State of Texas
Regional ITS Architectures and Deployment Plans

Childress Region

Regional ITS Architecture Report

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LIST OF ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials
ATIS	Advanced Travel Information System
ATMS	Advanced Traffic Management System
AVL	Automatic Vehicle Location
BRINSAP	Bridge Inventory Inspection System
CC	Control Center
CCTV	Closed-Circuit Television
CMRC	Childress Regional Medical Center
CPT	Common Public Transportation
CVO	Commercial Vehicle Operations
DMS	Dynamic Message Sign
DOT	Department of Transportation
DPS	Department of Public Safety
DSRC	Dedicated Short Range Communications
EIA	Electronic Industries Association
EMS	Emergency Medical Services
EOC	Emergency Operations Center
ETMCC	External TMC Communication
EV	Emergency Vehicle
FC	Fare Collection
FHWA	Federal Highway Administration
HAR	Highway Advisory Radio
HAZMAT	Hazardous Materials
HRI	Highway-Rail Intersections
I/F	Interface
IM	Incident Management

LIST OF ACRONYMS

IMMS	Incident Management Message Sets
ISP	Information Service Provider
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System
MCM	Maintenance and Construction Management
MCV	Maintenance and Construction Vehicle
MOU	Memorandum of Understanding
MS	Message Sets
NEMA	National Electrical Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration
NTCIP	National Transportation Communications for ITS Protocol
OB	Onboard
PI	Passenger Information
PSAP	Public Safety Answering Point
PTMS	Public Transportation Management System
SAE	Society of Automotive Engineers
SDO	Standards Development Organization
SP	Spatial Representation
TCIP	Transit Communication Interface Protocol
TEA-21	Transportation Equity Act for the 21st Century
TM	Traffic Management
TMC	Traffic Management Center
TMDD	Traffic Management Data Directory
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation
VIVDS	Video Image Vehicle Detector System
WIM	Weigh-in-Motion

SUMMARY

In January 2001, the Federal Highway Administration (FHWA) issued a final rule to implement Section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21) requiring that Intelligent Transportation System (ITS) projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards.

To meet these requirements, in 2001 the Texas Department of Transportation (TxDOT) initiated the development of Regional ITS Architectures and Deployment Plans throughout the State of Texas. The Childress Region was the sixth in the series of Regional ITS Architectures to be prepared as part of this initiative.

The Childress Region is located in the southeastern portion of the Texas Panhandle. The Region is rural, with the City of Childress being the largest population center in the Region. Other cities and towns include Shamrock, Wellington, Quanah, Crowell, and Paducah. The Childress Region is bordered by four other TxDOT Districts (Amarillo, Lubbock, Abilene, and Wichita Falls) as well as the State of Oklahoma.

The Architecture for the Childress Region followed a comprehensive process focused on stakeholder outreach and education, identifying market packages and interfaces tailored to the needs of the Childress Region, and developing a consensus-based architecture for the Region. This architecture provides a framework for ITS infrastructure to be deployed and integrated in the Childress Region over the next 20 years.

Stakeholders from throughout the Region participated in the development of the Regional ITS Architecture, including representatives from TxDOT (Childress and neighboring Districts), the Texas Department of Public Safety (DPS), cities in the Region, and private transit agencies. These stakeholders provided input and review at key steps in the architecture development process, including a project kick-off meeting, architecture development and review workshops, and final review of the architecture documentation.

An inventory of existing and planned ITS infrastructure in the Region provided the basis for the architecture development. Stakeholder needs that could be addressed by ITS technologies guided the selection of market packages, data flows, and integration requirements. A diverse range of needs were identified by stakeholders in the Region. The highest priority needs focused on improving emergency coordination and response, information sharing among TxDOT Districts in the Panhandle and West Texas, and providing accurate, timely advisories about road and weather conditions to travelers. Coordination with Oklahoma also was a priority for stakeholders.

Market packages were selected that corresponded to the desired services and functions identified for the Region, and were customized for Childress Region agencies and equipment. These market packages included high priority 'foundation' services and functions, such as network surveillance and road weather information systems, as well as market packages to address coordination needs, including incident management system and regional traffic control and coordination. Stakeholders then prioritized these market packages as high, medium, and low. These priorities were used in the second phase of the project to develop the ITS Deployment Plan for the Childress Region.

An interconnect, or "Sausage Diagram" was developed for the Childress Region which provided a top-level overview of system functions and primary interconnects. More detailed interfaces were then developed which identified the connectivity between the systems and elements. Each element identified in the ITS architecture for the Childress Region was mapped to the other elements that it must interface

with. These interfaces were further defined by architecture data flows between individual elements that specify the information to be exchanged. These data flows could include requests for information, alerts and messages, status requests, confirmations, and other information requirements.

Functional requirements for the Childress Region were identified through customized market packages and data flows, and the equipment packages that deliver specific capabilities. The equipment packages that were identified provide more detailed descriptions of functionality and can be deployed incrementally. Standards that could apply to the Childress Region also were identified as part of the architecture development process.

An Operational Concept for the Childress Region was developed to illustrate how systems, components, and agencies will be integrated and function as a result of the framework provided by the Regional ITS Architecture. The purpose of the Operational Concept is to demonstrate the roles and responsibilities of the various stakeholders in the Childress Region. Potential agreements that could be required to support information sharing among agencies, joint operations, and other functions also were identified.

The Regional ITS Architecture for the Childress Region is documented in the final report. In addition, a companion web site was developed that contains all of the architecture information, stakeholders, regional inventory, customized market packages, interfaces, and standards.

1. INTRODUCTION

1.1 Project Overview

In January 2001, FHWA issued a final rule to implement Section 5206(e) of the TEA-21. This rule required that ITS projects funded through the Highway Trust Fund conform to the National ITS Architecture and applicable standards. The rule requests that the National ITS Architecture be used to develop a local implementation of the National ITS Architecture, which is referred to as a "Regional ITS Architecture."

In order to meet these requirements, TxDOT initiated the development of Regional ITS Architectures and Deployment Plans throughout the State of Texas. In addition to meeting the federal requirements for funding, the development of regional ITS architectures provides a framework for implementing ITS on a regional level, encourages interoperability and resource sharing, identifies applicable standards, and allows for cohesive long range planning among stakeholders in the Region. Although not required by the FHWA final rule, TxDOT expanded on the project sequence requirement to have an ITS deployment plan developed for each Region. An ITS deployment plan identifies and prioritizes projects that are needed to implement the ITS architecture on a short-, medium-, and long-term basis.

A key goal in the development of the Childress Regional ITS Architecture was to develop a consensus-based architecture with as many stakeholders as possible involved. Each stakeholder had an equal voice in determining the direction of the architecture for the Region. Stakeholders included representatives from TxDOT Districts in West and North Central Texas, DPS, cities in the Region, and transit agencies. A series of five meetings were held with the ITS stakeholders to discuss the development and gather input into the Childress Regional ITS Architecture and Deployment Plan. In addition, a project web site was developed which contains all of the information on the Childress Regional ITS Architecture and provides stakeholders with an opportunity to review and comment on the architecture directly from the web.

The result is an ITS architecture that establishes a vision and direction for the Region. ITS needs of the Childress Region were established early in the project. Existing and planned elements of the architecture have been identified and the key agencies required to develop the ITS services, or market packages as they are referred to in the National ITS Architecture, for the Childress Region also have been identified. An operational concept was developed that focuses on the roles and responsibilities of the various agencies involved in the Childress Region. A separate ITS Deployment Plan identifies projects in the Childress Region that are required to implement the architecture.

1.2 Document Overview

The Childress Regional ITS Architecture report is organized into five key sections:

Section 1 – Introduction

This section provides an overview of the State of Texas ITS Architectures and Deployment Plan Program, the ITS Architecture for the Childress Region, as well as an overview of some of the key features and stakeholders in the Childress Region.

Section 2 – Integration Strategy

This section discusses Childress Region stakeholder needs and issues, regional ITS initiatives and potential regional ITS programs, and opportunities for integration to achieve regional goals and contribute to regional and national ITS interoperability.

Section 3 – Regional ITS Architecture Development Process

An overview of the key steps involved in developing the ITS architecture for the Childress Region is provided in Section 3. It includes a discussion of the methodology, stakeholder involvement, architecture workshops, and architecture development process.

Section 4 – Conceptual Design

The conceptual design contains the key sections of the Childress Regional ITS Architecture. The inventory of existing and planned systems is presented in Section 4, and is sorted by both stakeholder as well as by entity for easy reference. The market packages that were selected for the Childress Region also are included in this section, as are the system functional requirements. The Childress Region interconnects are presented, including the "Sausage Diagram" showing the relationships of the key subsystems and elements in the Region, system interfaces, and the physical subsystem architecture flows. Standards that apply to the Childress Regional ITS Architecture also are listed.

Section 5 – Operational Concept

An Operational Concept has been prepared that discusses the key functions and services of the envisioned ITS for the Childress Region. As part of this concept, operational scenarios are described and roles and responsibilities of stakeholders are discussed. Potential public-public and public-private agreements also have been identified.

The Childress Regional ITS Architecture also contains two appendices:

- Appendix A – Customized Market Packages; and
- Appendix B – Interface Diagrams.

A web site has been established that contains the architecture documentation, inventories, interconnects, market packages, interfaces, and functional requirements. This web site can be accessed from www.consystec.com, and by selecting the link to the Texas Regional ITS Architecture Home Page, and then Childress Region. The web site provides hyperlinks to more detailed information about the Childress Regional ITS Architecture than what could feasibly be included in the printed document. In certain sections of the document, readers are referred to the web site for additional information and details. At the time this report was published, the Childress Regional ITS Architecture web site was being hosted at www.consystec.com. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.

1.3 The Childress Region

1.3.1 Geographic Overview

The Childress Region is located in the eastern portion of the Texas Panhandle. The boundaries of the Childress Region were defined by stakeholders to correspond with the TxDOT Childress District, one of 25 Districts throughout the state. The Childress Region is

bordered by the Amarillo District to the northwest, the Lubbock District to the southwest, and the Abilene District to the south. The Region shares its eastern borders with the state of Oklahoma and TxDOT's Wichita Falls District. **Figure 1** shows a geographic overview of the Childress Region.

There are 13 counties in the Childress Region:

- Briscoe;
- Childress;
- Collingsworth;
- Cottle;
- Dickens;
- Donley;
- Foard;
- Hall;
- Hardeman;
- King;
- Knox;
- Motley; and
- Wheeler.

With an estimated population of 42,625 in the Region and a square mile area of 11,238, Childress is a rural region without any major metropolitan areas. Key cities and towns in the Region include Childress, Wellington, Shamrock, Quanah, Crowell, and Paducah. TxDOT serves as the primary agency for on-system roadways in these and other cities. Although city and county agencies provide maintenance for facilities in their jurisdictions, most of these cities and towns are located on or near Interstate, US or State Route highways and TxDOT serves as the lead agency for any improvements and maintenance activities.

1.3.2 Roadway Infrastructure

Several key corridors traverse the Childress Region, making it an important gateway to the Texas Panhandle, Oklahoma, and neighboring TxDOT Districts. Major roadway facilities within the Region include I-40, and US Highways 287, 83 and 70. The Childress Region also has several State Highways that serve as important links to US Highways and Interstates.

Although the majority of I-40 is located in the Amarillo District, a portion of I-40 also is located in Donley County in the northern part of the Region and Wheeler County on the Texas/Oklahoma border. As a major east-west corridor for Texas and its neighboring states, any restrictions or impacts on I-40 will affect nearby routes. In the case of the Childress Region, these would include US Highways 287 and 83, as well as State Highways 207, 70, and 273. In the event of a major incident along I-40 in New Mexico, near Amarillo or in Oklahoma, traffic is likely to be diverted to one of these alternate routes in the Childress Region. With the rural nature of the Childress Region, there are limited traveler services and facilities along any of these alternate routes; a situation that becomes extremely problematic in the event of a major incident or closure. As an example, a devastating ice storm hit the Panhandle in late December, 2000, stranding thousands of motorists and truckers along US Highway 287. The numbers of stranded travelers overwhelmed the small community, requiring opening the local High School, churches and the Childress Fair Park Auditorium as emergency shelters. If advanced warning of the hazardous conditions could have been communicated to the Districts south and east of I-40, travelers could have been diverted sooner on to safer routes.

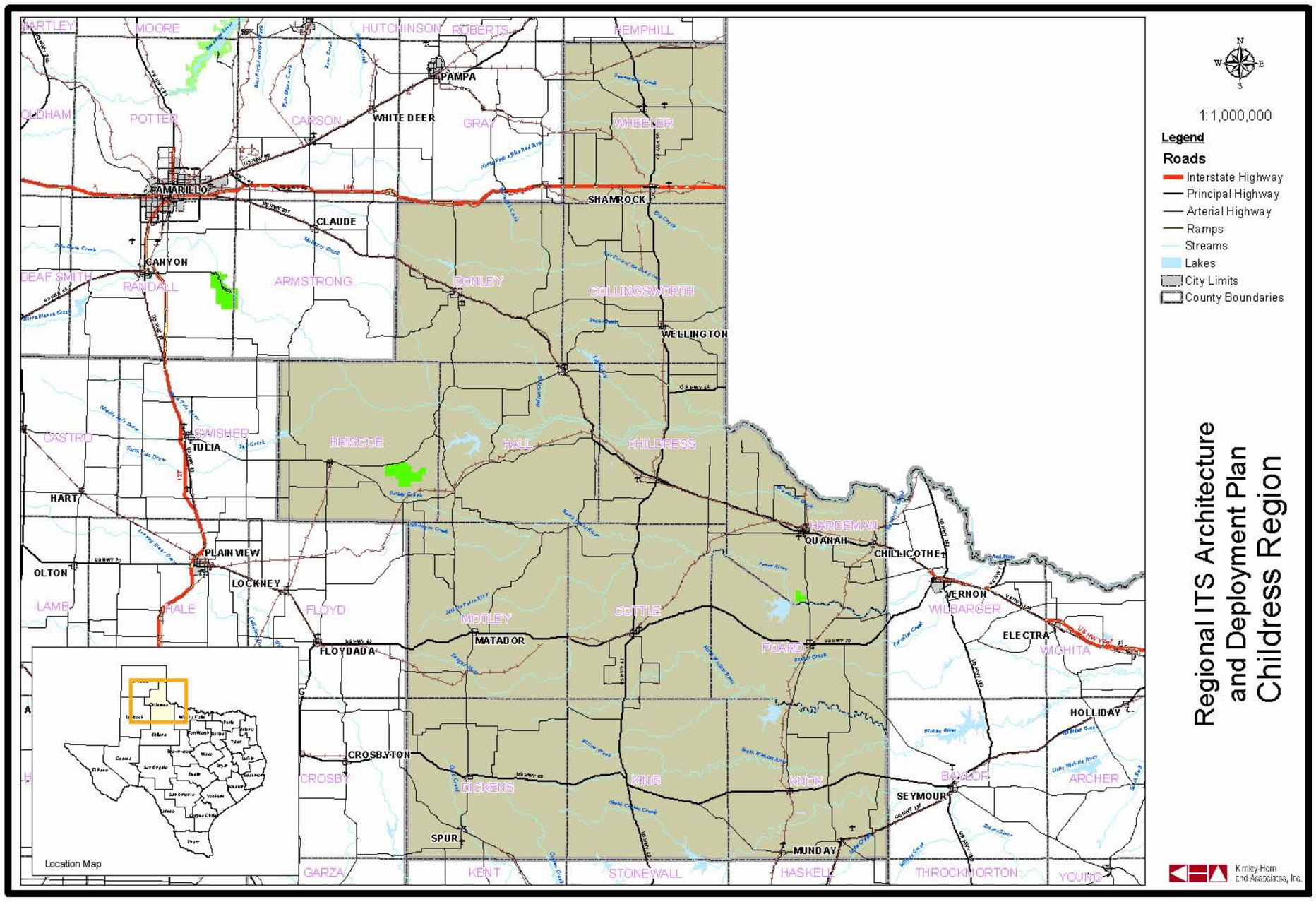


Figure 1 – Childress Region Map

US Highway 287 is a significant link between Colorado and Dallas/Fort Worth, which creates a major truck route through Amarillo, Childress and other communities along the corridor. Staff at the TxDOT Childress District estimate that 40-50 percent of the vehicle traffic along US 287 is commercial trucks. The amount of truck traffic is expected to increase along US 287 in the near future. Lockheed Martin will have a jet fighter manufacturing plant in Forth Worth, and this route will be the primary corridor for trucks hauling goods from the plant that need to head north to connect with I-40. US Highway 287 is the primary route between Wichita Falls, Childress, and Amarillo, which makes coordination among these Regions extremely important.

The City of Childress is situated at the junction of US Highways 287, 62/83. US Highway 83 is a north-south corridor in the eastern part of the Childress Region that connects to I-40 at Shamrock in Wheeler County, and traverses north through the Amarillo Region where it meets with US Highway 60 which is a key route into Oklahoma. US 83 provides access via several State Highways and farm-to-market roads to western Oklahoma. Further south, US 83 extends through Abilene to Laredo on the Texas/Mexico border; this corridor is a direct route from Mexico to Canada. Another key north-south corridor in the Region is State Highway 70, which traverses the western portion of the Childress Region and provides a link to I-40 in Donley County.

1.3.3 Childress Region ITS Plans

Currently, there is limited deployment of ITS in the Childress Region. Existing and planned near-term ITS technologies focus on detection, traveler information, and coordination with neighboring TxDOT Districts.

Traffic Management

US Highway 287 has video image vehicle detection (VIVD) and signal interconnect through Childress. The signal at US 287/SR256 also is equipped with emergency preemption. TxDOT operates and maintains all traffic signals within the Childress Region. TxDOT also has traffic counting stations at key points along I-40.

Traveler Information

There are several portable dynamic message signs (DMS) that are used throughout the Childress Region to notify travelers of upcoming construction, detours, closures or other hazards. The TxDOT Childress District owns four portable DMS, and Wheeler County has two. Permanent DMS are planned on I-40 westbound east of Shamrock and on US 287 westbound in advance of US 83.

The Childress Region would like to implement additional traveler information tools to better inform motorists and truckers about adverse conditions along roadways in the Region (or in nearby Regions). With few alternate routes in this rural Region, it is important to provide travelers with ample advance warning of hazards or impacts on their routes. Highway advisory radio (HAR) and kiosks, particularly at and near rest areas, are envisioned to be able to provide travelers with road conditions, weather and other valuable information. There are also plans to develop a District web site that can be used for pre-trip information. TxDOT already maintains web and phone-based travel information tools that travelers can call to find out about planned closures and restrictions on major routes throughout the Region. This information is static (not real-time) and is updated by TxDOT as needed.

The Public Information Officer at TxDOT Childress is responsible for sending media in the Childress Region (as well as neighboring Regions) notifications or updates about construction, closures, restrictions and other hazards. Information is sent to radio, television and print media via a FaxNet system. Emergency radio broadcast systems are in place to provide warnings and advisories of weather hazards such as winter storms or tornadoes.

Incident and Emergency Management

TxDOT, DPS, the Forest Service, County Sheriffs, and local police have established excellent working relationships and routinely combine resources for incident and emergency management within the Childress Region. With TxDOT's maintenance and service vehicles, they are often called upon as a first responder to major incidents (including non-transportation related) in the Region. The Texas DPS in Childress has an Emergency Operations Center, and serves as 24-hour dispatch for emergency resources throughout the Region. The Forest Service is located in the same facility as the Texas DPS. Texas DPS has a mobile command center equipped with communications.

The North Texas Regional Planning Commission provides 911 for the Region. There is a 911 Public Safety Access Point (PSAP) in each county. In some counties the sheriff's office is the PSAP, and in others, such as the City of Childress, it is the Childress Police. In Foard County, 911 calls go directly to Three Rivers EMS.

Radio is the primary communications between dispatch centers and vehicles; this includes Texas DPS, local law enforcement, and TxDOT maintenance.

The Childress Regional Medical Center (CMRC) is the largest medical facility in the Region. Several of the small medical facilities throughout the Region have closed down, making the CRMC in Childress the only fully-functioning hospital that serves a majority of the surrounding counties. Both ambulance and helicopter emergency transport are required and available.

Public Transportation

Because of the rural nature of the Childress Region, transit services are predominantly on-demand, although there are a few fixed-route schedules. There are three transit providers in the Region:

- Panhandle Community Services;
- Rolling Plains Management Corporation – Sharp Lines; and
- Double Mountain Coach.

Radio dispatch and communications is difficult, so the primary communications medium between dispatch centers and drivers are cell phones. Sharp Lines is investigating the feasibility of automatic vehicle location (AVL) for its vehicles, but there is difficulty getting location data back because of the rural nature of the system. Sharp Lines also is spearheading a pilot brokerage project which will serve as a referral service for various transit, public transportation and demand-response transit services in the area. Presently, this is a pilot program in neighboring Wichita Falls, but plans are to serve as a central dispatch and develop a customized program that connects to multiple transit providers for dispatch, scheduling and travel information.

1.3.4 Childress Stakeholders

Stakeholder coordination and involvement is one of the key elements to the development of a Regional ITS Architecture and Deployment Plan. ITS often transcends traditional transportation infrastructure, so it is important to involve several perspectives in the architecture development and visioning process. In the case of the Childress Region, its proximity to other TxDOT Districts (Amarillo, Abilene, Lubbock and Wichita Falls), and the state of Oklahoma, input from these stakeholders is a critical part of defining the interfaces, integration needs, and overall vision for ITS in the Childress Region.

The following is a list of public and private stakeholders in the Childress Region who have participated in the project workshops or provided input to the study team as to the needs and issues that should be considered as part of the Childress Regional ITS Architecture:

- Childress County;
- City of Childress;
- City of Shamrock;
- Rolling Plains Management Corporation (Sharp Lines);
- Texas Department of Public Safety;
- TxDOT Abilene District;
- TxDOT Amarillo District;
- TxDOT Childress District;
- TxDOT Traffic Operations Division (Austin); and
- TxDOT Wichita Falls District.

1.3.5 Major Industries and Employers

Farming and ranching are key contributors to the Childress Region's economy. Cotton, cattle, wheat, hay, and grain sorghums are the primary agriculture products that help to sustain the regional economy – more than $22 million annually just in Childress County alone. Major employers in the Region include the CMRC, T.L. Roach prison facility, and Wal-Mart.

2. INTEGRATION STRATEGY

2.1 Integration Purpose

The purpose of the integration strategy is to identify the needs, stakeholders, and strategy for regional integration in the Childress Region.

For each operating agency or stakeholder entity identified through the development of the Regional ITS Architecture, there are operations that currently exist as normal practice in order to accomplish the primary business goals and objectives for each stakeholder. The integration of each agency with any of the other stakeholders will not change the agency's primary function or disrupt its typical business practices. The integration process will require that the data that is exchanged between the two entities meet certain requirements for that particular data type. Identifying the need for this connection between agencies and the opportunities for integration and interoperability in the Region are key purposes of this section. Although there are several state, county and local agencies that could potentially be involved in current and future ITS activities in the Region, the primary integration focus is likely to be among Childress and other TxDOT centers (Districts) in West Texas and the Panhandle.

This section provides an overview of the major issues and stakeholders' needs within the Childress Region and the primary areas of concern that were identified in the preparation of the Childress Regional ITS Architecture.

The first step in developing any regional ITS architecture is identifying major stakeholders in the Region. Key stakeholders that participated in the development of the Childress Regional ITS Architecture are listed in **Table 1**. A number of other stakeholders were identified and invited to participate. In many cases, these stakeholders were not able to attend due to time constraints. Minutes of meetings, copies of reports, and access to the project web site was provided to these stakeholders to encourage their participation as much as possible.

2.2 Regional Needs

Needs from the Childress Region were identified in the project kick-off meeting held on July 30, 2002. Stakeholders participating in that meeting identified the needs in the Region according to the eight user service areas defined in the National ITS Architecture. The needs identified in the project kick-off meeting are documented in **Table 2**. Additional needs and concerns have been identified through subsequent project meetings and discussions with stakeholders.

Table 1 – Childress Stakeholder Agencies and Contacts

Stakeholder Agency	Contact	Address	Phone Number	E-Mail
City of Childress	Jerry Cummins	P.O. Box 1087 Childress, Texas 79201	(940) 937-3684	citymanager@childresstx.com
City of Shamrock	David Rushing	207 North Main Shamrock, Texas 79079	(806) 256-2516	irishedb@hotmail.com
Rolling Plans Management Group	Lezlie Carroll	Box 490 Crowell, Texas 79227	(940) 684-1571	sharplines@yahoo.com
TxDOT – Abilene District	Roy Wright	4250 North Clack Abilene, Texas 79604	(915) 616-6805	rwright@dot.state.tx.us
TxDOT – Amarillo District	Chris Freeman	P.O. Box 7368 Amarillo, Texas 79114	(806) 356-3290	cfreema@dot.state.tx.us
TxDOT – Amarillo District	Robin Frisk	P.O. Box 7368 Amarillo, Texas 79114	(806) 356-3292	rfrisk@dot.state.tx.us
TxDOT – Childress District	Danny Brown	7599 US 287 Childress, Texas 79201	(940) 937-7251	dbrown3@dot.state.tx.us
TxDOT – Childress District	Tracy Cain	16215 FM 338 Wellington, Texas 79095	(806) 447-5137	tcain@dot.state.tx.us
TxDOT – Childress District	Craig Clark	7599 US 287 Childress, Texas 79201	(940) 937-7145	cclark3@dot.state.tx.us
TxDOT – Childress District	Tonya Cummins	7599 US 287 Childress, Texas 79201	(940) 937-7164	tcummin@dot.state.tx.us
TxDOT – Childress District	Clyde Harper	7599 US 287 Childress, Texas 79201	(940) 937-7185	charper@dot.state.tx.us
TxDOT – Childress District	Darlene Harris	7599 US 287 Childress, Texas 79201	(940) 937-7138	dharri2@dot.state.tx.us
TxDOT – Childress District	Terry Keener	7599 US 287 Childress, Texas 79201	(940) 937-2571	tkeener@dot.state.tx.us
TxDOT – Childress District	Chris Medford	7599 US 287 Childress, Texas 79201	(940) 937-7132	cmedfor@dot.state.tx.us
TxDOT – Childress District	Barbara Seal	7599 US 287 Childress, Texas 79201	(940) 937-7145	bseal@dot.state.tx.us
TxDOT – Childress District	Kenneth Whitaker	16100 I-40 Shamrock, Texas 79079	(806) 256-3206	N/A
TxDOT – Wichita Falls District	Davis Powell	1601 Southwest Parkway Wichita Falls, Texas 76302	(940) 720-7717	dpowel2@dot.state.tx.us
TxDOT Traffic Operations Division	Bernie Walker	125 East 11th Street Austin, Texas 78701	(512) 416-3264	bwalker@dot.state.tx.us
TxDOT Traffic Operations Division	Janie Light	125 East 11th Street Austin, Texas 78701	(512) 416-3258	jlight@dot.state.tx.us

Table 2 – Childress Region: Summary of ITS Needs

Childress Region

Summary of ITS Needs
Childress Regional ITS Architecture and Deployment Plan Kick-Off Meeting
July 30, 2002

Institutional Issues/Needs

- Need better/enhanced communication and information sharing among Districts, cities, counties, law enforcement, etc.
- Need better outreach to rural areas to participate in regional ITS planning and programs
- Need policies for using dynamic message signs, standardized messages, and types of messages
- Need compatibility among West Texas Districts

Traffic Management Needs

- Need detours for weather and emergencies – there are currently no standard detour plans to re-route traffic in the event of a major incident or closure
- Need weather detection and notification systems (currently there are no Road Weather Information Systems in the Childress District). Childress and surrounding counties are coordinating for a grant to get a NOAA transmitter.

Traveler Information Needs

- Need permanent DMS (I-40, US 287, and other major routes) in advance of key decision points and alternate routes
- Need to equip DMS with closed-circuit television (to verify messages) and with flashing warning lights
- Need permanent Highway Advisory Radio (HAR) transmitters (along I-40 and US 287) at key decision points and in advance of alternate routes
- Need to coordinate with Amarillo HAR along I-40
- Need 511 for travel information
- Need to communicate current road condition and safety messages to motorists
- Need DMS or large screen kiosks at rest areas to inform truckers and motorists of conditions, closures, etc.

Data Needs (Collecting, Sharing)

- Need center-to-center communications and shared use of field equipment
- Need shared viewing of weather/incident information among the Districts
- Need to expedite sharing and dissemination of accident data (DPS database); need automated reporting and storage of information

Public Transportation Management Needs

None identified

Electronic Payment Needs

None identified

Commercial Vehicle Operations Needs

- Need weigh-in-motion on I-40 so weigh stations can flag specific vehicles

Table 2 – Childress: Summary of ITS Needs (continued)

Emergency Management Needs

- Need preemption on all signals for fire and police
- Need to enhance current regional emergency operations center (currently located at Texas DPS in Childress)
- Need better information sharing and coordination among emergency and traffic management (ambulance, helicopter, hospital)
- Need to provide DPS, sheriff, police and fire access to data
- Need automatic vehicle location (AVL) on DPS vehicles
- Need a mobile emergency ops/incident management center with mobile communications capabilities (similar to Forest Service)

Advanced Vehicle Safety Systems Needs

None Identified

Information Management Needs (Data Archiving)

None identified – data needs have been covered in other categories

Maintenance and Construction Management Needs

- Need AVL on TxDOT maintenance vehicles
- Need automated road condition detection, warning and treatment systems (such as anti-icing)

Other Needs

- Need video/security systems at rest areas and roadside parks – (currently at some rest areas)
- Need flood detection and warning systems

2.3 Regional Integration and Interoperability

The Childress Region is bordered by the Amarillo, Lubbock, Abilene and Wichita Falls Regions, as well as the State of Oklahoma, and planning for integration and coordination with these neighboring areas is a critical part of the ITS architecture development. These regions share common major corridors, including I-40, US Highways 287, 83, 70, and State Highways 207, 70, and 86. A major incident on any of these corridors impacts several TxDOT Regions and potentially other states. Coordination and information sharing among state and local jurisdictions, including transportation, public safety, and emergency services is paramount to ensuring that any hazards, closures, and other impacts on these shared corridors is communicated to the appropriate agencies.

Communicating accurate and current information about road conditions was identified as a high priority in the Childress Region. Many of the planned ITS projects in the Region are aimed at providing increased traveler information tools. These include information kiosks at rest areas, dynamic message signs, and highway advisory radio. 511, which would provide road condition information via the telephone, was identified as an important tool. Equally important to the dissemination of information to motorists and truck drivers is the data coming in to the system. Data that could be obtained from road weather information systems would be relayed back to the Childress District which could then be broadcast over a range of public and private systems.

Center-to-center links among TxDOT District offices have been identified as key needs. For Childress, this would provide a direct line of communication among the TxDOT Transportation

Management Centers in the Panhandle, West Texas, and North Central Texas. Another key link is from the Fort Worth TMC to Childress; Fort Worth is the originating point for AMBER Alert messages to be broadcast to the other TxDOT District Offices. Sharing information in common data formats on similar platforms, which will be accomplished with ATMS software and center-to-center communications in each of the TxDOT Districts, will help to standardize and streamline communications among these management centers.

In the Childress Region, TxDOT is often a first responder in the event of a major incident, weather, or forest fire; TxDOT in the Childress Region responds to more than transportation incidents. Residents in the region often look to the TxDOT office for information about weather and storm warnings, particularly in the winter months. With limited detection for traffic or weather, the majority of information about current conditions, hazards, incidents and weather impacts come from visual observations from TxDOT, Texas DPS, and local sheriffs and police who are out in the field. These agencies routinely coordinate for incident management as a matter of common practice. The Texas DPS in Childress functions as an Emergency Operations Center during major incidents, and stakeholders cited a need to provide for an enhanced regional emergency operations center (EOC). Providing communications, information sharing links, and resource coordination among these key agencies will improve already successful working relationships.

Public transportation is limited in the Childress Region. While there are very few fixed-routes as would be found in a more urbanized area, there is still a need to provide transit and non-emergency transportation services for residents in the Region. These on-demand services are provided by private companies, including Panhandle Community Services, Sharp Lines (Rolling Plains Management Corporation), and Double Mountain Coach. Sharp Lines has embarked on an innovative pilot project that is centralizing information about transit services in the area so callers will have one-stop access to information about services, routes and availability from various providers in the Panhandle and north central Texas. Communications between transit dispatch centers and vehicles in the field is sometimes problematic due to poor (or nonexistent) radio reception, and the majority of communications takes place over mobile phones. Providing transit agencies with advanced notice of closures or restrictions will allow them to make the necessary route changes to ensure that passengers and drivers can get to their destinations in a safe, timely manner.

3. REGIONAL ITS ARCHITECTURE DEVELOPMENT PROCESS

Development of the Regional ITS Architecture and Deployment Plan for the Childress Region relied heavily on stakeholder input to ensure that the architecture reflected local needs. A series of five meetings was held with stakeholders to gather input, and a web site with the components of the regional architecture, as well as hard copies of documents, were made available to stakeholders for review and comment.

3.1 Childress Process

The process followed for the Childress Region was designed to ensure that stakeholders could provide input and review to the development of the Region's ITS Architecture.

Prior to the first project kick-off meeting with the contractor and stakeholders, TxDOT identified relevant stakeholders in the Region to begin discussions on the development of a Regional ITS Architecture and Deployment Plan. The TxDOT District Traffic Operations Engineer led this effort. Stakeholders signed a memorandum of understanding (MOU) stating that they would work together in the Region to develop the ITS architecture.

After selecting a contractor, the process shown in **Figure 2** was used to develop the Region's ITS Architecture. In addition to the architecture, an ITS Deployment Plan for the Region also was developed to identify projects needed to implement the architecture.

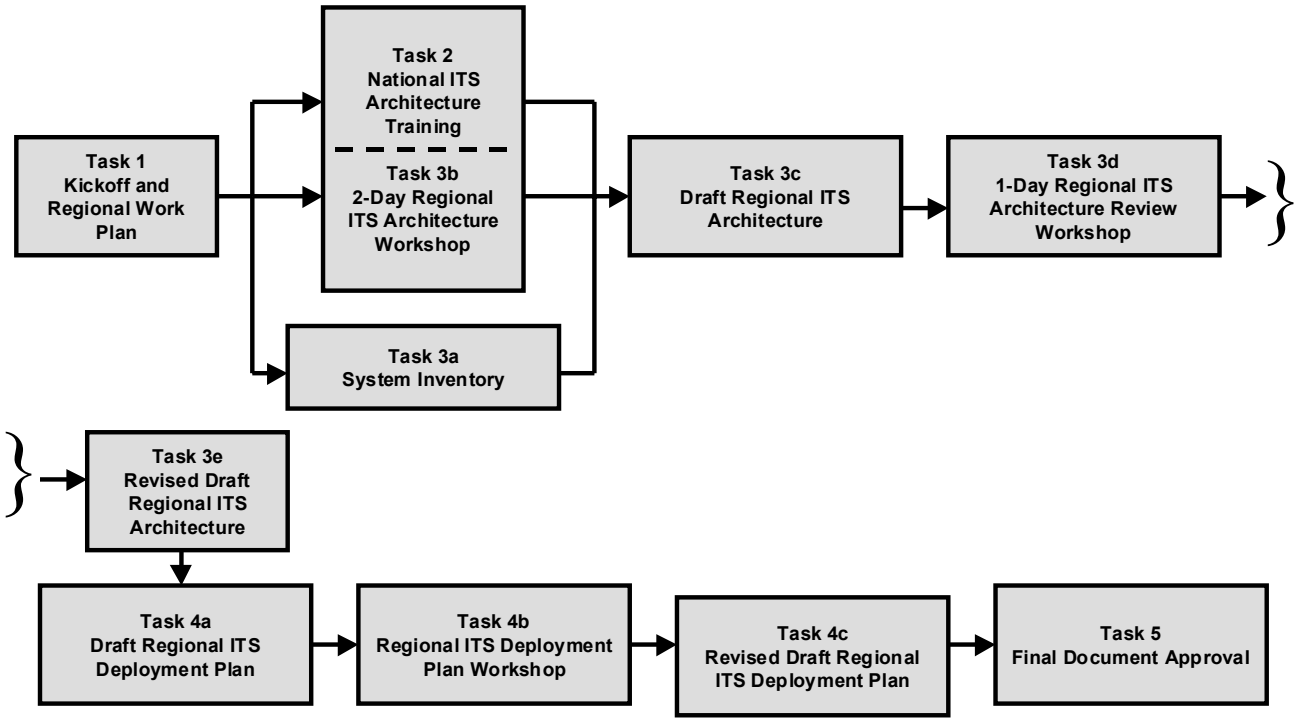


Figure 2 – Childress Regional ITS Architecture and Deployment Plan Development Process

A total of five meetings with stakeholders over a period of eleven months was used to develop the Childress Regional ITS Architecture and Deployment Plan. These meetings included:

- 1-Day Kick-off and Regional Work Plan Meeting;
- 2-Day Regional ITS Architecture Workshop;
- 1-Day Regional ITS Architecture Review Workshop;
- ITS Deployment Plan Workshop; and
- Final Comment Resolution Review and Final Meeting.

Key components of the process are described below:

Task 1 – Kick-Off and Regional Work Plan: Based on the initial stakeholder meeting and MOU that was signed, a number of key stakeholders were identified. Additional stakeholders that did not sign the initial MOU also were identified and invited to the first project kick-off meeting. At this meeting, the regional work plan was presented to stakeholders for review and comment. Subsequent meeting dates were identified and agreed upon by the stakeholders.

As part of this meeting, a workshop was held with the stakeholders to identify three additional areas of information:

- Additional stakeholders to invite to participate in the process;
- Needs of the stakeholders in the Childress Region; and
- Existing and planned ITS elements in the Region.

Task 2 – National ITS Architecture Training: Task 2 was the development and presentation of training on the National ITS Architecture. The purpose of the training was to familiarize stakeholders with the architecture terminology to the extent needed to allow them to provide input and review on the Childress Region's ITS Architecture. The National ITS Architecture training was presented in conjunction with the 2-Day Regional ITS Architecture Workshop described in Task 3B.

Task 3A – System Inventory: Collecting information for the system inventory began at the kick-off meeting through the workshop with the stakeholders to determine existing and planned ITS elements in the region. After the kick-off meeting, follow-up calls were conducted with a number of local stakeholders to gather additional input for the architecture. To complete the inventory, stakeholders were presented with the results of the inventory in the 2-Day ITS Architecture Workshop described in Task 3B.

Task 3B – 2-Day Regional ITS Architecture Workshop: The purpose of the 2-Day Regional ITS Architecture Workshop was to review the inventory with stakeholders and begin the development of the Childress Regional ITS Architecture. Training on the National ITS Architecture also was integrated into the workshop so that key elements of the architecture, such as market packages, could be explained prior to selecting and customizing these elements. The result of the 2-Day Regional ITS Architecture Workshop was a draft Regional ITS Architecture for Childress, which included a complete system inventory, interconnect diagram, customized market packages, identification of functional requirements through process specifications, system interfaces, and relevant ITS standards.

Task 3C – Draft Regional ITS Architecture: After the 2-Day Regional ITS Architecture Workshop was completed, a project web site (www.consystec.com) was developed with a dedicated link to the Texas Regional ITS Architecture program. Stakeholders were asked to review the web site and provide comments through an email link set up on the site. A hard copy of the Draft Regional ITS Architecture for the Childress Region was sent to stakeholders prior to the 1-Day Regional ITS Architecture Review Workshop.

Task 3D – 1-Day Regional ITS Architecture Review Workshop: The 1-Day Regional ITS Architecture Review workshop was designed to allow stakeholders to review the draft architecture and provide comments. The primary focus of the workshop was to review the architecture flows between elements in the market packages. Training on architecture flows as well as ITS standards also was completed.

Task 3E – Revised Draft Regional ITS Architecture: Input from stakeholders in the 1-Day Regional ITS Architecture Review Workshop, as well as comments from stakeholders reviewing the web site and hard copy document, were used to revise the Draft Regional ITS Architecture. The revisions were incorporated into the web site as well as into the hard copy document. The Revised Draft Regional ITS Architecture was mailed to stakeholders for additional review.

Task 4A – Draft Regional ITS Deployment Plan: A Draft Regional ITS Deployment Plan was developed based on the prioritization of market packages and needs expressed by the stakeholders in the Region. The Draft Regional ITS Deployment Plan included a list of recommended projects in a 5-year, 10-year, and 20-year timeframe. Each project was linked to at least one or more market packages from the Childress Regional ITS Architecture.

Task 4B – Regional ITS Deployment Plan Workshop: The Draft Regional ITS Deployment Plan was presented to stakeholders at the Regional ITS Deployment Plan Workshop. Stakeholders were asked to provide input on the recommended projects, priority, and deployment timeframe.

Task 4C – Revised Draft Regional ITS Deployment Plan: Based on the review and input from stakeholders at the Regional ITS Deployment Plan Workshop, as well as review comments received from stakeholders outside of the workshop, a Revised Draft Regional ITS Deployment Plan was developed and sent to stakeholders.

Task 5 – Final Document Approval: A final comment resolution meeting was held with stakeholders to review the Revised Draft Regional ITS Architecture and the Revised Draft Regional ITS Deployment Plan. Next steps for the Region also were discussed. Comments were incorporated and a final Regional ITS Architecture and Regional ITS Deployment Plan were developed.

3.2 USDOT Regional ITS Architecture Guidance

On October 12, 2001, the U.S. Department of Transportation (USDOT) issued guidance on development of a regional ITS architecture through the document "Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS Architecture for Your Region." **Figure 3** summarizes the guidance provided by the USDOT.

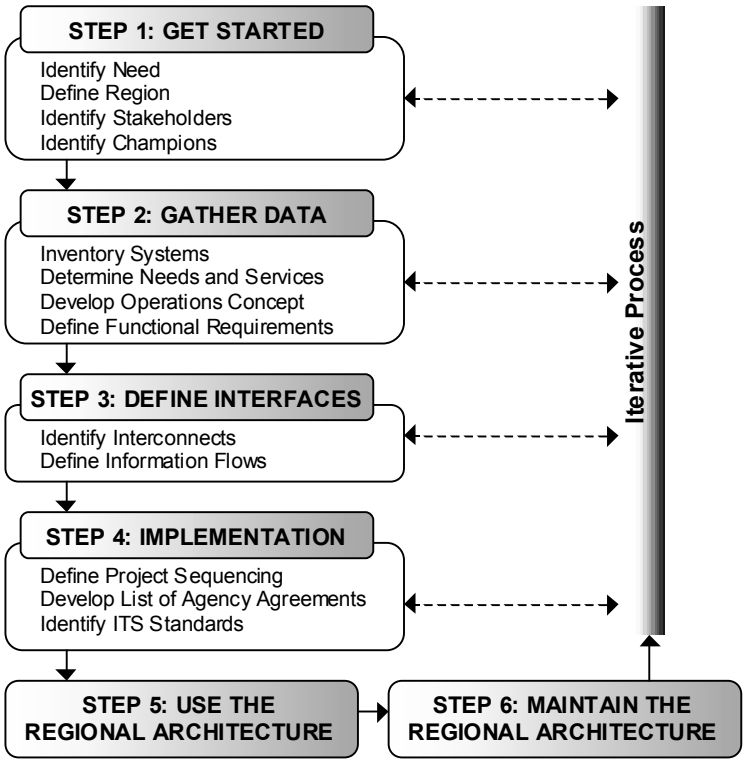
The process used to develop the Childress Regional ITS Architecture and Deployment Plan follows Steps 1 through 4 of the guidance. Steps 5 and 6 are designed to provide guidance upon the completion of the development of the Regional ITS Architecture.

Step 1, Get Started, of the guidance was completed in Task 1 – Kick-off and Regional Work Plan, as well as preliminary work completed by TxDOT to identify initial stakeholders and the need to complete the architecture for the Childress Region. Through these efforts, the need for an architecture, appropriate stakeholders, and the Region was defined.

Step 2, Gather Data, was completed through Task 1 – Kick-off and Regional Work Plan, Task 3A – System Inventory, and Task 3B – 2-Day Regional ITS Architecture Workshop. These efforts allowed the inventory for the Childress Region to be completed, identified ITS needs in the Region, and led to the development of an operational concept and definition of functional requirements.

Step 3, Define Interfaces, was completed in Task 3B – 2-Day Regional ITS Architecture Workshop and Task 3D – 1-Day Regional ITS Architecture Review Workshop. These workshops engaged stakeholders in customizing Market Packages for the Region, which included identifying interconnects among elements in the architecture and reviewing and selecting data flows between elements.

Step 4, Implementation, was completed in Task 3D – 1-Day Regional ITS Architecture Review Workshop through the prioritization of market packages. Sequencing of projects began in this process and was completed in the ITS Deployment Plan. Applicable ITS standards to match the identified data flows also were identified through the 1-Day ITS Architecture Review Workshop.



(Source: Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS Architecture for Your Region, USDOT)

Figure 3 – USDOT Guidance on Regional ITS Architecture Development

4. CONCEPTUAL DESIGN

4.1 Systems Inventory

An important initial step in the architecture development process is to establish an inventory of existing ITS elements. At the project kick-off meeting and through subsequent discussions with agency representatives throughout the Region, Childress stakeholders provided the team with a list of existing, planned, and future systems that would play a role in the Region's ITS architecture. "Planned" is defined as a system with funding identified while "future" is defined as a system that does not yet have funding identified.

Existing, planned, and future systems in the Childress Region were identified in the following categories:

- ***Travel and Traffic Management*** – includes state traffic management center, center-to-center links, detection systems, CCTV, fixed and portable dynamic message signs, broadcast traveler information, and other related technologies.
- ***Public Transportation Management*** – includes transit and paratransit automatic vehicle location, and transit travel information systems.
- ***Commercial Vehicle Operations*** – includes weigh-in-motion.
- ***Emergency Management*** – includes emergency operations/management centers and improved information sharing among traffic and emergency services.
- ***Information Management*** – includes electronic data management and archiving systems.
- ***Maintenance and Construction Management*** – includes road weather information systems, automated road treatment system, and automatic vehicle location for maintenance vehicles.

The System Inventory is a valuable task for several reasons. First, it provides a baseline of existing and planned ITS projects and systems in the Region. Second, it outlines which agencies are currently deploying and operating ITS, as well as those that are planning to implement ITS programs. Third, it provides a foundation for identifying needed elements or agency participation for the regional ITS, which will be important for subsequent tasks including the market package identification and prioritization, system interface and integration requirements in the Region, and ultimately the ITS Deployment Plan.

4.1.1 Subsystems and Terminators

Each identified system or component in the Childress Regional ITS inventory was mapped to a subsystem or terminator in the National ITS Architecture. Subsystems and terminators are the 'entities' that represent systems in ITS. Subsystems are the highest level building blocks of the physical architecture, and the National ITS Architecture groups them into four major classes: Centers, Roadside, Vehicles, and Travelers. Each of these major classes includes various subsystems that represent a set of transportation functions (or processes) that are likely to be collected together under one agency, jurisdiction, or location, and correspond to physical elements, such as traffic operations centers, traffic signals, vehicles, and so on. **Figure 4** shows the National ITS Architecture subsystems. This figure, also known as the "sausage diagram" is a standard interconnect diagram, showing the relationships of the various subsystems within the architecture; a customized interconnect diagram for the Childress Region is included in Section 4.3.1 of this report.

Communication functions between the subsystems are represented in the ovals. It should be noted that "wireline" communication refers to fixed-point to fixed-point communications, which include not only twisted pair and fiber optic technologies, but also such wireless technologies as microwave and spread spectrum.

Terminators are the people, systems, other facilities, and environmental conditions outside of ITS that need to communicate or interface with ITS subsystems. They help to define the boundaries of the National ITS Architecture as well as a regional system. Examples of terminators include drivers, traffic operations personnel, information service providers, weather effects (snow, rain, ice), telecommunications systems, and government reporting systems, among others.

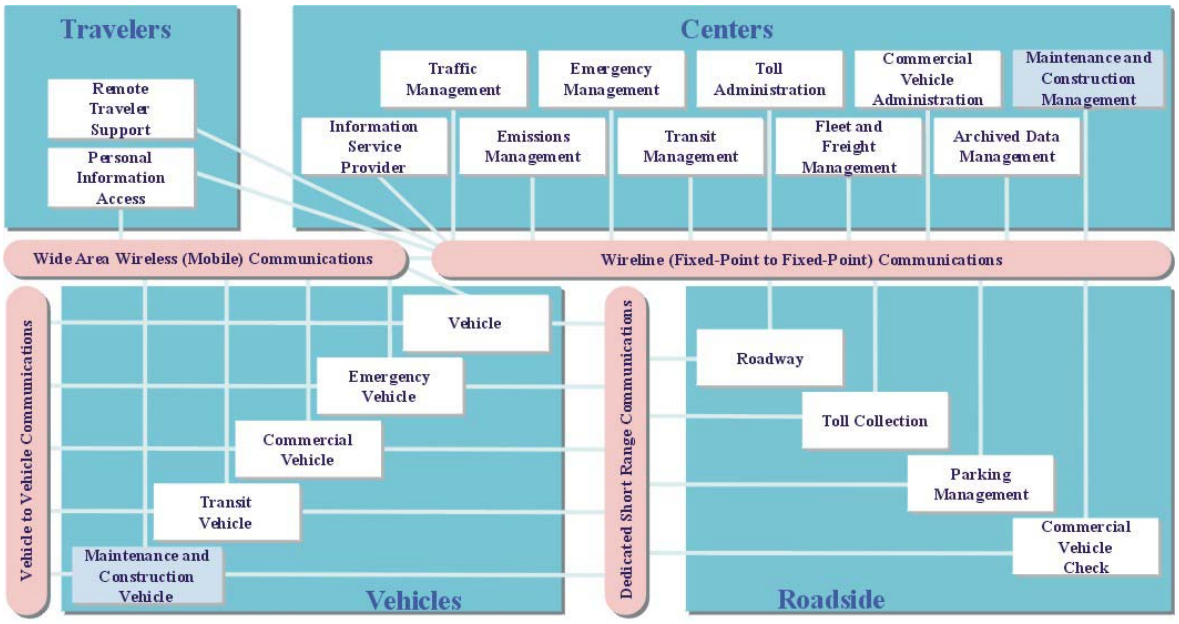


Figure 4 – Physical Subsystem Interconnect Diagram

4.1.2 Childress ITS Inventory by Stakeholder

Each stakeholder is associated with one or more systems or elements (subsystems and terminators) that make up the transportation system in the Childress Region. **Table 3** sorts the inventory by stakeholder, so each stakeholder can easily identify and review all their relevant assets that are identified in the Childress Regional ITS Architecture.

The information in **Table 3** also is included on the Childress ITS Architecture web site, which is accessible by selecting the link to the Texas Regional ITS Architecture, the Childress Region, and then selecting the "Inventory by Stakeholder" button which will open the stakeholder list. Each element in the list contains a hyperlink to more detailed information, including status, description, stakeholder, and other elements within the inventory with which it interfaces. (At the time this report was published, the Childress Regional ITS Architecture web site was being hosted at www.consystec.com. TxDOT plans to permanently host the site in the future at www.dot.state.tx.us/trf/its.)

4.1.3 Childress ITS Inventory by Entity

The Childress Regional ITS Architecture inventory is made up of the transportation and communications centers, the field equipment, the vehicles, and other systems in the regional transportation system. These components have been assigned to a subsystem or terminator as defined by the National ITS Architecture. **Table 4** presents the Childress Region inventory using the associated National ITS Architecture subsystem or terminator. This sorts elements that perform similar functions together, so elements of a particular type can be easily identified.

This inventory also can be accessed from the Childress Regional ITS Architecture web site by selecting the "Inventory by Entity" button.

Table 3 – Childress Inventory of Regional Subsystems/Terminators (sorted by Stakeholder)

Stakeholder	Element	Entity	Status
Childress City Police Department	Childress City Public Safety Dispatch	Emergency Management Subsystem	Existing
Commercial Vehicle Operators	Commercial Vehicles	Commercial Vehicle Subsystem	Existing
	Commercial Vehicles	Vehicle Subsystem	Existing
Community Convention and Visitors Bureau	Community Convention and Visitors Bureau	Event Promoters	Existing
County EOC	County EOC	Emergency Management Subsystem	Existing
County Road and Bridge	County Road and Bridge	Maintenance and Construction Management Subsystem	Existing
	County Road and Bridge Equipment Repair Facility	Equipment Repair Facility	Existing
	County Road and Bridge Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
Double Mountain Coach	Double Mountain Coach Dispatch	Transit Management Subsystem	Existing
	Double Mountain Coach Vehicles	Transit Vehicle Subsystem	Existing
DPS	DPS Communications Service	Emergency Management Subsystem	Existing
	DPS Emergency Vehicles	Emergency Vehicle Subsystem	Existing
	DPS Inspection Stations	Commercial Vehicle Check Subsystem	Existing
DPS Division of Emergency Management	State EOC	Emergency Management Subsystem	Existing
Independent School Districts	Independent School District Buses	Transit Vehicle Subsystem	Existing
	Independent School District Dispatch	Transit Management Subsystem	Existing
Local Media	Local Print and Broadcast Media	Media	Existing
Municipal Public Works Department	Municipal Public Works Department Equipment Repair Facility	Equipment Repair Facility	Existing
	Municipal Public Works Department Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
Municipal or County Public Safety	Municipal/County Emergency Vehicles	Emergency Vehicle Subsystem	Existing
	Municipal/County Public Safety Dispatch	Emergency Management Subsystem	Existing

Table 3 – Childress Inventory of Regional Subsystems/Terminators (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
Municipal Public Works Department	Municipal Public Works Department	Maintenance and Construction Management Subsystem	Existing
NOAA	National Weather Service	Weather Service	Existing
ODOT	Oklahoma TMCs	Traffic Management Subsystem	Existing
Panhandle Transit	Panhandle Transit Dispatch	Transit Management Subsystem	Existing
	Panhandle Transit Vehicles	Transit Vehicle Subsystem	Existing
Private Carriers	Private Commercial Vehicle Fleet Management	Fleet and Freight Management Subsystem	Existing
Private Information Service Providers	Private Sector Traveler Information Services	Information Service Provider Subsystem	Future
Private Tow/Wrecker Providers	Private Tow/Wrecker Dispatch	Emergency Management Subsystem	Existing
Private Travelers	Private Travelers Personal Computing Devices	Personal Information Access Subsystem	Future
	Private Vehicles	Vehicle Subsystem	Existing
Public Transportation Agencies	Brokerage Project Public Transportation Telephone System	Personal Information Access Subsystem	Future
Rail Operators	Rail Operators	Rail Operations	Existing
	Rail Operators Wayside Equipment	Wayside Equipment	Existing
Regional Emergency and Public Safety Agencies	Childress Regional Incident and Mutual Aid Network	Emergency Management Subsystem	Future
Regional Hospitals	Childress Regional Medical Center	Care Facility	Existing
	Childress Regional Medical Center	Emergency Management Subsystem	Existing
Rolling Plains Management Corporation	Rolling Plains SHARP Line Transit Dispatch	Transit Management Subsystem	Existing
	Rolling Plains SHARP Line Transit Vehicles	Transit Vehicle Subsystem	Existing
Texas Department of Health	Texas Department of Health	Information Service Provider Subsystem	Existing
Texas Forest Service	Texas Forest Service Mobile Command Center	Emergency Management Subsystem	Existing
	Texas Forest Service Operations Center	Emergency Management Subsystem	Existing

Table 3 – Childress Inventory of Regional Subsystems/Terminators (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
TxDOT	Other Texas Region TMCs	Traffic Management Subsystem	Existing
	Other TxDOT District Maintenance Sections	Maintenance and Construction Management Subsystem	Existing
	TxDOT 511 System	Information Service Provider Subsystem	Future
	TxDOT BRINSAP	Asset Management	Existing
	TxDOT Childress District Anti-icing Equipment	Roadway Subsystem	Future
	TxDOT Childress District Area Engineers Office	Maintenance and Construction Management Subsystem	Existing
	TxDOT Childress District CCTV	Roadway Subsystem	Future
	TxDOT Childress District CVO Corridor System	Roadway Subsystem	Future
	TxDOT Childress District Data Collection Equipment	Roadway Subsystem	Future
	TxDOT Childress District DMS	Roadway Subsystem	Future
	TxDOT Childress District Environmental Sensors	Roadway Subsystem	Future
	TxDOT Childress District Field Sensors	Roadway Subsystem	Future
	TxDOT Childress District HAR	Roadway Subsystem	Future
	TxDOT Childress District Maintenance and Construction Vehicles	Maintenance and Construction Vehicle Subsystem	Existing
	TxDOT Childress District Maintenance Sections	Maintenance and Construction Management Subsystem	Existing
	TxDOT Childress District Portable Field Equipment	Roadway Subsystem	Existing
	TxDOT Childress District Storage Facilities	Storage Facility	Existing
	TxDOT Childress District TMC	Maintenance and Construction Management Subsystem	Existing
	TxDOT Childress District TMC	Traffic Management Subsystem	Existing
	TxDOT Childress District Traffic Data Archive	Archived Data Management Subsystem	Future
	TxDOT Childress District Traffic Signals	Roadway Subsystem	Existing

Table 3 – Childress Inventory of Regional Subsystems/Terminators (sorted by Stakeholder) (continued)

Stakeholder	Element	Entity	Status
TxDOT (continued)	TxDOT Childress District Web Page	Information Service Provider Subsystem	Existing
	TxDOT Childress District Web Page	Maintenance and Construction Management Subsystem	Existing
	TxDOT Childress District Web Page	Traffic Management Subsystem	Existing
	TxDOT Childress District Weigh-in-Motion Station	Roadway Subsystem	Future
	TxDOT Childress Traffic Data Archive Users	Archived Data User Systems	Future
	TxDOT District Shop	Equipment Repair Facility	Existing
	TxDOT Fort Worth TMC (TransVision)	Traffic Management Subsystem	Existing
	TxDOT Highway Condition Reporting System	Information Service Provider Subsystem	Existing
	TxDOT Motor Carrier Routing Information	Information Service Provider Subsystem	Existing
	TxDOT Public Transportation Management System (PTMS)	Archived Data Management Subsystem	Existing
	TxDOT Public Transportation Management System (PTMS) Users	Archived Data User Systems	Future
	TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	Remote Traveler Support Subsystem	Existing
TxDOT/DPS	TxDOT/DPS Crash Record Information System	Archived Data Management Subsystem	Existing
	TxDOT/DPS Crash Record Information System	Information Service Provider Subsystem	Existing
	TxDOT/DPS Crash Record Information System Users	Archived Data User Systems	Existing

Table 4 – Childress Inventory of Regional Subsystems/Terminators (sorted by Entity)

Entity	Element	Stakeholder	Status
Archived Data Management Subsystem	TxDOT Childress District Traffic Data Archive	TxDOT	Future
	TxDOT Public Transportation Management System (PTMS)	TxDOT	Existing
	TxDOT/DPS Crash Record Information System	TxDOT/DPS	Existing
Archived Data User Systems	TxDOT Childress Traffic Data Archive Users	TxDOT	Future
	TxDOT Public Transportation Management System (PTMS) Users	TxDOT	Future
	TxDOT/DPS Crash Record Information System Users	TxDOT/DPS	Existing
Asset Management	TxDOT BRINSAP	TxDOT	Existing
Care Facility	Childress Regional Medical Center	Regional Hospitals	Existing
Commercial Vehicle Check Subsystem	DPS Inspection Stations	DPS	Existing
Commercial Vehicle Subsystem	Commercial Vehicles	Commercial Vehicle Operators	Existing
Emergency Management Subsystem	Childress City Public Safety Dispatch	Childress City Police Department	Existing
	Childress Regional Incident and Mutual Aid Network	Regional Emergency and Public Safety Agencies	Future
	Childress Regional Medical Center	Regional Hospitals	Existing
	County EOC	County EOC	Existing
	DPS Communications Service	DPS	Existing
	Municipal/County Public Safety Dispatch	Municipal or County Public Safety	Existing
	Private Tow/Wrecker Dispatch	Private Tow/Wrecker Providers	Existing
	State EOC	DPS Division of Emergency Management	Existing
	Texas Forest Service Mobile Command Center	Texas Forest Service	Existing
	Texas Forest Service Operations Center	Texas Forest Service	Existing
Emergency Vehicle Subsystem	DPS Emergency Vehicles	DPS	Existing
	Municipal/County Emergency Vehicles	Municipal or County Public Safety	Existing

Table 4 – Childress Inventory of Regional Subsystems/Terminators (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Equipment Repair Facility	County Road and Bridge Equipment Repair Facility	County Road and Bridge	Existing
	Municipal Public Works Department Equipment Repair Facility	Municipal Public Works Department	Existing
	TxDOT District Shop	TxDOT	Existing
Event Promoters	Community Convention and Visitors Bureau	Community Convention and Visitors Bureau	Existing
Fleet and Freight Management Subsystem	Private Commercial Vehicle Fleet Management	Private Carriers	Existing
Information Service Provider Subsystem	Private Sector Traveler Information Services	Private Information Service Providers	Future
	Texas Department of Health	Texas Department of Health	Existing
	TxDOT 511 System	TxDOT	Future
	TxDOT Childress District Web Page	TxDOT	Existing
	TxDOT Highway Condition Reporting System	TxDOT	Existing
	TxDOT Motor Carrier Routing Information	TxDOT	Existing
	TxDOT/DPS Crash Record Information System	TxDOT/DPS	Existing
Maintenance and Construction Management Subsystem	County Road and Bridge	County Road and Bridge	Existing
	Municipal Public Works Department	Municipal Public Works Department	Existing
	Other TxDOT District Maintenance Sections	TxDOT	Existing
	TxDOT Childress District Area Engineers Office	TxDOT	Existing
	TxDOT Childress District Maintenance Sections	TxDOT	Existing
	TxDOT Childress District TMC	TxDOT	Existing
	TxDOT Childress District Web Page	TxDOT	Existing
Maintenance and Construction Vehicle Subsystem	County Road and Bridge Vehicles	County Road and Bridge	Existing
	Municipal Public Works Department Vehicles	Municipal Public Works Department	Existing
	TxDOT Childress District Maintenance and Construction Vehicles	TxDOT	Existing

Table 4 – Childress Inventory of Regional Subsystems/Terminators (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Media	Local Print and Broadcast Media	Local Media	Existing
Personal Information Access Subsystem	Brokerage Project Public Transportation Telephone System	Public Transportation Agencies	Future
	Private Travelers Personal Computing Devices	Private Travelers	Future
Rail Operations	Rail Operators	Rail Operators	Existing
Remote Traveler Support Subsystem	TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks	TxDOT	Existing
Roadway Subsystem	TxDOT Childress District Anti-icing Equipment	TxDOT	Future
	TxDOT Childress District CCTV	TxDOT	Future
	TxDOT Childress District CVO Corridor System	TxDOT	Future
	TxDOT Childress District Data Collection Equipment	TxDOT	Future
	TxDOT Childress District DMS	TxDOT	Future
	TxDOT Childress District Environmental Sensors	TxDOT	Future
	TxDOT Childress District Field Sensors	TxDOT	Future
	TxDOT Childress District HAR	TxDOT	Future
	TxDOT Childress District Portable Field Equipment	TxDOT	Existing
	TxDOT Childress District Traffic Signals	TxDOT	Existing
	TxDOT Childress District Weigh-in-Motion Station	TxDOT	Future
Storage Facility	TxDOT Childress District Storage Facilities	TxDOT	Existing
Traffic Management Subsystem	Oklahoma TMCs	ODOT	Existing
	Other Texas Region TMCs	TxDOT	Existing
	TxDOT Childress District TMC	TxDOT	Existing
	TxDOT Childress District Web Page	TxDOT	Existing
	TxDOT Fort Worth TMC (TransVision)	TxDOT	Existing

Table 4 – Childress Inventory of Regional Subsystems/Terminators (sorted by Entity) (continued)

Entity	Element	Stakeholder	Status
Transit Management Subsystem	Double Mountain Coach Dispatch	Double Mountain Coach	Existing
	Independent School District Dispatch	Independent School Districts	Existing
	Panhandle Transit Dispatch	Panhandle Transit	Existing
	Rolling Plains SHARP Line Transit Dispatch	Rolling Plains Management Corporation	Existing
Transit Vehicle Subsystem	Double Mountain Coach Vehicles	Double Mountain Coach	Existing
	Independent School District Buses	Independent School Districts	Existing
	Panhandle Transit Vehicles	Panhandle Transit	Existing
	Rolling Plains SHARP Line Transit Vehicles	Rolling Plains Management Corporation	Existing
Vehicle Subsystem	Commercial Vehicles	Commercial Vehicle Operators	Existing
	Private Vehicles	Private Travelers	Existing
Wayside Equipment	Rail Operators Wayside Equipment	Rail Operators	Existing
Weather Service	National Weather Service	NOAA	Existing

4.2 Regional Market Packages

Upon completion of the system inventory, the next step in the development of the architecture was to identify the transportation services that are important to the Childress Region. In the National ITS Architecture, services are referred to as market packages. Market packages could include several stakeholders and elements that work together to provide a service in the Region. Examples of market packages from the National ITS Architecture include Network Surveillance, Traffic Information Dissemination, and Transit Vehicle Tracking. There are currently a total of 75 market packages identified in the National ITS Architecture.

In the Childress Region, the National ITS Architecture market packages were reviewed by the stakeholders and selected based on the relevance of the service that the market package could provide to the Region. All of the market packages that stakeholders in the Childress selected for implementation in the Region are identified in **Table 5**, as well as the primary stakeholders responsible for implementing the market packages and the elements in the Region that serve a role in providing the market package service. The market packages are identified as either existing, planned, or future for the Region. In many cases, existing market packages might still need to be enhanced to increase the service that the market package provides.

Upon selecting the market packages that were applicable for the Region, stakeholders then reviewed each market package and the elements that could be included to customize it for the Region. This customization is discussed further in the following section.

Table 5 – Childress Region Selected Market Packages

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
ATMS01	Network Surveillance	Private Sector Traveler Information Services	TxDOT Childress District	Future
		TxDOT Childress District CCTV		
		TxDOT Childress District Field Sensors		
		TxDOT Childress District TMC		
		TxDOT Childress District Web Page		
ATMS02	Probe Surveillance	Commercial Vehicles	TxDOT Childress District	Future
		Private Vehicles		
		TxDOT Childress District CVO Corridor System		
		TxDOT Childress District TMC		
ATMS03	Surface Street Control	TxDOT Childress District TMC	TxDOT Childress District	Existing
		TxDOT Childress District Traffic Signals		
ATMS06	Traffic Information Dissemination	Childress City Public Safety Dispatch	TxDOT Childress District	Future
		County EOC		
		County Road and Bridge		
		DPS Communications Service		
		Independent School District Dispatch		
		Local Print and Broadcast Media		
		Municipal Public Works Department		

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
ATMS06 (continued)	Traffic Information Dissemination (continued)	Municipal/County Public Safety Dispatch Rolling Plains SHARP Line Transit Dispatch Texas Forest Service Mobile Command Center Texas Forest Service Operations Center TxDOT Childress District DMS TxDOT Childress District HAR TxDOT Childress District Maintenance Sections TxDOT Childress District TMC		
ATMS07	Regional Traffic Control	Oklahoma TMCs Other Texas Region TMCs TxDOT Childress District TMC TxDOT Fort Worth TMC (TransVision)	TxDOT Childress District	Future
ATMS08	Incident Management System	Childress City Public Safety Dispatch Community Convention and Visitors Bureau County EOC County Road and Bridge Double Mountain Coach Dispatch DPS Communications Service DPS Emergency Vehicles Independent School District Dispatch Municipal Public Works Department Municipal/County Emergency Vehicles Municipal/County Public Safety Dispatch Oklahoma TMCs Other Texas Region TMCs Other TxDOT District Maintenance Sections Panhandle Transit Dispatch Private Tow/Wrecker Dispatch Rolling Plains SHARP Line Transit Dispatch State EOC Texas Forest Service Mobile Command Center Texas Forest Service Operations Center TxDOT Childress District Environmental Sensors	Emergency Management and Transportation Agencies	Future

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
ATMS08 (continued)	Incident Management System (continued)	TxDOT Childress District Maintenance Sections TxDOT Childress District TMC		
ATMS13	Standard Railroad Grade Crossing	Rail Operators Wayside Equipment TxDOT Childress District TMC TxDOT Childress District Traffic Signals	TxDOT Childress District	Future
ATMS15	Railroad Operations Coordination	Rail Operators TxDOT Childress District TMC	TxDOT Childress District	Future
EM1	Emergency Response	Childress City Public Safety Dispatch Childress Regional Incident and Mutual Aid Network Childress Regional Medical Center County EOC DPS Communications Service Municipal/County Public Safety Dispatch State EOC Texas Forest Service Mobile Command Center Texas Forest Service Operations Center	Emergency Management Agencies	Future
EM2	Emergency Routing	Childress Regional Medical Center DPS Communications Service DPS Emergency Vehicles Municipal/County Emergency Vehicles Municipal/County Public Safety Dispatch TxDOT Childress District TMC TxDOT Childress District Traffic Signals	TxDOT Childress District/Department of Public Safety	Future
			TxDOT Childress District/Municipal/County Public Safety	Future
MC01	Maintenance and Construction Vehicle Tracking	County Road and Bridge County Road and Bridge Vehicles Municipal Public Works Department Municipal Public Works Department Vehicles TxDOT Childress District Maintenance and Construction Vehicles TxDOT Childress District Maintenance Sections	TxDOT Childress District	Future
			Municipal Public Works Department	Future
			County Road and Bridge	Future

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
MC02	Maintenance and Construction Vehicle Maintenance	County Road and Bridge	TxDOT Childress District	Future
		County Road and Bridge Equipment Repair Facility	Municipal Public Works Department	Future
		County Road and Bridge Vehicles	County Road and Bridge	Future
		Municipal Public Works Department		
		Municipal Public Works Department Equipment Repair Facility		
		Municipal Public Works Department Vehicles		
		TxDOT Childress District Maintenance and Construction Vehicles		
		TxDOT Childress District Maintenance Sections		
		TxDOT Childress District TMC		
		TxDOT District Shop		
MC03	Road Weather Data Collection	National Weather Service	TxDOT Childress District	Future
		TxDOT Childress District Environmental Sensors		
		TxDOT Childress District Maintenance Sections		
		TxDOT Childress District TMC		
MC04	Weather Information Processing and Distribution	Childress City Public Safety Dispatch	TxDOT Childress District	Future
		Childress Regional Medical Center		
		County EOC		
		County Road and Bridge		
		Double Mountain Coach Dispatch		
		DPS Communications Service		
		Independent School District Dispatch		
		Local Print and Broadcast Media		
		Municipal Public Works Department		
		Municipal/County Public Safety Dispatch		
		National Weather Service		
		Oklahoma TMCs		
		Other Texas Region TMCs		
		Panhandle Transit Dispatch		
		Rail Operators		

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
MC04 (continued)	Weather Information Processing and Distribution (continued)	Rolling Plains SHARP Line Transit Dispatch TxDOT Childress District Maintenance Sections TxDOT Childress District TMC TxDOT Childress District Web Page TxDOT Highway Condition Reporting System		
MC05	Roadway Automated Treatment	TxDOT Childress District Anti-icing Equipment TxDOT Childress District Maintenance Sections TxDOT Childress District TMC	TxDOT Childress District	Future
MC06	Winter Maintenance	Childress City Public Safety Dispatch Childress Regional Medical Center County EOC County Road and Bridge Double Mountain Coach Dispatch DPS Communications Service Independent School District Dispatch Municipal Public Works Department Municipal/County Public Safety Dispatch National Weather Service Oklahoma TMCs Other Texas Region TMCs Panhandle Transit Dispatch Private Tow/Wrecker Dispatch Rolling Plains SHARP Line Transit Dispatch State EOC Texas Forest Service Mobile Command Center Texas Forest Service Operations Center TxDOT Childress District Maintenance and Construction Vehicles TxDOT Childress District Maintenance Sections TxDOT Childress District Storage Facilities TxDOT Childress District TMC TxDOT Childress District Web Page TxDOT Highway Condition Reporting System	TxDOT Childress District	Future

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
MC08	Work Zone Management	Childress City Public Safety Dispatch Childress Regional Medical Center County Road and Bridge Double Mountain Coach Dispatch DPS Communications Service Independent School District Dispatch Local Print and Broadcast Media Municipal Public Works Department Municipal/County Public Safety Dispatch Oklahoma TMCs Other Texas Region TMCs Panhandle Transit Dispatch Rolling Plains SHARP Line Transit Dispatch Texas Forest Service Mobile Command Center Texas Forest Service Operations Center TxDOT Childress District Area Engineers Office TxDOT Childress District Maintenance and Construction Vehicles TxDOT Childress District Maintenance Sections TxDOT Childress District Portable Field Equipment TxDOT Childress District TMC TxDOT Childress District Web Page TxDOT Highway Condition Reporting System	TxDOT Childress District	Future
MC09	Work Zone Safety Monitoring	TxDOT Childress District Maintenance and Construction Vehicles TxDOT Childress District Portable Field Equipment	TxDOT Childress District	Future
MC10	Maintenance and Construction Activity Coordination	County Road and Bridge Municipal Public Works Department Oklahoma TMCs Other Texas Region TMCs Rail Operators TxDOT BRINSAP TxDOT Childress District Area Engineers Office	TxDOT Childress District	Future

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
MC10 (continued)	Maintenance and Construction Activity Coordination (continued)	TxDOT Childress District Maintenance Sections TxDOT Childress District TMC TxDOT Childress District Web Page TxDOT Highway Condition Reporting System		
APTS1	Transit Vehicle Tracking	Double Mountain Coach Dispatch Double Mountain Coach Vehicles Independent School District Buses Independent School District Dispatch Panhandle Transit Dispatch Panhandle Transit Vehicles Rolling Plains SHARP Line Transit Dispatch Rolling Plains SHARP Line Transit Vehicles	Independent School Districts Rolling Plains SHARP Line Transit Double Mountain Coach Panhandle Transit	Future Future Future Future
APTS2	Transit Fixed-Route Operations	Independent School District Buses Independent School District Dispatch TxDOT Childress District TMC TxDOT Childress District Web Page	Independent School Districts	Future
APTS3	Demand Response Transit Operations	Double Mountain Coach Dispatch Double Mountain Coach Vehicles Panhandle Transit Dispatch Panhandle Transit Vehicles Private Sector Traveler Information Services Rolling Plains SHARP Line Transit Dispatch Rolling Plains SHARP Line Transit Vehicles Texas Department of Health TxDOT Childress District Web Page	Rolling Plains SHARP Line Transit Panhandle Transit Double Mountain Coach	Future Future Future
APTS5	Transit Security	Childress City Public Safety Dispatch Double Mountain Coach Dispatch Double Mountain Coach Vehicles DPS Communications Service Municipal/County Public Safety Dispatch Panhandle Transit Dispatch Panhandle Transit Vehicles Rolling Plains SHARP Line Transit Dispatch Rolling Plains SHARP Line Transit Vehicles	Rolling Plains SHARP Line Transit Panhandle Transit Double Mountain Coach	Future Future Future

Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
APTS8	Transit Traveler Information	Brokerage Project Public Transportation Telephone System	Rolling Plains SHARP Line Transit	Future
		Double Mountain Coach Dispatch		
		Panhandle Transit Dispatch		
		Rolling Plains SHARP Line Transit Dispatch		
CVO06	Weigh-In-Motion	Commercial Vehicles	Department of Public Safety	Future
		DPS Inspection Stations	TxDOT Childress District	Future
		TxDOT Childress District TMC		
		TxDOT Childress District Weigh-in-Motion Station		
CVO10	HAZMAT Management	Commercial Vehicles	Department of Public Safety	Future
		DPS Communications Service		
		Municipal/County Public Safety Dispatch		
		Private Commercial Vehicle Fleet Management		
ATIS1	Broadcast Traveler Information	Local Print and Broadcast Media	TxDOT Childress District	Future
		TxDOT 511 System		
		TxDOT Childress District TMC		
		TxDOT Childress District Web Page		
		TxDOT Highway Condition Reporting System		
ATIS2	Interactive Traveler Information	TxDOT Childress District Web Page	TxDOT Childress District	Future
		TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks		
		Private Travelers Personal Computing Devices		
ATIS5	ISP Based Route Guidance	Private Commercial Vehicle Fleet Management	TxDOT Motor Carrier Routing Information	Future
		Private Travelers Personal Computing Devices		
		TxDOT Childress District TMC		
		TxDOT Motor Carrier Routing Information		
AD1	ITS Data Mart	Childress City Public Safety Dispatch	TxDOT Public Transportation Management System	Future
		Double Mountain Coach Dispatch		
		DPS Communications Service	TxDOT/DPS Crash Record Information System	Future
		Independent School District Dispatch		
		Municipal/County Public Safety Dispatch	TxDOT Childress District Traffic Data Archive	Future
		Panhandle Transit Dispatch		
		Rolling Plains SHARP Line Transit Dispatch		

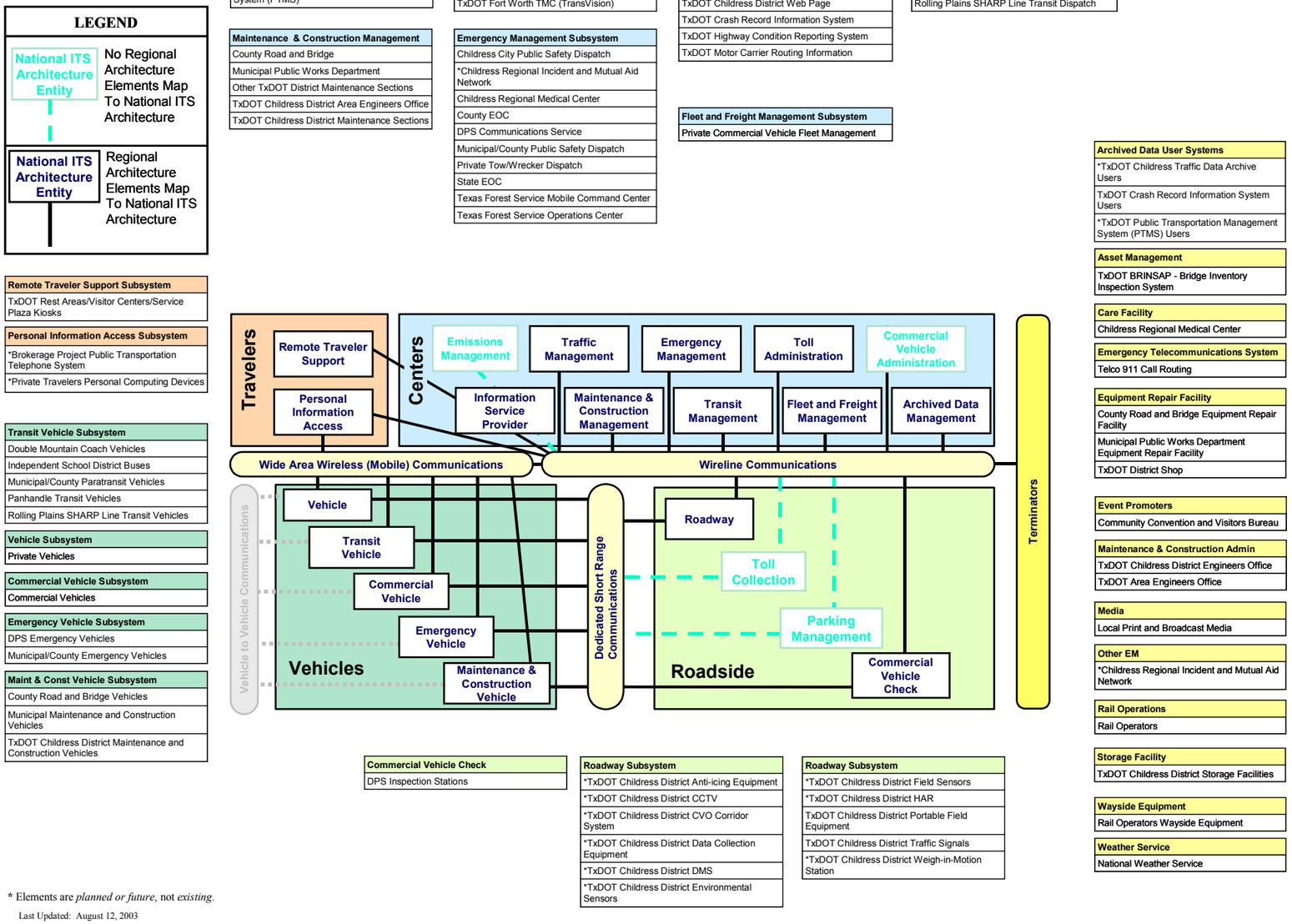
Table 5 – Childress Region Selected Market Packages (continued)

Market Package	Market Package Name	Elements Associated with Market Package	Primary Stakeholders Responsible for Implementation	Status
AD1 (continued)	ITS Data Mart (continued)	TxDOT Childress District Data Collection Equipment TxDOT Childress District TMC TxDOT Childress District Traffic Data Archive TxDOT Childress Traffic Data Archive Users TxDOT Public Transportation Management System (PTMS) TxDOT Public Transportation Management System (PTMS) Users TxDOT/DPS Crash Record Information System TxDOT/DPS Crash Record Information System Users		

4.3 Interconnections

4.3.1 Top Level Regional System Interconnect Diagram

A system interconnect diagram, or sausage diagram (shown previously in **Figure 4**), shows the systems and primary interconnects in the Region. The National ITS Architecture interconnect diagram has been customized for the Childress Region based on the information gathered from the stakeholders and system inventory. **Figure 5** on the following page summarizes the existing, planned, and future ITS elements for the Childress Region in the context of a physical interconnect. Subsystems and elements specific to Childress are called out in the boxes surrounding the main interconnect diagram, and these are color-coded to the subsystem to which they are associated. The rectangles represent the architecture subsystems, and the terminators are represented by the rounded rectangles. Elements with an asterisk (*) are planned and future system elements.



Archived Data Management Subsystem
*TxDOT Childress District Traffic Data Archive
TxDOT Crash Record Information System
TxDOT Public Transportation Management System (PTMS)

Traffic Management Subsystem
Oklahoma TMCs
Other Texas Region TMCs
TxDOT Childress District TMC
TxDOT Fort Worth TMC (TransVision)

Information Service Provider Subsystem
*Private Sector Traveler Information Services
Texas Department of Health
*TxDOT 511 System
TxDOT Childress District Web Page
TxDOT Crash Record Information System
TxDOT Highway Condition Reporting System
TxDOT Motor Carrier Routing Information

Transit Management Subsystem
Double Mountain Coach Dispatch
Independent School District Dispatch
Panhandle Transit Dispatch
Rolling Plains SHARP Line Transit Dispatch

Maintenance & Construction Management
County Road and Bridge
Municipal Public Works Department
Other TxDOT District Maintenance Sections
TxDOT Childress District Area Engineers Office
TxDOT Childress District Maintenance Sections

Emergency Management Subsystem
Childress City Public Safety Dispatch
*Childress Regional Incident and Mutual Aid Network
Childress Regional Medical Center
County EOC
DPS Communications Service
Municipal/County Public Safety Dispatch
Private Tow/Wrecker Dispatch
State EOC
Texas Forest Service Mobile Command Center
Texas Forest Service Operations Center

Fleet and Freight Management Subsystem
Private Commercial Vehicle Fleet Management

Remote Traveler Support Subsystem
TxDOT Rest Areas/Visitor Centers/Service Plaza Kiosks

Personal Information Access Subsystem
*Brokerage Project Public Transportation Telephone System
*Private Travelers Personal Computing Devices

Transit Vehicle Subsystem
Double Mountain Coach Vehicles
Independent School District Buses
Municipal/County Paratransit Vehicles
Panhandle Transit Vehicles
Rolling Plains SHARP Line Transit Vehicles

Vehicle Subsystem
Private Vehicles

Commercial Vehicle Subsystem
Commercial Vehicles

Emergency Vehicle Subsystem
DPS Emergency Vehicles
Municipal/County Emergency Vehicles

Maint & Const Vehicle Subsystem
County Road and Bridge Vehicles
Municipal Maintenance and Construction Vehicles
TxDOT Childress District Maintenance and Construction Vehicles

Commercial Vehicle Check
DPS Inspection Stations

Roadway Subsystem
*TxDOT Childress District Anti-icing Equipment
*TxDOT Childress District CCTV
*TxDOT Childress District CVO Corridor System
*TxDOT Childress District Data Collection Equipment
*TxDOT Childress District DMS
*TxDOT Childress District Environmental Sensors

Roadway Subsystem
*TxDOT Childress District Field Sensors
*TxDOT Childress District HAR
TxDOT Childress District Portable Field Equipment
TxDOT Childress District Traffic Signals
*TxDOT Childress District Weigh-in-Motion Station

Archived Data User Systems
*TxDOT Childress Traffic Data Archive Users
TxDOT Crash Record Information System Users
*TxDOT Public Transportation Management System (PTMS) Users

Asset Management
TxDOT BRINSAP - Bridge Inventory Inspection System

Care Facility
Childress Regional Medical Center

Emergency Telecommunications System
Telco 911 Call Routing

Equipment Repair Facility
County Road and Bridge Equipment Repair Facility
Municipal Public Works Department Equipment Repair Facility
TxDOT District Shop

Event Promoters
Community Convention and Visitors Bureau

Maintenance & Construction Admin
TxDOT Childress District Engineers Office
TxDOT Area Engineers Office

Media
Local Print and Broadcast Media

Other EM
*Childress Regional Incident and Mutual Aid Network

Rail Operations
Rail Operators

Storage Facility
TxDOT Childress District Storage Facilities

Wayside Equipment
Rail Operators Wayside Equipment

Weather Service
National Weather Service

* Elements are *planned or future*, not *existing*.

Last Updated: August 12, 2003

Figure 5 – Childress Regional System Interconnect Diagram

4.3.2 Customized Market Packages

The market packages in the National ITS Architecture were customized to reflect the unique systems, subsystems, and terminators in the Childress Region. Each market package is shown graphically, with the market package name, Childress-specific element, and with the unique agency and system identifiers within the subsystems and terminators.

Figure 6 is an example of an ATMS market package for Standard Railroad Grade Crossings that has been customized for the Childress Region. This market package shows the two subsystems (Traffic Management and Roadway), and the associated entities (Rail Operators Wayside Equipment). Data flows between the subsystems and the terminators (Wayside Equipment) indicate what information is being shared.

Market packages that were customized for the Childress Region are shown in **Appendix A**. These market packages also are included on the Childress Regional ITS Architecture web site by selecting the "Market Package" button. Market packages are grouped by functional area (Traffic Management, Maintenance and Construction, Public Transportation, etc.), and each of the customized market packages can be viewed by clicking on the Market Package Diagram icon under each area heading. It is important to note that while the market package table on the web site shows all of the available market packages from the National ITS Architecture, only those selected for the Childress Region are included in the diagrams. The selected market packages on the web site also are highlighted in the table with bold print, and are indicated as existing or planned.

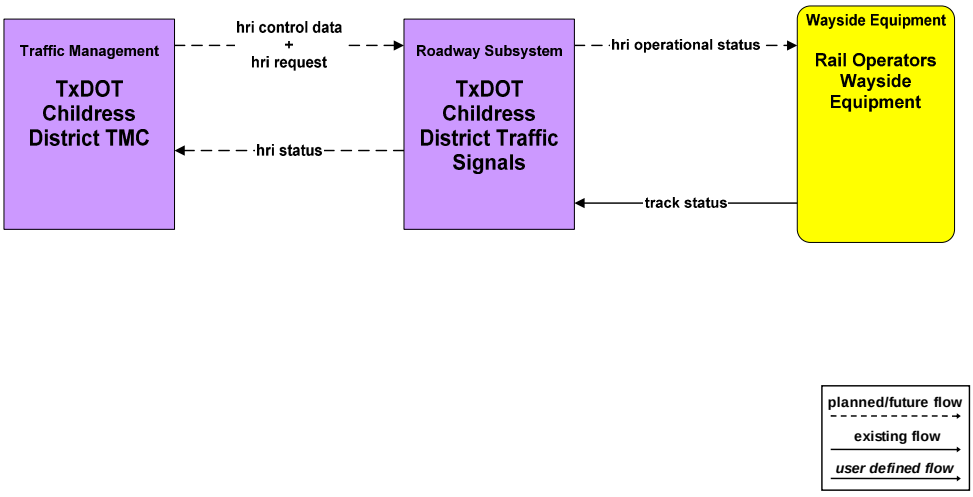


Figure 6 – Childress Standard Railroad Grade Crossing Customized Market Package

4.3.3 Childress Architecture Interfaces

While it is important to identify the various systems and stakeholders as part of a regional ITS, a primary purpose of the architecture is to identify the *connectivity* between transportation systems in the Childress Region. The interconnect diagram shown previously in **Figure 5** showed the high-level relationships of the subsystems and terminators in the Childress Region and the associated local projects and systems. The customized market packages represent services that can be deployed as an integrated capability, and the market package diagrams show the information flows between the subsystems and terminators that are most important to the operation of the market packages. How these systems interface with each other is an integral part of the overall ITS architecture.

There are 72 different elements identified as part of the Childress Regional ITS Architecture. These elements include traffic management centers, transit vehicles, dispatch systems, emergency management agencies, media outlets, and others – essentially, all of the existing and planned physical components that contribute to the regional intelligent transportation system. Interfaces have been identified for each element in the Childress Regional ITS Architecture, and each element has been mapped to those other elements with which it must interface. For example, the TxDOT Childress District TMC has existing or planned interfaces with 38 other elements in the Childress Region, ranging from field equipment and dispatch center, to other TxDOT District TMCs. Other interfaces are far less complex, such as the interface between the DPS vehicles and the DPS Communications Dispatch.

An example of one of the system interfaces is shown in **Figure 7**. This graphic shows the TxDOT Childress District traffic signals and the existing and planned interfaces with other elements throughout the Region. These interfaces are shown as existing, planned, or future. Interfaces defined as planned have funding identified, while future interfaces are desired by stakeholders but funding has not yet been identified.

Each element and its defined interfaces are listed in **Appendix B**. Elements and their interfaces also are accessible via the Childress Regional ITS Architecture web site by clicking on the “Interfaces” button. Elements are listed alphabetically in the column on the left, and each entry in the Interfacing Element column on the right is a link to more detailed information about the particular interface. The architecture flows between the individual element interfaces are described in more detail in the following section.

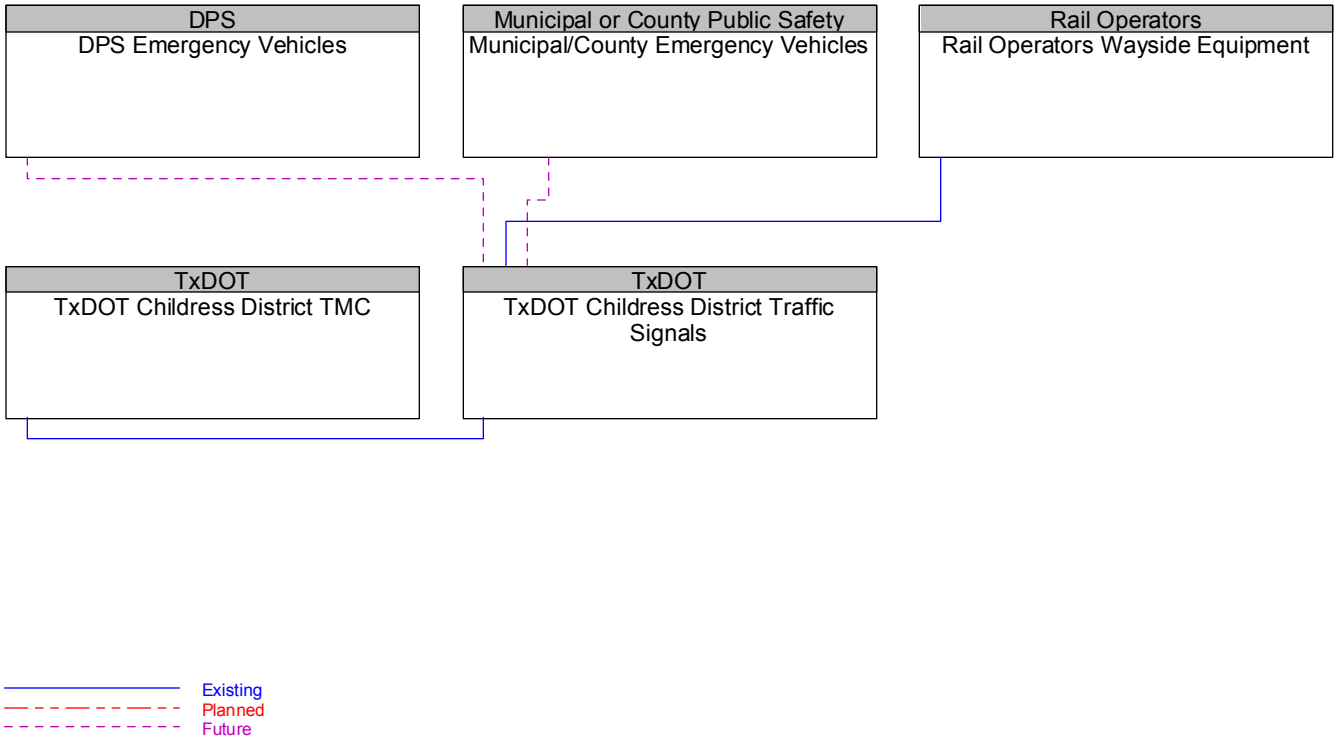


Figure 7 – TxDOT Childress District Traffic Signals Interfaces

4.3.4 Physical Subsystem Architecture Flows

Architecture flows between the subsystems and terminators define the specific information (data) that is exchanged between subsystems and terminators. Each architecture flow has one or more data flows that specify what information is exchanged and the direction of the exchange. These data flows could be requests for information, alerts and messages, status requests, broadcast advisories, event messages, confirmations, electronic credentials, and other key information requirements. These architecture flows define the interface requirements between the various elements in the Childress Regional ITS Architecture.

An example of the architecture flows between two elements is shown in **Figure 8**. In this interface, the flows between the TxDOT Childress District TMC and other Texas Region TMCs show information that must go from the Childress District TMC to other Texas TMCs, as well as information that the TMC needs from devices. Similar to the interfaces, architecture flows also are defined as existing, planned, or future.

Each of the individual element interfaces can be accessed on the Childress Regional ITS Architecture web site by clicking on the "Interfaces" button. Selecting any of the interfacing elements from the column on the right will display an interface diagram and architecture flows between two specific elements, similar to the diagram shown in **Figure 8**. Each data flow is defined, and any standards associated with that data flow are noted. Standards as they apply to the Childress Region are discussed in more detail in Section 4.5.

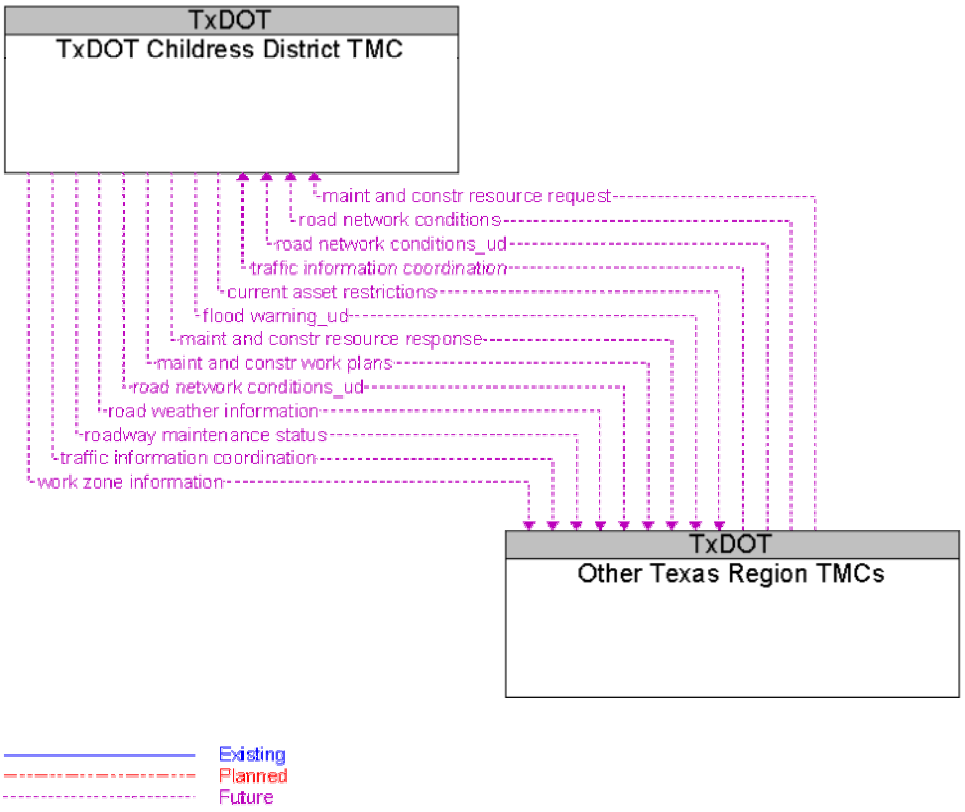


Figure 8 – TxDOT Childress District TMC to Other Texas Region TMCs Architecture Flows

4.4 Functional Requirements

Functions are a description of what the system has to do. In the National ITS Architecture, functions are defined at several different levels, ranging from general subsystem descriptions through somewhat more specific equipment package descriptions to Process Specifications that include substantial detail. Guidance from the USDOT on developing a Regional ITS Architecture recommends that each Region determine the level of detail of the functional requirements for their Region. In the Childress Region, it is recommended that the development of detailed functional requirements such as the "shall" statements included in Process Specifications for a system be developed at the project level. These detailed "shall" statements identify all functions that a project or system needs to perform.

For the Childress Regional ITS Architecture, functional requirements have been identified at two levels. The customized market packages, discussed previously in Section 4.3.2, describe the services that ITS needs to provide in the Region and the architecture flows between the elements. These market packages and data flows describe what the ITS system in Childress has to do and the data that needs to be shared among elements.

At a more detailed level, functional requirements for the Childress Region also are described in terms of equipment packages that are associated with one or more subsystems in the Childress Regional ITS Architecture as shown in **Table 6**. An equipment package is a functional capability that could be deployed at a specific time. Each equipment package can be linked in the National ITS Architecture to the Process Specifications that might be applicable. It is recommended that during the design concept stage of a project, the applicable equipment package and associated Process Specifications from the National ITS Architecture be reviewed by the implementer to determine the appropriate functional requirements for the project. A link for each equipment package is available on the Childress Regional ITS Architecture web site by clicking on the "Functions" button.

Table 6 – Childress Region Equipment Packages

Subsystem	Equipment Package
Archived Data Management Subsystem	Government Reporting Systems Support
	ITS Data Repository
	Traffic and Roadside Data Archival
Commercial Vehicle Administration Subsystem	CV Data Collection
Commercial Vehicle Check Subsystem	Roadside WIM
Commercial Vehicle Subsystem	On-Board Cargo Monitoring
	On-board CV Electronic Data
Emergency Management Subsystem	Emergency Call-Taking
	Emergency Data Collection
	Emergency Dispatch
	Emergency Environmental Monitoring
	Emergency Response Management
	Mayday Support

Table 6 – Childress Region Equipment Packages (continued)

Subsystem	Equipment Package
Emergency Vehicle Subsystem	On-board EV En Route Support
	On-Board EV Environmental Monitoring
	On-board EV Incident Management Communication
Emissions Management Subsystem	Emissions Data Collection
Fleet and Freight Management Subsystem	Fleet HAZMAT Management
Information Service Provider Subsystem	Basic Information Broadcast
	Infrastructure Provided Route Selection
	Interactive Infrastructure Information
	ISP Data Collection
	ISP Probe Information Collection
Maintenance and Construction Management Subsystem	MCM Automated Treatment System Control
	MCM Data Collection
	MCM Environmental Information Collection
	MCM Environmental Information Processing
	MCM Incident Management
	MCM Maintenance Decision Support
	MCM Vehicle and Equipment Maintenance Management
	MCM Vehicle Tracking
	MCM Winter Maintenance Management
	MCM Work Activity Coordination
	MCM Work Zone Management
	MCM Work Zone Safety Management
Maintenance and Construction Vehicle Subsystem	MCV Environmental Monitoring
	MCV Vehicle Location Tracking
	MCV Vehicle Safety Monitoring
	MCV Vehicle System Monitoring and Diagnostics
	MCV Winter Maintenance
	MCV Work Zone Support
Parking Management Subsystem	Parking Data Collection
Personal Information Access Subsystem	Personal Basic Information Reception
	Personal Interactive Information Reception
	Personal Location Determination
	Personal Provider-Based Route Guidance
Remote Traveler Support Subsystem	Remote Basic Information Reception
	Remote Interactive Information Reception
	Remote Mayday I/F
	Remote Transit Information Services
	Secure Area Monitoring

Table 6 – Childress Region Equipment Packages (continued)

Subsystem	Equipment Package
Roadway Subsystem	Roadside Data Collection
	Roadside Signal Priority
	Roadway Automated Treatment
	Roadway Basic Surveillance
	Roadway Environmental Monitoring
	Roadway Equipment Coordination
	Roadway Incident Detection
	Roadway Probe Beacons
	Roadway Signal Controls
	Roadway Traffic Information Dissemination
	Roadway Work Zone Safety
	Roadway Work Zone Traffic Control
	Standard Rail Crossing
Toll Administration Subsystem	Toll Data Collection
Traffic Management Subsystem	Collect Traffic Surveillance
	HRI Traffic Management
	Rail Operations Coordination
	TMC Environmental Monitoring
	TMC Incident Detection
	TMC Incident Dispatch Coordination/Communication
	TMC Probe Information Collection
	TMC Regional Traffic Control
	TMC Signal Control
	TMC Traffic Information Dissemination
	TMC Work Zone Traffic Management
	Traffic Data Collection
	Traffic Maintenance
Transit Management Subsystem	Transit Center Fixed-Route Operations
	Transit Center Information Services
	Transit Center Multi-Modal Coordination
	Transit Center Paratransit Operations
	Transit Center Security
	Transit Center Tracking and Dispatch
	Transit Data Collection
	Transit Environmental Monitoring
	Transit Garage Operations

Table 6 – Childress Region Equipment Packages (continued)

Subsystem	Equipment Package
Transit Vehicle Subsystem	On-Board Environmental Monitoring
	On-board Fixed Route Schedule Management
	On-board Paratransit Operations
	On-board Transit Information Services
	On-board Transit Security
	On-board Transit Trip Monitoring
Vehicle Subsystem	Basic Vehicle Reception
	Interactive Vehicle Reception
	Smart Probe
	Vehicle Location Determination
	Vehicle Mayday I/F
	Vehicle Probe Support
	Vehicle Provider-Based Route Guidance
	Vehicle Safety Monitoring System

4.5 Standards

Standards are an important tool that will allow efficient implementation of the elements in the Childress Regional ITS Architecture over time. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances, vendors change, and as new approaches evolve. The USDOT's ITS Joint Program Office is supporting Standards Development Organizations (SDOs) with an extensive, multi-year program of accelerated, consensus-based standards development to facilitate successful ITS deployment in the United States. **Table 7** identifies each of the ITS standards that could apply to the Childress Regional ITS Architecture. These standards are based on the physical subsystem architecture flows previously identified in Section 4.3.4. The connection of each standard to the applicable architecture flows between elements can be viewed on the Childress Regional ITS Architecture web site by clicking on the "Interfaces" or "Standards" buttons.

Table 7 – Applicable ITS Standards for the Childress Region

SDO	Document ID	Title	Type
AASHTO/ITE/NEMA	NTCIP 1201	Global Object Definitions	Message
	NTCIP 1202	Object Definitions for Actuated Traffic Signal Controller Units	Message
	NTCIP 1203	Object Definitions for Dynamic Message Signs	Message
	NTCIP 1204	Object Definitions for Environmental Sensor Stations and Roadside Weather Information System	Message
	NTCIP 1205	Data Dictionary for Closed Circuit Television (CCTV)	Message
	NTCIP 1206	Data Collection and Monitoring Devices	Message
	NTCIP 1208	Object Definitions for Video Switches	Message
	NTCIP 1209	Transportation System Sensor Objects	Message
	NTCIP 1210	Objects for Signal Systems Master	Message
	NTCIP 1211	Objects for Signal Control Priority	Message
	NTCIP 1301	Message Set for Weather Reports	Message
	NTCIP 1401	TCIP – Common Public Transportation (CPT) Business Area Standard	Message
	NTCIP 1402	TCIP – Incident Management (IM) Business Area Standard	Message
	NTCIP 1403	TCIP – Passenger Information (PI) Business Area Standard	Message
	NTCIP 1404	TCIP – Scheduling/Runcutting (SCH) Business Area Standard	Message
	NTCIP 1405	TCIP – Spatial Representation (SP) Business Area Standard	Message
	NTCIP 1406	TCIP – Onboard (OB) Business Area Standard	Message
	NTCIP 1407	TCIP – Control Center (CC) Business Area Standard	Message
	NTCIP 1408	TCIP – Fare Collection (FC) Business Area Standard	Message
	Various	NTCIP Center-to-Center Standards Group	Communication
	Various	NTCIP Center-to-Field Standards Group	Communication

Table 7 – Applicable ITS Standards for the Childress Region (continued)

SDO	Document ID	Title	Type
ASTM	ASTM 5 GHz Data Link	Standard Specification for 5.9 GHz Data Link Layer	Communication
	ASTM 5 GHz Phys	Standard Specification for 5.9 GHz Physical Layer	Communication
	ASTM DD 17.54.00.2	ADMS Data Dictionary Specifications	Data
	ASTM PS 105-99	Specification for Dedicated Short Range Communication (DSRC) Data Link Layer: Medium Access and Logical Link Control	Communication
	ASTM PS 111-98	Specification for Dedicated Short Range Communication (DSRC) Physical Layer using Microwave in the 902-928 MHz	Communication
IEEE	IEEE P1512.1	Standard for Traffic Incident Management Message Sets for Use by EMCs	Message
	IEEE P1512.2	Standard for Public Safety IMMS for use by EMCs	Message
	IEEE P1512.3	Standard for Hazardous Material IMMS for use by EMCs	Message
	IEEE P1512.a	Standard for Emergency Management Data Dictionary	Data
	IEEE P1512-2000	Standard for Common Incident Management Message Sets (IMMS) for use by EMCs	Message
	IEEE P1556	Security/Privacy of Vehicle/RS Communications including Smart Card Communications	Communication
	IEEE P1570	Standard for Interface Between the Rail Subsystem and the Highway Subsystem at a Highway Rail Intersection	Message
	IEEE Std 1455-1999	Standard for Message Sets for Vehicle/Roadside Communications	Message
ITE	ITE TM 1.03	Standard for Functional Level Traffic Management Data Dictionary (TMDD)	Data
	ITE TM 2.01	Message Sets for External TMC Communication (MS/ETMCC)	Message
SAE	SAE J1746	ISP-Vehicle Location Referencing Standard	Data
	SAE J2313	On-Board Land Vehicle Mayday Reporting Interface	Message
	SAE J2353	Data Dictionary for Advanced Traveler Information System (ATIS)	Data
	SAE J2354	Message Set for Advanced Traveler Information System (ATIS)	Message
	SAE J2529	Rules for Standardizing Street Names and Route IDs	Message
	SAE J2540	Messages for Handling Strings and Look-Up Tables in ATIS Standards	Message

4.6 Phases of Implementation

The Regional ITS Architecture will be implemented through a series of projects led by both public sector and private sector agencies. Key foundation systems will need to be implemented in order to support other systems that have been identified in the Regional ITS Architecture. The deployment of all of the systems required to achieve the final Regional ITS Architecture build out will be incremental and will occur over many years.

A sequence of projects and recommended time frames has been identified in the Childress Regional ITS Deployment Plan. These projects have been sequenced over a 20-year period, with projects identified for deployment in a 5-, 10-, and 20-year timeframe. These timeframes correspond with priorities and needs identified by stakeholders in the Childress Region.

Some of the key market packages that will provide the functions of the key foundation systems in the Childress Region are listed below. Projects associated with these and other market packages identified for the Region have been included in the Childress Regional ITS Deployment Plan.

- Network Surveillance;
- Road Weather Data Collection;
- Traffic Information Dissemination;
- Incident Management System;
- Emergency Response; and
- Broadcast Traveler Information.

In addition to the above market packages, the implementation of an appropriate communications system in the Childress Region to support ITS is critical for continued deployment of projects.

5. OPERATIONAL CONCEPT

The operational concept for the Childress Region provides a description of the stakeholders' roles and responsibilities in the operation of the systems that are being proposed. This operational concept provides an "executive summary" view of the way the Childress Region's systems will work together, and it documents the roles and responsibilities for the each of the services that the intelligent transportation system will provide. The approach to describing the operational concept is to present specific operational scenarios that describe and define the stakeholders' general role in providing the services.

In addition to the operational scenarios that illustrate the roles and responsibilities of each agency, a list of the key agencies that are responsible for operations in the eight ITS areas is presented. This list will serve as a high level overview of the different roles and responsibilities in this operational concept. In addition, specific roles and coordination requirements for operations are illustrated through the customized market package diagrams presented in **Appendix A**.

With the information sharing needs, operational requirements, and in some cases shared or joint operations of systems, agreements may be required to better define roles and responsibilities. A list of potential agreements has been included in section 5.3. As projects are implemented and agencies move toward integration on a regional level, these potential agreements should be reviewed for their applicability.

5.1 Operational Scenarios

Scenario 1

The first operational scenario describes how the integrated elements of the Childress Region's ITS program will function together in the event of a major incident caused by a train derailment near US 287. In this operational scenario, highway rail crossings in the Childress Region have been instrumented with enhanced detection and warning systems. TxDOT Childress District Area Offices are interconnected via workstations and a local area network. Center-to-center communications facilitate information sharing among TxDOT Transportation Management Centers in the Panhandle and north central parts of the state, as well as with Oklahoma. Some portions of US 287 are instrumented with permanent DMS, some of which have CCTV cameras transmitting images from selected locations to allow operators to verify messages. These systems are controlled from the Childress TMC at the TxDOT Childress District Office using the ATMS software, and this TMC also facilitates information sharing with other Districts as well as motorists.

The highway/rail detection system sends a signal back to the TMC that an eastbound train is approaching the junction of US 287 near Acme in Hardeman County. This signal also activates the roadside equipment near the intersection to warn motorists on both sides of US 287 of the approaching train. There is a malfunction, either on board the train or a defective piece of track, and four train cars slip as the train approaches the junction. Two stopped vehicles on the east side of the 287 are impacted by the derailment.

The workstation at the TMC shows detectors on 287 near this junction demonstrating very high volumes, indicating that traffic has come to a standstill. This stands to reason as cars should be stopped for the train. A 911 call is placed and DPS dispatch is notified of the derailment by a motorist calling from a mobile phone who has witnessed the accident. The dispatcher logs the

incident details and a notification alarm is automatically sent to the TxDOT Childress TMC with preliminary details, and with a message that DPS officers have been dispatched to the scene. Several more 911 calls come in from motorists and truck drivers who have come upon the incident. Because there are no CCTV cameras located near this intersection, dispatchers only have incoming calls to provide them with details. With the incident and traffic conditions confirmed, the TxDOT Childress TMC is able to immediately send notification to the TxDOT Area Offices in Wellington and Munday informing them of the situation, as well as the TMCs in Wichita Falls, Amarillo, Abilene and Oklahoma DOT. The center-to-center communications links allows for instantaneous dissemination of the same message to multiple TxDOT District TMCs. With the regional integration and notification systems, DPS's alert also is sent to local emergency response and public safety, including the County EOC, local police, and the Childress Regional Medical Center to alert them to the incident.

DPS is the first to arrive on scene and assumes the role of incident command, and the officer's communication with DPS dispatch in Childress is relayed to other agencies, including on-scene assessment and resource requirements. Based on DPS's notification, fire, police, and TxDOT crews are sent to the scene to assist with any injuries, clearance, and traffic control. With traffic backing up on both sides of US 287, the TxDOT Childress TMC operator sends word through center-to-center links to TxDOT Wichita Falls, Amarillo and Abilene that a substantial segment of US 287 will need to be closed for several hours. The Childress TMC operator posts a message on DMS located on either side of the incident on US 287 warning travelers to take an alternate route; requests for Wichita Falls and Amarillo Districts to post a similar message on routes near US 287 also are sent. The Okalahoma DOT is notified that US 287 near Acme is closed, and is advised to re-route traffic on Oklahoma routes approaching US 287. The Childress web page is updated with the alert and closure information, and radio and television media are able to broadcast the information to motorists. TxDOT crews set up portable DMS on US 83, US 70 and US 283 alerting motorists of the situation and traffic control devices are put in place to route motorists on to alternate routes. On scene, TxDOT crews implement reverse lane strategies to slowly route stopped vehicles away from the incident, thereby securing the scene for emergency crews to clear the incident.

Scenario 2

A major snow and ice storm has hit the eastern portions of the Texas Panhandle and Oklahoma causing dangerous conditions along I-40, US 287, US 83, and other routes. The TMCs in Childress and Amarillo have been receiving warnings from the National Weather Service about the impending storm, and are braced for emergency conditions. RWIS stations along I-40 and US 287 are showing that pavement temperatures are dropping, indicating that there is heavy precipitation and ice. TxDOT maintenance crews have been plowing the snow that has fallen on US 287 and I-40, and verified the information that RWIS is sending back to the TMC. Anti-icing systems are automatically spreading chemicals on bridges and other areas that are prone to freezing. Flashers on signs near the bridges warn motorists that the systems are active.

By evening, I-40 and US 83 in the northern part of the Childress Region are icing over, which is causing treacherous driving conditions in that part of the Panhandle. Several motorists have skidded off the roadways, and 911 calls are received by local Sheriffs and DPS offices from the stranded motorists. The Childress TMC puts its winter maintenance strategies in place, and with verification of conditions from DPS, the Wellington Area Office, and RWIS sensors in the field, the TMC operator sends out a broadcast message to Amarillo, Wichita Falls, Oklahoma and local emergency agencies about the conditions and planned diversion strategy. The Childress TMC operator posts messages on permanent DMS located on US 287 warning westbound drivers to

divert south. Amarillo TMC operators post messages on DMS located near Amarillo and along I-40 of the icy conditions and also advise an alternate route. Wichita Falls TMC operators post messages on their DMS located on US 287 alerting drivers to divert south. CCTV cameras near the DMS verify that the messages are posted, and operators can see that motorists are diverting onto other routes. Through the center-to-center communications, TMCs in Forth Worth, Abilene and Lubbock are informed of the conditions and advised to warn motorists heading north of the hazardous conditions and diversion strategies. Childress TMC operators update the web page so that media will be notified and can disseminate the information over radio and TV broadcasts.

The TxDOT Wellington Area Office dispatches its maintenance vehicles to US 83 and I-40, and sends a request from the office workstation to the Childress and Amarillo TMC for additional resources. Anti-icing systems are being monitored, as are RWIS detectors, from the TxDOT Childress TMC. A link to the National Weather Service allows local conditions to be transmitted from TxDOT to the National Weather Service so that broader notification and emergency warnings can be sent to other agencies.

The TMC and DPS stay in constant contact, and are able to update and notify each agency of current happenings. DPS dispatchers are able to view camera images from the Childress and Amarillo CCTV cameras at the workstation located at DPS in Childress. The alerts between TxDOT and DPS are sent to local police, sheriffs, County EOCs and fire stations. These alerts are notifying outlying areas of the diverting traffic as well as requesting additional resources to assist with traffic diversion. Portable DMS are set up on alternate routes and act as trailblazer signs to direct motorists to safer routes. TxDOT's RWIS data is viewable by multiple agencies, keeping them continuously apprised of current road conditions. TxDOT TMC operators are able to notify DPS, maintenance and other emergency vehicle dispatch centers to advise their drivers of safer routes. These dispatch centers then identify the precise location of emergency/service vehicles via automatic vehicle location and route them to the stranded motorists so that they can assist with getting them to an emergency shelter for the evening. Panhandle Community Services Transit and Sharp Lines are sent an emergency request for assistance to help get stranded travelers to shelters in Shamrock, Wellington and Childress.

5.2 Roles and Responsibilities

The operational scenarios described in the previous section illustrate the interagency cooperation and coordination that is required in two situations that might occur in the Childress Region. During any operational scenario, a number of agencies will be required to coordinate closely to perform their operational responsibilities. The key agencies that have a lead role or responsibility during operations are listed below for each ITS area. It is recognized that a number of other agencies will also need to be involved during a scenario in addition to the ones listed below, although it is not expected that these agencies will play as critical a role in operations.

Travel and Traffic Management

- City of Childress (Police, Traffic)
- County Road and Bridge
- Other State Departments of Transportation
- Other Texas Department of Transportation Districts

- Texas Department of Public Safety
- Texas Department of Transportation

Public Transportation Management

- Panhandle Transit
- Sharp Lines (Rolling Plains Management Corp.)
- Independent School Districts

Electronic Payment

- Not Applicable

Commercial Vehicle Operations

- Texas Department of Public Safety
- Texas Department of Transportation

Emergency Management

- City of Childress
- Childress Regional Medical Center
- Local City/County EOCs
- Local County Sheriffs
- Local Law Enforcement
- Texas Department of Public Safety
- Texas Department of Transportation

Information Management

- Texas Department of Transportation

Maintenance and Construction Management

- City of Childress
- County Road and Bridge
- Texas Department of Transportation

5.3 Childress Agreements

The Regional ITS Architecture for the Childress Region has identified several agency interfaces, information exchanges, and integration strategies that would be needed to provide the ITS services and systems identified by the stakeholders in the Region. Interfaces and data flows among public and private entities in the Childress Region will require agreements among agencies that establish parameters for sharing agency information to support traffic management, incident management, provide traveler information, and other functions identified in the Regional ITS Architecture.

Currently, there are few formal agreements in place in the Childress Region. Stakeholders indicated that while there is a high degree of cooperation among agencies, there hasn't been a need for formal agreements to facilitate multi-jurisdictional resource sharing, cooperation or mutual aid. With the implementation of ITS technologies, integrating systems from one or more agencies, and the anticipated level of information exchange identified in the architecture, it is likely that more formal agreements will be needed. These agreements, while perhaps not requiring a financial commitment from agencies in the Region, should outline specific roles, responsibilities, data exchanges, levels of authority, and other facets of regional operations. Some agreements also will outline specific funding responsibilities, where appropriate and applicable.

Table 8 provides a list of potential agreements for the Childress Region based on the interfaces identified in the Regional Architecture. It is important to note that as ITS services and systems are implemented in the Region, part of the planning and review process for those projects should include a review of potential agreements that would be needed for implementation or operations.

Table 8 – Potential Agreements for the Childress Region

Agreement and Agencies	Status	Agreement Description	Considerations
Data Sharing and Usage (Public) TxDOT Childress District and Public Agencies within the Region	Future	This agreement would define the parameters, guidelines and policies for inter- and intra-agency ITS data sharing. This data sharing would support regional activities related to traffic management, incident management, and traveler information, and other functions. 'Data' also would include video images from CCTV cameras. The terms of this agreement should generally address such items as: ▪ Agency as information source ▪ Types of data and information to be shared ▪ Repository for information (i.e., TxDOT Childress TMC as central hub) ▪ How the information will be used (traffic incident management, displayed on web site for travel information, distributed to private media, etc.) ▪ Parameters for data format, quality, security	These agreements are typically zero-dollar agreements, in that there is no charge among agencies for the actual data, although there might be some cost incurred for infrastructure, systems or fiber to enable communications between agencies.

Table 8 – Potential Agreements for the Childress Region (continued)

Agreement and Agencies	Status	Agreement Description	Considerations
Data Sharing and Usage (Public-Private) TxDOT Childress District and Private Media/Information Service Providers	Future	This agreement would define the parameters, guidelines and policies for private media use of regional ITS-related information from TxDOT Childress. This type of agreement is recommended between TxDOT (data provider) and the media (data user) to define terms of use for broadcasting public-agency information regarding traffic conditions, closures, restrictions, as well as video images. Agreements can also include requirements for the media to 'source' the information (i.e., using the TxDOT logo on all video images broadcast).	These agreements can be zero-dollar agreements, although some agencies have stipulated identifying the information, public service announcements by the media, or other requirements as a term of use. The private media entity is typically responsible for paying any necessary costs for access (i.e., communications infrastructure to link to the TxDOT database or video switch). These agreements also typically include a sunset clause to allow the agency to periodically review the agreement and make any modifications prior to renewal.
Shared Video Monitoring (Public) TxDOT, Texas DPS, Local Sheriff and Police	Future	This agreement would enable shared video monitoring of TxDOT CCTV cameras by public safety and emergency services agencies in the Childress Region for incident management purposes. This agreement would define the parameters and policies for public safety agencies to access video images via the TxDOT video switch. It is recommended that the agreement include any TxDOT policies relating to video images (including archiving, privacy, disclaimers, use of video and redistribution) as well as processes for agency requests for specific views. Shared video monitoring does not address shared use or shared control of video equipment functions.	These agreements are typically zero-dollar agreements, in that there is no charge among agencies for the actual data, although there might be some cost incurred for infrastructure, systems or fiber to enable communications between agencies, particularly with the high bandwidth required for transmitting live video images.
Mutual Aid Agreements (Public) Texas DPS, Fire, Police, EOCs, TxDOT, Forest Service	Existing (Informal)	Mutual aid agreements currently exist as informal arrangements in the Childress Region, although they are a routine practice among public safety and emergency services agencies. Formal mutual aid agreements will become more important as agencies integrate systems and capabilities, particularly automated dispatch and notification.	These agreements are typically zero-dollar agreements, although there might be some funding required to support regional incident management activities. The agreement also would outline resource commitments that would be part of any mutual aid arrangement (personnel, equipment, facilities, etc.).