

2017

**Dixie MPO
ITS Architecture**

Completed by:

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For:

**The Utah Department of
Transportation**

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Purpose & Need

The purpose of developing this regional ITS architecture for the Dixie MPO is to meet the minimum requirements for implementing section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21), Public Law 105-178, 112 Stat. 457, pertaining to conformance with the National Intelligent Transportation Systems Architecture and Standards.

A check list of these requirements is provided in Table 1, below. As noted, all requirements have been met by this updated architecture and its accompanying RAD-IT architecture file.

Table 1 ITS Architecture Minimum Requirements

ITS Architecture and Standards (https://ops.fhwa.dot.gov/its_arch_imp/policy_1.htm#940_9)

940.9 Regional ITS Architecture		
Section	Criteria/Question	Compliance
	The regional ITS architecture shall include, at a minimum, the following:	
d. 1.	A description of the region;	Yes
d. 2.	Identification of participating agencies and other stakeholders;	Yes
d. 3.	An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture;	Yes
d. 4.	Any agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture;	Yes
d. 5.	System functional requirements	Yes
d. 6.	Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture);	Yes
d. 7.	Identification of ITS standards supporting regional and national interoperability; and	Yes
d. 8.	The sequence of projects required for implementation.	Yes (See Note 1)

Note-1: While this item is addressed in the content of this Regional Architecture, a list of projects is not provided within this report. See "Sequence of Projects" on Page-20 for more details.

Regional Description

The Dixie Metropolitan Planning Organization (MPO) consists of the major metropolitan center in St. George and the surrounding communities from Ivins to La Verkin.

The boundaries of this MPO area are shown in Figure 1.

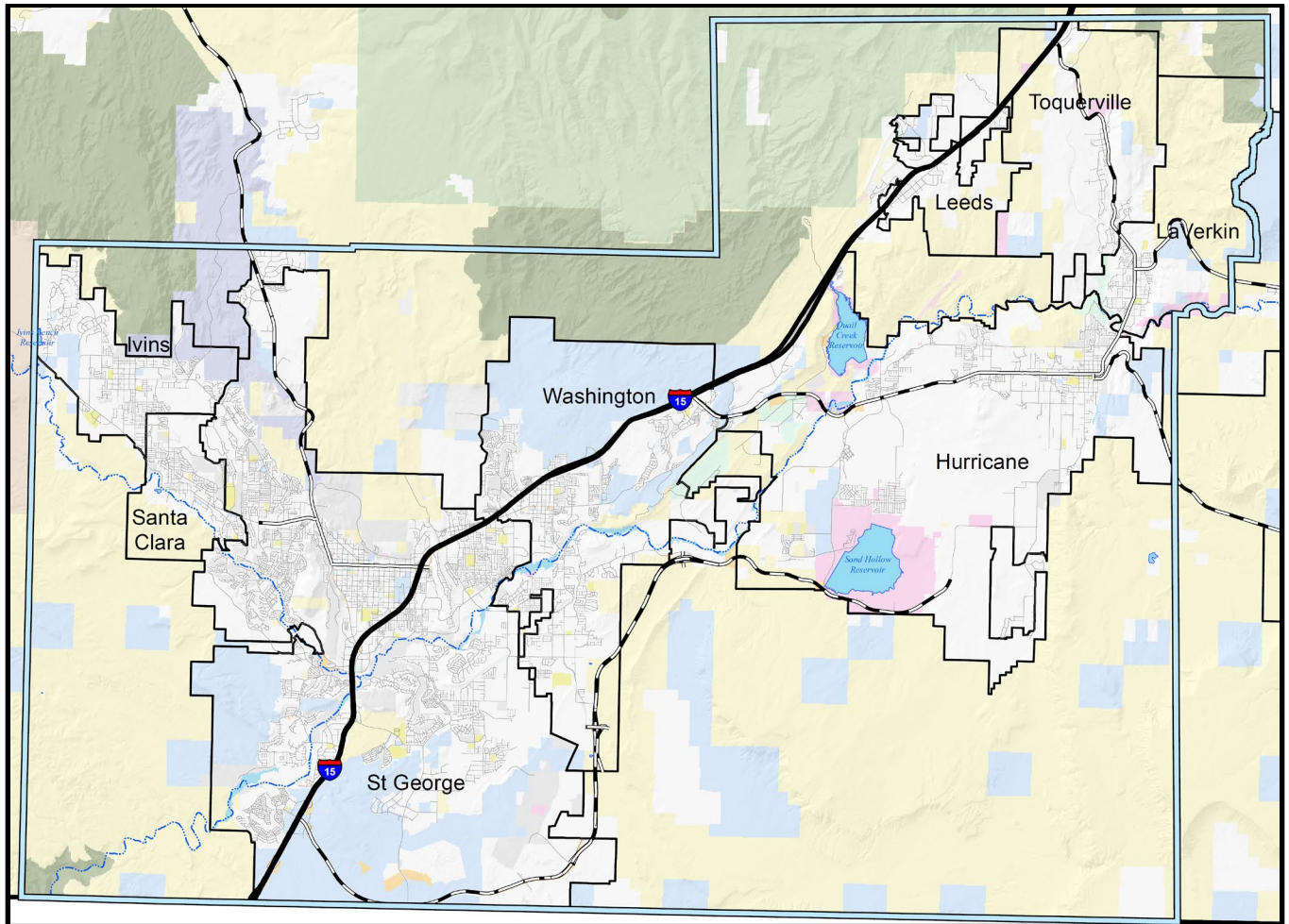


Figure 1 Dixie MPO Boundary Map (Source: dixiempo.wordpress.com)

Participating Agencies and Stakeholders

Agencies and Stakeholders participating in this ITS architecture are provided below. While the National ITS Architecture program provides for and suggests many, many other entities for inclusion in this process, the majority of those additional entities either do not exist in the Dixie area or do not currently have interest or application within the ITS network. As such, they are not listed here for the sake of brevity.

Table 2 Stakeholders

Stakeholder Name	
Bureau of Land Management	St. George Area Chamber of Commerce
Cedar City Corporation	St. George City Fire Department
City of Santa Clara (Police and Fire)	St. George City Police Department
City of St. George	St. George Maintenance
Clark County Nevada	St. George Municipal Airport
Clark County Public Works	St. George Public Works
Division of Emergency Services and Homeland Security	SunTran Bus System
Dixie Ambulance Service	Traveling Public
Dixie National Forest-Pine Valley Ranger District	UDOT Cedar City District Office
Dixie Regional Medical Center	UDOT Region 4
Dixie Regional MPO	UDOT Southern Regional Office
Federal Highway Administration	UDOT Traffic Operations Center
Five Counties Association of Governments	UDOT Transit Office
Hurricane Valley Chamber of Commerce	Utah Highway Patrol
Iron County Circuit Rider Planner	Utah State and Institutional Lands Administration
Ivins City Public Safety (Police and Fire)	Utah Transit Authority
Mesquite City Nevada	Utah Trucking Association
Mojave County	Washington City Chamber of Commerce
Mojave County Community Development	Washington City Fire Department
Mojave County Planning and Zoning	Washington City Public Safety
Mojave County Public Works	Washington County
Nevada Dept. of Transportation District 1 – Las Vegas Office	Washington County Emergency Services
Santa Clara City Economic Development Committee	Zion National Park
Shivwits Band, Paiute Tribe	

Operational Concept

An Operational Concept for a Regional ITS Architecture captures each stakeholder’s roles and responsibilities (R&R) in the implementation and operation of transportation systems as they pertain to the major areas of services to be provided. Roles and responsibilities can be generally defined at a region wide level or they can be service specific.

The Dixie MPO operational concept is provided in Table 2 below for the stakeholders identified previously.

Table 3 Dixie MPO Operational Concept

RR Area Name	Stakeholder	RR Description
Archived Data Management	St. George Public Works	Collect traffic data, including speed and volumes, Create data archives of various operational parameters of the local transportation system for use in regional, state and national planning activities
	UDOT Traffic Operations Center	Collect traffic data on freeways and state routes
Emergency Management	Bureau of Land Management	Track and report incidents and events on lands owned and operated by BLM
	Clark County Nevada	Receive and respond accordingly to incident information from the Dixie Region, Track and report incidents and events within Clark County that may restrict or close the Interstate or other major highways
	Division of Emergency Services and Homeland Security	Assist in the coordination of major emergency response in the Dixie Region, Receive and respond accordingly to incident information from the Dixie Region, Share incident and threat information with state and local emergency management agencies
	Dixie Ambulance Service	Operate and maintain emergency vehicles, including onboard ITS-related equipment, Provide incident status to St. George Dispatch Center, Receive routing and traffic information from the St. George Dispatch Center, Track and report incidents and events on lands owned and operated by the National Forest
	Dixie National Forest-Pine Valley Ranger District	Track and report incidents and events on lands owned and operated by the National Forest

RR Area Name	Stakeholder	RR Description
	Local Public Safety	Create, store and utilize emergency response plans to facilitate coordinated response, Operate and maintain emergency vehicles, including onboard ITS-related equipment, Provide incident status to St. George Dispatch Center, Receive routing and traffic information from the St. George Dispatch Center
	Mojave County	Receive and respond accordingly to incident information from the Dixie Region, Track and report incidents and events within Arizona that may restrict or close the Interstate or other significant highways
	St. George City Police Department	Create, store and utilize emergency response plans to facilitate coordinated response, Dispatch emergency vehicles, Dynamically route emergency vehicles based on real-time traffic information, Exchange incident and threat information with other emergency management systems and with maintenance and construction systems, Interface with other emergency and transportation agencies to support coordinated emergency response, Maintain centralized emergency management systems, Monitor the St. George Traffic Control Center, Monitor traffic via closed circuit television, Operate and maintain emergency vehicles, including onboard ITS-related equipment, Provide incident status to St. George Dispatch Center, Receive public safety calls and provide appropriate response, Receive routing and traffic information from the St. George Dispatch Center, Track the location of emergency vehicles
	St. George Municipal Airport	Create, store and utilize emergency response plans to facilitate coordinated emergency response, Exchange incident and threat information with emergency management systems, Interface with emergency and traffic agencies to support coordinated emergency response, Maintain centralized emergency management software systems
	St. George Public Works	Exchange incident information with emergency management systems, Implement traffic control response to incidents, Interface with emergency and other traffic agencies to support coordinated emergency response, Share traffic information with emergency responders and other transportation agencies
	UDOT Region 4	Maintain and operate incident response vehicles

RR Area Name	Stakeholder	RR Description
	UDOT Traffic Operations Center	Dispatch incident response vehicles, Interface with emergency and other traffic agencies to support coordinated emergency response, Share traffic information with emergency responders and other transportation agencies
	Utah Highway Patrol	Create, store and utilize emergency response plans to facilitate coordinated response, Dispatch emergency vehicles, Exchange incident and threat information with other emergency management systems and with maintenance and construction systems, Maintain centralized emergency management systems, Monitor the St. George Traffic Control Center, Monitor traffic via closed circuit television, Operate and maintain emergency vehicles, including onboard ITS-related equipment, Operate and maintain incident response vehicles, Receive public safety calls and provide appropriate response
	Zion National Park	Track and report incidents and events on lands owned and operated by the National Park
Maintenance and Construction Operations	Local Maintenance	Coordinate with traffic and other maintenance agencies for scheduling and performing maintenance and construction activities., Provide construction and maintenance information with other maintenance, safety and traffic agencies in the Dixie Region
	St. George Maintenance, Washington County	Coordinate with traffic and other maintenance agencies for scheduling and performing maintenance and construction activities, Provide construction and maintenance information with other maintenance, safety and traffic agencies in the Dixie Region
	St. George Municipal Airport	Oversee operations and maintenance of the St. George Airport, including aviation-related and groundside transportation infrastructure
	St. George Public Works	Coordinate with other Dixie Region agencies on the deployment and integration of new traffic signals
Surface Street Control	Dixie Ambulance Service, Local Public Safety, St. George City Police Department, Utah Highway Patrol, Washington County	Issue requests for emergency signal preemption

RR Area Name	Stakeholder	RR Description
	St. George Public Works	Maintain centralized traffic signal software, Manage traffic on city-owned arterials using traffic signals, Monitor freeway operations, Monitor traffic on local arterial roads and interstates, Operate and maintain local traffic signal network, Operate and maintain the Traffic Control Center, Operate, monitor and maintain closed circuit television system
	SunTran Bus System	Maintain and service transit vehicles, Operate and maintain centralized transit management software
	UDOT Region 4	Manage traffic on state-owned arterials using traffic signals, Operate and maintain a Traffic Control Center in Cedar City, Operate and maintain state-owned traffic signals
	UDOT Southern Regional Office	
	UDOT Traffic Operations Center	Monitor traffic via closed circuit television, Operate and maintain a statewide Traffic Operations Center, Operate and maintain and 511 web site and telephone system
Traffic Incident Management	St. George Public Works	Coordinate traffic control response to incidents with emergency responders and other transportation agencies, Coordinate with emergency responders for the deployment, operation and maintenance of emergency vehicle preempt
	UDOT Traffic Operations Center	Coordinate with emergency responders for the deployment, operation and maintenance of emergency vehicle preempt
Transit Management	SunTran Bus System	Schedule and dispatch fixed-route and paratransit vehicles
Traveler Information	Media	Collect information from traffic and emergency agencies regarding incidents, road closures, delays, congestion and weather related travel issues, Disseminate traffic and transportation information to the public, Monitor closed circuit television
	St. George Public Works	Operate and monitor dynamic message signs, Provide traffic and incident information to the public, including construction, maintenance, road closures, detours, delays, congestion and incident information
	SunTran Bus System	Collect, process and disseminate transit information to the public

RR Area Name	Stakeholder	RR Description
	Traveling Public	Receive, process and use traffic and transit information using en-route systems (e.g. dynamic message signs and highway advisory radio) to make educated travel choices, Receive, process and use traffic and transit information using personal devices (e.g. personal computers, telephones) to make educated travel choices
	UDOT Traffic Operations Center	Collect, process and disseminate traffic information, Maintain and operate dynamic message signs
Weather Information and Dissemination	UDOT Traffic Operations Center	Operate and maintain road weather information systems, Receive weather data from road weather information systems and disseminate information to the traveling public

Interagency Agreements

Agreements among different stakeholder agencies and organizations are generally required to realize the integration shown in the regional architecture, and to allow for project interoperability into the future as administrations change and various stakeholders evolve.

The culture in Utah is different than most states in the US; generally, agencies have a very conciliatory and partnered relationship. This means that historically, formal agreements between agencies sharing use of the ATMS network have not always been executed. However, these pro-active and engaged stakeholders in the system – including UDOT – address this requirement in two distinct ways;

- All users on the UDOT network are required to register for a VPN account with the UDOT network manager. This account is granted with the acceptance of certain policies for use, etc.
- All the stakeholders in each MPO region conduct a quarterly ATMS Technical Subcommittee meeting, where they discuss current and planned projects, impacts, needs, issues, etc. All local cities, state agencies, and other stakeholders for the network are invited and regularly attend, meaning that while a formal agreement is not always present, the stakeholders are both aware of the activities in their area and have the opportunity to weigh in on and influence the direction of these activities.

For the purposes of this document however, the agreements outlined in Table 4 below are either existing or needed, based on the operational concepts defined previously.

Table 4 Existing or Needed Dixie Valley ITS Agreements

ITS Project(s)	Involved Stakeholders	Type of Agreement(s)	Agreement Description
Regional Traffic Control Center	<ul style="list-style-type: none"> • City of St. George • UDOT • Other cities 	<ul style="list-style-type: none"> • Memorandum of Understanding (MOU) 	An MOU will be necessary in the planning and development stage of this project to verify the roles of various agencies, and to document the interest of other cities to participate in a Regional TCC. During the specific project planning, other agreements may be required, including interagency, funding and master agreements.
Communications Plan	<ul style="list-style-type: none"> • Dixie MPO • City of St. George • UDOT 	<ul style="list-style-type: none"> • Handshake Agreement 	A handshake agreement will effectively address the need for sharing plans and needs for communication infrastructure during this planning project.
UDOT Traffic Marketing	<ul style="list-style-type: none"> • Media • St. George Public Works • SunTran • UDOT 	<ul style="list-style-type: none"> • Handshake Agreement – or – • MOU • Interagency Agreement 	UDOT may have a standard agreement in place for the use of-- and importing information into-- UDOT Traffic. If so, that agreement should be reviewed by local agencies and modified as needed to suit local requirements.

ITS Project(s)	Involved Stakeholders	Type of Agreement(s)	Agreement Description
Computer Aided Dispatch Integration with UDOT Traffic	<ul style="list-style-type: none"> • City of St. George Police • UDOT 	<ul style="list-style-type: none"> • Handshake Agreement – or – • MOU • Interagency Agreement 	<p>UDOT may have a standard agreement in place for the use of and importing information into UDOT Traffic. If so, that agreement should be reviewed by local agencies and modified as needed to suit local requirements.</p>
Corridor Projects	<ul style="list-style-type: none"> • St. George Public Works • UDOT • Other Cities 	<ul style="list-style-type: none"> • MOU • Interagency Agreements 	<p>The agreements necessary for corridor planning and deployment may also be covered under the Traffic Control Center agreements. Corridor agreements will define how each Stakeholder expects the corridor to be operated and maintained, as well as, defining the hierarchy of control of devices in the corridor. Interagency Agreements will be used for corridors that cross jurisdictional boundaries, or have devices from more than one agency with shared control within them.</p>
Emergency Operation Center (EOC)	<ul style="list-style-type: none"> • City of St. George Police • City of St. George Fire • Washington County Sheriff • Local Public Safety • Utah Highway Patrol • Media 	<ul style="list-style-type: none"> • MOU 	<p>Similar to the Regional Traffic Control Center, an MOU will be required initially to define the roles, responsibilities and requirements of all EOC Stakeholders. During the design and detailed planning for a center, additional agreements should be identified. They may include interagency, funding and master agreements.</p>
Emergency Automated Vehicle Location	<ul style="list-style-type: none"> • City of St. George Police • City of St. George Fire • Washington County Sheriff • Washington County Fire • Local Public Safety • Dixie Ambulance 	<ul style="list-style-type: none"> • Interagency Agreement • Operational Agreement 	<p>The agreements required for this project will likely be between the City of St. George Police and the other entities, because each will utilize the tracking services established at the St. George Dispatch, but will potentially own their own equipment aboard vehicles. Existing agreements used by the Dispatch Center may be modified.</p>
Emergency Vehicle Pre-emption	<ul style="list-style-type: none"> • City of St. George Public Works • UDOT • City of St. George Fire • Washington County Fire • Local Public Safety • Dixie Ambulance 	<ul style="list-style-type: none"> • MOU 	<p>The agreement will clearly define the roles and responsibilities of each agency, as well as what constitutes proper use or abuse of signal preemption, and the potential penalties for abuse.</p>

ITS Project(s)	Involved Stakeholders	Type of Agreement(s)	Agreement Description
Weather Warning System	<ul style="list-style-type: none"> • City of St. George Public Works • UDOT • Local Emergency Services 	<ul style="list-style-type: none"> • MOU 	<p>The roles and responsibilities for Flood Warning will most likely be covered by the agreements created for other projects. In particular, the UDOT Traffic Marketing Project will address the relationship between St. George and UDOT, while Incident Management Strategies should address the required agreements among local agencies.</p>
Incident Management Strategies	<ul style="list-style-type: none"> • City of St. George Public Works • City of St. George Police • City of St. George Fire • City of St. George Maintenance • Local Maintenance • Local Emergency Services • Suntran • UDOT • Utah Highway Patrol • Washington County Maintenance • Washington County Sheriff 	<ul style="list-style-type: none"> • MOU • Operational Agreement 	<p>During planning and design, an MOU can help to solidify the roles of each Stakeholder. During deployment and operation, an Operational Agreement will clearly define the roles and responsibilities of each agency, including the relationship between the operator of the central system that houses incident and resource information and the other agencies.</p>
ITS Architecture Update	<ul style="list-style-type: none"> • Dixie MPO • UDOT 	<ul style="list-style-type: none"> • Handshake Agreement 	<p>The updating of the ITS Architecture can be funded by a single source, and a handshake agreement will suffice to define the roles and responsibilities of local agencies in the update process.</p>
Maintenance Coordination	<ul style="list-style-type: none"> • St. George Maintenance • UDOT • Local Maintenance • Washington County Maintenance • Media • Suntran 	<ul style="list-style-type: none"> • MOU 	<p>Similar to Incident Management Strategies, an MOU will serve the purpose of defining each Stakeholder's role in the planning and design of ITS systems to coordinate maintenance activities. An Operational Agreement may be needed once a system is deployed and in use.</p>
Regional Traveler Information	<ul style="list-style-type: none"> • City of St. George Public Works • UDOT • Media • Suntran 	<ul style="list-style-type: none"> • MOU 	<p>The MOU can be used to more clearly define the relationship of UDOT and local entities in using UDOT Traffic to broadcast traveler information for the Region. In addition, it can be used to define the role of media in collecting and broadcasting traveler information.</p>

System Functional Requirements

System functional requirements are one of the required components of a regional ITS architecture as identified in FHWA Rule 940.9(d)5 and FTA Architecture Policy section 5.d.5.

The Dixie ITS functional requirements are high-level descriptions of what each part of the regional ITS system should do. They provide a description of the tasks or activities (the “functions”) that are performed by each system in the inventory - documenting the share of the work that each system is required to do to provide the ITS services for a region or project. It is important to note that these functions are generally required under the National ITS Architecture, not optional, and as such are expressed as “Shall” statements to maintain overall compatibility between systems, vendors and equipment, and stakeholders.

The approach to developing functional requirements for the Dixie MPO was consistent with recommended practice, and as such the requirements have been developed at a fairly high level, with individual requirement statements being associated with individual equipment packages within the system. A tabular listing of these requirements can be found in the attached (PDF) file, “*Appendix B – Functional Requirements*”. These elements were removed from this report for the sake of brevity.

The requirements themselves were generated using the FHWA provided RAD-IT software, and are **contained in the attached RAD-IT file accompanying this report**. This software is provided by the FHWA specifically for the purpose of generating these regional architectures; a description of this software and links to it are provided in **Appendix A**.

Interface Requirements

This section presents the system architecture interconnects and architecture flows for the Dixie Region. Interconnects and flows are a very important parts of the system architecture because they provide the most specific indication of which portions of the existing ITS system exchanges information.

As noted in the previous section above, the **RAD-IT Software** was used to generate the flows and interconnections, and these are available in the RAD-IT file accompanying this report.

Background

Interconnects and flows identify the connections between the various parts of the Dixie ITS system. Specifically, they identify connections between inventory elements. An inventory element is a component of the ITS system that is associated with a particular organization (stakeholder), such as the UDOT Statewide Traffic Operations Center.

Interconnects show general relationships, indicating only that two inventory elements are connected and that some sort of information is exchanged between them. In this sense, interconnects provide a summary view of connections within the regional ITS network. Architecture flows show more detail, identifying the specific *type* of information that flows between inventory elements and the *direction* of the information flow.

Interconnects and flows are normally identified using diagrams, although tabular lists can easily be generated. Both diagrams and lists can be easily generated using the RAD-IT Architecture software.

Development of Dixie Interconnects and Flows

The Dixie interconnect and architecture flow diagrams were developed using the RAD-IT software. RAD-IT provides a comprehensive list of potential flows between the inventory elements associated with the market package. The RAD-IT software is able to generate such a list by cross-referencing two databases; the selected Dixie market packages, and the list of potential architecture flows associated with any given market package. The later association is based strictly on the National ITS Architecture definition of market packages.

To develop the initial draft set of Dixie flow diagrams for each Dixie market package, the relevant flows were selected from the RAD-IT list of candidate flows for each package. The resultant flow diagram for the Dixie MPO is shown in Figure 2, below, and illustrates a high level view of all the Dixie ITS inventory elements.

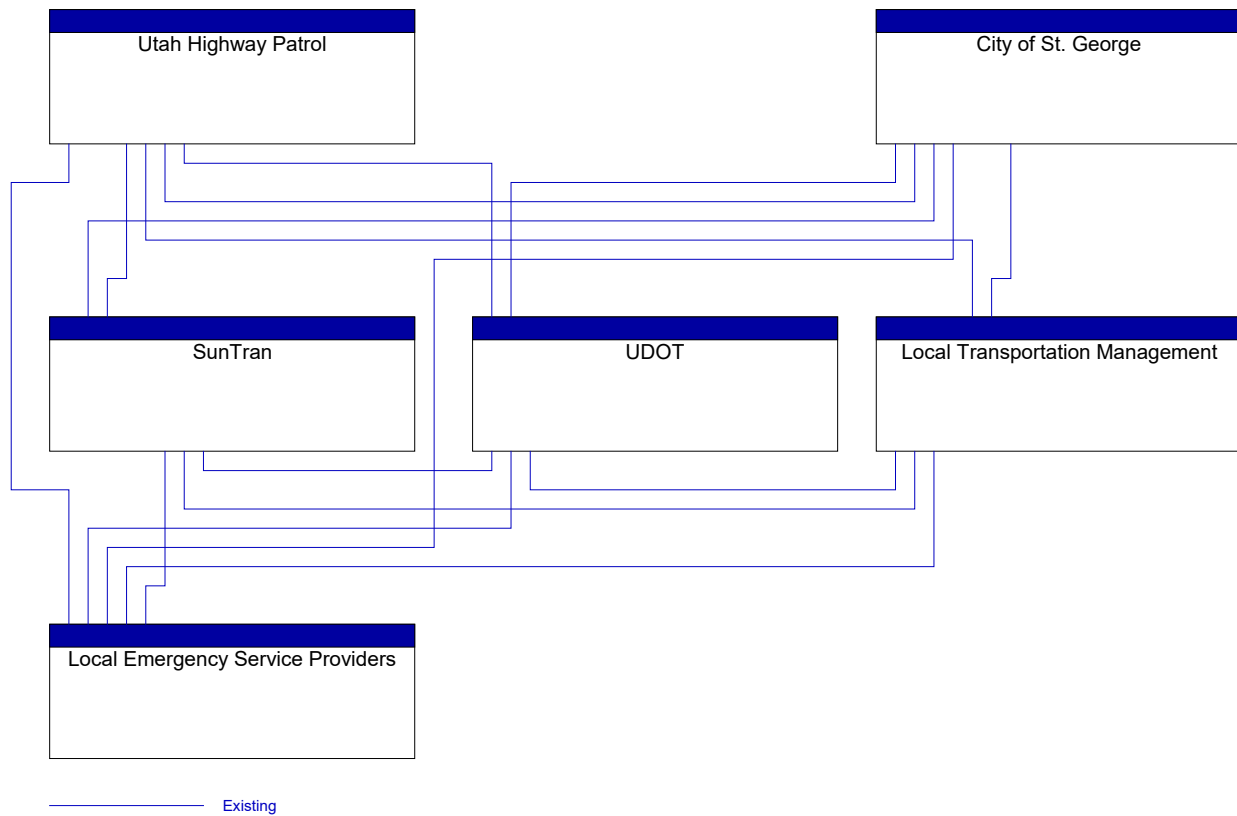


Figure 2 Dixie MPO Interconnect Diagram.

Figure 3 on the following page shows the architecture flow diagram. Whereas the interconnect diagram above shows only the general connections between elements, the architecture flow diagram shows specific information that passes between elements and the direction that the information flows.

Note that these figures are provided here for reference only – due to their size and scale, it is recommended to view this and any other flow diagrams within the RAD-IT software viewer.

Finally, the 3rd element of the RAD-IT software developed architecture – the tabular listing of interconnections and flows – is shown in Table 4 (below) for the Dixie MPO.

Table 5 Dixie MPO Tabular Listing of Architecture Flows

Source Element	Destination Element	Flow Name
City of St. George	Local Emergency Service Providers, Utah Highway Patrol	alert status, incident notification, road network environmental situation data, road weather advisories
City of St. George	Local Transportation Management	road network environmental situation data
City of St. George	SunTran	demand responsive transit request, shared use status, transit fare request, transit trip request, trip confirmation
City of St. George	UDOT	alternate mode information, emergency traveler information, fare and price information, incident information, logged vehicle routes, parking information, road network conditions, road network environmental situation data, road network traffic situation data, traffic images, transit service information, travel service information request, travel service reservation request
Local Emergency Service Providers	Utah Highway Patrol	alert notification coordination, emergency plan coordination, evacuation coordination, incident command information coordination, incident information for public, incident notification, incident notification response, incident report, incident response coordination, incident response status, resource coordination, threat information coordination, transportation system status
Local Emergency Service Providers, Utah Highway Patrol	City of St. George	alert notification, evacuation information, incident information, incident information for public, incident notification response, transportation system status
Local Emergency Service Providers, Utah Highway Patrol	Local Transportation Management	alert notification, emergency plan coordination, evacuation information, incident information, incident response status, maint and constr resource request, threat information, transportation system status, work plan feedback
Local Emergency Service Providers, Utah Highway Patrol	SunTran	alert notification, emergency plan coordination, emergency transit service request, evacuation information, incident information, incident response status, threat information, transportation system status
Local Emergency Service Providers, Utah Highway Patrol	UDOT	alert notification, emergency plan coordination, emergency route request, emergency traffic control request, evacuation information, incident information, incident response status, remote surveillance control, resource deployment status, resource request, road closure notification, threat information, transportation system status
Local Transportation Management	City of St. George, SunTran	current infrastructure restrictions, maint and constr work plans, road weather information, roadway maintenance status, work zone information
Local Transportation Management	Local Emergency Service Providers, Utah Highway Patrol	alert status, current infrastructure restrictions, emergency plan coordination, incident information, maint and constr resource response, maint and constr work plans, request for enforcement, road network status assessment, road weather information, roadway maintenance status, work zone information
Local Transportation Management	UDOT	current infrastructure restrictions, environmental conditions data, equipment maintenance status, field device coordination, incident information, maint and constr resource response, maint and constr work plans, road network status assessment, road weather information, roadway maintenance status, work zone information
SunTran	City of St. George	demand responsive transit plan, emergency transit schedule information, transit and fare schedules, transit fare information, transit incident information, transit probe data, transit schedule adherence information, transit schedule information, transit trip plan
SunTran	Local Emergency Service Providers, Utah Highway Patrol	alert status, emergency plan coordination, emergency transit schedule information, emergency transit service response, payment violation notification, transit emergency data, transit system status assessment
SunTran	Local Transportation Management	work plan feedback

Source Element	Destination Element	Flow Name
SunTran	UDOT	demand responsive transit plan, dynamic bus lane request, emergency transit schedule information, traffic control priority request, transit and fare schedules, transit fare information, transit incident information, transit probe data, transit schedule adherence information, transit schedule information, transit system data, transit trip plan
UDOT	City of St. George	alternate mode information, emergency traveler information, incident information, parking information, road network conditions, traffic control information, traffic images, transit service information, transportation operational strategies, travel service information, travel service reservations
UDOT	Local Emergency Service Providers, Utah Highway Patrol	alert status, current lane restrictions, emergency plan coordination, emergency routes, emergency traffic control information, incident information, incident response status, lane violation notification, request for enforcement, resource deployment status, resource request, road network conditions, road network environmental situation data, road network status assessment, road weather advisories, traffic images, transportation operational strategies
UDOT	Local Transportation Management	environmental conditions data, equipment maintenance request, field device coordination, incident information, maint and constr resource request, road network conditions, road network environmental situation data, road network status assessment, traffic images, transportation operational strategies, work plan feedback
UDOT	SunTran	demand responsive transit request, dynamic bus lane status, incident information, road network conditions, shared use status, traffic control priority status, traffic images, transit fare request, transit trip request, transportation operational strategies, trip confirmation
Utah Highway Patrol	Local Emergency Service Providers	alert notification coordination, emergency plan coordination, evacuation coordination, incident command information coordination, incident information for public, incident notification, incident notification response, incident report, incident response coordination, incident response status, resource coordination, threat information coordination, transportation system status

ITS Standards

The RAD-IT software will eventually feature the ability to assign and manage ITS standards for the various interconnections and data flows between entities. However, this is not yet available in the current version of the software.

In lieu of that functionality, Table 6 below provides a list of the standards that are applicable to the elements found in the Dixie MPO. It should be noted that the ITS infrastructure for the Dixie is managed and regulated primarily by the Utah Department of Transportation (UDOT) as part of their management of the overall ITS network statewide. As such, application of standards is actively monitored, equipment is standardized with reputable vendors, systems are designed and constructed to be interoperable with other areas of the State of Utah, etc. In short, this oversight provides the regulation to ensure that industry and national standards are applied and that interoperability is maintained within this region.

Table 6 ITS Standards

Document ID	Standard Title	Standard Type
80	Advanced Traveler Information Systems (ATIS) General Use Standards Group	Group
APTA TCIP-S-001 3.0.4	Standard for Transit Communications Interface Profiles	Message/Data
ITE TMDD	Traffic Management Data Dictionary (TMDD) and Message Sets for External Traffic Management Center Communications (MS/ETMCC)	Message/Data
P10	eXtensible Markup Language	Group
P11	NTCIP using DATEX	Group
SAE J2354	Message Set for Advanced Traveler Information System (ATIS)	Message/Data

Sequence of Projects

ITS projects have been actively progressing within the Dixie region every year since the previous (2004) architecture report was drafted, with many more currently planned and underway.

As noted in the previous section, the Utah Department of Transportation (UDOT) has historically let the way with most ITS related work in this and all other regions within the State of Utah, as they own the majority of the communications infrastructure, the most vital elements within the statewide system, and control most of the funding used to deploy these projects. It can safely be said that few – if any – ITS related projects are conducted in Utah that are not directly connected to or utilize UDOT's existing system in some way.

Because of the success UDOT has had in the past 15 years with managing these deployments, a list of upcoming or potential projects in this area is not provided here. For further details or to obtain a copy of the documents referenced above, contact UDOT at their Traffic Operations Center in Salt Lake City, Utah, at 801-887-3700.

APPENDIX A – RAD-IT Software

The ITS Architecture diagrams and flows/connections associated with this regional report are developed using the RAD-IT software, available from the FHWA at the following site. This software is required to be able to view or otherwise interact with any developed architecture package.

<http://local.iteris.com/arc-it/html/resources/tools.html>

The Dixie MPO architecture has been fully mapped in this program, and the resultant diagrams and interconnection flow charts are available in a separate, RAD-IT file attached to this report.

Web-based training on the use of RAD-IT is also available at the following website:

<http://local.iteris.com/arc-it/html/resources/raditwebtraining.html>

Participants will be able to use the RAD-IT software to create and modify a regional or project architecture including providing a link to planning, entering stakeholders, entering inventory data, selecting ITS services, creating operational concepts, tailoring functional requirements, building and customizing interfaces, generating standards listings, entering agreements, creating outputs, and applying features to new projects.