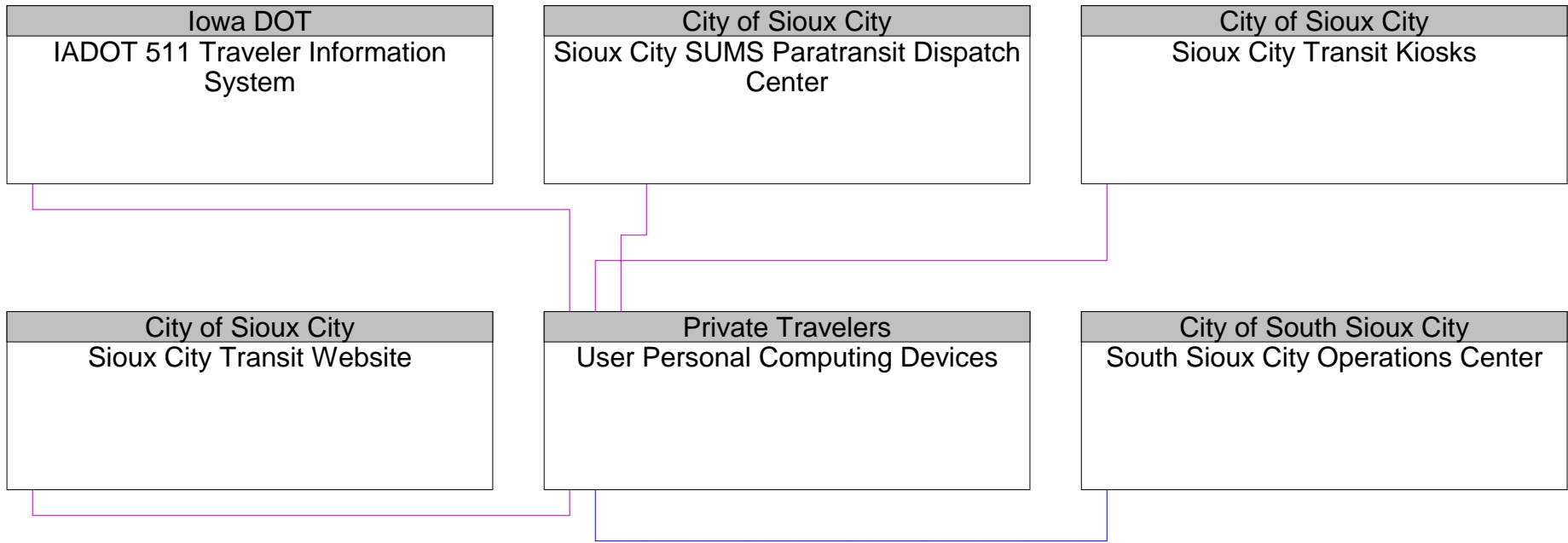
# Emergency Elements





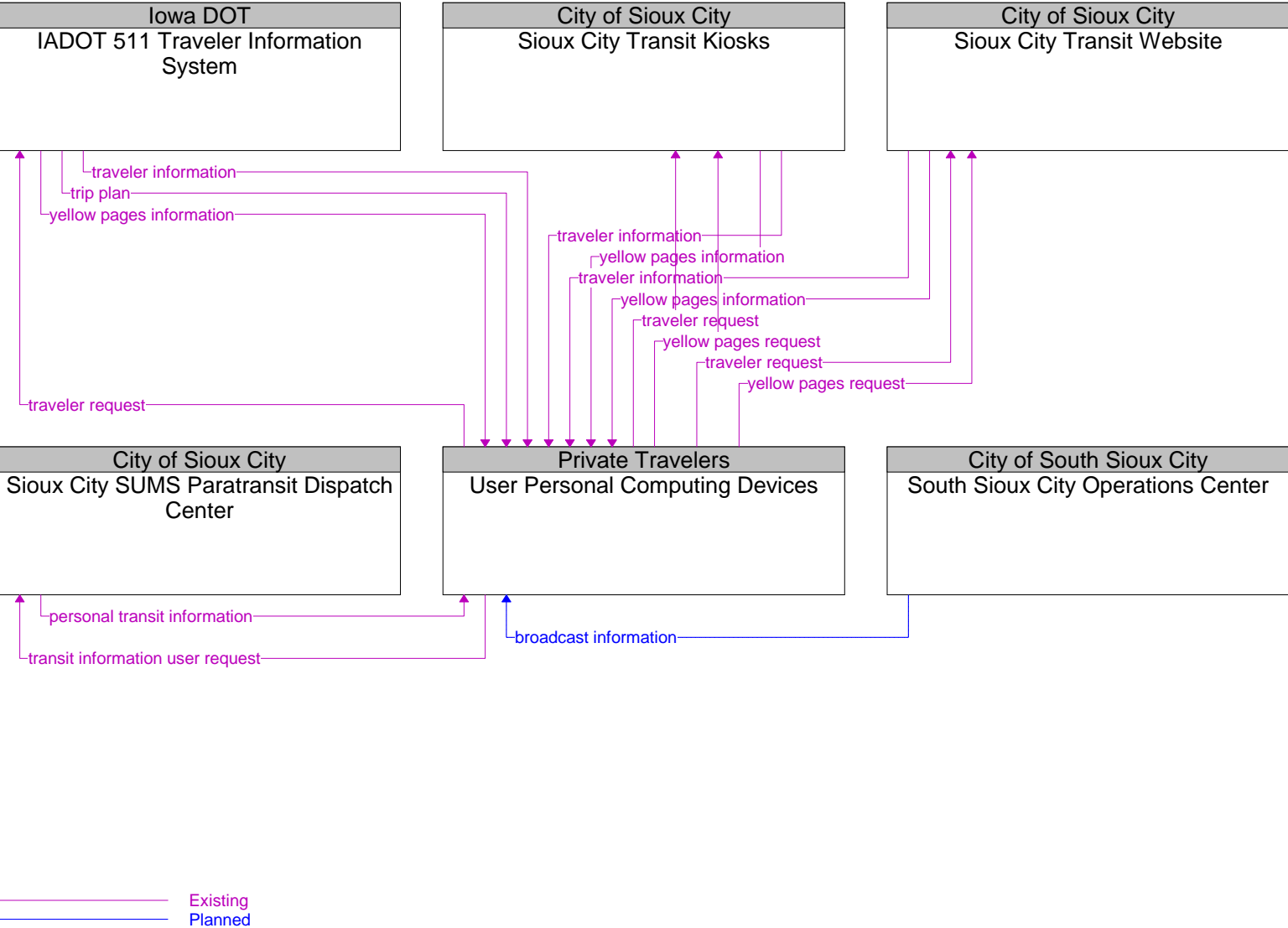
## **Private Elements**

Figure A7 – Top-Level Interconnect Diagram (Private Elements)



— Existing  
— Planned

Figure A8 – Architecture Flow Diagram (Private Elements)



# Roadway Elements

## Figure A9 – Top-Level Interconnect Diagram (Roadway Elements)

Due to size constraints Figure A9 is attached at the end of the Technical Appendix.



## Figure A10 – Architecture Flow Diagram (Roadway Elements)

Due to size constraints Figure A10 is attached at the end of the Technical Appendix.

# Transit Elements

Figure A11 – Top-Level Interconnect Diagram (Transit Elements)

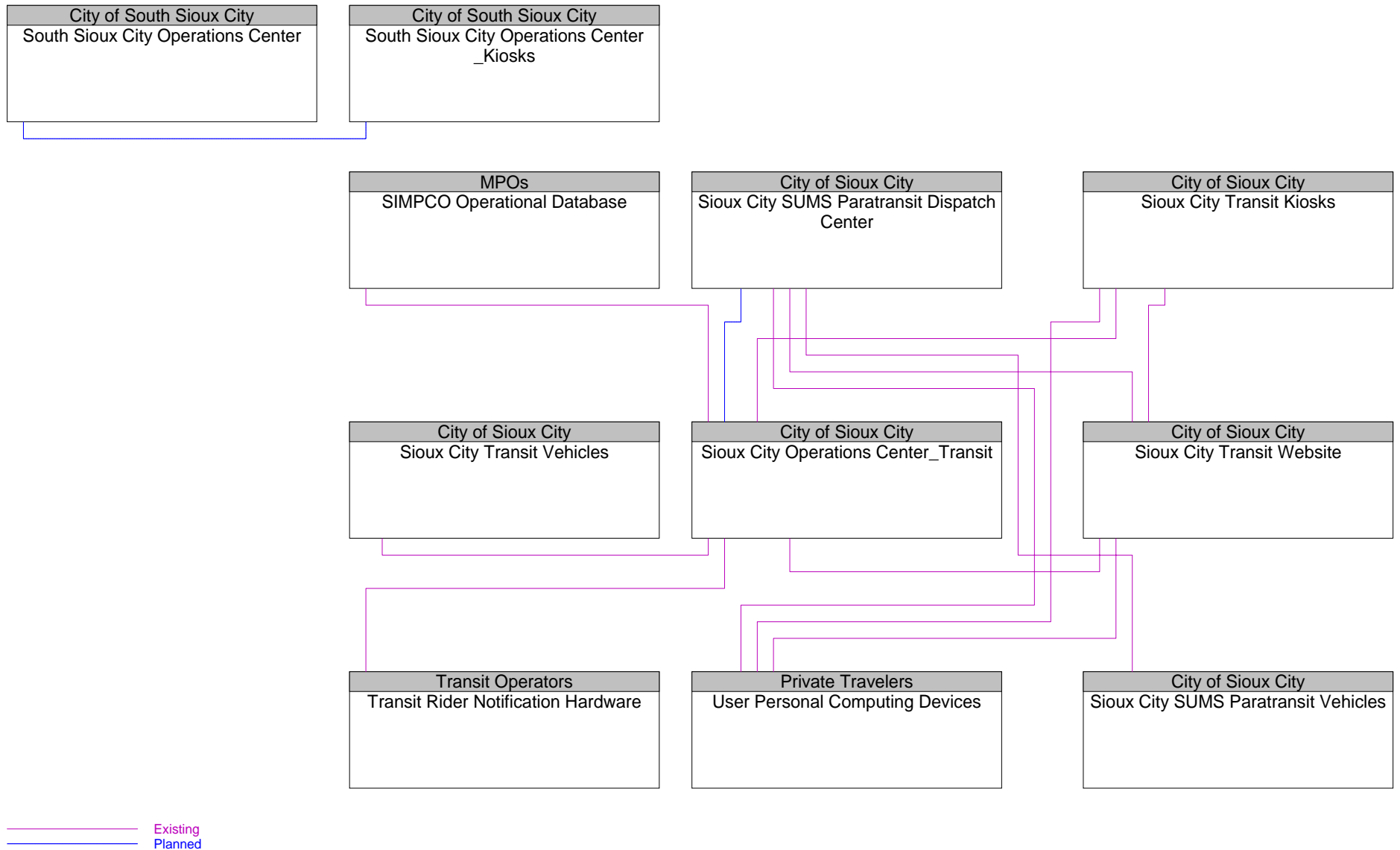
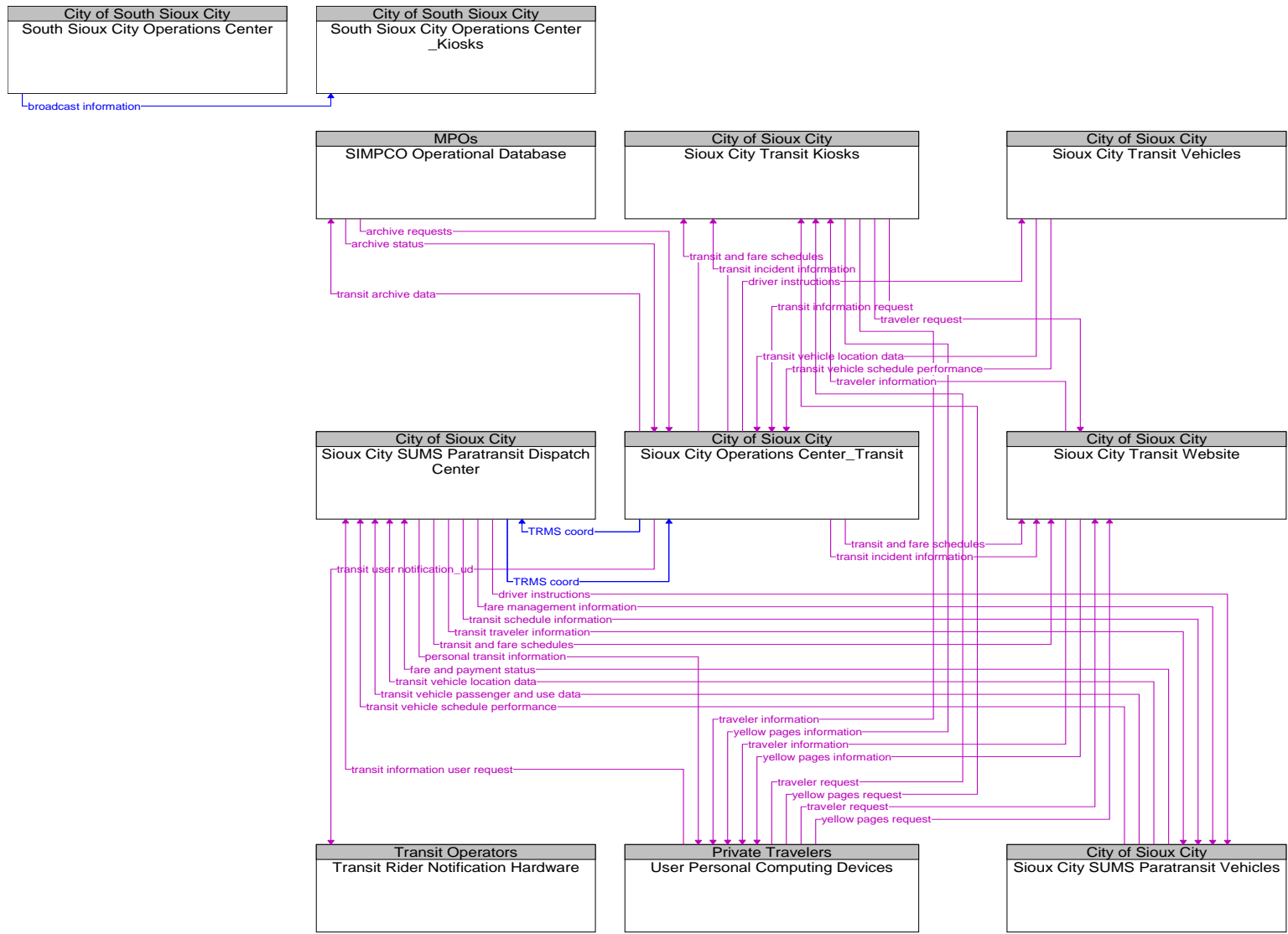


Figure A12 – Architecture Flow Diagram (Transit Elements)



Existing  
Planned

## **Weather Elements**

Figure A13 – Top-Level Interconnect Diagram (Weather Elements)

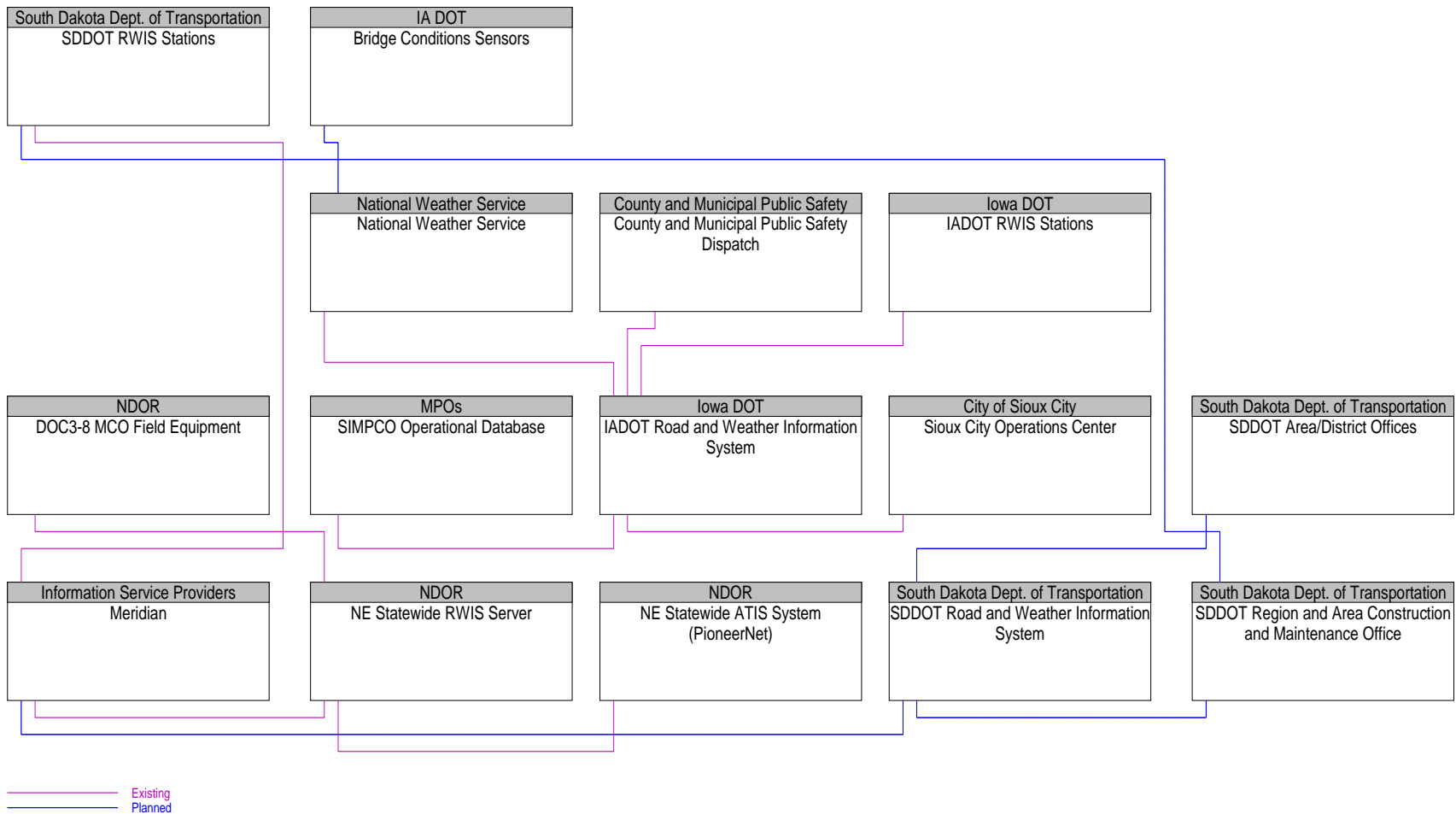
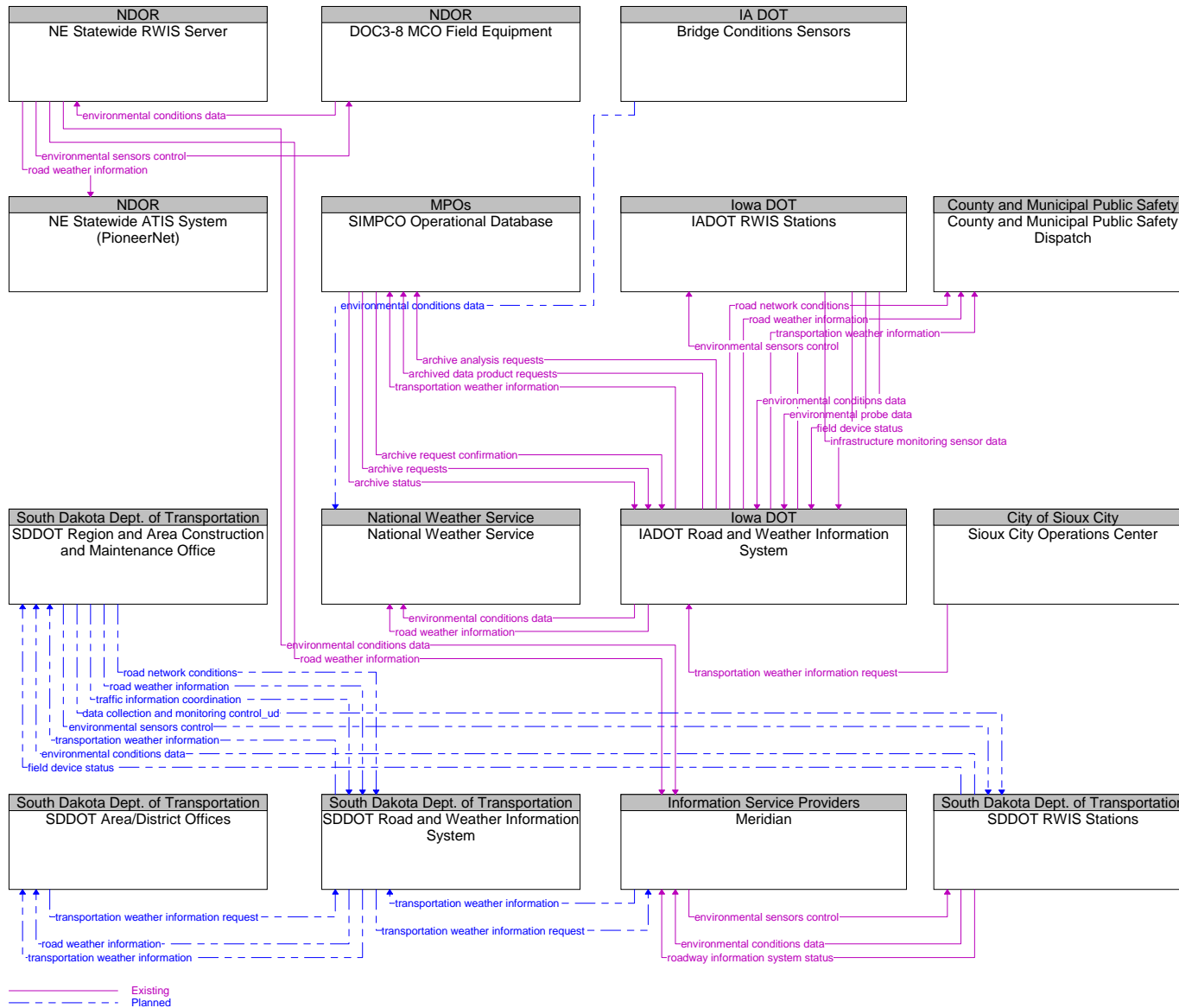


Figure A14 – Architecture Flow Diagram (Weather Elements)



# **APPENDIX B:**

# **ITS ARCHITECTURE STANDARDS**



A key to maximizing the future benefits of ITS investments will be ensuring the future interoperability of systems deployed. A variety standards development organizations (SDOs), have begun the process of creating standardized methods of exchange and formats for ITS data to allow systems to co-exist and build upon each others functionality.

As of this writing, several standards had been completed, but many more are in the development stage. The most complete standards are for the operations of Dynamic Message Signs and the use of standards-conformant products may be required to use certain funding sources. Other standards, such as signal control and center to center data exchange, are less developed, but products using the draft standards may be available.

In general, the use of standards-conformant products is encouraged for ITS deployments. The use of these products decreases the likelihood of using obsolete or “orphan” products that are no longer supported by their manufacturers and are incompatible with other systems. It should be noted that the ITS standards will not prescribe a specific technology or solution to be implemented, nor do they dictate which systems should be used in a given area or any specific approach to addressing a user need. Rather the standards describe how data should be formatted and exchanged between systems when implemented.

This appendix lists all of the relevant standards that apply to the SIMPCO regional architecture. Each flow in the architecture is identified within the standard listing, which are grouped by their SDO.

# Lead SDO:AASHTO/ITE/NEMA

## Global Object Definitions NTCIP 1201

Supports interfaces:

Source: Bridge Conditions Sensors Destination: IADOT District Office Personnel  
Flow: environmental conditions data

Source: Bridge Conditions Sensors Destination: National Weather Service  
Flow: environmental conditions data

Source: County and Municipal Fire Rescue Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control

Source: North Sioux City Operations Center\_Traffic Signal System Destination: North Sioux City Operations Center  
Flow: signal control status  
Flow: traffic flow

Source: North Sioux City Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data

Source: Sergeant Bluff Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control

Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control  
Source: Sioux City Operations Center\_Traffic Signal System Destination: Sioux City Operations Center  
Flow: signal control status  
Source: South Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Source: South Sioux City Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data  
Source: South Sioux City Operations Center\_Traffic Signal System Destination: South Sioux City Operations Center  
Flow: signal control status

## Object Definitions for Actuated Traffic Signal Controller Units NTCIP 1202

Supports interfaces:

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Source: North Sioux City Operations Center\_Traffic Signal System Destination: North Sioux City Operations Center  
Flow: signal control status  
Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Source: Sioux City Operations Center\_Traffic Signal System Destination: Sioux City Operations Center  
Flow: signal control status  
Source: South Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Source: South Sioux City Operations Center\_Traffic Signal System Destination: South Sioux City Operations Center  
Flow: signal control status

## Object Definitions for Environmental Sensor Stations & Roadside Weather Information System NTCIP 1204

Supports interfaces:

Source: Bridge Conditions Sensors Destination: IADOT District Office Personnel  
Flow: environmental conditions data  
Source: Bridge Conditions Sensors Destination: National Weather Service  
Flow: environmental conditions data

## Data Dictionary for Closed Circuit Television (CCTV) NTCIP 1205

Supports interfaces:

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control  
Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control  
Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control

## Data Collection & Monitoring Devices NTCIP 1206

Supports interfaces:

Source: North Sioux City Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data  
Source: Sergeant Bluff Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data  
Source: South Sioux City Operations Center\_Traffic Signal System Destination: SIMPCO Operational Database  
Flow: roadside archive data

## Object Definitions for Video Switches NTCIP 1208

Supports interfaces:

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control  
Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control  
Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: video surveillance control

## Transportation System Sensor Objects NTCIP 1209

Supports interfaces:

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: traffic sensor control  
Source: North Sioux City Operations Center\_Traffic Signal System Destination: North Sioux City Operations Center  
Flow: traffic flow  
Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: traffic sensor control  
Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: traffic sensor control  
Source: South Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: traffic sensor control

## Objects for Signal Systems Master NTCIP 1210

Supports interfaces:

Source: North Sioux City Operations Center Flow: signal control data	Destination: North Sioux City Operations Center_Traffic Signal System
Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sergeant Bluff Operations Center
Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sioux City Operations Center
Source: North Sioux City Operations Center_Traffic Signal System Flow: signal control status	Destination: North Sioux City Operations Center
Source: Sergeant Bluff Operations Center Flow: traffic control coordination	Destination: North Sioux City Operations Center
Source: Sioux City Operations Center Flow: traffic control coordination	Destination: North Sioux City Operations Center
Source: Sioux City Operations Center Flow: signal control data	Destination: Sioux City Operations Center_Traffic Signal System
Source: Sioux City Operations Center Flow: signal control data	Destination: South Sioux City Operations Center_Traffic Signal System
Source: Sioux City Operations Center_Traffic Signal System Flow: signal control status	Destination: Sioux City Operations Center
Source: South Sioux City Operations Center Flow: traffic control coordination	Destination: North Sioux City Operations Center
Source: South Sioux City Operations Center Flow: signal control data	Destination: South Sioux City Operations Center_Traffic Signal System
Source: South Sioux City Operations Center_Traffic Signal System Flow: signal control status	Destination: South Sioux City Operations Center

## Objects for Signal Control Priority NTCIP 1211

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles	Destination: South Sioux City Operations Center_Traffic Signal System

Flow: local signal preemption request

Source: North Sioux City Operations Center Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

Source: Sioux City Operations Center Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data

Source: Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data

Source: South Sioux City Operations Center Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data

## **NTCIP Center-to-Center Standards Group See Footnotes**

Supports interfaces:

Source: Bridge Conditions Alert System Destination: CARS Central Database  
Flow: ISP coordination

Source: CARS Central Database Destination: Bridge Conditions Alert System  
Flow: ISP coordination

Source: County and Municipal Public Safety Dispatch Destination: CARS Central Database  
Flow: incident information

Source: North Sioux City Operations Center Destination: Sergeant Bluff Operations Center  
Flow: traffic control coordination

Source: North Sioux City Operations Center Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: North Sioux City Operations Center Destination: Sioux City Operations Center  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: North Sioux City Operations Center Destination: South Sioux City Operations Center  
Flow: traffic information coordination

Source: Remote SIMPCO Operational Databases Destination: SIMPCO Operational Database  
Flow: archive coordination

Source: Sergeant Bluff Operations Center Destination: North Sioux City Operations Center  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: Sergeant Bluff Operations Center Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: SIMPCO Operational Database Destination: North Sioux City Operations Center  
Flow: archive requests  
Flow: archive status

Source: SIMPCO Operational Database Destination: Remote SIMPCO Operational Databases  
Flow: archive coordination

Source: SIMPCO Operational Database Destination: Sergeant Bluff Operations Center  
Flow: archive requests  
Flow: archive status

Source: SIMPCO Operational Database Destination: Sioux City Operations Center  
Flow: archive requests  
Flow: archive status

Source: SIMPCO Operational Database Destination: South Sioux City Operations Center  
Flow: archive requests  
Flow: archive status

Source: Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: Sioux City Operations Center Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: South Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: request for road network conditions  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: South Sioux City Operations Center Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: Train Detection Equipment Destination: County and Municipal Public Safety Dispatch  
Flow: incident response coordination

## NTCIP Center-to-Field Standards Group      See Footnotes

Supports interfaces:

Source: Bridge Conditions Sensors      Destination: IADOT District Office Personnel  
Flow: environmental conditions data

Source: Bridge Conditions Sensors      Destination: National Weather Service  
Flow: environmental conditions data

Source: North Sioux City Operations Center      Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control

Source: North Sioux City Operations Center\_Traffic Signal System      Destination: North Sioux City Operations Center  
Flow: signal control status  
Flow: traffic flow

Source: North Sioux City Operations Center\_Traffic Signal System      Destination: SIMPCO Operational Database  
Flow: roadside archive data

Source: Sergeant Bluff Operations Center\_Traffic Signal System      Destination: SIMPCO Operational Database  
Flow: roadside archive data

Source: Sioux City Operations Center      Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control

Source: Sioux City Operations Center      Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control  
Flow: video surveillance control

Source: Sioux City Operations Center\_Traffic Signal System      Destination: Sioux City Operations Center  
Flow: intersection blockage notification  
Flow: signal control status

Source: South Sioux City Operations Center      Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: signal control data  
Flow: traffic sensor control

Source: South Sioux City Operations Center\_Traffic Signal System      Destination: SIMPCO Operational Database  
Flow: roadside archive data

Source: South Sioux City Operations Center\_Traffic Signal System      Destination: South Sioux City Operations Center  
Flow: signal control status

Source: Train Detection Equipment      Destination: North Sioux City Operations Center  
Flow: multimodal crossing status

Source: Train Detection Equipment      Destination: Sergeant Bluff Operations Center  
Flow: multimodal crossing status

Source: Train Detection Equipment      Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: multimodal crossing status

Source: Train Detection Equipment      Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: multimodal crossing status

Source: Train Detection Equipment      Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: multimodal crossing status



## Lead SDO:        **ASTM**

### **Standard Specification for 5.9 GHz Data Link Layer**

### **ASTM 5 GHz Data Link**

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System
Source: Sioux City Emergency Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: Sioux City Emergency Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: Sioux City Emergency Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: Sioux City Emergency Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System

### **Standard Specification for 5.9 GHz Physical Layer ASTM 5 GHz Phys**

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System

Source: County Sherrif and Municipal Police Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

## ADMS Data Dictionary Specifications ASTM DD 17.54.00.2

Supports interfaces:

Source: North Sioux City Operations Center Destination: SIMPCO Operational Database  
 Flow: traffic archive data

Source: Sergeant Bluff Operations Center Destination: SIMPCO Operational Database  
 Flow: traffic archive data

Source: Sioux City Operations Center Destination: SIMPCO Operational Database  
 Flow: traffic archive data

Source: South Sioux City Operations Center Destination: SIMPCO Operational Database  
 Flow: traffic archive data

## Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control ASTM PS 105-99

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County and Municipal Fire Rescue Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: County Sherrif and Municipal Police Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
 Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

## **Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz ASTM PS 111-98**

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles

Flow: local signal preemption request

Destination: North Sioux City Operations Center\_Traffic Signal System

Source: County and Municipal Fire Rescue Vehicles

Flow: local signal preemption request

Destination: Sergeant Bluff Operations Center\_Traffic Signal System

Source: County and Municipal Fire Rescue Vehicles

Flow: local signal preemption request

Destination: Sioux City Operations Center\_Traffic Signal System

Source: County and Municipal Fire Rescue Vehicles

Flow: local signal preemption request

Destination: South Sioux City Operations Center\_Traffic Signal System

Source: County Sherrif and Municipal Police Vehicles

Flow: local signal preemption request

Destination: North Sioux City Operations Center\_Traffic Signal System

Source: County Sherrif and Municipal Police Vehicles

Flow: local signal preemption request

Destination: Sergeant Bluff Operations Center\_Traffic Signal System

Source: County Sherrif and Municipal Police Vehicles

Flow: local signal preemption request

Destination: Sioux City Operations Center\_Traffic Signal System

Source: County Sherrif and Municipal Police Vehicles

Flow: local signal preemption request

Destination: South Sioux City Operations Center\_Traffic Signal System

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System

Flow: local signal preemption request

## **Standard for Public Safety IMMS for use by EMCs IEEE P1512.2**

Supports interfaces:

Source: Train Detection Equipment Destination: County and Municipal Public Safety Dispatch

Flow: incident response coordination

## Standard for Hazardous Material IMMS for use by EMCs IEEE P1512.3

Supports interfaces:

Source: Train Detection Equipment      Destination: County and Municipal Public Safety Dispatch  
Flow: incident response coordination

## Standard for Emergency Management Data Dictionary IEEE P1512.a

Supports interfaces:

Source: County and Municipal Public Safety Dispatch      Destination: CARS Central Database  
Flow: incident information  
Source: Train Detection Equipment      Destination: County and Municipal Public Safety Dispatch  
Flow: incident response coordination

## Standard for Common Incident Management Message Sets (IMMS) for use by EMCs IEEE P1512-2000

Supports interfaces:

Source: County and Municipal Public Safety Dispatch      Destination: CARS Central Database  
Flow: incident information  
Source: Train Detection Equipment      Destination: County and Municipal Public Safety Dispatch  
Flow: incident response coordination

## Security/Privacy of Vehicle/RS Communications including Smart Card Communications IEEE P1556

Supports interfaces:

Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County and Municipal Fire Rescue Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: North Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: Sioux City Operations Center_Traffic Signal System
Source: County Sherrif and Municipal Police Vehicles Flow: local signal preemption request	Destination: South Sioux City Operations Center_Traffic Signal System

Source: Sioux City Emergency Vehicles Destination: North Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request  
Source: Sioux City Emergency Vehicles Destination: Sergeant Bluff Operations Center\_Traffic Signal System  
Flow: local signal preemption request  
Source: Sioux City Emergency Vehicles Destination: Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request  
Source: Sioux City Emergency Vehicles Destination: South Sioux City Operations Center\_Traffic Signal System  
Flow: local signal preemption request

## **Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection IEEE P1570**

Supports interfaces:

Source: Railroad Crossing Alert Flow: hri operational status	Destination: Train Detection Equipment
Source: Train Detection Equipment Flow: track status	Destination: North Sioux City Operations Center_Traffic Signal System
Source: Train Detection Equipment Flow: track status	Destination: Railroad Crossing Alert
Source: Train Detection Equipment Flow: track status	Destination: Sergeant Bluff Operations Center_Traffic Signal System
Source: Train Detection Equipment Flow: track status	Destination: South Sioux City Operations Center_Traffic Signal System

## Lead SDO: ITE

### Standard for Functional Level Traffic Management Data Dictionary (TMDD) ITE TM 1.03

Supports interfaces:

Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sergeant Bluff Operations Center
Source: North Sioux City Operations Center Flow: traffic archive data	Destination: SIMPCO Operational Database
Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sioux City Operations Center
Source: North Sioux City Operations Center Flow: traffic information coordination	Destination: South Sioux City Operations Center
Source: Sergeant Bluff Operations Center Flow: traffic control coordination Flow: traffic information coordination	Destination: North Sioux City Operations Center
Source: Sergeant Bluff Operations Center Flow: traffic archive data	Destination: SIMPCO Operational Database
Source: Sioux City Operations Center Flow: traffic control coordination Flow: traffic information coordination	Destination: North Sioux City Operations Center
Source: Sioux City Operations Center Flow: traffic archive data	Destination: SIMPCO Operational Database
Source: South Sioux City Operations Center Flow: request for road network conditions Flow: traffic control coordination Flow: traffic information coordination	Destination: North Sioux City Operations Center
Source: South Sioux City Operations Center Flow: traffic archive data	Destination: SIMPCO Operational Database

### Message Sets for External TMC Communication (MS/ETMCC) ITE TM 2.01

Supports interfaces:

Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sergeant Bluff Operations Center
Source: North Sioux City Operations Center Flow: traffic archive data	Destination: SIMPCO Operational Database
Source: North Sioux City Operations Center Flow: traffic control coordination	Destination: Sioux City Operations Center
Source: North Sioux City Operations Center Flow: traffic information coordination	Destination: South Sioux City Operations Center
Source: Sergeant Bluff Operations Center Flow: traffic control coordination Flow: traffic information coordination	Destination: North Sioux City Operations Center

Source: Sergeant Bluff Operations Center      Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: Sioux City Operations Center      Destination: North Sioux City Operations Center  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: Sioux City Operations Center      Destination: SIMPCO Operational Database  
Flow: traffic archive data

Source: South Sioux City Operations Center      Destination: North Sioux City Operations Center  
Flow: request for road network conditions  
Flow: traffic control coordination  
Flow: traffic information coordination

Source: South Sioux City Operations Center      Destination: SIMPCO Operational Database  
Flow: traffic archive data

**Lead SDO: SAE**

**Data Dictionary for Advanced Traveler Information System (ATIS) SAE J2353**

Supports interfaces:

- Source: Bridge Conditions Alert System Destination: CARS Central Database  
Flow: ISP coordination
- Source: CARS Central Database Destination: Bridge Conditions Alert System  
Flow: ISP coordination
- Source: South Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: request for road network conditions

**Message Set for Advanced Traveler Information System (ATIS) SAE J2354**

Supports interfaces:

- Source: Bridge Conditions Alert System Destination: CARS Central Database  
Flow: ISP coordination
- Source: CARS Central Database Destination: Bridge Conditions Alert System  
Flow: ISP coordination
- Source: South Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: request for road network conditions

**Rules for Standardizing Street Names and Route IDs SAE J2529**

Supports interfaces:

- Source: Bridge Conditions Alert System Destination: CARS Central Database  
Flow: ISP coordination
- Source: CARS Central Database Destination: Bridge Conditions Alert System  
Flow: ISP coordination
- Source: South Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: request for road network conditions



## Messages for Handling Strings and Look-Up Tables in ATIS Standards

SAE J2540

Supports interfaces:

Source: Bridge Conditions Alert System Destination: CARS Central Database  
Flow: ISP coordination

Source: CARS Central Database Destination: Bridge Conditions Alert System  
Flow: ISP coordination

Source: South Sioux City Operations Center Destination: North Sioux City Operations Center  
Flow: request for road network conditions