Florida Department of Transportation District One

Basis for Changes to the FDOT District One, Five and Seven RITSAs

December 9, 2013

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Changes to FDOT District One, Five and Seven Regional Intelligent Transportation System Architectures (RITSAs) to Incorporate the I-4 Polk County Fog Detection Project

1.0 Introduction

This document is to serve as the basis for updating the District One RITSA to enable the I-4 Polk County Fog Detection Project to adhere to the RITSA. In preparing this document, research has been conducted into the Nationwide, Statewide and District One existing ITS Architectures.

2.0 Project Specific Information

The I-4 Polk County Fog Detection Project is being installed along the Interstate Four corridor within Polk County, Florida as a means of collecting and distributing visibility information throughout this corridor. This area is known for its propensity for being a low lying collection area for dense fog and smoke. This condition has led to several accidents within the corridor including the January 2008 seventy car pileup which killed five people and wounded 37 others. The real-time data collection and processing will be sent to the District Seven Traffic Management Center to be disseminated to motorists in approach of and within the corridor to notify them of degraded visibility and where they can expect these conditions.

3.0 Geographical Restrictions

The I-4 corridor runs east and west through Polk County between Orlando and Tampa. Polk County is the only county along the I-4 corridor which lies within the District One boundaries. Therefore, the District One ITS Section is responsible for instrumenting the Polk County I-4 corridor with devices, but does not have an existing TMC to manage the system. The system is managed by District Seven west of US 27 and District Five east of US 27. There may be a possible future connection to the District One Headquarters building in Bartow, but it is unknown at this time when or even if this connection will occur.

Figure 1: Map of FDOT Districts
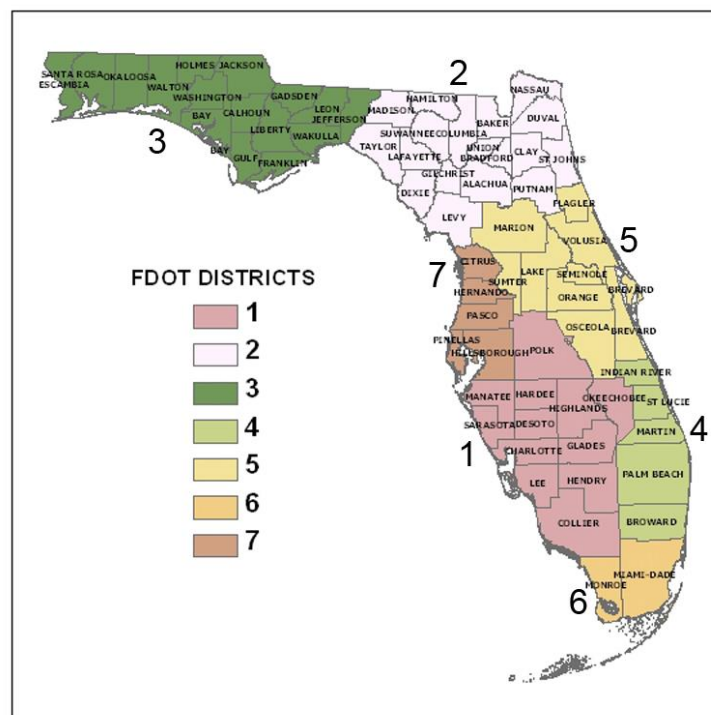
4.0 ITS Architecture

The National ITS Architecture (NITSA) includes all available Service Packages and data flows available to all States and Agencies working under the ITS Architecture. The Service Packages are categorized under various Service Areas, such as Commercial Vehicle Operations, Emergency Management, and Maintenance and Construction Management, as shown below. The various Service Packages detail the functions, entities/subsystems and information/data flows for specific services of an ITS System, such as Road Weather Data Collection or Weather Information Processing and Distribution, in this case. Within the Service Package is a detailed description of what the Service Package is, what services it performs, and what benefits it provides, as well as data flows, goals and objectives, ITS applications, and more.

Figure 2: Sample Service Packages

The Statewide ITS Architecture (SITSA) uses only the Service Areas and Service Packages relevant within the State or as mandated by FDOT within the state. A Regional ITS Architecture (RITSA) further draws down the number of Service Areas and/or Service Packages to only those relevant to the region. On occasion, a SITSA or RITSA must be updated due to new technology, a change in direction by leadership or simply an addition of a previously undefined aspect of a project. In this case, the RITSA must be updated due to the need to include District Seven and District Five in the operation of the project due to communications constraints and geographic restrictions.

5.0 District One RITSA

The District One RITSA was updated on August 18, 2008. As written, the RITSA includes all Service Packages required by the I-4 Polk County Fog Detection Project. However, when reviewing Service Packages *MC03 Road Weather Data Collection* and *MC04 Weather Information Processing and Distribution,* it was noted there are no data flows which include the road weather information going from the District One field equipment to the District Seven TMC for processing and distributing the data. Therefore, it is necessary to update the District One RITSA to include these information flows within the MC03 and MC04 Service Packages. Further investigation into the Districts One, Five and Seven RITSAs revealed several areas of each RITSA which need to be addressed to correctly detail the existing as well as the future operational relationships once the Polk County Fog Detection System is in place. The various required RITSA changes are detailed below for Districts One, Five and Seven.

6.0 District One Required Changes

a) District One is requesting an update of the existing portion of the FDOT District Seven portion of the District One RITSA to include ATMS01 Network Surveillance Service Package – I-4 with the associated data flow as shown below.
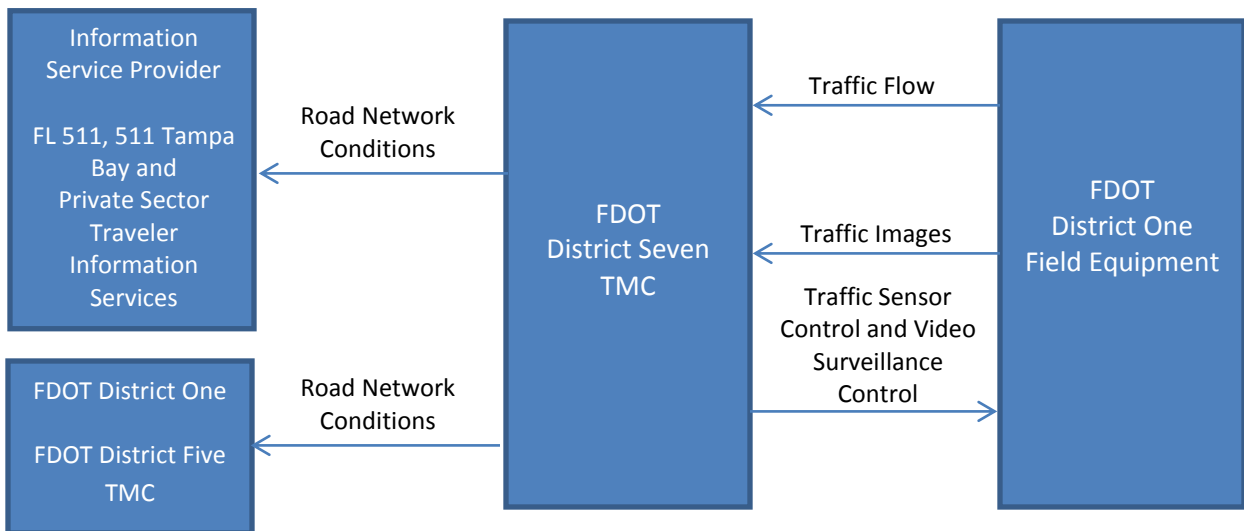
b) District One is requesting an update of the existing portion of the FDOT District Seven portion of the District One RITSA to include ATMS06 Traffic Information Dissemination Package – I-4 with the associated data flow as shown below.
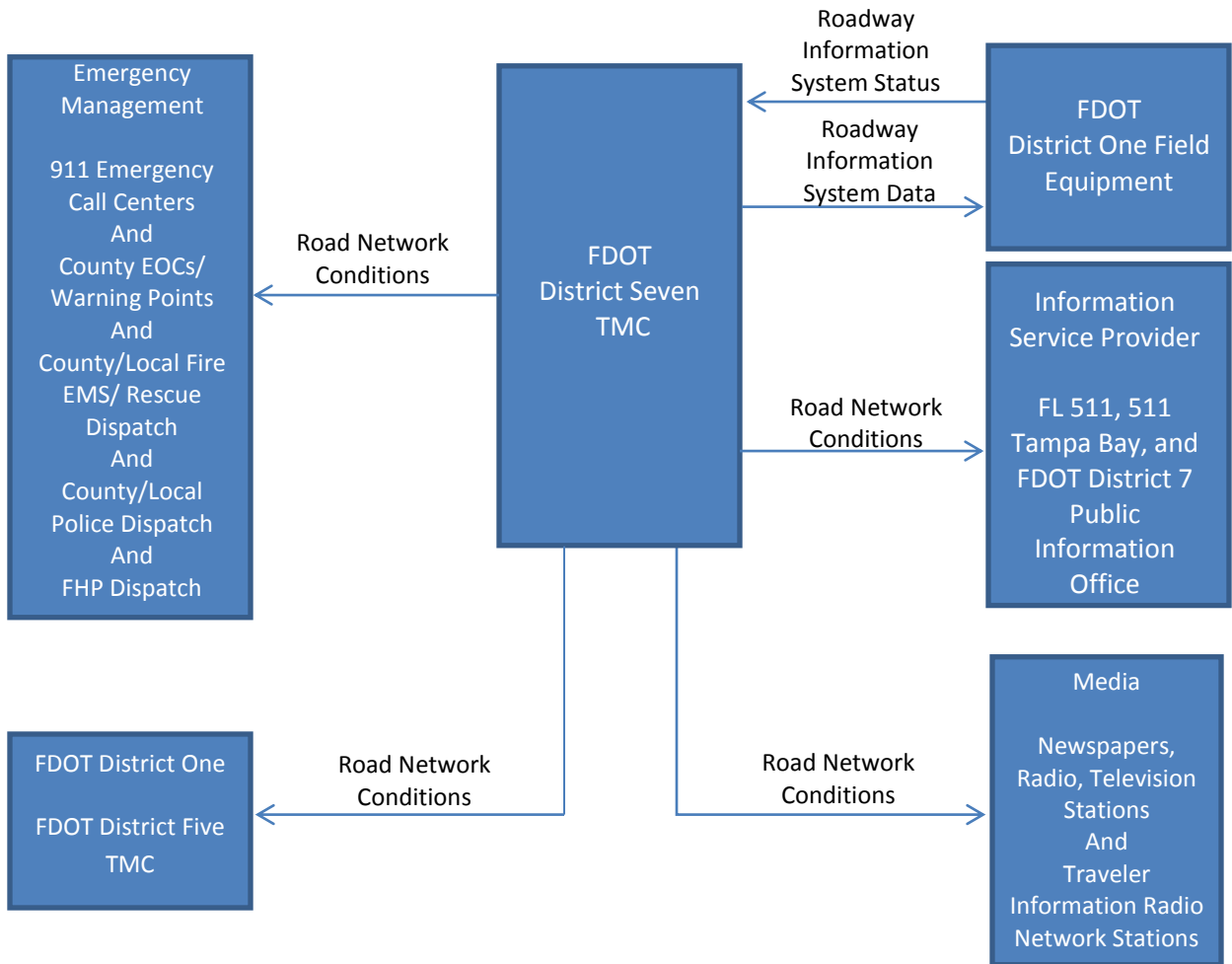
c) District One is requesting an update of the District One Service Package MC03 Road Weather Data Collection to include a data flow chart which depicts environmental sensor control originating at the District Seven TMC and terminating at the FDOT District One Field Equipment and also depicts environmental conditions data originating from the FDOT District One Field Equipment and terminating at the District Seven TMC. This data flow is shown below.

d) District One is requesting an update of the District One Service Package MC04 Weather Processing and Distribution to include a data flow chart which depicts the District Seven TMC distributing road weather information to field devices located on I-4 within Polk County and in advance of Polk County when needed to provide weather information to motorists in advance of areas with degraded visibility. The data flow chart must also show the District Seven TMC distributing road weather information and operational responses to District One for their use in tracking the benefits and performance of the system. This data flow is shown below.

| FDOT District One Field Equipment on I-4 in Polk County | ← Road Weather Information | FDOT District Seven TMC | Road Weather Information → | FDOT District One / FDOT District Five TMC |

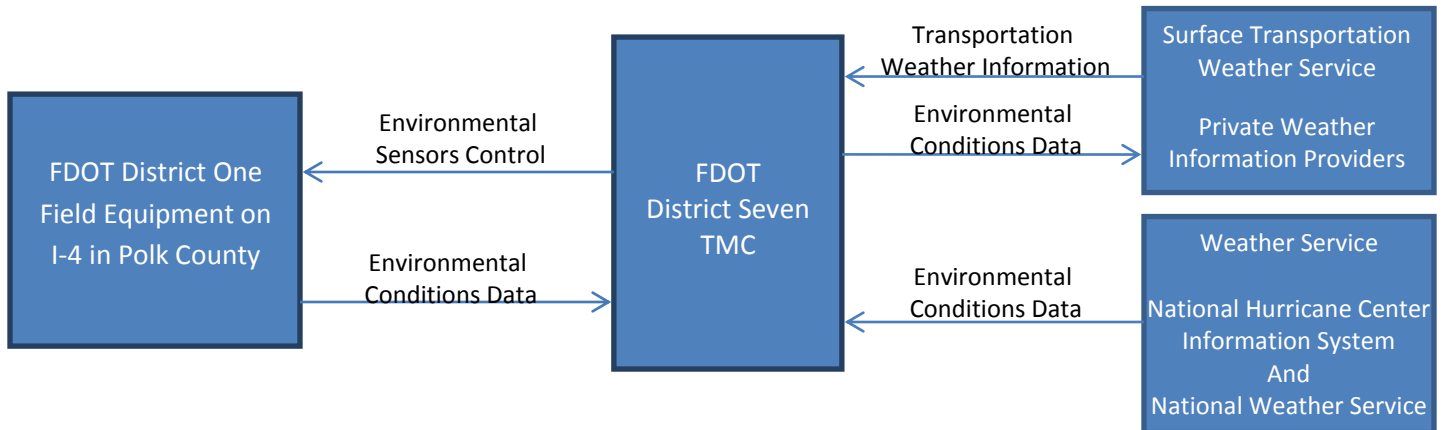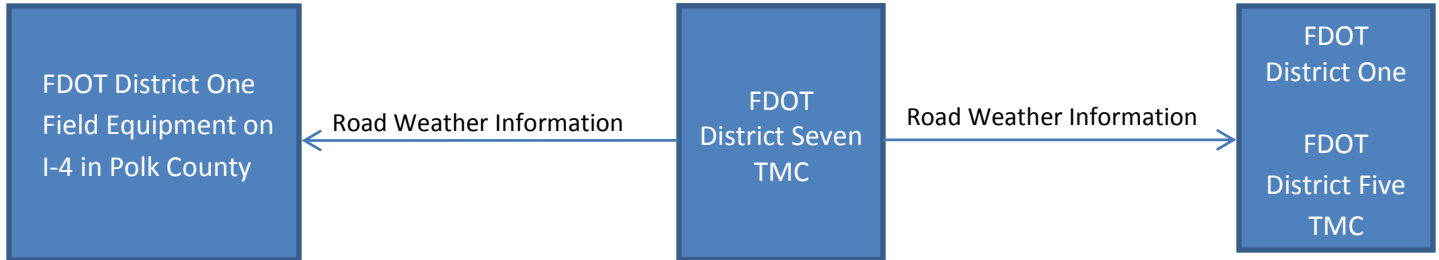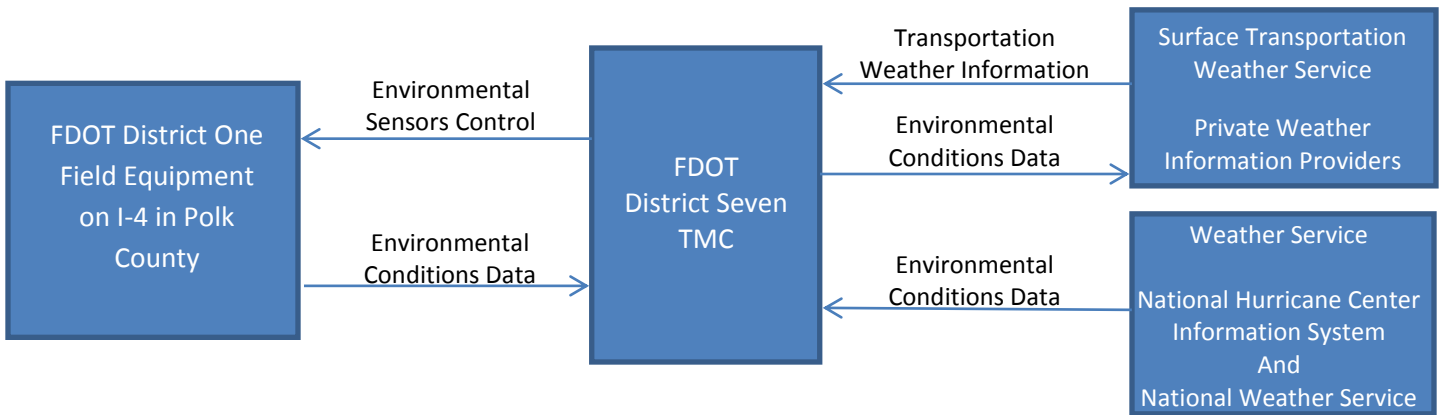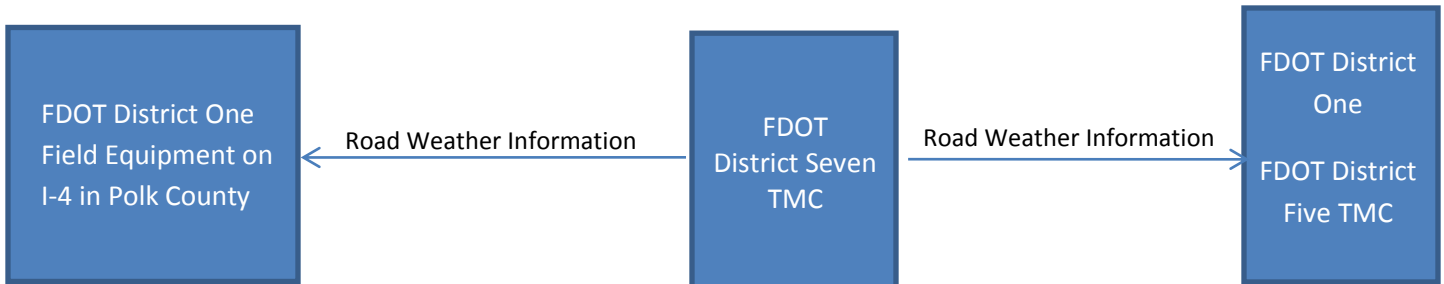e) District One is requesting an update of the existing FDOT District Seven portion of the District One RITSA to include the MC03 Road Weather Data Collection Service Package. The associated data flow is shown below.

| FDOT District One Field Equipment on I-4 in Polk County | | FDOT District Seven TMC | | Surface Transportation Weather Service / Private Weather Information Providers |

- ← Environmental Sensors Control
- Environmental Conditions Data →
- ← Transportation Weather Information
- Environmental Conditions Data →
- ← Environmental Conditions Data (Weather Service / National Hurricane Center Information System And National Weather Service)

f) District One is requesting an update of the existing FDOT District Seven portion of the District One RITSA to include the MC04 Weather Processing and Distribution Service Package. The associated data flow is shown below.

| FDOT District One Field Equipment on I-4 in Polk County | ← Road Weather Information | FDOT District Seven TMC | Road Weather Information → | FDOT District One / FDOT District Five TMC |

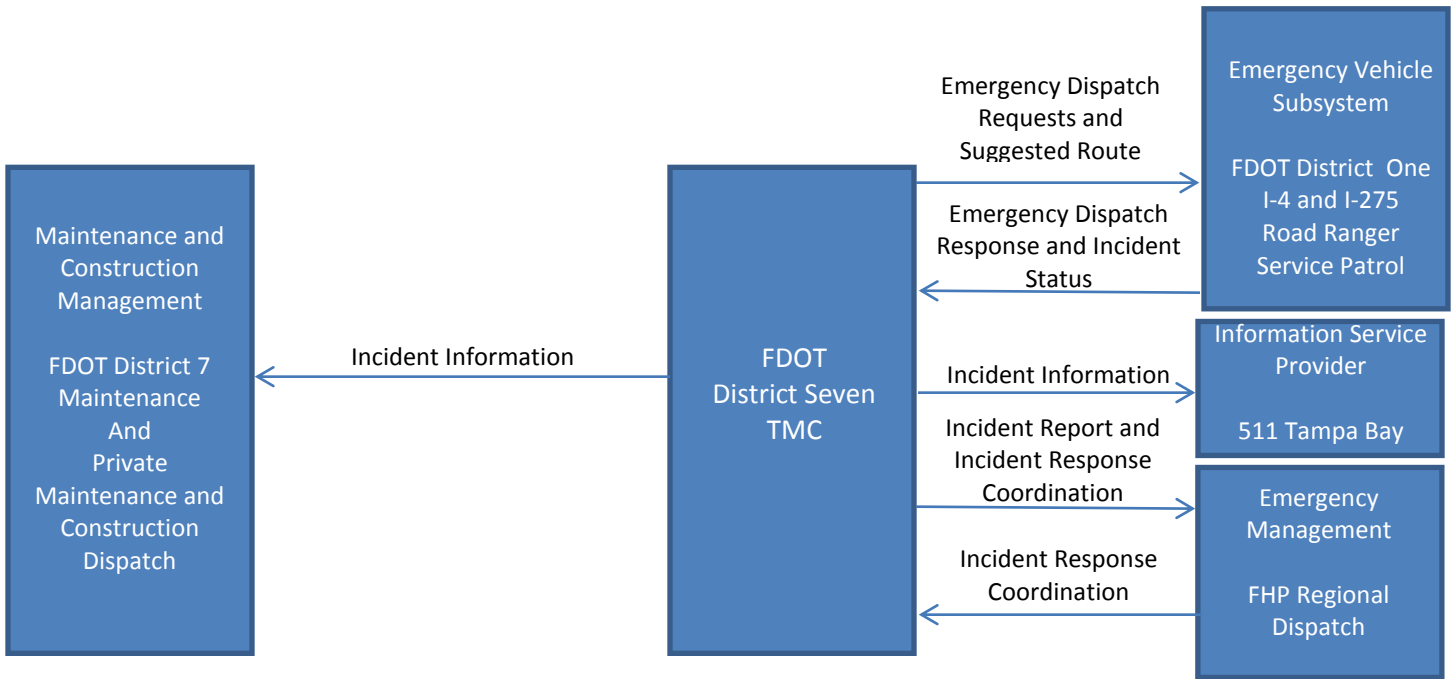g) District One is requesting an update of the existing FDOT District Seven Portion of the District One RITSA to include the EM04 Roadway Service Patrol Service Package. The associated data flow is shown below.

h) District One is requesting that District Five be added to the District One RITSA with the following Service Packages: ATMS01 Network Surveillance, ATMS06 Traffic Information Dissemination, MC03 Road Weather Data Collection and MC04 Weather Information Processing and Distribution.

i) District One is requesting that the new District Five portion of the RITSA include ATMS01 Network Surveillance Service Package with the associated data flow as shown below.

j) District One is requesting that the new District Five portion of the RITSA include ATMS06 Traffic Information Dissemination Package with the associated data flow as shown below.

Diagram 1

Emergency Management 911 Emergency Call Centers And County EOCs/ Warning Points And County/Local Fire EMS/ Rescue Dispatch And County/Local Police Dispatch And FHP Dispatch	**FDOT District Five TMC**	**FDOT District One Field Equipment**

Roadway Information System Status →(to FDOT District Five TMC)
Roadway Information System Data →(to FDOT District One Field Equipment)

Road Network Conditions →(to Emergency Management)

Road Network Conditions →(to Information Service Provider — FL 511 And FDOT District 5 Public Information Office)

FDOT District One / FDOT District Seven TMC
Road Network Conditions →(to FDOT District One / FDOT District Seven TMC)

Road Network Conditions →(to Media — Newspapers, Radio, Television Stations And Traveler Information Radio Network Stations)

k) District One is requesting the new District Five portion of the District One RITSA include MCO3 Road Weather Data Collection Package with the associated data flow as shown below.

Diagram 2

FDOT District One Field Equipment on I-4 in Polk County
Environmental Sensors Control →
Environmental Conditions Data →

FDOT District Seven TMC

Transportation Weather Information ←(from Surface Transportation Weather Service)
Environmental Conditions Data →(to Surface Transportation Weather Service / Private Weather Information Providers)

Weather Service — National Hurricane Center Information System And National Weather Service
Environmental Conditions Data →(to FDOT District Seven TMC)

Environmental Conditions Data →(to FDOT District One / FDOT District Five TMC)

l) District One is requesting the new District Five portion of the District One RITSA include MC04 Weather Information Processing and Dissemination Package with the associated data flow as shown below.
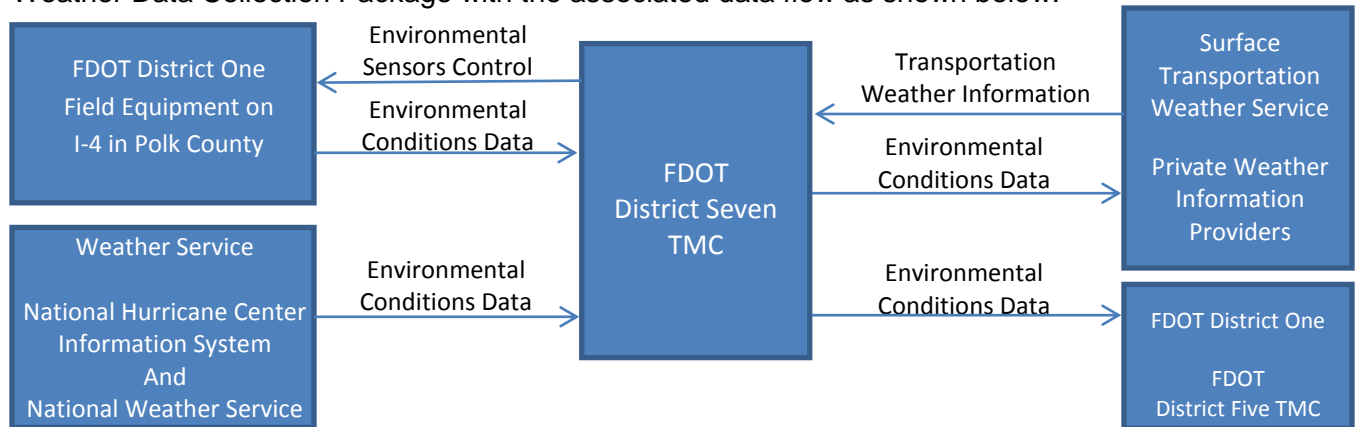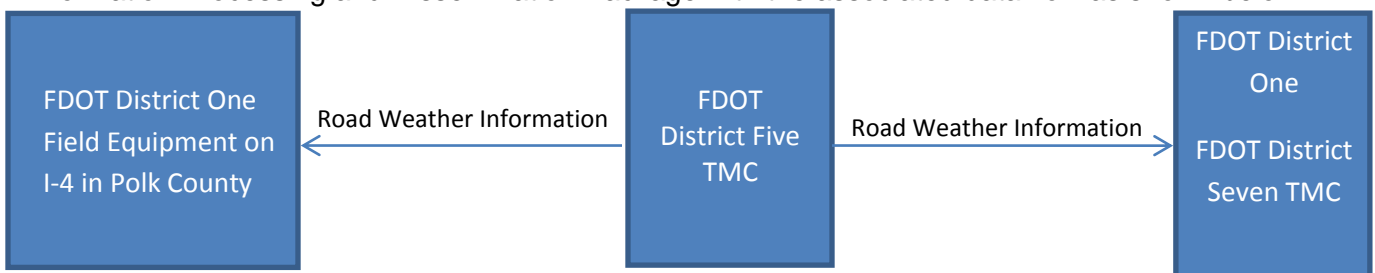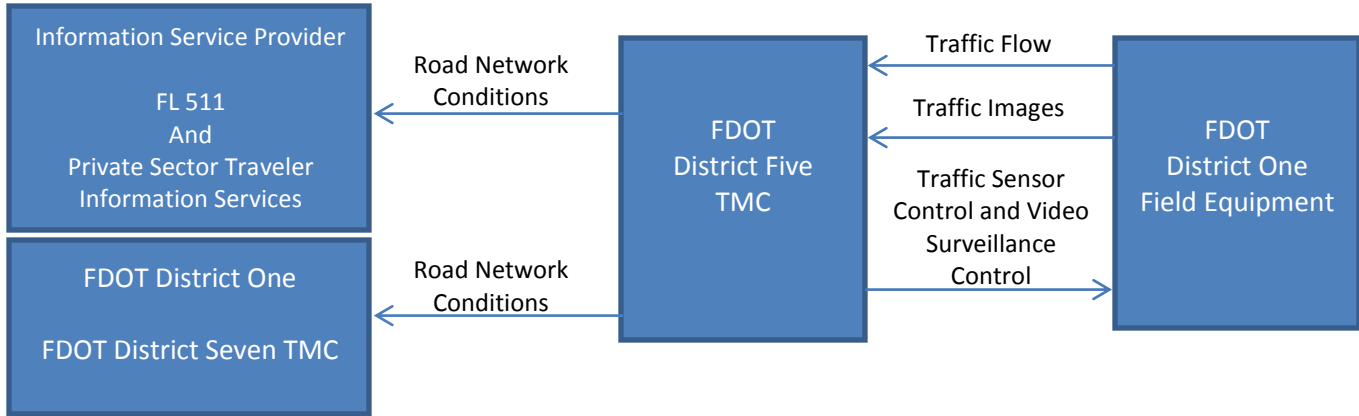
Diagram 3

FDOT District One Field Equipment on I-4 in Polk County ← Road Weather Information ← **FDOT District Five TMC** → Road Weather Information → **FDOT District One / FDOT District Seven TMC**
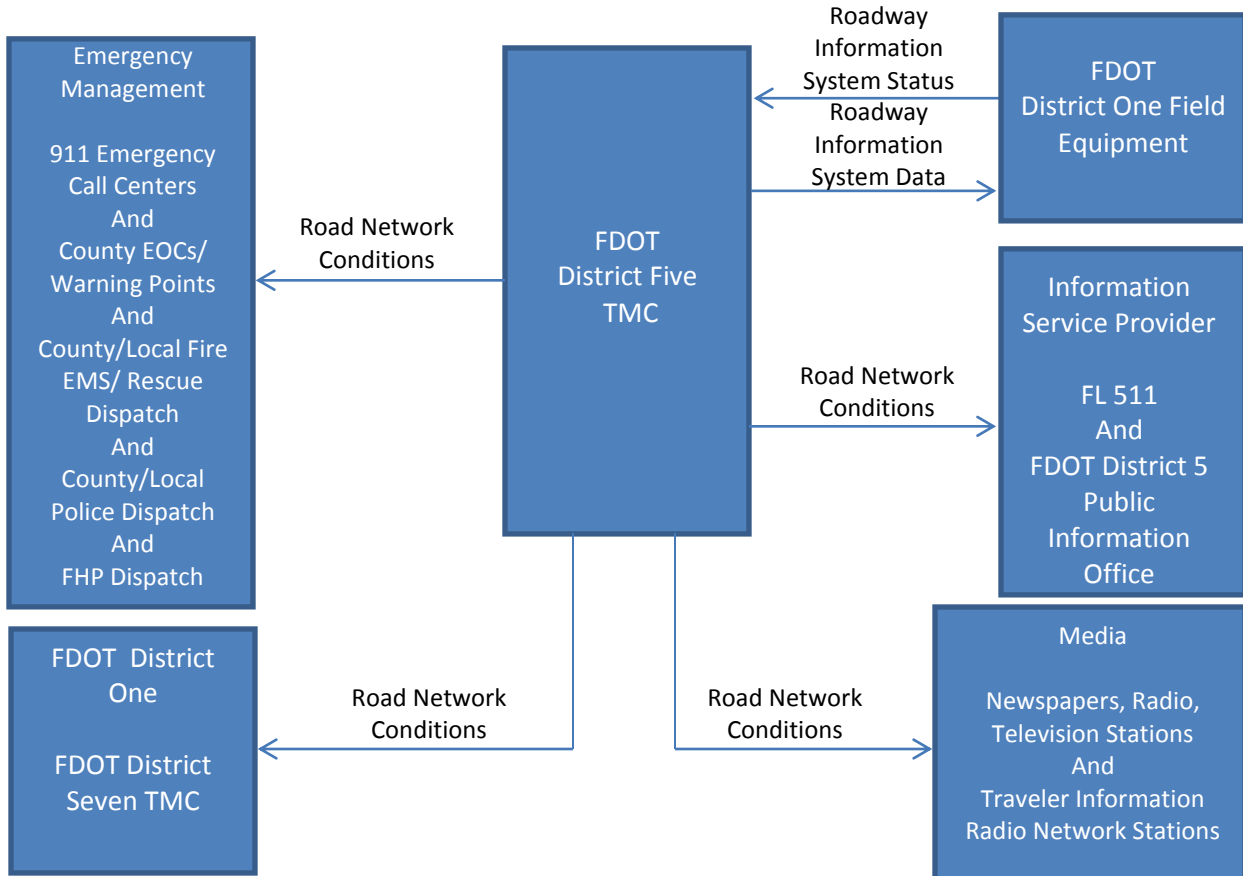
7.0 District Five Required Changes

The District Five RITSA was updated on September 1, 2009 and does not include District One. In speaking with Central Office regarding the need to update District Five's RITSA, it was agreed that the District Five RITSA should be updated if they are operating or receiving data directly from District One devices. This was discussed during a teleconference on September 19, 2013, which included personnel from Districts 1, 5, and 7. During the teleconference it was agreed that District Five should have District One included in their RITSA with the following Service Packages: ATMS01 Network Surveillance, ATMS06 Traffic Information Dissemination, MC03 Road Weather Data Collection and MC04 Weather Information Processing and Distribution.

a) District One is requesting that the new District One portion of the District Five RITSA include ATMS01 Network Surveillance Service Package with the associated data flow as shown below.
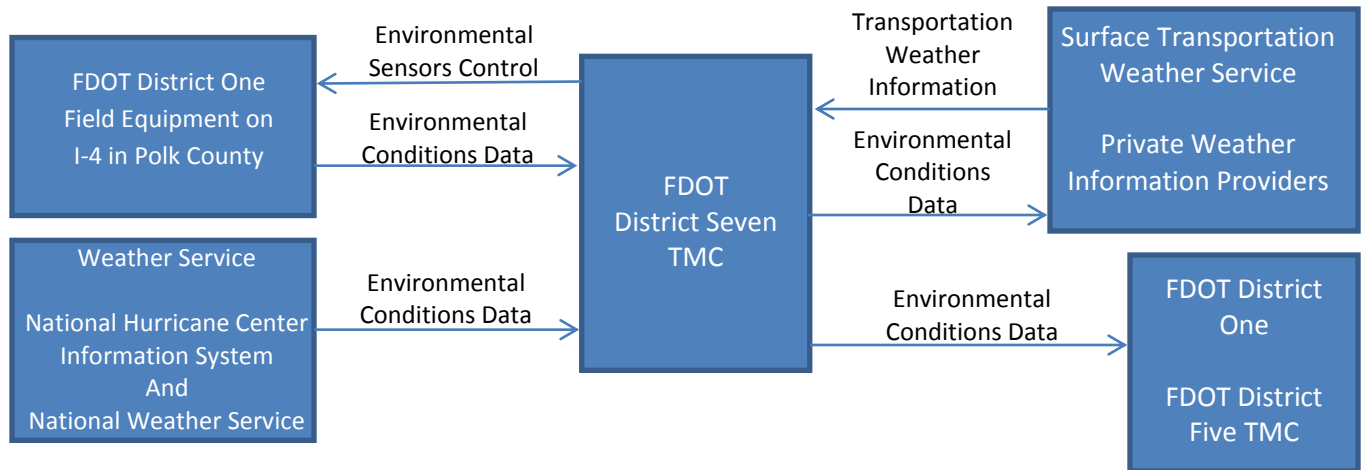

b) District One is requesting that the new District One portion of the District Five RITSA include ATMS06 Traffic Information Dissemination Package with the associated data flow as shown below.
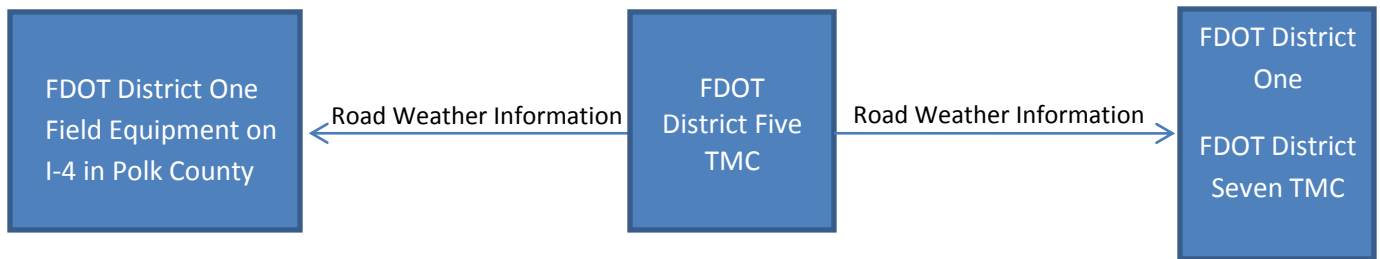
c) District One is requesting the new District One portion of the District Five RITSA include MCO3 Road Weather Data Collection Package with the associated data flow as shown below.

d) District One is requesting the new District One portion of the District Five RITSA include MC04 Weather Information Processing and Dissemination Package with the associated data flow as shown below.
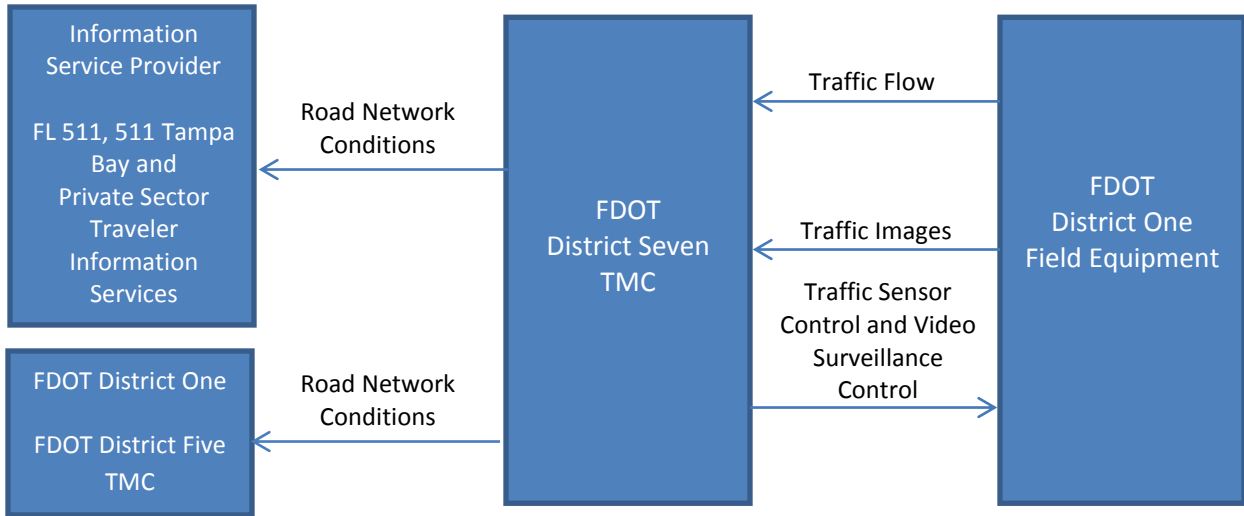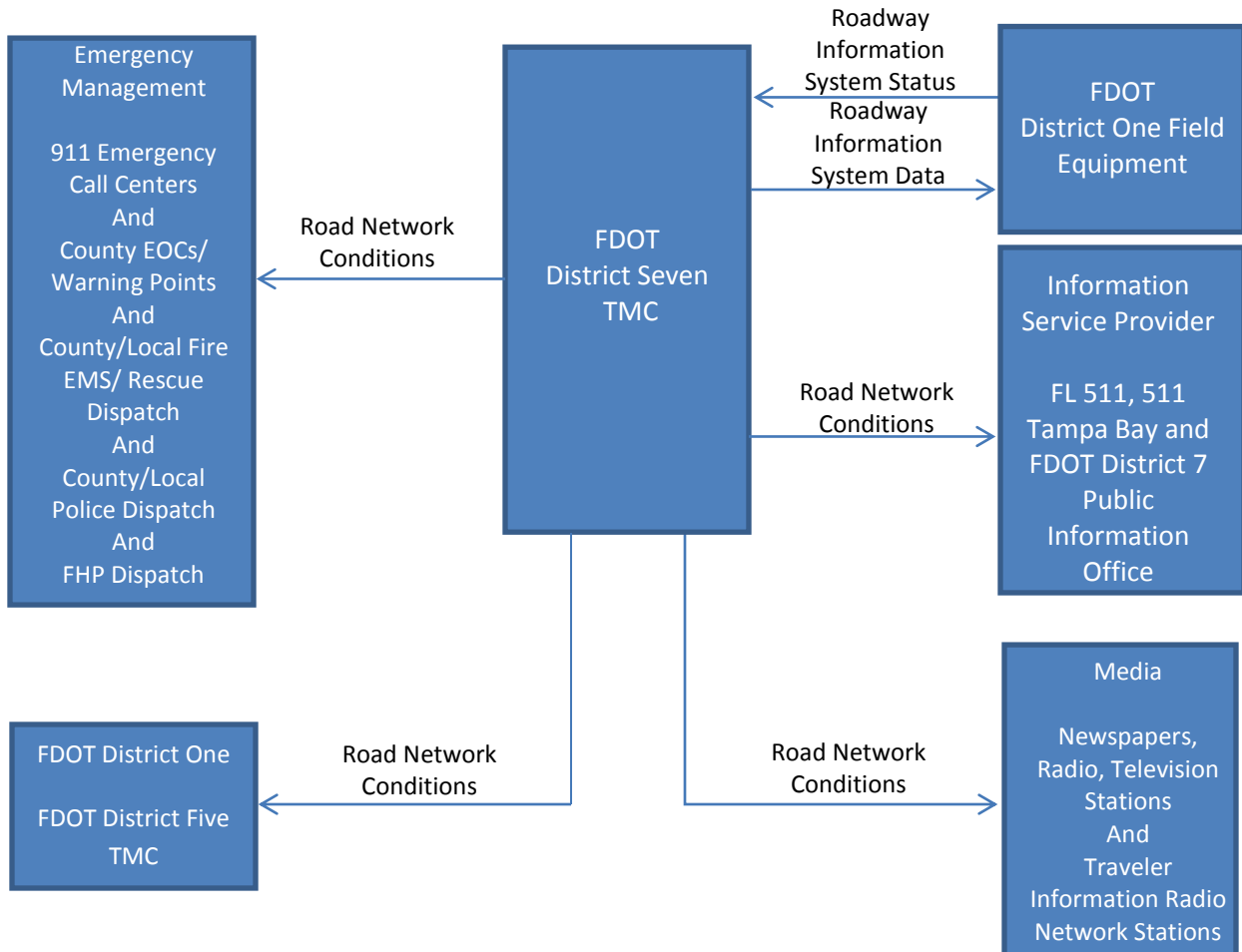

8.0 District Seven Required Changes

The District Seven RITSA was updated on March 16, 2006 and does not include District One. In speaking with Central Office regarding the need to update District Seven's RITSA, it was agreed that the District Seven RITSA should be updated if they are operating or receiving data directly from District One devices. This was discussed during a teleconference on September 19, 2013, which included personnel from Districts One, Five, and Seven. During the teleconference it was agreed District Seven should have District One included in their RITSA with the following Service Packages: ATMS01 Network Surveillance, ATMS06 Traffic Information Dissemination, MC03 Road Weather Data Collection and MC04 Weather Information Processing and Distribution.

a) District One is requesting that the new District One portion of the District Seven RITSA include ATMS01 Network Surveillance Service Package with the associated data flow as shown below.
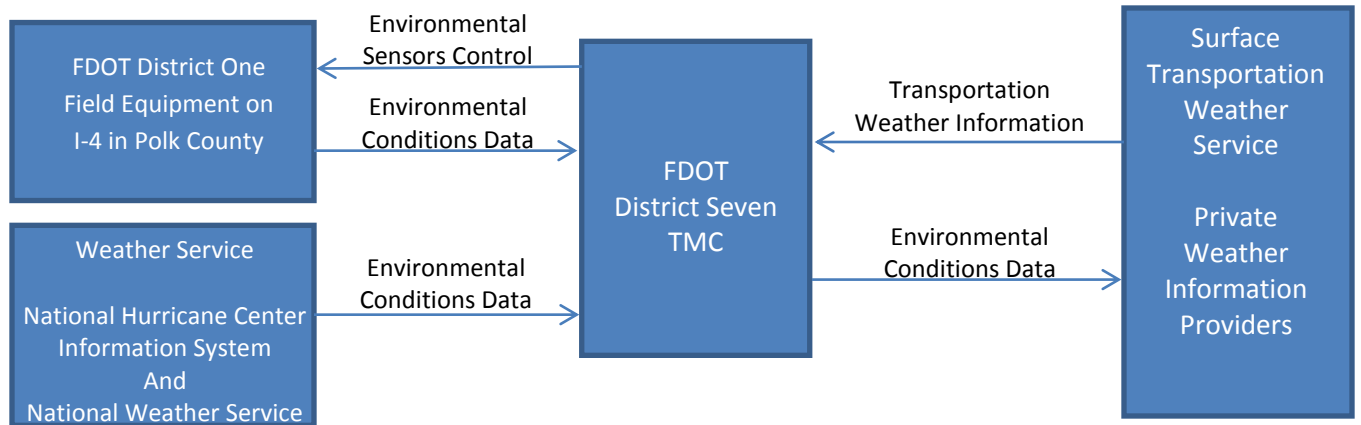
| Information Service Provider — FL 511, 511 Tampa Bay and Private Sector Traveler Information Services | ← Road Network Conditions | FDOT District Seven TMC | ← Traffic Flow — ← Traffic Images — Traffic Sensor Control and Video Surveillance Control → | FDOT District One Field Equipment |
| FDOT District One / FDOT District Five TMC | ← Road Network Conditions | | | |

b) District One is requesting that the new District One portion of the District Seven RITSA include ATMS06 Traffic Information Dissemination Package with the associated data flow as shown below.
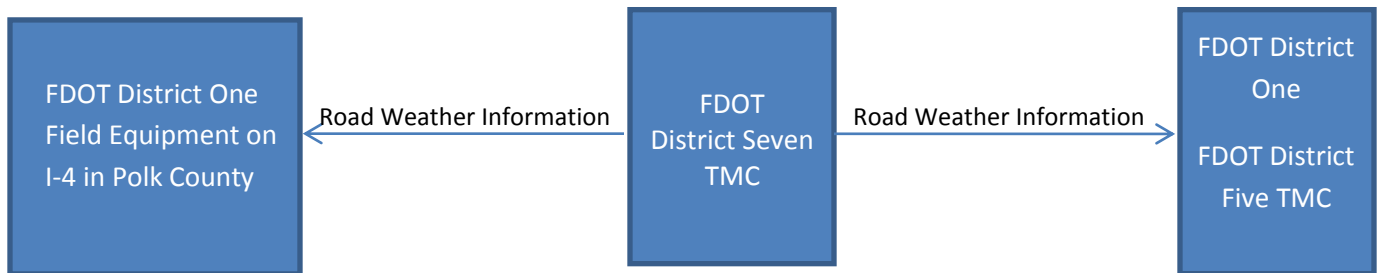
| Emergency Management — 911 Emergency Call Centers And County EOCs/ Warning Points And County/Local Fire EMS/ Rescue Dispatch And County/Local Police Dispatch And FHP Dispatch | ← Road Network Conditions | FDOT District Seven TMC | Roadway Information System Status ← — Roadway Information System Data → | FDOT District One Field Equipment |
| | | | Road Network Conditions → | Information Service Provider — FL 511, 511 Tampa Bay and FDOT District 7 Public Information Office |
| FDOT District One / FDOT District Five TMC | ← Road Network Conditions | | Road Network Conditions → | Media — Newspapers, Radio, Television Stations And Traveler Information Radio Network Stations |

c) District One is requesting the new District One portion of the District Seven RITSA include MCO3 Road Weather Data Collection Package with the associated data flow as shown below.

d) District One is requesting the new District One portion of the District Seven RITSA include MC04 Weather Information Processing and Dissemination Package with the associated data flow as shown below.

e) District One is requesting the new District One Portion of the District Seven RITSA include the EM04 Roadway Service Patrol Package with the associated data flow as shown below.
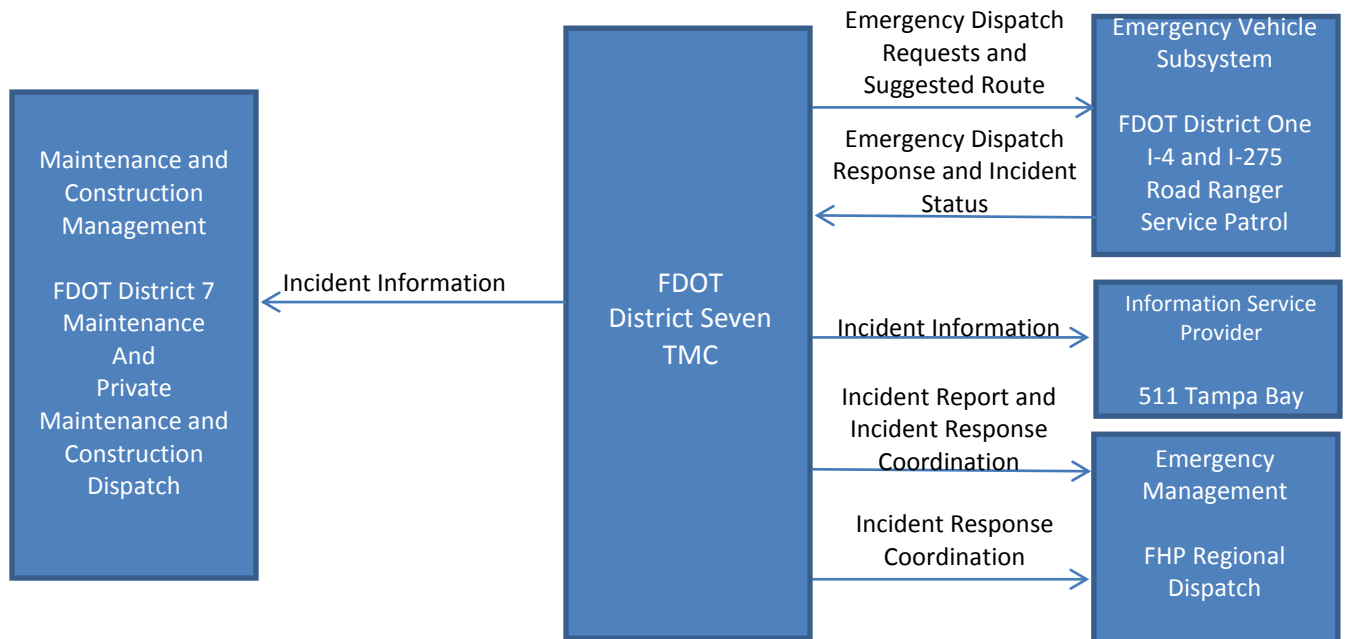
9.0 Conclusion

The updates to Service Packages detailed within this document are required to not only ensure the Polk County Fog Detection System Project is included within the District One RITSA, but to also include the applicable FDOT Districts and Service Packages to detail the operational relationships between Districts One, Five, and Seven. Once these updates are performed, District One will be able to continue with the development of the project and work toward realization of the Polk County Fog Detection System.