I-30 East Texas Corridor Study

Royse City to Texarkana

TxDOT, Transportation Planning and Programming Division

January 2017

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TITUS COUNTY

Titus County Courthouse

Brian P. Lee
County Judge

Honorable Mr. Chairman and Commissioners:

The I-30 East Texas Corridor Working Group is pleased to present the following document which details the needs and opportunities we have discovered for this critical national corridor. Over the last year, since the Texas Transportation Commission appointed us to oversee this study, we have worked with TxDOT staff, engineers and concerned citizens to develop a master plan that will improve the region's safety and mobility. Investing in this corridor will reduce fatalities and injuries, as well as stimulate the local, regional and national economies.

Today, I-30 is a major freight route that connects trucking centers from Dallas/Fort Worth to Memphis, TN. It is the transportation backbone within our six-county region. I-30 plays a major role in the efficient movement of people and goods, but the high percentage of freight vehicles creates unique opportunities. Transportation is the economic engine in rural northeast Texas, and offers huge benefits for our economy and the quality of life of all Americans.

This study serves as a "check-up" for the 45-year old facility. The Interstate has been handling major traffic for decades and there are improvements that need to be made. Over the coming years, both freight and commuter traffic will continue to grow. In order to maintain safety and a robust quality of life, major investments are required. The recommendations in the following pages are the result of the Working Group's comprehensive process of citizen involvement. Through surveys, public forums, and frank discussions at all levels of our communities, we have created a road map on how to maintain and improve I-30 so that it can continue to provide excellent service for "The Next 30 Years".

I would like to thank all those who contributed their time and talents to this process by joining me in serving on the I-30 Working Group. We look forward to working with your staff over the coming years to turn these plans into reality.

Sincerely,

Brian P. Lee
Titus County Judge
Committee Chair, I-30 East Texas Working Group

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List of Abbreviations

AADT	Annual Average Daily Traffic
ARRA	American Recovery and Reinvestment Act
AV	Automated Vehicles
BRINSAP	Bridge Inventory, Inspection, and Appraisal Program
CAGR	Cumulative Average Growth Rate
CRIS	Crash Records Information System
CV	Connected Vehicle
DSRC	Dedicated Short Range Communications
FASTLANE	Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies
FM	Farm to Market Road
Ft.	Feet
FHWA	Federal Highway Administration
FPM	Freight Performance Measures
GARVEE	Grant Anticipation Revenue Vehicle Bonds
ITS	Intelligent Transportation System
LOS	Level of Service
Mi.	Miles
MPH	Miles per Hour
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
NCTCOG	North Central Texas Council of Governments
NPMRDS	National Performance Management Research Data Set
NETEX	Northeast Texas Rural Rail Transportation District
NETRMA	Northeast Texas Regional Mobility Authority
PABS	Private Activity Bonds
PMIS	Pavement Management Information System
PPPs	Public Private Partnerships
RHiNo	Roadway-Highway Inventory Network
ROW	Right-of-Way

SH	State Highway
SIB	State Infrastructure Bank
STIP	Statewide Transportation Improvement Program
SuRRMA	Sulphur River Regional Mobility Authority
TIFIA	Transportation Infrastructure Finance And Innovation Act
TIGER	Transportation Investment Generating Economic Recovery
TRZ	Transportation Reinvestment Zone
TTP 2040	Texas Transportation Plan 2040
TxDOT	Texas Department of Transportation
TxPROS	Texas Permitting & Routing Optimization System
UCDB	Under Clearance Database
UCR	Urban Congestion Report
US	United States Highway
UTP	Unified Transportation Plan
VMT	Vehicle-Miles Traveled
WMA	Wildlife Management Area

1. Introduction

Interstate Highway 30 (I-30) is an east-west facility, spanning 367 miles through two states, and connecting Little Rock, Arkansas to Dallas-Fort Worth, Texas. Built in the 1960's, the final segment was completed in 1971. The entire I-30 corridor is part of the Eisenhower Interstate System and the portion in Texas is included on the Texas Trunk System. Based on connections to major freight generators and gateways, I-30 was included in the Primary Freight Network in the 2015 Texas Freight Mobility Plan[1].

The segment of I-30 studied herein encompasses 144 miles from Farm to Market (FM) 2642 in Hunt County to the Texas-Arkansas state line, almost forty percent of I-30's total length of 367 miles. It crosses 12 communities including the cities of Greenville, Sulphur Springs, Mount Vernon, Mount Pleasant, New Boston, and Texarkana. The corridor also spans six counties; Hunt, Hopkins, Franklin, Titus, Morris and Bowie. In addition, two Metropolitan Planning Organizations (MPOs) have jurisdiction over portions of the study area; the North Central Texas Council of Governments (NCTCOG) and the Texarkana MPO. Similarly, the Sulphur River Regional Mobility Authority (SuRRMA) and the Northeast Texas Regional Mobility Authority (NETRMA) provide services to some counties within the study area.

The study area lies within the jurisdiction of six counties and two Texas Department of Transportation (TxDOT) districts. Several urbanized areas are located along the corridor; the Texarkana Metropolitan Area is the largest with a population of over 140,000. The study area is almost equally distributed between the Paris and Atlanta Districts of TxDOT. This corridor is a fully access-controlled facility and is recognized for its prominent use as a freight corridor. ***Map 1.1 I-30 East Texas Corridor Study Area*** identifies the different districts, counties, cities, and intersecting highways in the study area.

Commissioner Jeff Austin III sponsored a Working Group to participate in the study and establish guiding goals. Working group members were charged with the following responsibilities: provide local insight on needs and preferences to the analytical process and, communicate study directions and findings to their local constituents and through presentations to Commissioners Courts, City Councils, Chambers of Commerce and other interested groups.

A variety of factors were analyzed in the development of this study such as existing and future traffic volumes, crash histories, physical characteristics, community needs, and environmental features. The TexAmericas Center, the Red River Army Depot and the White Oak Creek Wildlife Management Area (WMA), currently located along the corridor, were also considered.

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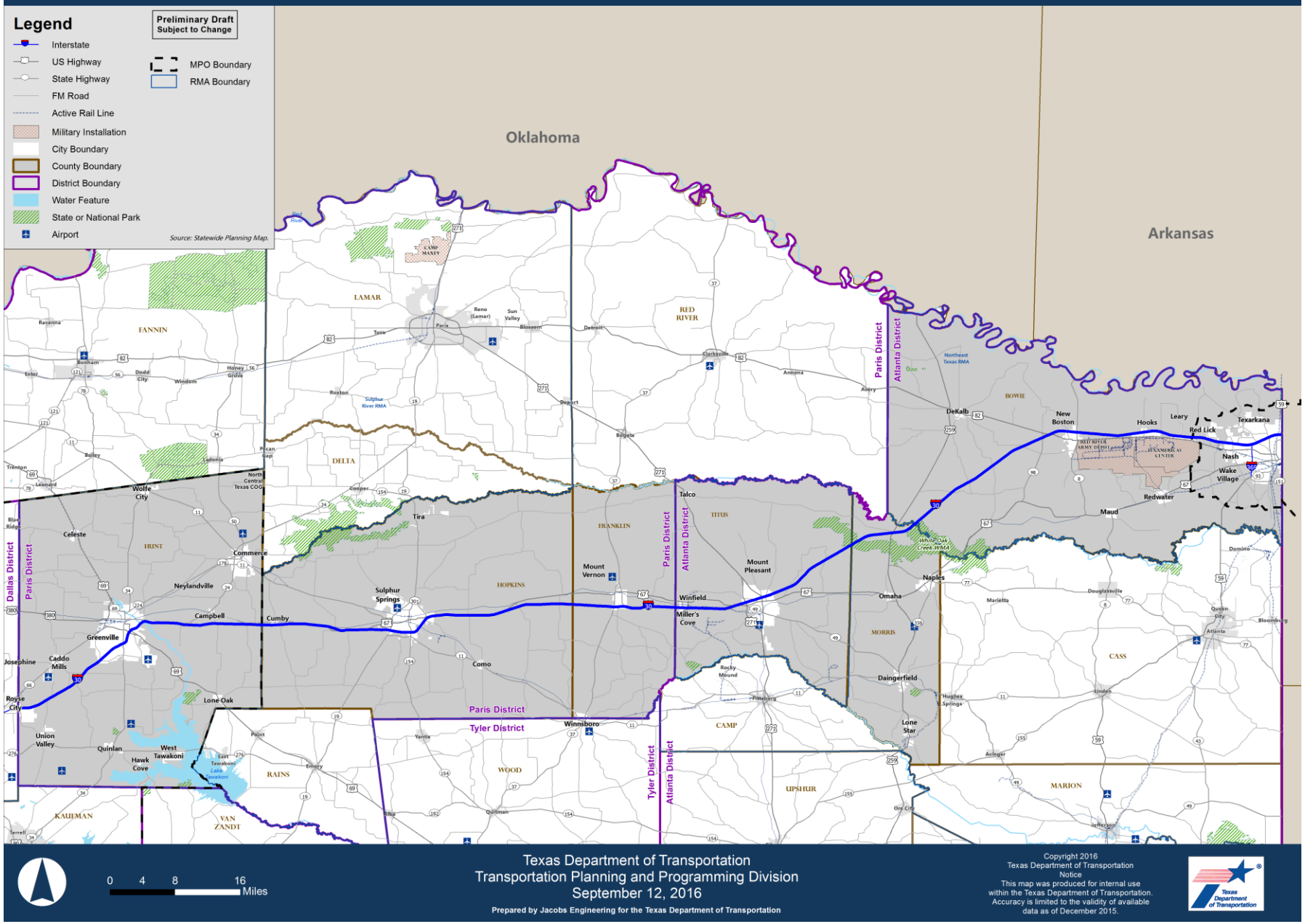
[1] *Texas Freight Mobility Plan*. Texas Department of Transportation. 29 July 2015. <http://ftp.dot.state.tx.us/pub/txdot-info/freight/plan/2015/mobility-plan.pdf>.

The following report describes the existing conditions of the I-30 corridor and outlines a development plan describing improvements needed in the near (through 2020), mid (2021-2030) and long term (2031-2040) in order to maintain and improve the current and future operation of the corridor.

Map 1.1 I-30 East Texas Corridor Study Area



2. Goals and Objectives

During the first Working Group meeting, members participated in a goal setting exercise to identify specific goals and objectives to guide the study. They were asked to rank four goals from 1 to 4, with 1 being the most important, and highlight the objective(s) that they thought were particularly relevant to each of the goals. They were also given the option to add additional goals or objectives. As a result of the exercise, four goals and three objectives for each goal were established. Additional information about the goal setting exercise can be found in **Appendix A - Goals and Objectives Memorandum**.

- Goal 1: Maintain a safe system

  Objectives
  - Reduce high crash locations
  - Improve frontage road continuity and create one-way frontage roads
  - Improve signage

- Goal 2: Improve mobility along I-30

  Objectives
  - Improve pavement conditions
  - Improve trucking movements
  - Reduce bottlenecks and congestion spots

- Goal 3: Connect communities

  Objectives
  - Improve connectivity to the Interstate
  - Facilitate economic activity
  - Propose alternatives to private automobile for intercity travel

- Goal 4: Realize identified solutions

  Objectives
  - Prioritize improvements that complement local development plans
  - Consider alternative funding strategies and/or partnerships
  - Implement the most cost-effective improvements

3. Technical Analysis

This chapter analyzes the current conditions along the portion of the I-30 freeway subject of this study. Technical analyses focused on existing traffic demand, safety and functionality as well as the expected performance of the corridor by the year 2040.

3.1 Corridor Analysis

The following sections describe the data analyzed to develop corridor-wide recommendations as well as localized improvements. Data used included roadway inventory, traffic forecasts, Level of Service (LOS), as well as crash histories.

3.1.1 Corridor Characteristics

The overall function of the corridor depends on the present condition of its various characteristics and the roadway's relationship to the surrounding communities and counties. A summary of these characteristics is presented in the following sections.

a. Study Area

The population of Texas is expected to grow from 25 million residents in 2010 to as much as 36.5 million by 2040, according to the Texas State Data Center (assuming a 0.5 migration scenario[2]). Since some parts of the State are expected to grow faster than others, the higher growth areas may experience traffic congestion. As shown in ***Map 3.1 – County Population 2010***, counties in the study area have populations of 150,000 people or less. In 2010, the six counties along I-30 had a total population of 270,000 people. ***Maps 3.2 and 3.3 - Percent Growth in County Population 2010-2020 and 2010-2040***, illustrate the predicted population change for counties surrounding the Dallas-Fort Worth Metroplex and the I-30 corridor. These 2040 forecasts indicate that population between 2010 and 2040 is expected to occur mainly in Hunt, Hopkins and Titus counties, as observed in ***Map 3.3 - Percent Growth in County Population 2010-2040***. A summary of county populations is presented in **Table 3.1.**

The average percent of growth expected by 2040 along the corridor is 30 percent, which is less than the 46 percent expected growth in the total Texas population between 2010 and 2040 according to the Texas State Data Center. While the entire Texarkana Metropolitan Statistical Area (MSA) was home to 143,486 people in 2010, the city of Texarkana on the Texas side had only 36,500 people for the same year, making it the largest community in the study area. Greenville ranks second with 25,600 people.

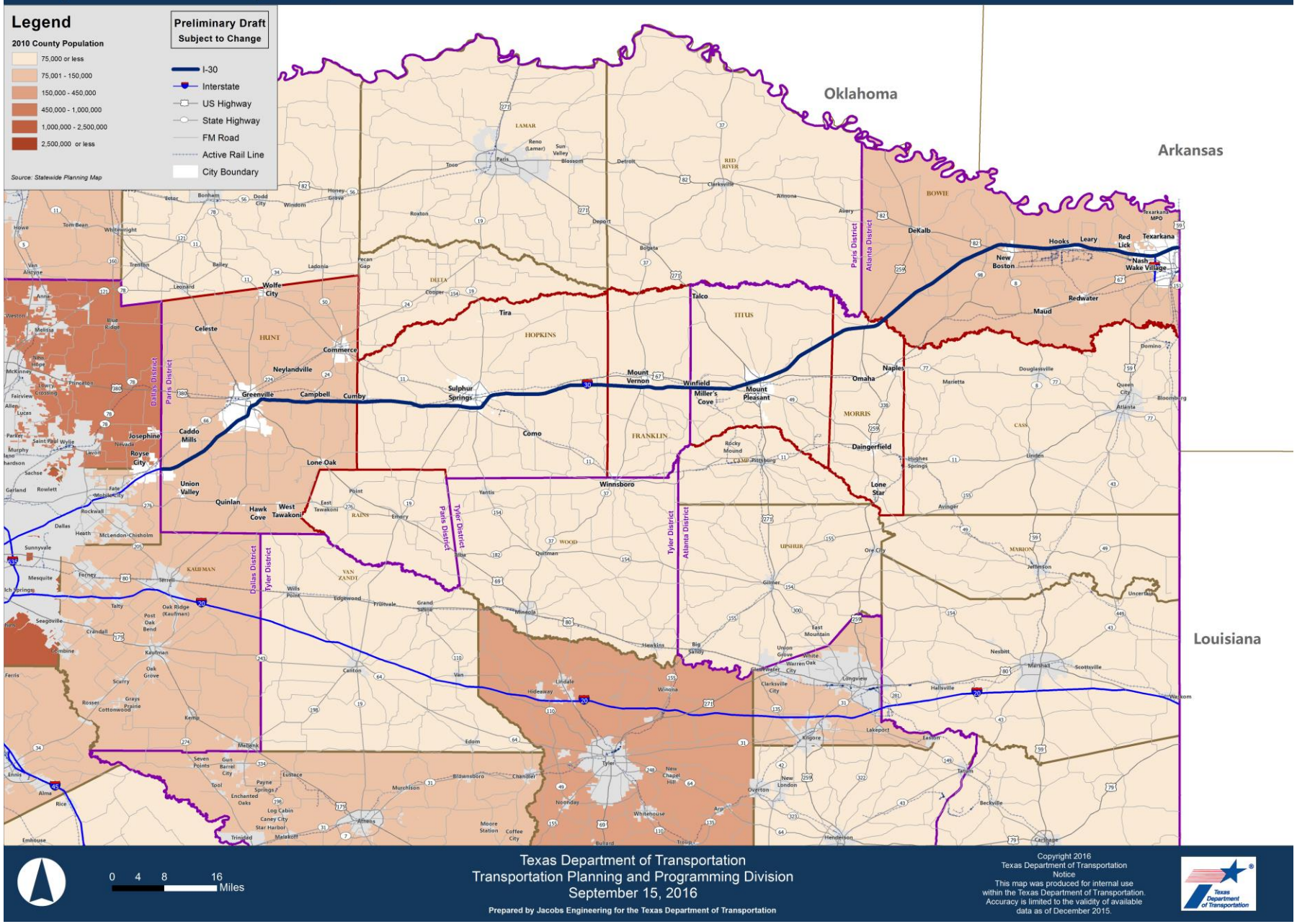
2 Texas State Data Center, 18 Feb. 2016. Nov. 2015. <http://osd.texas.gov/Data/TPEPP/Projections/>.

Table 3.1 - County populations along the I-30 corridor

County	2010 Population	2040 Projected Population	Annual Growth Rate (%)
Hunt	86,129	164,886	2.2%
Hopkins	35,161	43,555	0.7%
Franklin	10,605	11,930	0.4%
Titus	32,334	46,283	1.2%
Morris	12,934	13,886	0.2%
Bowie	92,565	99,263	0.2%
Total	269,728	379,803	1.1%

Source: 0.5 Migration Scenario, Texas State Data Center.

Map 3.1 - County Population 2010



Texas Department of Transportation
Transportation Planning and Programming Division
September 15, 2016

Prepared by Jacobs Engineering for the Texas Department of Transportation

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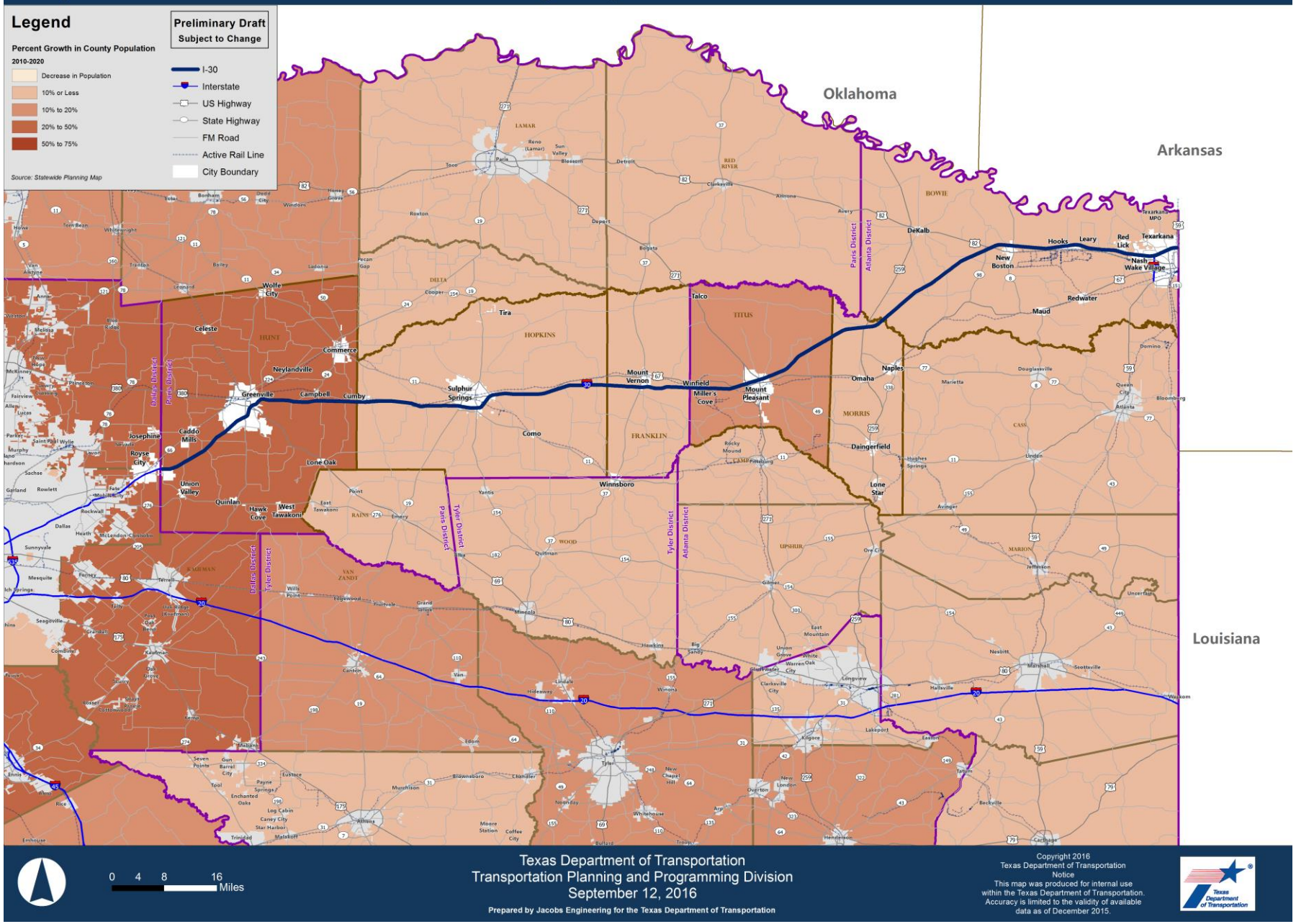
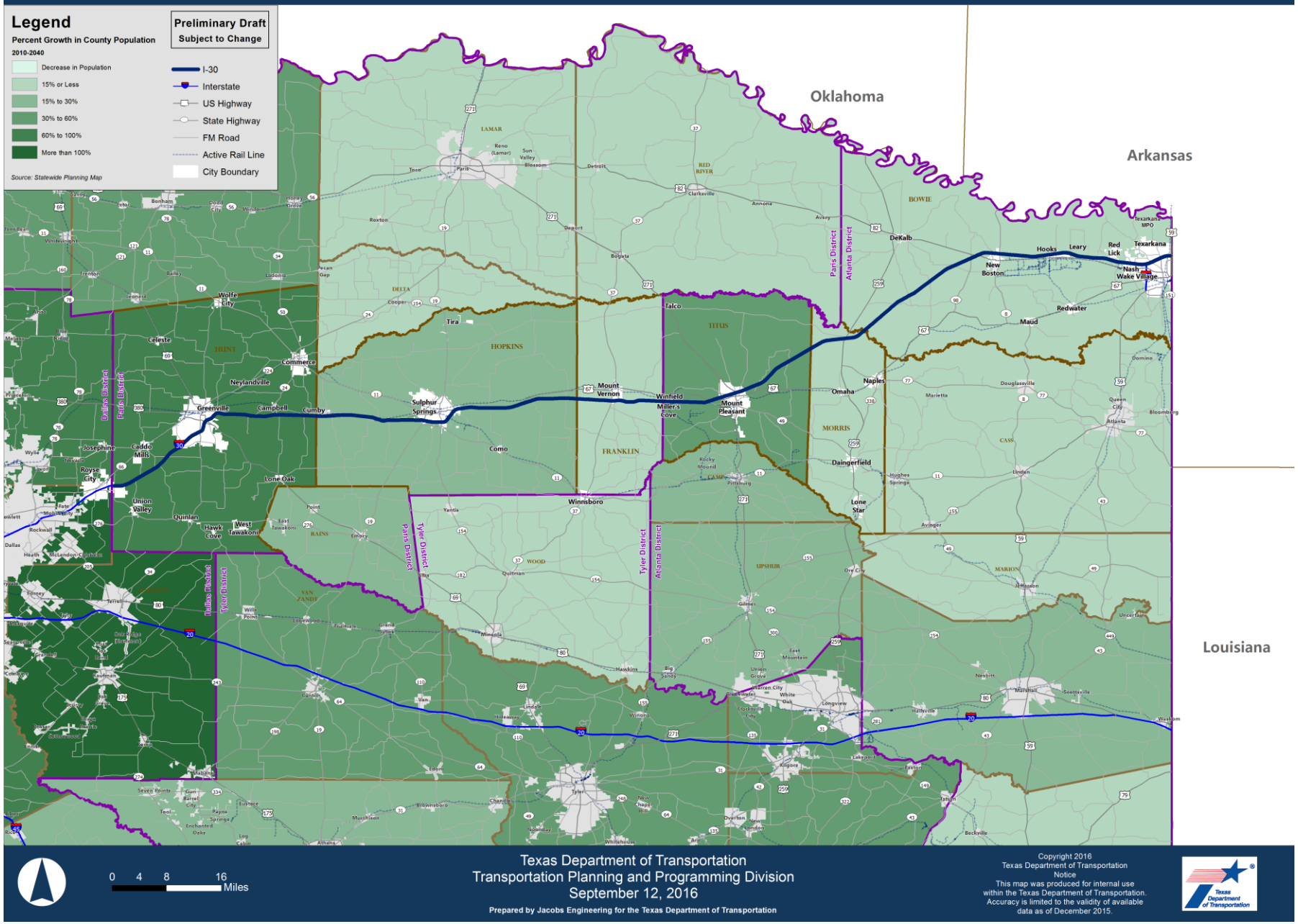
Map 3.2 - Percent Growth in County Population 2010-2020



Map 3.3 - Percent Growth in County Population 2010-2040



b. Road Inventory and Characteristics

The initial stages of the study focused on developing a better understanding of the corridor by reviewing its infrastructure characteristics. **Table 3.2** summarizes the results of this analysis and the following sections provide a more detailed description of the sources used to obtain this information and some of the main observations.

Table 3.2 - Road characteristics by category along the I-30 corridor

Road Characteristic	I-30 Corridor
Cross Section (miles)	
Four-lane divided	144
Right-of-Way (miles)	
300 ft. to 399 ft.	87
More than 400 ft.	57
Total	**144 Miles**
Medians (miles)	
30 ft. to 39 ft.	38
40 ft. to 49 ft.	84
More than 50 ft.	22
Total	**144 Miles**
Bridge Condition (total structures based on Sufficiency Rating)	
Good (≥ 90)	172
Satisfactory (70 - 89)	123
Fair (< 70)	26
Total	**321**
Pavement Surface Condition (total lane miles of pavement, main lanes and frontage roads)	
Very good (≥ 90)	296
Good (70 - 89)	64
Fair (50 - 69)	25
Poor (35 - 49)	8
Very poor (< 35)	65
Total	**458 Miles**

Source: TxDOT Statewide Planning Map

c. Frontage Roads

To augment the controlled access nature of an Interstate facility, frontage roads provide access to/from adjacent land uses. I-30 does not have continuous frontage roads throughout the entire length of the study area. However, there are a total of 173 miles of existing frontage roads on both sides of the facility, with approximately 129 miles of these frontage roads providing two-way operation and 44 miles providing one-way operation.

One-way frontage roads are concentrated where I-30 traverses urbanized areas including Greenville, Sulphur Springs, Mount Pleasant, Hooks, and Texarkana. Two-way frontage roads service most of the rural areas on the west end of the corridor, although there is still a lack

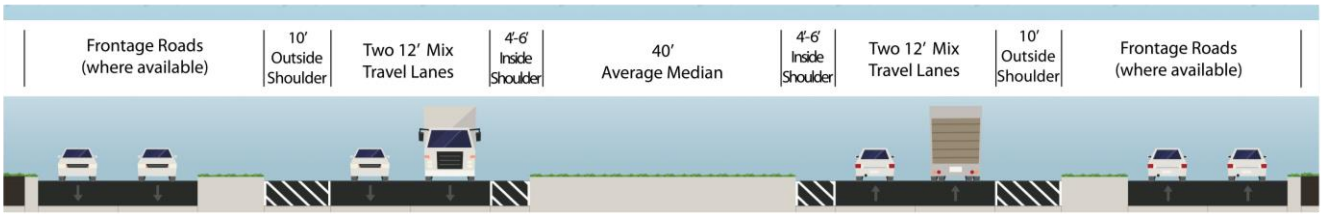
of connectivity in Titus County and the eastern edge of Hopkins County. Finally, Morris and the western section of Bowie counties have no frontage roads.

A bigger portion of the segments with frontage roads are located in the Paris District with 70 miles of frontage roads on the north side and 68 miles on the south side. The Atlanta District has 19 miles of frontage roads to the north of I-30 and 16 miles of frontage roads to the south. All frontage roads provide access to eastbound and westbound traffic movements depending whether the facility is designated as one-way or two-way. ***Map 3.4 - Frontage Roads Paris District and Map 3.5- Frontage Roads Atlanta District*** illustrate the location of existing frontage roads.

d. Cross Section and Right-of-Way

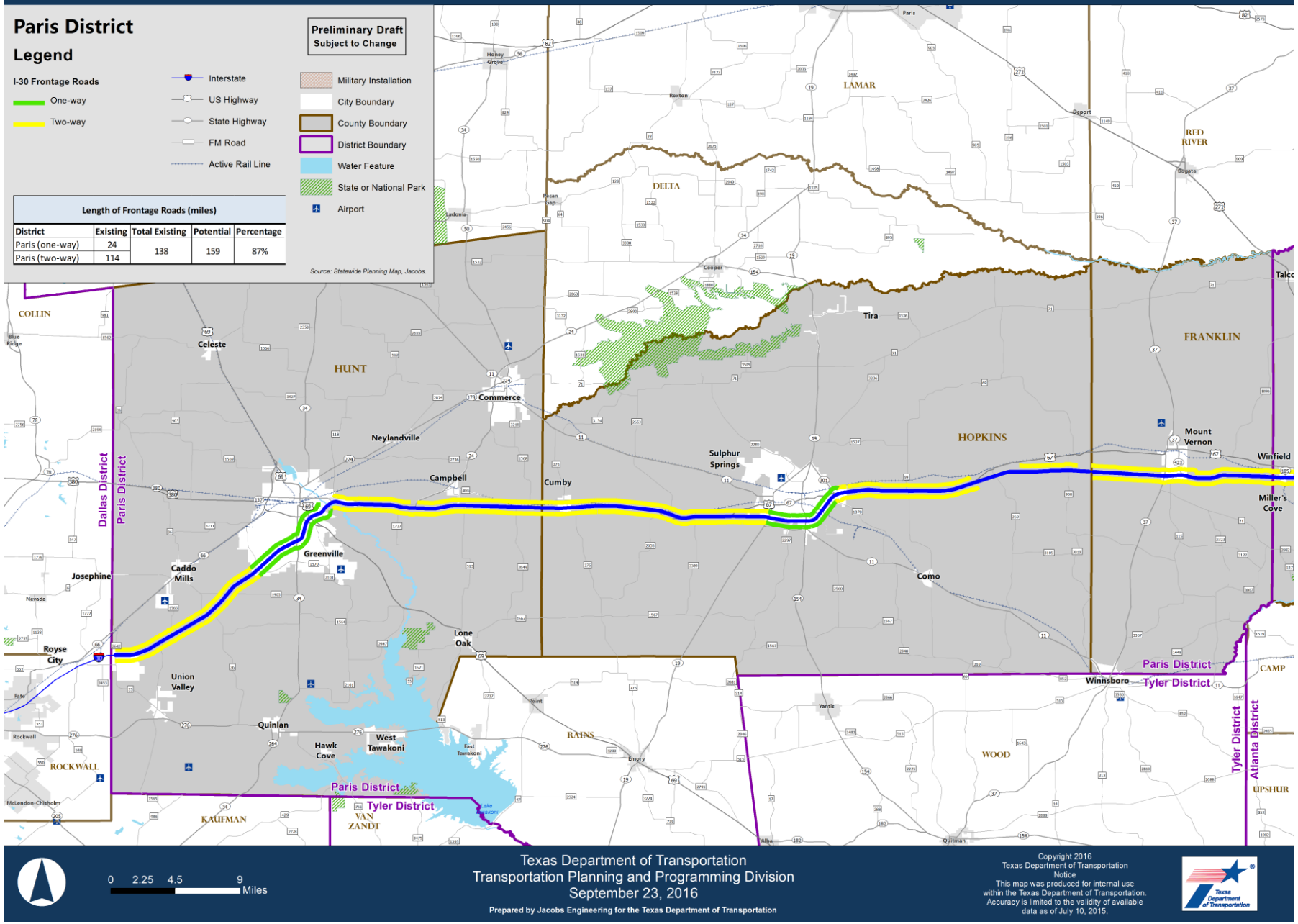
The I-30 corridor is a fully access-controlled facility, with posted speed limits of 65 to 75 miles per hour (mph), a consistent cross-section of two 12 ft. general purpose lanes in each direction of travel, 10 ft. right paved shoulders as well as 4 ft. left paved shoulders (see **Figure 3.1**). These characteristics are consistent with the Federal Highway Administration's (FHWA) design standards for interstate facilities. Only 9.6 miles are within the Texarkana MPO boundary. While a total of 3.8 miles of this segment have a 75 mph posted speed limit, the remaining 5.8 miles have a posted speed of 65 mph. The remainder of the corridor has a consistent speed limit of 75 mph.

Figure 3.1 - Cross section along the I-30 corridor

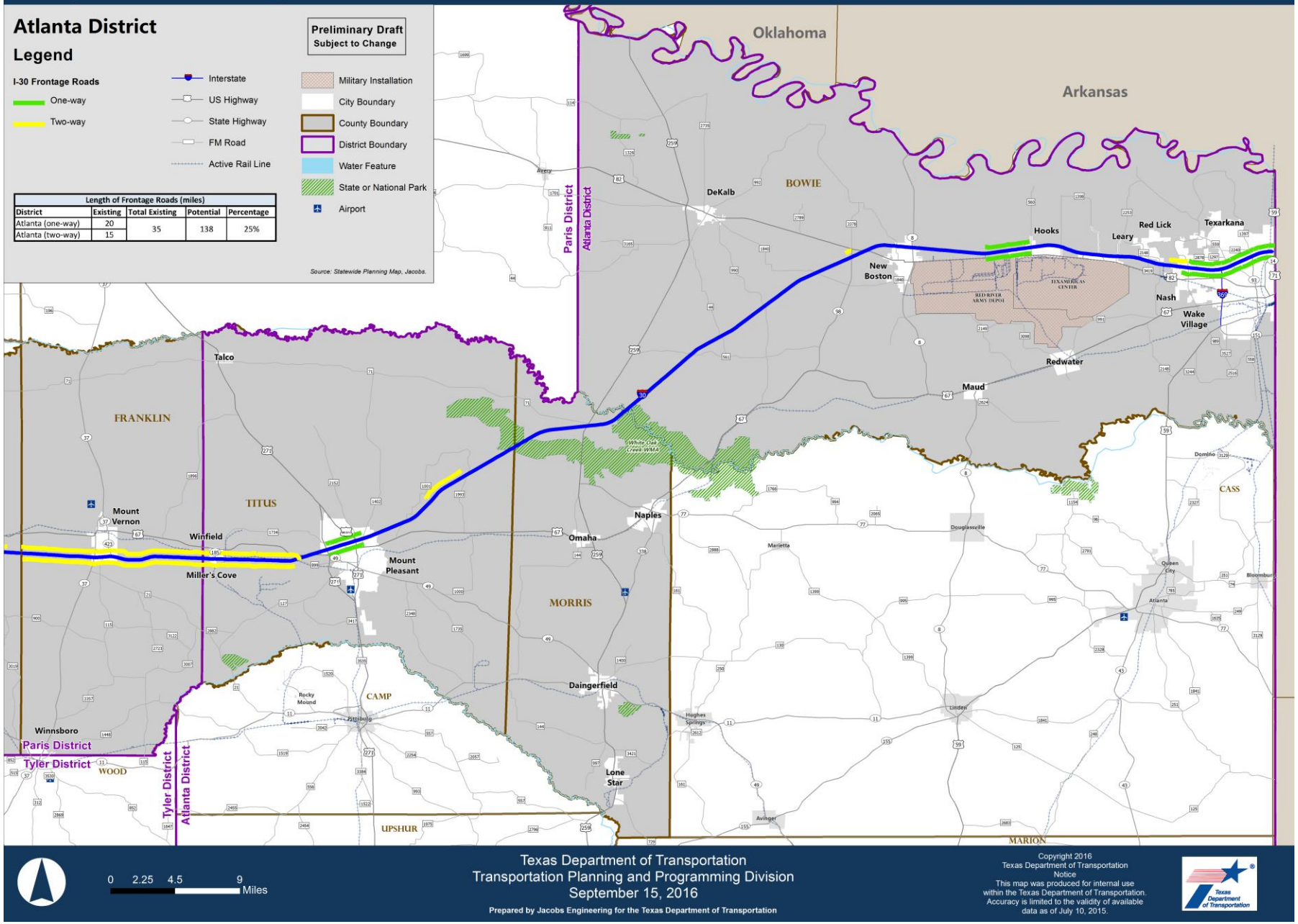


Source: Jacobs, 2015

Map 3.4 - Frontage Roads



Map 3.5 - Frontage Roads



Along I-30, the ROW varies from 300 to 725 ft. Sixty percent of the corridor ROW is in the 300 and 399 ft. range, which is considered constrained meaning it is mainly occupied. Segments with wider ROW (over 399 ft.) are largely in the Atlanta District, with concentrations in Titus and Morris counties. Most of the narrower ROW (300-399 ft.) is located within Hunt, Hopkins and Franklin counties in the Paris District, which also happens to be where the majority of frontage roads are concentrated. ***Map 3.6 - Right of Way Width*** illustrates the ROW availability along the corridor.

e. Median and Median Barriers

Within the Paris District, the median widths vary minimally, with an average width of 40 ft. However, throughout the Atlanta District, median widths are less consistent. To the west of Titus County the 40 ft. average width continues, but once in Morris County, the median widths expand to 80 ft. or more. The change in Morris County is related to I-30 traversing the White Oak Creek Wildlife Management Area (WMA). In Bowie County, medians average 60 ft. in width near the Red River Army Depot and the TexAmericas Center, before narrowing down back to 40 ft. inside the Texarkana city limits.

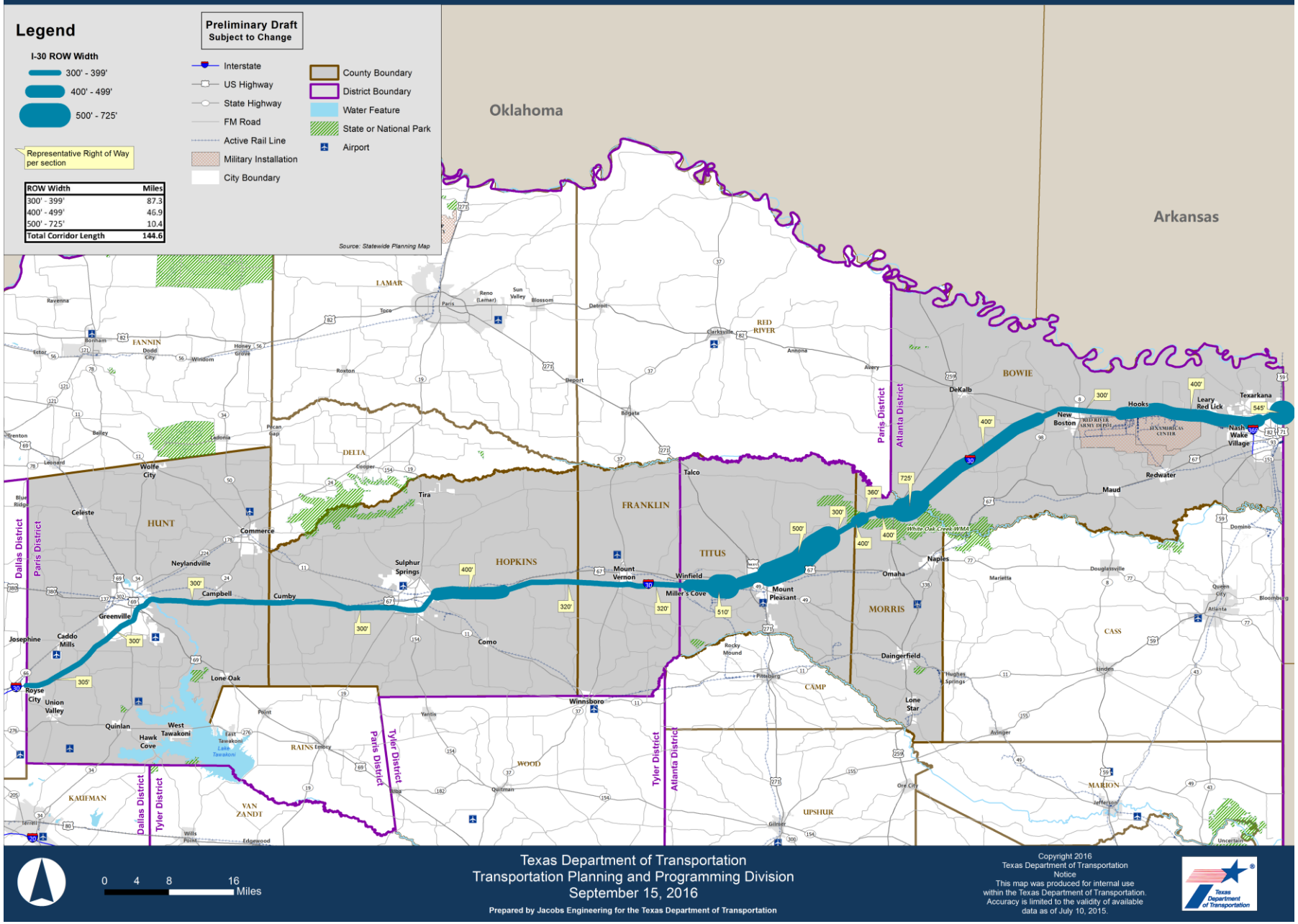
Eighty-three percent of the corridor has median barrier protection. The Paris District has installed 73.7 miles of concrete barriers, while the Atlanta District has a total of 46 miles of cable barriers. Medians along Morris County and the western edge of Bowie County currently do not have median protection; this does not present a safety hazard since their average width is above the recommended minimum of 80 ft. The only segment of unprotected median where the width does not exceed the 80 ft. requirement is found approximately one mile west of the interchange with SH 98 near New Boston. ***Map 3.7 Median Width and Median Barriers*** illustrate the representative median widths per section along the corridor and the types of existing median barriers.

f. Pavement Conditions

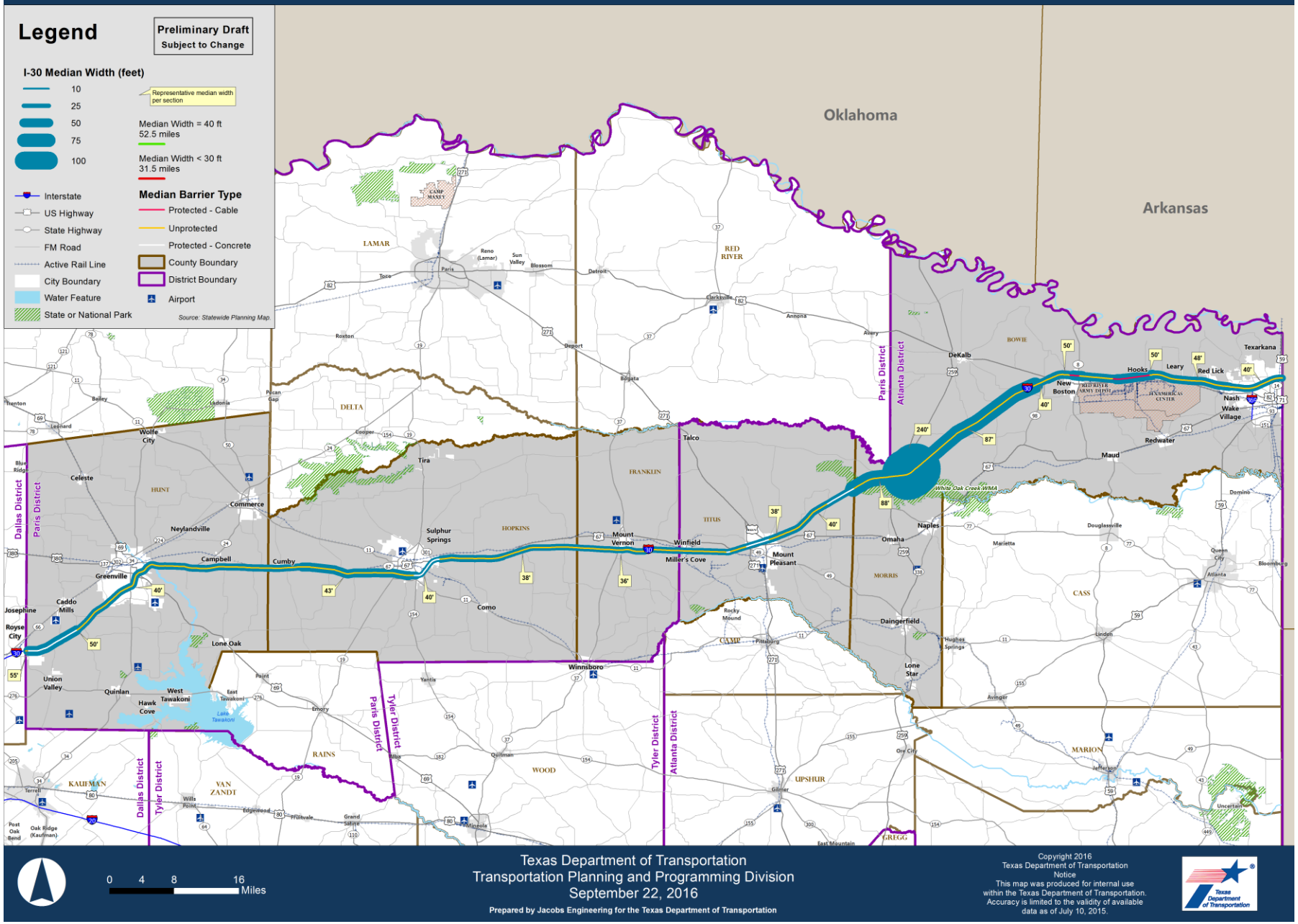
The pavement surface condition for main lanes and frontage roads was evaluated as an indicator of the need for improvement. Information from the TxDOT Pavement Management Information System (PMIS) was used to determine the present condition of the pavement surface and describe the overall conditions along the corridor. Every year, the database is updated with pavement distress ratings, visual surveys, as well as ride quality assessments.

Pavement condition along the interstate is considered to be *very good* and *good* when the score is 90 or higher. Such is the case for 63 percent of the total linear miles of existing pavement. Main lane pavement within Hunt, Franklin and Morris counties is mostly rated as *very good* and *good*. However, there are two segments, totaling 30.8 miles, identified as deficient. From the Hunt-Hopkins county line to the western edge of Sulphur Springs, 13 miles of the pavement along the main lanes is considered to be in *very poor* condition (< 34).

Map 3.6 Right of Way Width



Map 3.7 Median Width and Median Barriers



The other 17.6 miles in need of attention are located in the eastern edge of the study area from Spur 86 to the Texas-Arkansas State line. In this section, a 3.4 mile resurfacing project has already been programmed, between I-369 and FM 559. Thus, 14.4 miles of the deficient segment are not currently planned for improvement.

Shorter segments along both the main lanes and the frontage roads, as shown in ***Map 3.8 and Map 3.9 – Pavement Conditions*** are also rated as *fair* (50-69), *poor* (35-49) or *very poor* (< 34); nevertheless, all portions are addressed by one of the other five overlay and resurfacing projects programmed along the corridor at the time of this study. ***Map 3.8 and 3.9*** depict the exact boundaries of the projects in addition to their project status.

Structural adequacy of the pavement is not part of these ratings, and is not typically improved by overlays and resurfacing strategies. Given the age of the interstate, an in-depth study into the overall pavement condition throughout the corridor is recommended because of the advanced age of the pavement (the final segment of this corridor was opened to traffic in 1971). Such research may determine that the pavement is approaching its maximum service life, and the most effective solution would be to completely replace some or all pavement.

g. Vertical Clearance and Bridge Conditions

Bridge conditions are evaluated in terms of sufficiency ratings, a score that takes into consideration measures such as structural deficiency and functional obsolescence. These two characteristics are included in the Bridge Inventory Inspection and Appraisal Program (BRINSAP), which is maintained by TxDOT. Both measurements express the current structural condition, design and capacity of a bridge. A third important consideration, vertical clearance, is stored in the Under Clearance Database (UCDB) and is used to determine maximum height of vehicles that are ensured safe passage though the corridor.

I-30 has a total of 321 structures that either have I-30 crossing over or under other facilities. Structures rated above 90, are considered in *good* condition and should require no more than regular maintenance. Structures rated as *satisfactory* (70 to 89) may require some repairs, while structures rated as *fair* (<70) may require repairs in the near future. **Table 3.3** shows the number of structures in each category by district location.

Table 3.3 - Bridge rating totals by district

Structural Rating	Paris District	Atlanta District	Total
Good (≥90)	98	74	172
Satisfactory (70-89)	67	56	123
Fair (<70)	10	16	26
Total	**175**	**146**	**321**

Vertical clearance is currently evaluated under two different design standards. The FWHA states that, nationwide, the minimum acceptable bridge clearance is 16 ft. In Texas, TxDOT

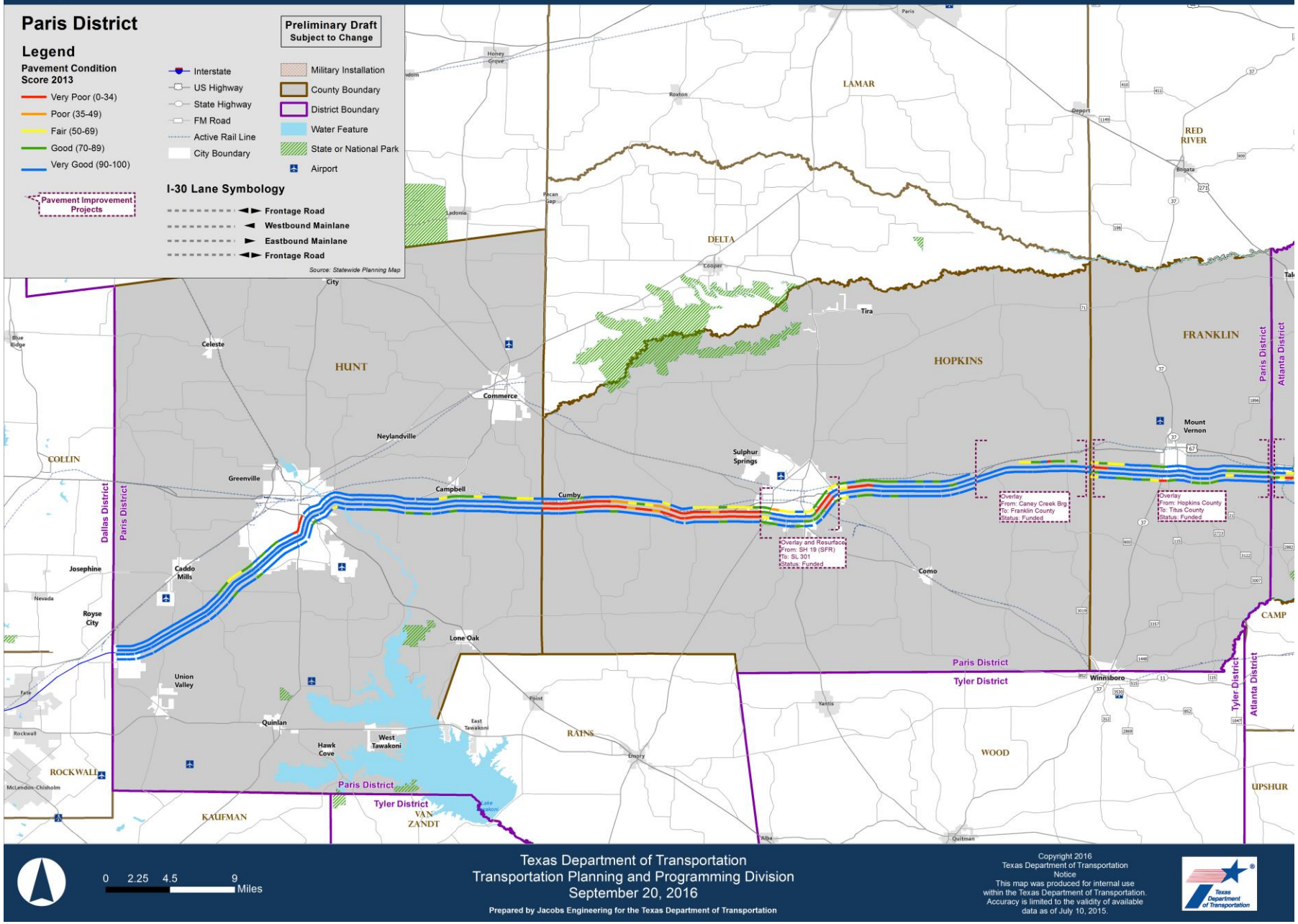
prefers six inches more (16' 6" ft.). Concerns about the growth in oversized loads on trucks have led to consideration of raising the minimum vertical clearance to 18'6'' for the most heavily used freight corridors (Primary Freight Network), and I-30 was designated as part of that system.

Vertical clearances for all underpasses along I-30 main lanes were obtained from the UCDB 2013 database. A total of 67 structures along I-30 do not meet the minimum federal or state standards. An alternative route analysis was performed using frontage roads and local streets to evaluate the additional time and miles trucks would have to travel to avoid constrained underpasses. While 48 out of the 62 structures do comply with federal standards, 19 have low clearances according to both federal and state regulations. ***Maps 3.10 and 3.11– Vertical Clearance*** depict the exact location of all low clearance structures. **Table 3.4** summarizes the total number of underpasses along the corridor and classifies them based on their vertical clearance.

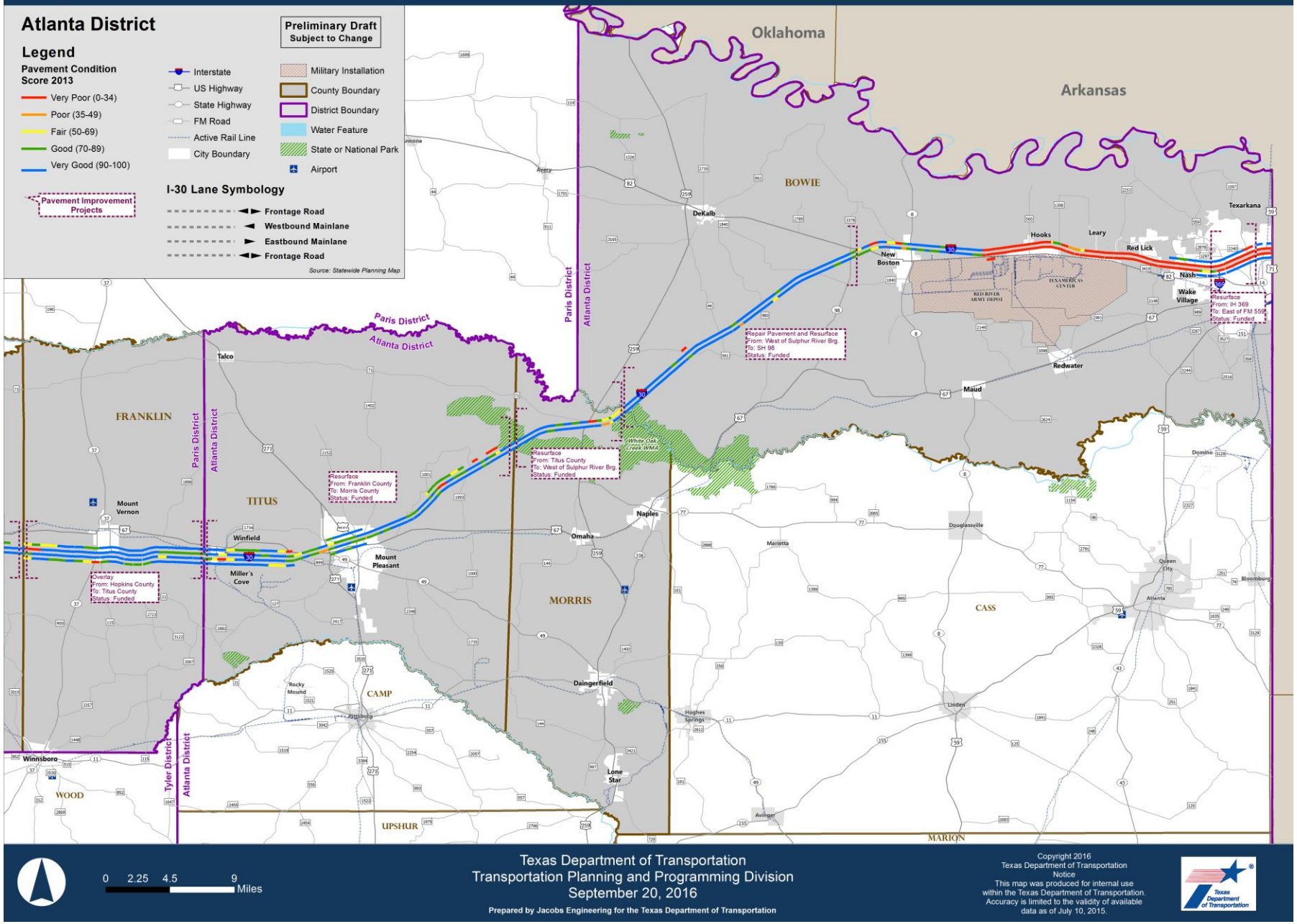
Table 3.4 - Total number of underpasses along the corridor

Paris District	< 16'	16' to 16'5"	16'6" to 18' 6"	> 18' 6"
Hunt	8	1	5	1
Hopkins	4	16	14	0
Franklin	0	3	3	0
Atlanta District				
Titus	0	8	8	2
Morris	0	0	0	0
Bowie	7	20	13	16
Total	19	48	43	19

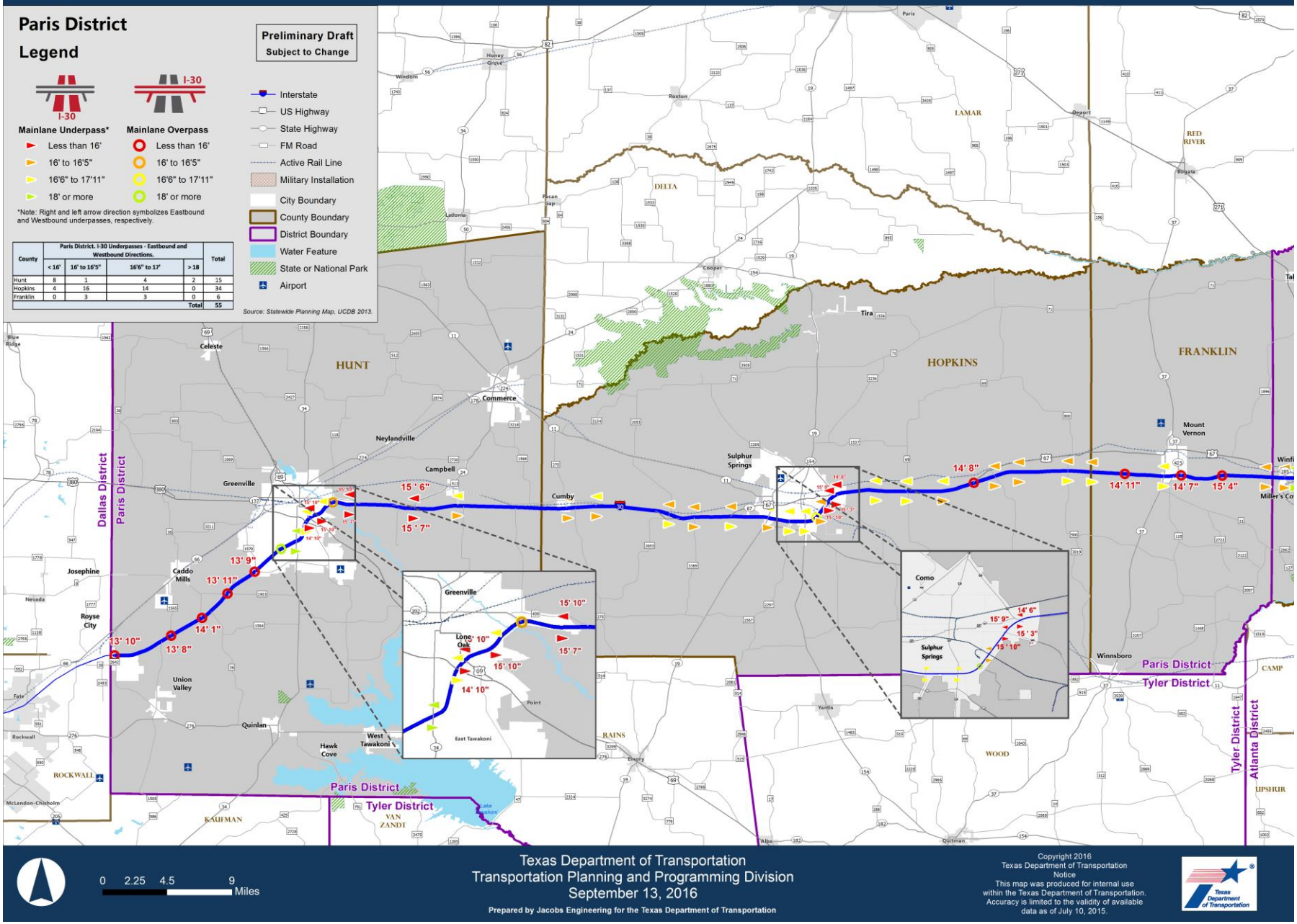
Map 3.8 Pavement Conditions



Map 3.9 Pavement Conditions

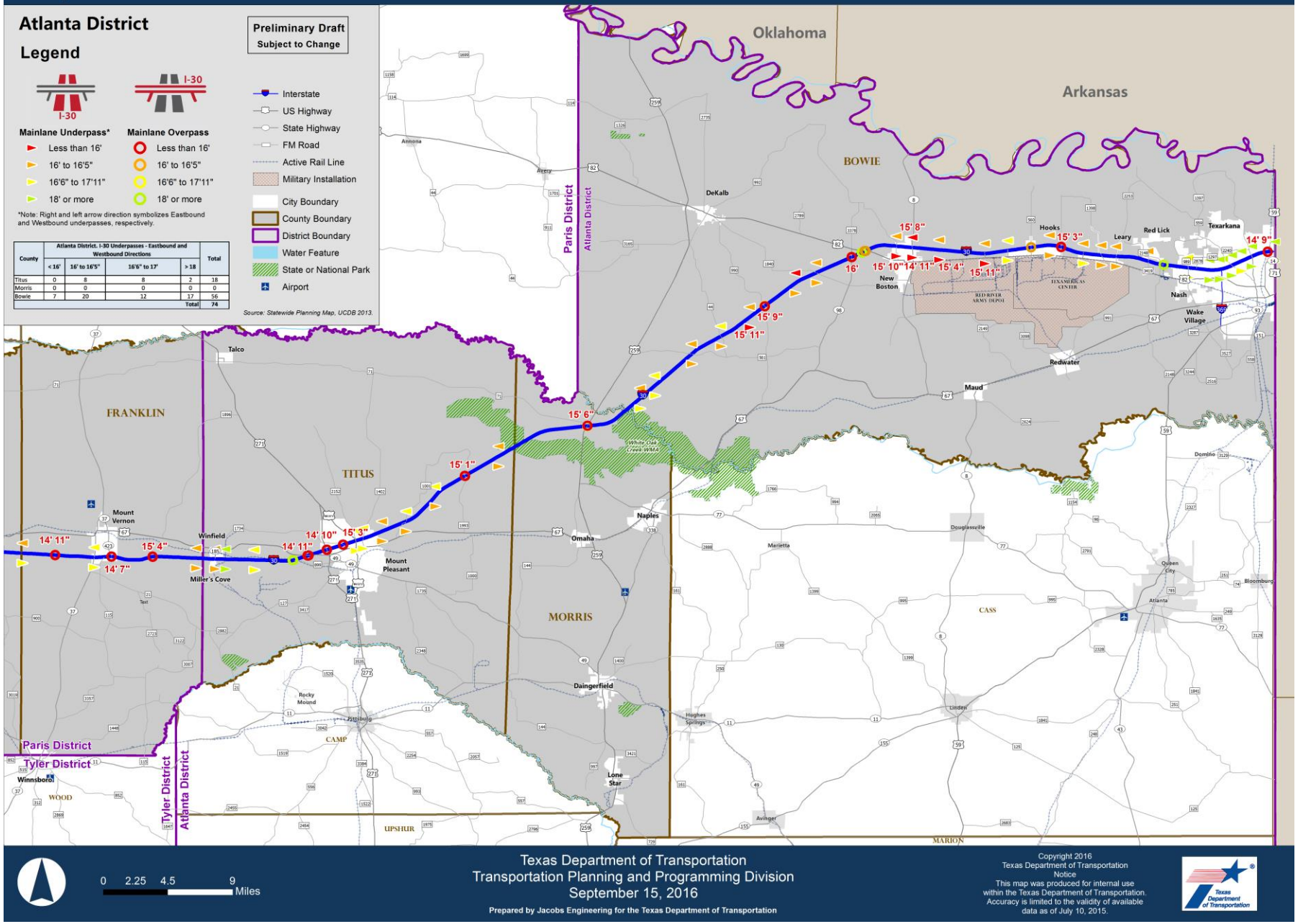


Map 3.10 Vertical Clearance



County	Paris District. I-30 Underpasses - Eastbound and Westbound Directions.				Total
	< 16'	16' to 16'5"	16'6" to 17'	> 18	
Hunt	8	1	4	2	15
Hopkins	4	16	14	0	34
Franklin	0	3	3	0	6
				Total	55

Map 3.11 Vertical Clearance



County	Atlanta District. I-30 Underpasses - Eastbound and Westbound Directions				Total
	< 16'	16' to 16'5"	16'6" to 17'	> 18	
Titus	0	8	8	2	18
Morris	0	0	0	0	0
Bowie	7	20	12	17	56
				Total	74

h. Geometrical Review of Highway Design

A geometric evaluation of access ramps along the corridor was performed to account for the evolution of roadway design standards in the last several decades. Increased speeds, traffic volumes and the age of the interstate made it necessary to assess the current configuration of exit and entrance ramps as well as their corresponding acceleration and deceleration lanes.

A total of 53 interchanges were evaluated which included a total of 214 ramps. Each ramp was given a rating between *A* and *D*, with *A* being *Excellent* and *D* being *Below Standard* based on their compliance with current design standards. Thirteen ramps were rated (N/A) as a result of the peculiar design of the interchange, or because they are direct connector flyovers. In these instances, unique nature of the ramp designs are not included in the Roadway Design Manual[3], and flyover design standards vary widely based on design speeds and other geometric constraints. **Table 3.5** summarizes all ratings while ***Maps 3.12 and 3.13 I-30 Geometrical Analysis*** depict the location and rating of each of the ramps.

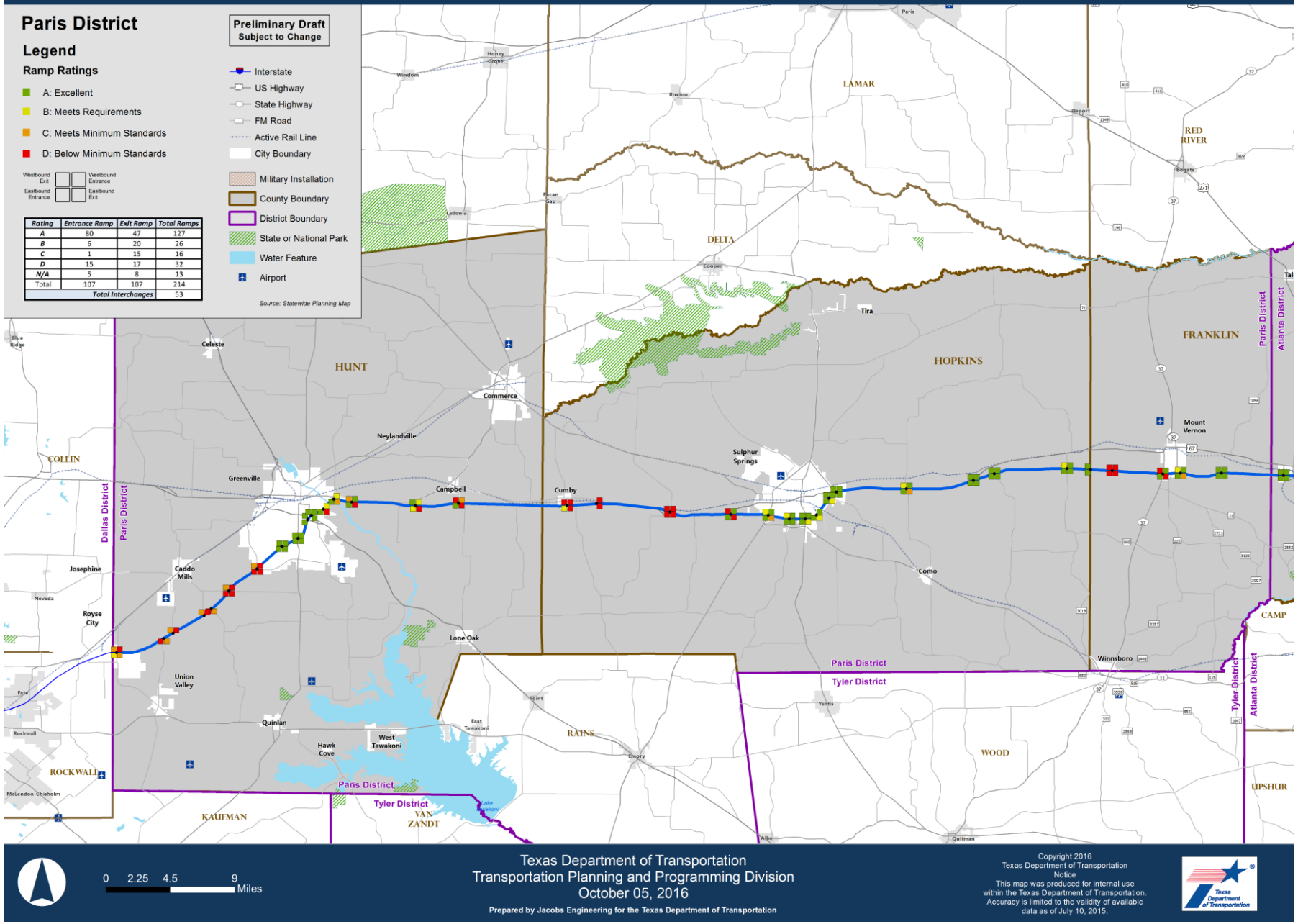
Table 3.5 - Geometrical Analysis of Ramps

Ramp Rating	A *Excellent*	B *Meets Standards*	C *Meets Minimum Standards*	D *Below Minimum Standards*
Paris District	**62**	**14**	**14**	**33**
Hunt	20	5	11	16
Hopkins	34	8	2	10
Franklin	8	1	2	6
Atlanta District	**65**	**12**	**1**	**0**
Titus	25	4	1	0
Morris	4	0	0	0
Bowie	36	8	0	0
Total	127	26	16	32

Concentrations of low-rated ramps can be found to the west and east of the city of Greenville. Hunt County has the highest number of substandard (D) ramps which create access problems from Royse City to the western Greenville City limit. Deficient ramps are present in Hopkins County from Cumby to the interchange with US 67. With the majority of the ramps having a rating of *A* or *B*, no deficient ramps were identified in the Atlanta District. However, there is a marginally acceptable (C) ramp west of Mount Pleasant.

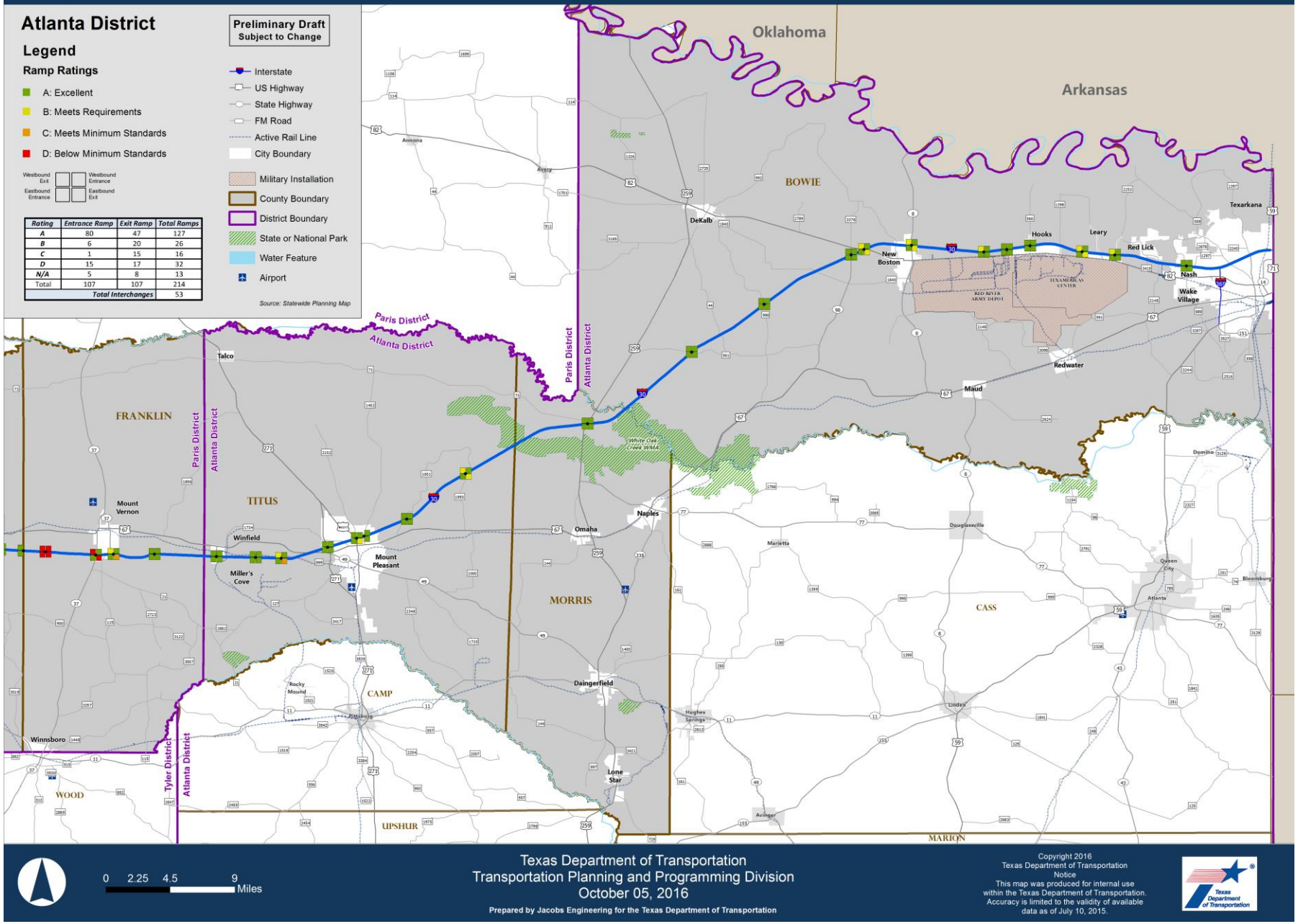
[3] http://onlinemanuals.txdot.gov/txdotmanuals/rdw/rdw.pdf

Map 3.12 I-30 Geometrical Analysis



Rating	Entrance Ramp	Exit Ramp	Total Ramps
A	80	47	127
B	6	20	26
C	1	15	16
D	15	17	32
N/A	5	8	13
Total	107	107	214
Total Interchanges			53

Map 3.13 I-30 Geometrical Analysis



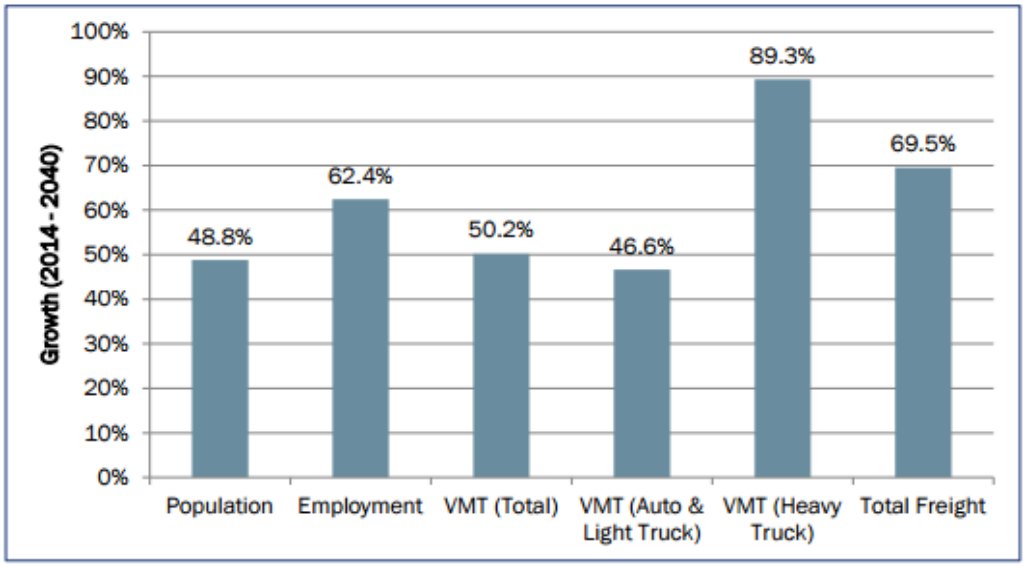
3.1.2 Traffic Forecasting and Levels of Service

a. Existing and Forecasted Traffic Volumes

Existing traffic counts were obtained from TxDOT's annual traffic counting program as summarized in the Statewide Planning Map[4]. Along I-30 near FM 2642 in the western edge of the study, 2014 Annual Average Daily Traffic (AADT) is around 40,000 vehicles; near the east end (in Texarkana), AADT is almost 65,000. In between, I-30 has volumes varying between 20,000 and 50,000, increasing slightly around urbanized areas like Greenville, Sulphur Springs, and Mount Pleasant.

Forecasts for the year 2040 were obtained from TP&P. The corridor was divided into eight segments and 2014 was used as the base year. The annual growth rate for the total AADT was calculated at 1.7 percent based on forecasts provided by TP&P. However, localized historical studies and forecasts from the Texas Freight Mobility Plan[5] suggest that trucks grow at a faster rate than automobiles (~ 1.9 times) based on **Figure 3.2.** Therefore, a different Cumulative Average Growth Rate (CAGR) was used for the cars and the trucks. Detailed existing traffic and forecasts for each of the sections are provided in **Table 3.6.**

Figure 3.2 - Statewide Growth Rates 2014 to 2040



Source: Based on TX SAMv3 data for population, employment, and VMT; Freight Plan Forecast Framework data for VMT; and TRANSEARCH®, FAF, and USACE data for freight estimated growth

Source: Texas Freight Mobility Plan

[4] July,2016

[5] http://ftp.dot.state.tx.us/pub/txdot/move-texas-freight/studies/freight-mobility/plan.pdf

Table 3.6 - 2040 Forecasted Automobile and Truck Traffic

From	To	County	2014 Traffic				2040 Forecast Traffic					
			% Trucks	Trucks	Auto	Total	CAGR Trucks	Trucks	CAGR Auto	Auto	Total	% Trucks
FM 2642	SH 24	Hunt	22.0%	8,862	31,419	40,281	2.6%	17,324	1.4%	44,676	62,000	27.9%
SH 24	SH 19	Hunt	38.8%	10,944	17,263	28,207	2.3%	19,823	1.2%	23,577	43,400	45.7%
SH 19	FM 1870	Hopkins	35.6%	12,260	22,177	34,437	2.4%	22,499	1.2%	30,501	53,000	42.5%
FM 1870	Franklin/Titus County Line	Franklin	41.5%	10,480	14,772	25,252	2.3%	18,817	1.2%	20,083	38,900	48.4%
Franklin / Titus County Line	US 82	Titus Morris Bowie	44.7%	9,847	12,181	22,028	2.2%	17,452	1.2%	16,448	33,900	51.5%
US 82	FM 2878 / Walton Drive	Bowie	37.3%	12,187	20,487	32,674	2.3%	22,222	1.2%	28,078	50,300	44.2%
FM 2878 / Walton Drive	FM 559	Bowie	34.3%	16,254	31,134	47,388	2.4%	30,030	1.2%	42,970	73,000	41.1%
FM 559	Texas / Arkansas State Line	Bowie	30.8%	19,983	44,897	64,880	2.4%	37,459	1.3%	62,441	99,900	37.5%

Source: Transportation Planning and Programming (TP&P) Division, TxDOT Austin.

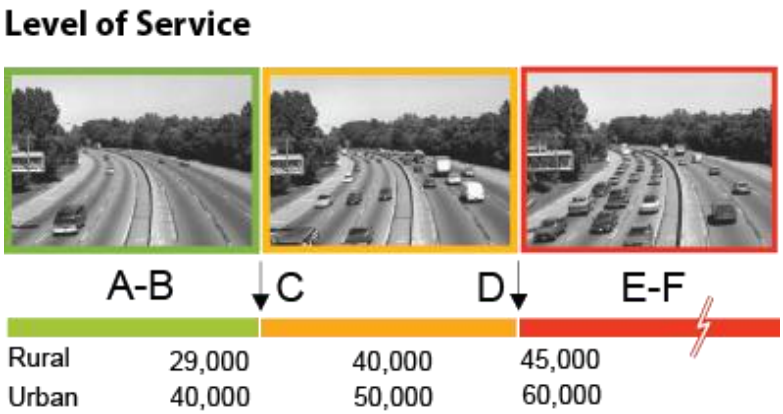
b. Level of Service and Capacity Needs

Capacity for the existing Interstate was calculated considering the road configuration and the vehicle counts described in the previous section. Level of Service (LOS) is the measure of the quality of traffic along a facility; as shown in **Figure 3.3** higher traffic volumes usually correspond to a drop in LOS as they can be expected to result in congestion.

Currently motorists experience little delay or congestion (LOS A-B) except for higher concentrations of traffic in the corridor which occurs from FM 2642 to the west end of Greenville as well as from SH 34 to SH 24, east of the same city. This increase in congestion is associated with traffic activity related to the Dallas-Fort Worth Metroplex. Even though traffic volumes are higher in the Texarkana area, the more urbanized nature of that portion of the corridor, including flatter peak demands and lower motorist expectations, do not generate the same level of congestion as the western portion. Current levels of service and corresponding traffic counts are depicted in ***Map 3.14 - Level of Service 2014.***

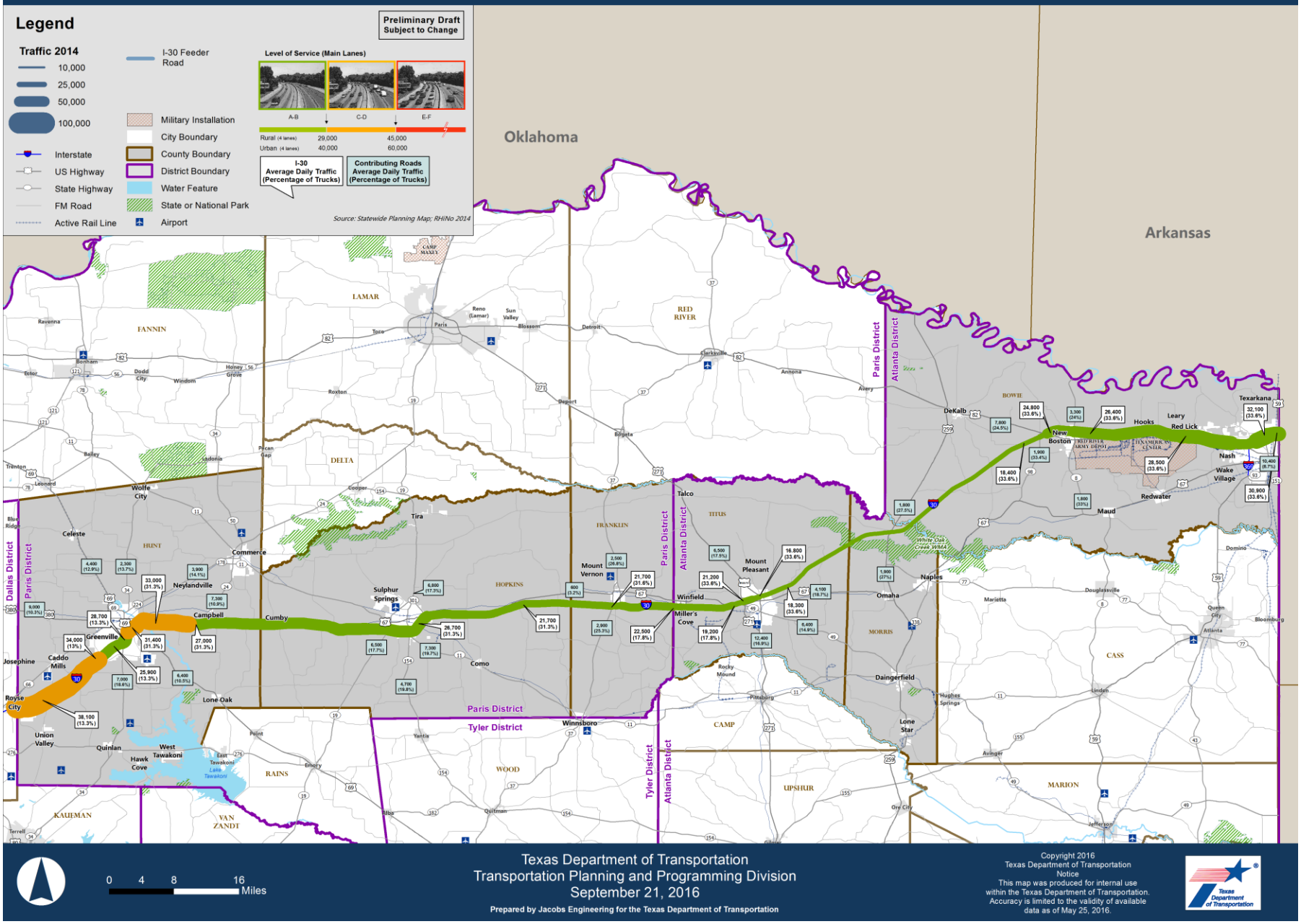
Considering a scenario with no improvement to I-30 in the next 25 years, as shown in ***Map 3.15 - Level of Service 2040***, LOS around Greenville will drop to E-F level and those within the city limits to C-D/E-F. Only rural sections between Mount Pleasant and New Boston will still perform at a Level of Service A-B by 2040. Sections from Campbell to Mount Pleasant and from New Boston to Red Lick at the east edge will experience a drop in their LOS to a C-D level. Texarkana also experience a drop in LOS.

Figure 3.3 - Level of Service

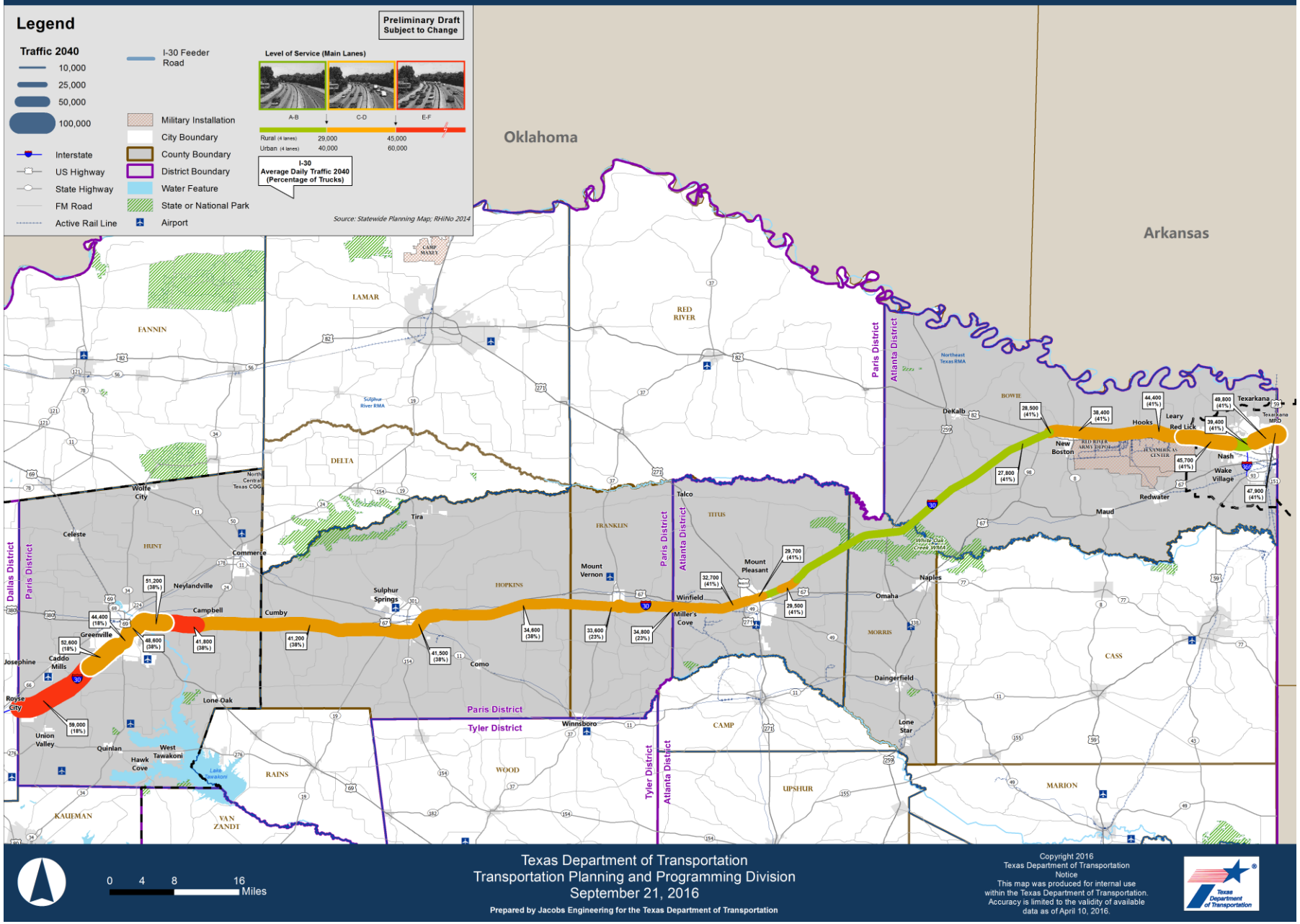


In case the corridor is improved with an additional lane of added capacity in each direction by the year 2040, the corridor can be expected to operate at a LOS A-B in the rural sections while keeping an acceptable LOS C-D along the urbanized sections running along Mount Vernon, Sulphur Springs, Mount Pleasant, and Texarkana.

Map 3.14 Level of Service 2014



3.15 Level of Service 2040



3.1.3 Crash Analysis

According to the Crash Records Information System (CRIS), a total of 3,422 crashes occurred along the I-30 corridor between January of 2010 and December of 2015. A crash analysis was performed to determine if there were any important patterns, which might help to identify useful safety improvements. The following sections summarize key findings from these efforts.

a. Crash Characteristics

The majority of crashes along the corridor (83 percent) occurred on the main lanes as opposed to the frontage roads, and most were not related to an intersection or a driveway - which is expected due to the access-controlled nature of the corridor. Most of the crashes (66 percent) led to property damage only. However, crashes that occurred on access ramps and frontage roads had worse severities (6.7 percent fatal, 10.3 percent incapacitating injury) than those on main lanes (2.1 percent fatal, 4.4 percent incapacitating injury) despite the lower speeds. Approximately 88 percent of these crashes were caused by the *failure to control speed*, *unsafe lane changes*, and/or *driver impairment*. With regards to environmental factors, most of the crashes occurred in daylight during dry and clear weather conditions.

Due to the unusually high number of multiple-vehicle crashes involving 3 or more vehicles, an additional analysis was performed. Multiple-vehicle crashes accounted for 26 percent of the total crashes along the corridor which was comparable with similar corridors in the region such as Interstate 20. Despite the high number of vehicles involved, the majority of multiple-vehicle crashes (66 percent) did not result in an injury. Only 30 percent were injury-inducing and 4 percent led to fatalities. More information on the different crash patterns can be found in **Appendix C – Crash Analysis Memorandum** of this report.

b. Crash Rates and Hotspots

Crash rates were calculated for the entire corridor to determine the relative frequency of crashes on a facility compared to similar roadways, segments, or intersections. The average crash rate for I-30 in the past 5 years was 77 crashes per Hundred Million Vehicle Miles of Travel (HMVMT), which is significantly higher than the statewide average for rural interstates in Texas (49 crashes per HMVMT). Although the majority of sections along the corridor reported crash rates lower than the statewide average, a number of segments near certain communities experienced higher crash rates. The sections with crash rates higher than 1.5 times the statewide average (approximately 73 crashes per HMVMT) were designated as areas of concern, or “hotspots”.

A total of six hotspots were identified along the corridor, which were named after the nearest community: Royse City, Greenville, Campbell, Mount Pleasant, Sulphur Springs and Texarkana, including 59 percent of all the crashes along the corridor. However, these hotspots cover only 51 miles or 35 percent of the total corridor length, so improvements at

these hotspots could substantially reduce the number and types of crashes occurring along the corridor.

According to crash reports, the most common *first harmful events* for all hotspots were *failure to control speed, unsafe lane change/lane departure and driver inattention*, as is observed along the rest of the corridor. While most were property-damage-only crashes, 1 percent of crashes were fatal and another 31 percent were injury-inducing. Despite their urban location, the majority of hotspot crashes (76 percent) were non-intersection related and only 9 percent occurred near at-grade intersections. **Table 3.7** summarizes all hotspots and their main characteristics. For more details on the crash analysis methodology and other approaches, refer to in **Appendix C – Crash Analysis Memorandum** of this report.

Table 3.7 - Hotspot Summary

Hotspot	Length (mi)	Crash Rate	# of crashes	% of injury inducing or fatal crashes	% of total hotspot crashes	% of total crashes along I-30
Royse City	5.41	102	201	18	10.1	6
Greenville	9.52	141	510	34	25.7	15
Campbell	5.8	91	112	33	5.6	4
Sulphur Springs	9.08	81	238	34	12.0	7
Mount Pleasant	6.04	119	159	26	8.0	5
Texarkana	15	130	767	34	38.6	22
Total	**50.8**	–	**1,987**	–	**100.0**	**59.0**

c. Hotspots and Ramp Improvements

Improvements to access points along the Interstate could reduce the number of crashes in the most frequent crash locations. Segments with design deficient ramps, or a high crash rate should be addressed as quickly as possible since the need for improvement has already been identified.

Paris District

A total of five interchanges with a need for ramp improvements were identified in the Paris District. Two of these are located within the Sulphur Springs crash hotspot, FM 2297 and FM 2653 E. Geometric analyses for both locations indicated that ramp conditions on these interchanges are less than the minimum required standards for modern freeway design. The interchange at FM 3451 also has a crash rate higher than the statewide rural average and ramp designs that are only marginally acceptable. However, the interchange is not located within a crash hotspot. The remaining two interchanges in need of improvements (FM 4131 & SH 37) are located in areas where crash rates are below the statewide average.

Atlanta District

Another five interchanges with less than adequate ramp designs were identified in the Atlanta District. The interchanges at FM 1402, FM 589 and SH 93 are all located within crash hotspot areas. While they meet the minimum requirements of design, FM 1402 is located within the Mount Pleasant crash hotspot. FM 589 and SH 93 are located within the Texarkana crash hotspot. The remaining two access points (SH 98 & CR 2003) are not located within a hotspot. The calculated crash rate for the former is above the statewide average, while the crash rate for County Road (CR) 2003 is below the statewide average.

d. Intersection Crash Analysis

In addition to the general corridor and hotspot crash analysis, crash records specific to major frontage-road intersections along the corridor were also analyzed to determine any significant crash patterns. For this purpose, both crashes coded to I-30 frontage roads and to intersecting facilities were analyzed. Major intersecting facilities were selected based on route designation or AADT. Only those intersections that had more than 5 crashes per year per approach were selected for a more detailed analysis. **Table 3.8** summarizes the four signalized intersections with the highest number of crashes and their most significant crash patterns. A more detailed breakdown of crashes at each location is provided **in Appendix D – Cross-Street Crash Memorandum** of this report.

Table 3.8 - Crash Patterns at Selected Major Intersections

Intersecting Facility	Total Crashes (2010 – 2014)	Major Patterns and Observations
SH 34	73	Most crashes were rear-end caused by driver inattention and failure to control speed. Slight increase in crashes in 2012. There were no fatal crashes, but 62 percent were injury-inducing.
SH 154	88	Half the crashes are angle crashes caused by failure to yield ROW while turning left. The rest of the crashes were rear-end by motorists traveling in all directions. Significant decrease in crashes in 2012. There were no fatal crashes. Approximately 30 percent were injury-inducing.
FM 559	118	Approximately 35 percent of the crashes were rear-end between vehicles traveling northbound and southbound. The rest of the crashes did not fit any patterns. None of the crashes were fatal; 30 percent were injury-inducing.
US 71 (US 59)	93	More than half the crashes (54 percent) were rear-end crashes in various directions while 30 percent were angle crashes between vehicles traveling in conflicting movements and failing to yield ROW. There were no fatal crashes and 41 percent led to injuries.

3.1.4 Other Considerations

a. Average Speeds

The National Performance Management Research Data Set (NPMRDS) and INRIX were used to determine average speeds along the I-30 Corridor in order to further analyze congested areas. The NPMRDS is a vehicle probe-based travel time data set acquired from HERE®[6] by the FHWA to support its Freight Performance Measures (FPM) and Urban Congestion Report (UCR) programs. This database provides travel times for three different categories: all vehicles, passenger vehicles, and trucks. Among other products and services, INRIX offers real-time traffic information for major road types and classes from highways, ramps and interchanges to arterials, city streets and other secondary roads. The INRIX data set provides detailed traffic speeds every 0.15 miles along I-30.

Based on the NPMRDS (HERE®), the average speed on main lanes along the I-30 corridor is 64.5 mph. As shown in **Figure 3.4**, average speeds below the limit of 75 mph were reported along almost the entire corridor. The highest speeds, above 75 mph, are observed through Greenville, East of Sulphur Springs, and through Mount Vernon. On the westbound main lanes a total of 4.1 miles had average speeds above the 75 mph limit, which are located in Hunt and Hopkins counties.

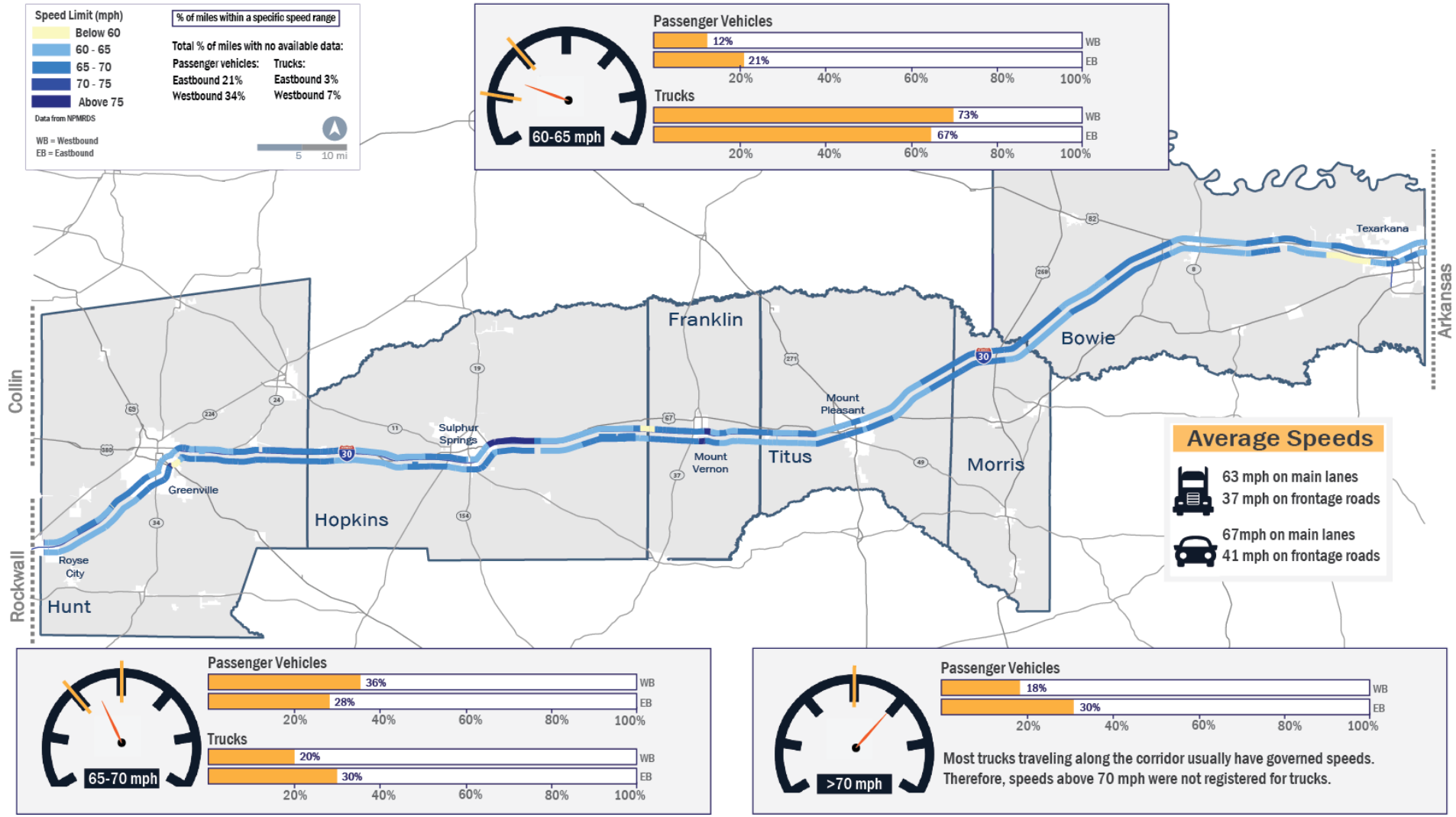
The average speed on main lanes for I-30 according to INRIX data is 64.2 mph, which is similar to the average obtained from NPMRDS (64.5 mph). However, according to INRIX data, speeds are much less variable; with the highest speeds only being recorded around 65 mph. When broken down into speed categories INRIX reports indicate that more than 92 percent of the corridor experiences speeds between 60 and 65 mph, while HERE classifies around 50 percent of the corridor under the same category. INRIX indicates that the highest speed registered along I-30 is 65 mph, but according to the HERE® data set nearly 50 percent of the corridor reported speeds above those of INRIX (65 - 70 mph). HERE® reports also go on to indicate that 3 percent of the total corridor miles experience speeds above 75 mph. After analyzing both data sets, and conducting observations in the field, the HERE data appears to more accurately reflect actual conditions along this portion of I-30.

When analyzing frontage roads, both the NPMRDS (HERE®) and INRIX data sets show average speeds of 39 mph along the frontage roads within Hunt and Hopkins counties. Neither of the datasets reported measurements along the other four counties within the study area. Comparison of average speeds in urban and rural areas show consistency among both datasets as well as average speeds of 64 mph within city boundaries along the corridor. However, NPMRDS (HERE®) allowed comparison of average speeds between different types of vehicles. For main lanes, the average speed for passenger vehicles is 67 mph and for trucks is 63 mph. While the average speed for passenger vehicles along frontage roads is 41 mph, the average speed for trucks is 37 mph.

[6] https://company.here.com/here/

Figure 3.4

Average Speed NPMRDS



b. Truck Parking Needs

Research was performed in order to identify the current availability of truck parking along the corridor, focused on those supplies available directly off the Interstate, for comparison with existing and future demand. I-30 has a total of 21 trucking facilities which include private stops such as big box store parking and service stations, as well as public stops such as rest areas and travel information centers. The facilities along the corridor are separated by an average distance of seven miles. To better understand truck parking needs, this study divided the corridor into three segments: Royse City at FM 2642 to West of SH 154 in Sulphur Springs (Western), East of SH 154 to West of US 82 in New Boston (Central), and from East of US 82 to the Arkansas State line (Eastern). ***Map 3.16 - Truck Flows*** shows the location and current capacity of all truck facilities as well as the latest recorded truck traffic levels along the corridor and major cross streets.

Table 3.9 - Existing and Forecasted Truck Parking Supply and Demand

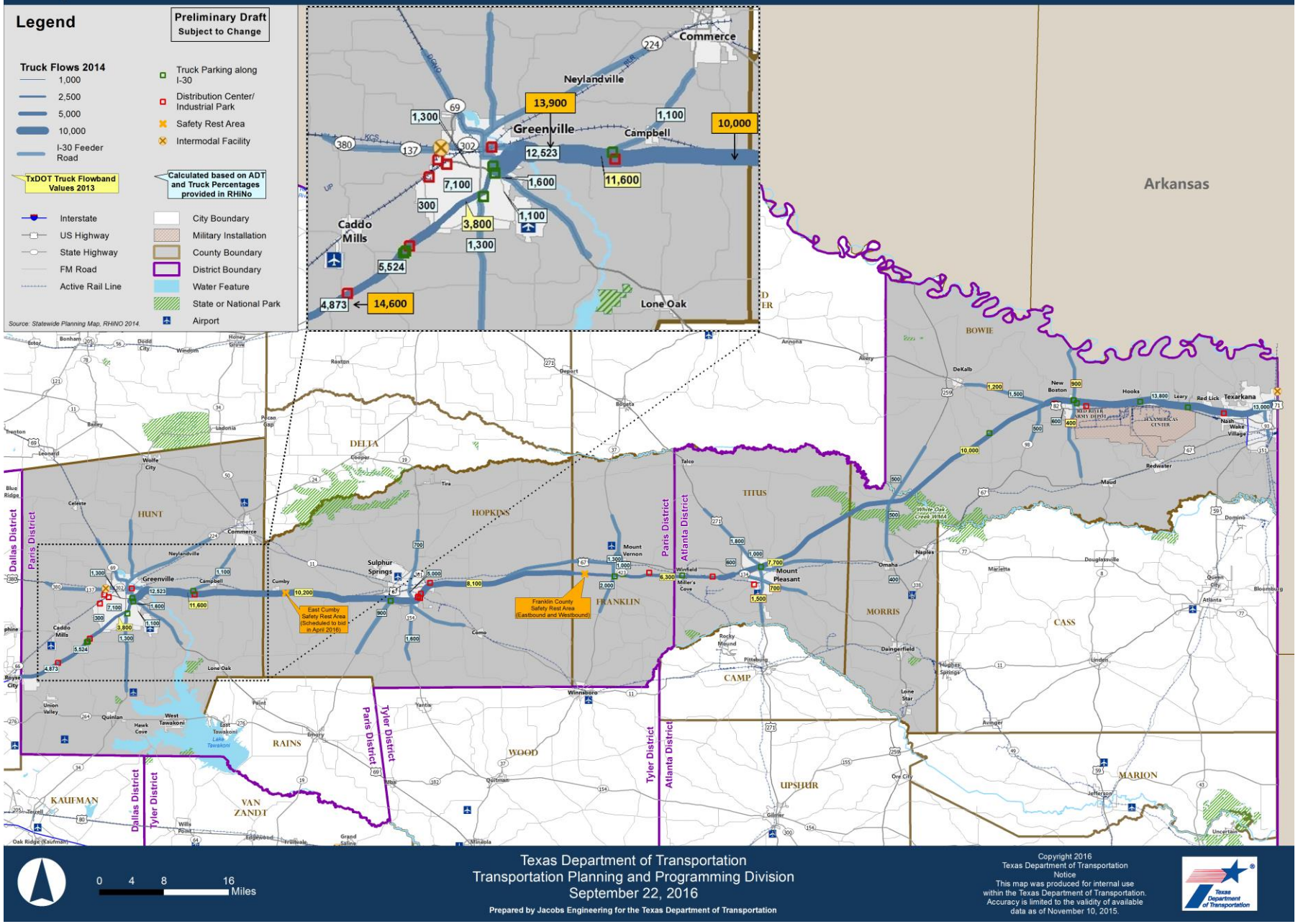
Segment Limits	Length (mi)	# of Available Parking Spaces	2014				2040			
			AADT	% Trucks	Truck Parking Demand	Surplus (Deficit)	Forecast AADT	% Trucks	Truck Parking Demand	Surplus (Deficit)
Western	45.6	356	31,500	25%	259	97	46,600	29%	383	(27)
Central	74	198	20,500	30%	399	(201)	31,800	43%	619	(421)
Eastern	24.8	145	28,400	34%	154	(9)	44,100	35%	240	(95)
Total	**144.4**	**699**	-	-	**812**	**(113)**	-	-	**1,242**	**(543)**

** Includes proposed 56 parking spaces east of Cumby expected to be open in two years*

As shown in **Table 3.9**, there is a forecasted deficit of almost 550 truck parking spaces. By 2040, a significant increase of the truck parking demand is expected in all sections of the corridor as a consequence of the projected growth in truck traffic. The Texas Freight Mobility Plan expects VMT for trucks to grow at about twice the rate of those of private vehicles. As seen in **Figure 3.2**, VMT for "Heavy Trucks" is expected to grow at almost 90 percent in contrast with that of the private automobile at only 47 percent.

In order to satisfy these demands, new truck parking facilities may be required, particularly in the central segment of the corridor which is short of current parking demand, as well as the western segment where growth in truck traffic along with its proximity to the Metroplex may require additional truck parking facilities. For the eastern segment, additional truck parking opportunities should be considered near the TexAmericas Center and Red River Army Depot in New Boston, while considering that private development may provide additional parking to satisfy a portion of the demand. For more details on the methodology of this analysis as well as calculations for current and forecasted truck parking supplies, refer to **Appendix F –Truck Parking Supply and Demand Memorandum** of this report.

Map 3.16 Truck Flows



c. Cross Section Alternatives

The possible expansion of the I-30 corridor required the consideration of different corridor-wide strategies that could lead to three different cross section options. Three different alternatives were chosen based on forecasted traffic volumes, traffic operations, and potential safety measures:

- **No Build:** Existing cross section (keep current four-lane divided cross section)
- **Alternative 1:** Three general purpose travel lanes cross section (with truck restriction on left lane)
- **Alternative 2:** Truck lane in the leftmost lane – buffer separated cross section – providing a flexible/permissive operation for trucks

A combination of the No Build alternative and either one of the remaining alternatives could be employed throughout the corridor as a solution for construction phasing. A fourth alternative, one with a dedicated truck lane on the left lane separated by a concrete barrier, was also evaluated but not included for further consideration due to cost, operation, and maintenance issues associated with it.

No Build: Keep Existing Cross Section

The No Build alternative assumes that no major changes are made to the current cross section of I-30 by 2040. The roadway will be kept as a four-lane facility with two - 12 ft. general purpose lanes in each direction of travel and a variable median with an average width of 40 ft. as shown below in **Figure 3.5.** Ramp and bridge modernization efforts could be performed to improve existing operations.

Alternative 1: Three General Purpose Lanes Cross Section

Alternative 1 would involve adding a new 12 ft. inside lane in each direction of travel resulting in a six-lane divided cross section along the corridor. This improvement includes the FHWA requirement for a 10 ft. shoulder in the median in each direction for six or more lanes. The resulting minimum total cross section (excluding frontage roads) would be 116 ft. **Figure 3.5** provides a general concept of this alternative. Usual practice often results in truck restrictions on the inside lane in each direction to reduce conflicts between passenger vehicles and trucks. Such an alternative creates additional capacity, and generally fits within the existing right-of-way of the corridor. All ramp and bridge modernization efforts would be incorporated into this strategy.

Alternative 2: Truck Lane – Buffer Separated Cross Section – Flexible/Permissive

Alternative 2 creates a similar six-lane divided cross section as Alternative 1; however, the left-most lane in each direction would be reserved as a truck-only, buffer-separated lane. The nature of this type of separation, which would include a 4 ft. painted buffer allows trucks to exit and enter the dedicated lane at any time. This would create maximum flexibility for truck drivers while minimizing interaction between passenger vehicles and long-distance-

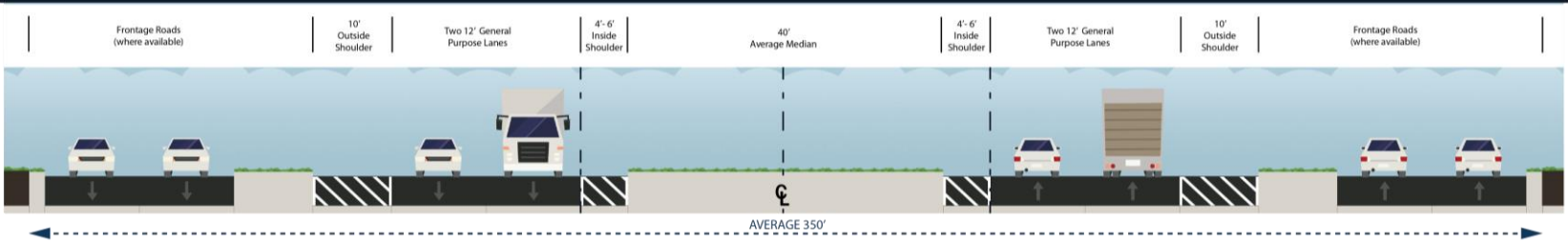
traveling trucks. Moreover, the flexibility of this alternative permits changes in lane dedication in the future if anticipated truck demands do not materialize. The dedicated 12 ft. truck lane is designed to have a 4 ft. buffer between the adjacent general purpose lane and a 10 ft. inside shoulder as shown in **Figure 3.5.**

Figure 3.5 – Cross Section Alternatives

I-30 East Texas Corridor
Cross Section Options

No Build. Current Average Cross Section

Two 12' general purpose lanes in each direction of travel.

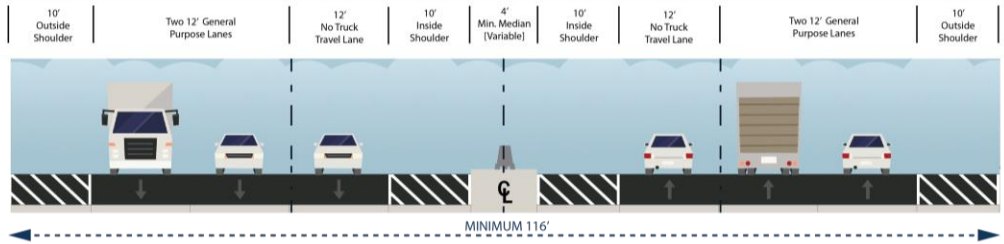


1. Three General Purpose Lanes Cross Section

Addition of a 12' lane and extended 10' shoulder in each direction within the existing median. Inside lane designated No Trucks.

PROS

- Generally fits within right-of-way
- Least costly
- Corresponds with current practice
- Added capacity
- No new maintenance features



CONS

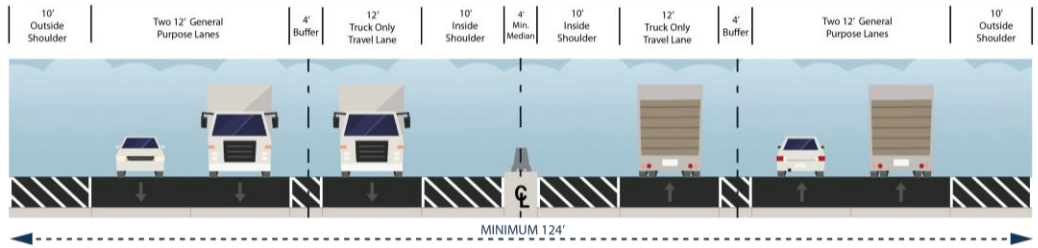
- No separation of freight operations
- Possible "truck wall" effect on the middle or outside lane

2. Truck Lane - Buffer Separated Cross Section - Flexible / Permissive

Addition of an extra 12' lane, extended 10' inside shoulder and 4' buffer in each direction. Inside lane designated Truck Only.

PROS

- Trucks are generally separated from conflicts with autos
- Maximum flexibility for truck drivers
- Easy conversion to #1 if demand not achieved
- Added capacity



CONS

- Trucks and autos can easily mix
- Enforcement issues with likely 10-15% violation rates
- Uncommon design creates different driver expectations

Traffic Operations Implications

To better understand the expected performance of each of the alternatives, the traffic density of cars and trucks along a quarter mile segment of the highway was determined. The safe headway assumed for trucks traveling at a speed of 65 mph is five seconds and that of passenger vehicles traveling at a speed of 75 mph is three seconds, corresponding to 480 ft. and 330 ft. respectively. Based on current and forecasted traffic volumes the densities in a quarter mile segment are summarized in **Table 3.10** and **Figure 3.6** illustrates the likely configurations for each alternative.

Table 3.10 - Number of trucks and cars in a quarter mile segment

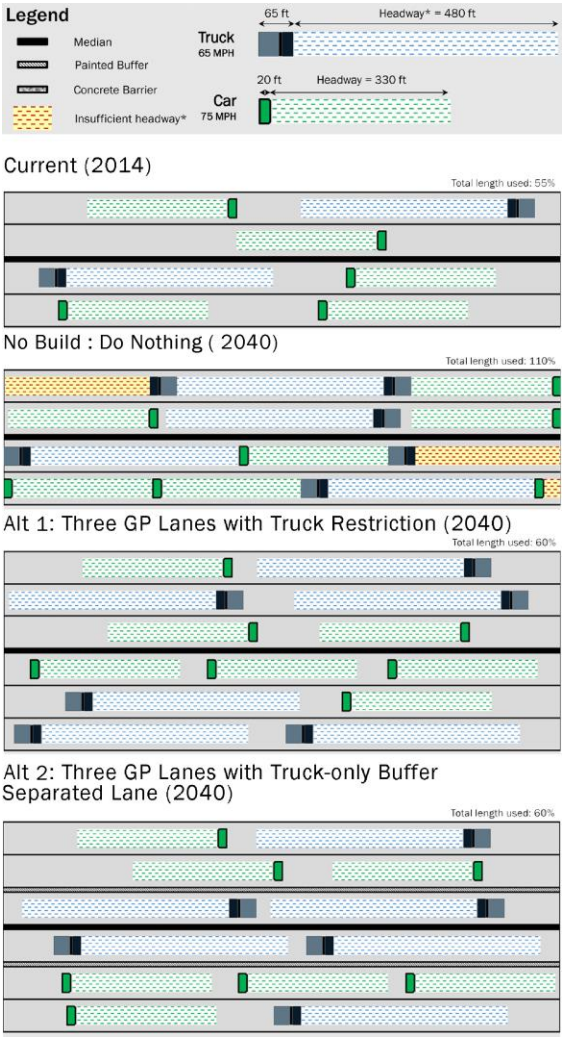
Direction of Travel	Current (2014)		Future (2040)	
	Trucks	Cars	Trucks	Cars
Westbound	1	2	3	3
Eastbound	1	3	3	4

Source: Jacobs

For each of the alternatives, the corresponding forecast of trucks and cars were arranged based on lane restrictions and the minimum headways. It was assumed that for Alternative 2, where a truck-only lane is to be provided, two-thirds of the trucks would use that lane and one-third would use the general purpose lanes.

The No Build alternative, which assumes that the current cross section is maintained in the future, is the only scenario where there is insufficient headway. This indicates that if no major improvements are made, safe headways cannot be maintained and therefore vehicles will be required to slow down or travel with shorter headways, resulting in less than ideal traffic operations. Based on these results, an additional lane in each direction is needed to maintain safe traffic operations with desired minimum headways. However, in terms of lane configuration and restrictions, the two alternatives (1 and 2) will lead to the same use of roadway space. A six-lane cross section with either configuration would provide adequate capacity through the year 2040.

Figure 3.6 – Traffic Density per alternative



d. Oversized and Overweight Routes

Aggregated information on oversized and overweight permits issued by the Department of Motor Vehicles Texas Permitting and Routing Optimization System (TxPROS), was requested to perform a pattern analysis on current alternative routes used by trucks along I-30. TxPROS indicated that less than 100 trucks a year with heights between 15 ft. 6 in. and 16 ft. 6 in. were rerouted from westbound I-30. In addition, only four trucks with heights greater than 16 ft. 6 in. were rerouted from westbound I-30. Based on the data selection process followed by TxPROS, no trucks were rerouted from eastbound I-30.

Data obtained from TxPROS did not identify any significant traffic of oversized and overweight vehicles along the I-30 corridor. Concerns regarding constrained underpasses were addressed in the vertical clearance section of this report *(see Section 3.1.1.g)*.

e. Planned and Programmed Improvements

The Paris and Atlanta Districts plan to include a total of four planned projects and twelve programmed projects along the corridor before the year 2040. Additionally there are three others projects scheduled for or are under construction at the time of this study[7]. Planned projects are included in the UTP 10-year plan while programmed ones have been assigned a tentative letting date. The total value of planned investments on the I-30 Corridor is a nearly $430 million, with nearly $48 million of these investments being used for projects soon to be or currently under construction. Additionally, $268 million are allotted to programmed projects deemed as those under development and $114 million are estimated for planned ones.

Projects under construction include bridge replacements in Hunt and Bowie counties as well as the construction of a safety rest area close to Cumby in Hopkins County.

As for programmed projects, there are seven projects programmed to address ramp improvements along the corridor. The construction of a grade separated interchange as well as rehabilitation and construction of frontage roads in Texarkana. Finally, planned projects include four expansions of the current section from four lanes to six lanes for a total of 44 miles along Hunt, Hopkins, Franklin and Titus counties.

For details and specific locations throughout the corridor, refer to *Map 3.17 – Under Construction, Planned and Programmed Improvements*[8].

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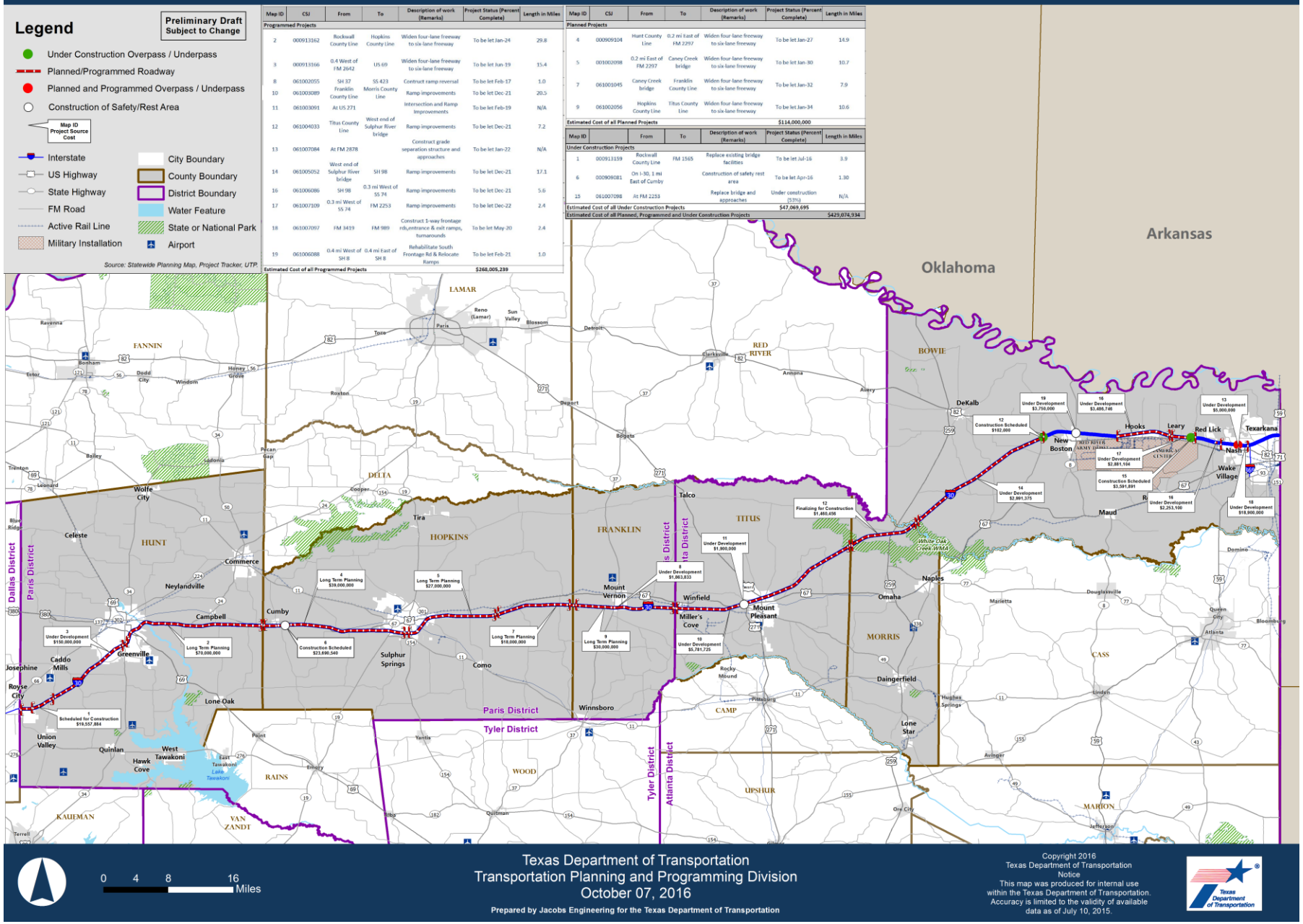
[7] Last updated on (Nov, 16 2015) using TxDOT's Statewide Planning Map and Project Tracker.

[8] Last update on February 29, 2016.

Map 3.17 Under Construction, Planned and Programmed Improvements



Map ID	CSJ	From	To	Description of work (Remarks)	Project Status (Percent Complete)	Length in Miles
Programmed Projects						
2	000913162	Rockwall County Line	Hopkins County Line	Widen four-lane freeway to six-lane freeway	To be let Jan-24	29.8
3	000913166	0.4 West of FM 2642	US 69	Widen four-lane freeway to six-lane freeway	To be let Jun-19	15.4
8	061002055	SH 37	SS 423	Contruct ramp reversal	To be let Feb-17	1.0
10	061003089	Franklin County Line	Morris County Line	Ramp improvements	To be let Dec-21	20.5
11	061003091	At US 271		Intersection and Ramp Improvements	To be let Feb-19	N/A
12	061004033	Titus County Line	West end of Sulphur River bridge	Ramp improvements	To be let Dec-21	7.2
13	061007084	At FM 2878		Construct grade separation structure and approaches	To be let Jan-22	N/A
14	061005052	West end of Sulphur River bridge	SH 98	Ramp improvements	To be let Dec-21	17.1
16	061006086	SH 98	0.3 mi West of SS 74	Ramp improvements	To be let Dec-21	5.6
17	061007109	0.3 mi West of SS 74	FM 2253	Ramp improvements	To be let Dec-22	2.4
18	061007097	FM 3419	FM 989	Construct 1-way frontage rds,entrance & exit ramps, turnarounds	To be let May-20	2.4
19	061006088	0.4 mi West of SH 8	0.4 mi East of SH 8	Rehabilitate South Frontage Rd & Relocate Ramps	To be let Feb-21	1.0
Estimated Cost of all Programmed Projects						$268,005,259

Map ID	CSJ	From	To	Description of work (Remarks)	Project Status (Percent Complete)	Length in Miles
Planned Projects						
4	000909104	Hunt County Line	0.2 mi East of FM 2297	Widen four-lane freeway to six-lane freeway	To be let Jan-27	14.9
5	001002098	0.2 mi East of FM 2297	Caney Creek bridge	Widen four-lane freeway to six-lane freeway	To be let Jan-30	10.7
7	061001045	Caney Creek bridge	Franklin County Line	Widen four-lane freeway to six-lane freeway	To be let Jan-32	7.9
9	061002056	Hopkins County Line	Titus County Line	Widen four-lane freeway to six-lane freeway	To be let Jan-34	10.6
Estimated Cost of all Planned Projects						$114,000,000

Map ID		From	To	Description of work (Remarks)	Project Status (Percent Complete)	Length in Miles
Under Construction Projects						
1	000913159	Rockwall County Line	FM 1565	Replace existing bridge facilities	To be let Jul-16	3.9
6	000909081	On I-30, 1 mi East of Cumby		Construction of safety rest area	To be let Apr-16	1.30
15	061007098	At FM 2253		Replace bridge and approaches	Under construction (53%)	N/A
Estimated Cost of all Under Construction Projects						$47,069,695
Estimated Cost of all Planned, Programmed and Under Construction Projects						$429,074,934

4. Working Group Activities

Commissioner Jeff Austin III sponsored a Working Group of 21 members for this study. The Working Group members represented I-30 communities including the interests of the six counties I-30 extends across, MPOs as well as other private and public entities. The Honorable Judge Brian Lee served as chair of the Working Group.

Members of the Working Group were tasked with providing insight about their communities as well as becoming spokespeople for the study's objective, analysis and results. **Table 4.1** lists each of the members of the Working Group and their affiliation.

Table 4.1 - I-30 East Texas Corridor Study Working Group Member List

Name	Entity
Judge Brian Lee (Chair)	**Titus County**
Judge Clay Jenkins	Dallas County
Judge David Sweet	Rockwall County
Judge John Horn	Hunt County
Judge Robert Newsom	Hopkins County
Judge Scott Lee	Franklin County
Judge Lynda Munkres	Morris County
Judge James Carlow	Bowie County
David Dreiling, Mayor	City of Greenville
Marc Maxwell	City of Sulphur Springs
Margaret Sears, Mayor	City of Mount Vernon
Mike Ahrens, City Manager	City of Mount Pleasant
Bob Bruggeman, Mayor	City of Texarkana
Kevin Feldt	NCTCOG (DFW MPO)
Rea Donna Jones	Texarkana MPO
Robert Murray	North East Texas Regional Mobility Authority
Chris Brown	Ark-Tex Council of Governments/North East Texas RPO
E. Delbert Horton	Sulphur River Regional Mobility Authority
Troy Sellers	Luminant (Mining Engineering Section)
Colonel Brandon Grubbs, Commander *(now retired)* Colonel Jason Carrico, Commander	Red River Army Depot
Scott Norton, Executive Director/CEO	TexAmericas Center

The Working Group met four times since it was established in December 2015. Three in-person meetings were held at different locations along the corridor and the remaining one

was conducted through a WebEx conference. Summaries for all meetings can be found on the project website or in ***Appendix G– I-30 Working Group Meetings Summaries***. [9]

The first Working Group meeting was held in Mount Pleasant on March 23, 2016 with 14 members attending. The main objectives of the meeting were to:

- Introduce the Working Group to the I-30 East Texas Corridor Study;
- Provide a general overview of the corridor and the study;
- Discuss capacity needs, safety improvements, economic development needs and multimodal improvements along the corridor through a group exercise subdivided into west, central and east sections;
- Review and establish goals and objectives for the study; and
- Discuss public outreach tools and ideas.

The second Working Group Meeting, was held in Greenville on May 31, 2016 with 15 members attending. The main objectives of this meeting were to discuss potential long- and short-range improvements, present safety and freight findings along the corridor, provide public outreach updates, and discuss public outreach tools and ideas.

Working Group members were presented with considerations for long- and short-range improvements, in preparation for group roundtable discussions. The difference between long- and short-range improvements was defined before dividing into smaller groups. Members then discussed with other local representatives current issues and proposed improvements.

The third Working Group Meeting was held in Texarkana on August 4, 2016. Its purpose was to evaluate and prioritize proposed improvements for the corridor. Members were asked to express their preferences for expanded cross section configuration as well as to prioritize which segments should be improved first. Grouped into their respective corridor regions (east, central, west), members then discussed and identified which localized improvements could make a bigger difference in their communities if implemented earlier.

The final meeting was held as a conference call and online meeting on October 13 and 14, and focused on the review of the draft study report as well as commentary and suggestions on the proposed improvement implementation plan. Further details about all the meetings can be found in ***Appendix G– I-30 Working Group Meetings Summaries*.**

[9] http://www.txdot.gov/inside-txdot/projects/studies/statewide/i30-east-texas-corridor.html

5. Public Outreach Activities and Findings

The purpose of public outreach efforts was to ensure the Working Group members had adequate outreach tools in order for them to successfully communicate with their constituents and communities as well as gather public input. Examples of communications tools provided to Working Group members included PowerPoint presentations; social media posts, comment cards, activity forms and fact sheets, as well as surveys which can be found in the ***Appendix H -Public Involvement Summary.***

5.1 Project Website

A project website[10] was created in March, 2016 to provide general information for the Working Group and the general public. Information provided on the website included the following:

- Overview of the corridor
- Working Group information
- Public involvement materials
- Working Group meeting presentations and summaries

5.2 Online Survey

An online public survey was created to gather specific input about needs and priorities along the corridor. The survey was available from early March to July 15, 2016 with a total of 939 responses received during this period. Responses to the survey were equally distributed by frequency of travel; however, geographically, most of the respondents came from Bowie County.

The questions included were as follows:

- Which of the following best describes why you most frequently use I-30?
- Where do you live?
- How often do you travel along I-30 between Royse City (Hunt County) and the Texas/Arkansas State line?
- Please rank your top priorities for the I-30 study (1 as most important, 4 as least important)
- Please rank the improvements you think are most important along the corridor (1 is most important, 7 is least important)
- What specific areas along I-30, between Royse City and Texarkana, do you feel need attention and what do you think should be done? (Example: lengthen the ramp at the [Street Name or Exit] lower the speed limit near City Name, etc.)

[10] http://www.txdot.gov/inside-txdot/projects/studies/statewide/i30-east-texas-corridor.html

- Please leave any additional comments about the I-30 study

The general public expressed their preference for improvements that would enhance safety and improve mobility, including the expansion of the corridor and improvements to its access points.

5.3 Truck Driver Comment Line

The Working Group expressed specific interest in feedback from truck drivers. For this purpose a fact sheet was created and a phone line to "call or text" comments was established. Informational flyers urging truck drivers to provide input were distributed to rest areas and truck stops along the corridor in late July of 2016. Overarching themes of comments received included the provision of more truck facilities, for both rest and parking, better enforcement of speed limits, as well as some separation of truck and passenger vehicle travel. A detailed account of all comments and materials used can be found in *Appendix H - Public Involvement Summary*

Figure 5.1 – Truck Flyer

Source: K-Strategies

5.4 Media Coverage

Two press releases were issued and nine media articles were centered on the study efforts during the initial four months of the public involvement process. These articles focused on soliciting input from neighboring communities, as did the press releases.

6. Costs and Funding

Improvement strategies for corridor plans such as the I-30 East Texas Corridor rely on Federal and State funding for the most part. The estimated funding available according to the June 2016 Cash Forecast from existing sources allocated to the corridor in the upcoming 25 years could approach almost $2.5 Billion. A cost approximation for proposed improvements was developed in order to compare them to expected funding at the time when they will be needed.

6.1 Cost Estimates

Preliminary cost estimates for all proposed improvements were developed as an aid in their programming. All costs are based on typical sections, previously approved by the Working Group members, and conceptual layouts presented to District staff in August 2016.

Table 6.1 Additional Costs and Contingencies

ADDITIONAL COSTS AS % OF CONSTRUCTION	% OF CONSTR. COST
Engineering & design	8%
Survey and geotechnical investigations	3%
Construction management	2%
QC/ inspection/ supervision	3%
Traffic control	10 - 15%
Drainage	5 - 15%
Safety (lighting, etc)	0.5 - 2.0%
Traffic signals	0 - 5%
Utility adjustments	1 - 5%
Landscaping and aesthetics	1 - 2%
Environmental mitigation	2 - 5%
ROW acquisition	0 - 2%
Contingency	30%

a. Corridor-wide Improvements

Corridor-wide improvements consisted of widening the entire corridor from FM 2642 to the Texas/Arkansas State Line from a four-lane divided to a six-lane divided cross section based on needs determined through traffic forecasts. Costs were estimated for both the limited scenario of widening the highway by making full use of existing pavement and a second scenario of completely reconstructing the existing Interstate pavements at the same time that an additional lane is added in each direction of travel.

Google Earth was used to identify various features of the existing roadway in order to produce all estimated measurements of the proposed improvement elements. These data can be confirmed during subsequent schematic designs. The I-30 corridor was divided into segments based on geographic and jurisdictional boundaries as well as major intersecting facilities. A cost for both, expansion and reconstruction, was estimated for each section of the corridor

A unit cost was estimated for a 100 ft. segment of pavement reconstruction at $118,991; based on 2016 TxDOT unit bid prices for excavation, embankment, bridge removal, barricades, signs, traffic handling, pavement structure, and other elements. Segment costs also include the cost of replacing or widening overpasses within each of them. A number of additional costs and contingencies were also calculated as a percentage of the estimated construction cost as shown in **Table 6.1**. Costs for some items were varied depending on existing site conditions. For more details please refer to the ***Appendix L –Cost Estimates Memorandum.***

b. Localized Improvements

The need for a number of localized improvements were also identified by staff and confirmed by the Working Group along the corridor. Such projects were classified into access improvements, interchange redesigns, bridge modifications, as well as frontage road addition or conversion projects. Cost estimates for each of the suggested improvements were determined based on visual analyses and measurements using Google Earth (unless As-Built plans were available). Removal of existing pavements, excavation, paving, as well as new walls and structures were all estimated from the concept drawings. Associated costs and contingencies were also applied to the initial construction cost estimate based on their applicability and the site conditions (See **Table 6.1**).

Where appropriate, localized improvement costs were combined with the corridor-wide expansion costs as is the case with improvements related to bridge modification. For example, if a segment along the corridor contains a certain overpass that was also identified as having low vertical clearance, then the cost of widening and replacing the bridge was included in the segment cost.

6.2 Funding Strategies

A funding forecast for the next 25 years was also developed in order to produce a financially constrained development strategy.

a. Federal and State Funding

The Federal and State funding forecasts are based on TxDOT's June 2016 Cash Flow Forecast (see **Appendix M - Assessment of Funding Options & Forecasts** ***Exhibit A***). These forecasts include funding sources like the State Highway Fund (SHF), Texas Mobility Fund (TMF), Propositions 12 and 14, toll revenues, as well as recently approved Propositions 1 and 7, among other sources. Similarly, expenses are categorized for planning, construction, maintenance, operations, as well as debt service.

To identify potentially available funding for the I-30 East Texas Corridor Plan, TxDOT's June 2016 forecasts for FY 2013 - FY 2026 were extended to FY 2040. For the year 2027, an average of the previous five years of revenues was considered. Following 2027, the revenues were escalated by 2.0 percent each year. The expenses for FY2027 – FY 2040

were calculated as proportionate to the average of revenues for years FY 2014 – FY 2026 (see **Appendix M – Assessment of Funding Options & Forecasts** ***Exhibit B)***

Available funding for the I-30 East Texas Corridor Plan was based on the Plan, Build, Maintain, and Project Development and Delivery categories of expenses. Each District was allocated funding proportional to the VMT in that District as a percent of the Statewide VMT. The Paris District is approximately 2.08 percent of the Statewide VMT and the Atlanta District is 2.04 percent of the Statewide VMT. Each District's funding was further proportioned based on the VMT on I-30 as compared to the Districtwide VMT, which amounted to 25.71 percent for Paris District and 19.50 percent for Atlanta District. Based on these allocations, the available funding was derived as shown in **Table 6.2**.

Table 6.2 Potential Funding Available ~~Summary~~ for I-30

District	Funding (2016$M)*			
	Near-Term	Mid-Term	Long-Term	Total
Paris District	$200~~70~~	$~~520~~430	$ 440~~650~~	$ 1,~~440~~070
Atlanta District	$ 150~~200~~	$320~~390~~	$~~480~~330	$800~~1,070~~
Total	**$350~~470~~**	**$750~~910~~**	**$770~~1,130~~**	**$1,870~~2,510~~**

**Rounded down to the nearest $10 million.*

The total funding available for I-30 is approximately $1.1~~. 4~~ billion in Paris District and $800 ~~1.0 b~~million in Atlanta District, for a total of $1~~2~~.9~~5~~ billion for the entire corridor, or about $80~~100~~ million per year. The development strategy cost is approximately $ 1.9 Billion in 2016$ (with only $1.4 billion scheduled for the period 2016-2040), which was programmed based on available funding. The cost of the development strategy included in **Chapter 7** would be programmed based on available funding. Since the available funding may not be adequate for all improvements in the development strategy, other funding/financing strategies should be considered to fill the gap in funding. These strategies are described below.

b. Alternative Funding/Financing Tools

Freight Program Funding: I-30 is a heavily used freight corridor, connecting the Dallas-Fort Worth Metroplex with the freight hub of Memphis, Tennessee. With truck volumes in the range of 40 percent today, and expected to grow even higher in the future, the corridor could be eligible for federal freight-specific funding. The most recent federal transportation bill, Fixing America's Surface Transportation Act (FAST Act), has two funding categories for freight. The National Highway Freight Program apportions approximately $1.2B/year to States by formula. The second program, which is known as the FASTLANE (Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies) Grant Program is funded at an average of $900 million annually, and is awarded based on competitive grant applications.

TRZ (Transportation Reinvestment Zone): The Texas Legislature has provided this innovative funding tool to be utilized by local governing bodies like cities and counties to fund

transportation projects. This governing body would designate a zone to promote a transportation project, and freeze the property tax revenue in such a zone. Any future increase in the property tax revenue collected in the zone is used to finance the transportation project. TRZ's could be used along with State Infrastructure Bank (SIB) loans, to obtain initial funding from the SIB, and use the increases in the property tax revenue as a repayment mechanism. More details are available at http://www.txdot.gov/government/programs/trz.html.

State Infrastructure Bank (SIB) Loans: The SIB was authorized in 1995 as part of the NHS to help accelerate mobility improvements. Texas was chosen as one of ten states by the federal government to test the pilot program. Since 1997, the Texas Legislature has authorized TxDOT to administer the SIB which provides access to financing at, or lower-than, market interest rates. It operates as a revolving fund, which grows based on the interest earned on prior loans. The Commission has approved over 100 loans totaling approximately $600 million under this program, and these loans have helped leverage more than$4.8 billion in transportation projects in Texas. The SIB program could be used in conjunction with the TRZ to fund local projects or provide local match. Details about the SIB program are available at http://www.txdot.gov/government/programs/sib.html.

Transportation Investment Generating Economic Recovery (TIGER) Discretionary Grant Program: The TIGER Grant Program was initiated as part of the American Recovery and Reinvestment Act (ARRA) of 2009, since then, the program has funded nearly $4.6 billion to projects with annual funding ranging from $474 million to as high as $1.5 billion in the first year. The funding is based on a competitive application basis and the Notice of Funding Availability is usually issued in the first months of a calendar year. Details about the TIGER Discretionary Grant Program are available at https://www.transportation.gov/tiger.

Local Registration Fees Revenue: These local option registration fee increases could provide additional funding for transportation projects. A number of counties including Hidalgo, Webb, El Paso, and Bexar have approved an increase in their vehicle registration fees to fund transportation improvements, with annual revenues ranging between $2 million to $12 million. These amounts could serve or assist as the local match for projects utilizing federal funding.

Transportation Infrastructure Finance and Innovation Act (TIFIA): The TIFIA loan program is available through the federal government to provide access to lower interest rate capital. The candidate project should have a dedicated repayment source, in terms of user charges, toll revenues, farebox revenues, availability payments, sales tax revenues, port revenues, etc. TIFIA could provide up to one-third of required funding for a project, and Texas has been successful in financing over 10 of its projects using TIFIA loans, in most cases repaid by toll revenues.

Grant Anticipation Revenue Vehicle (GARVEE) Bonds: GARVEE bonds are issued in anticipation of revenues from specific sources to finance a transportation project. In most

cases, such a revenue source is Federal Aid funding such as the Highway Trust Fund. On I-30, GARVEE bonds could be utilized to accelerate project(s), if additional funding is required before it would otherwise become available.

Private Activity Bonds (PABs): PABs provide the advantage of tax-exempt status for bonds issued by a private entity. This strategy could be considered if the State decided to partner with private entities through alternative delivery procurement process like Public Private Partnerships (PPPs). PABs have been utilized on several projects in Texas.

7. Corridor Development Strategy

The purpose of this corridor study was to produce a development strategy as a reference for agency and community decisions along the corridor related to the growth and maintenance of the facility. A long-term vision for the corridor facilitates the most efficient spending to create an ultimate configuration that serves all anticipated demands.

A list of proposed improvements was composed based on the previously described technical analysis and early input from the Working Group as well as the general public. Improvements were classified into six different categories; (1) expansion, (2) access improvement, (3) interchange redesign, (4) bridge modification, (5) frontage road addition, and (6) frontage road conversion, according to the nature of the improvement. The study identified 16 segments for expansion, six access improvement locations, nine interchanges in need of redesign and 17 bridges to be modified based on their vertical clearance or low structural rating. In addition to these, seven frontage roads segments were identified as candidates for one-way operation as well as two other locations where frontage road construction is necessary. **Figures 7.1 and 7.2** depict the geographic location for each of the proposed projects.

7.1 Improvement Prioritization and Scoring

The fifty seven projects included in the preliminary improvement list were first scored in accordance with the 2017 Unified Transportation Program (UTP) methods in an effort to maximize limited resources. The UTP is a 10-year, planning document, developed annually and used by TxDOT to guide transportation project development along the state.

Several assumptions were made for each component of the UTP Scoring System in order to reflect specific conditions along the I-30 corridor. The UTP strategic scores of the proposed improvements were divided into four quartiles. Based on this, the top quartile was rated as "high", the second quartile of projects rated as "medium" and the rest as "low". These ratings were provided to the Working Group members during their third meeting to help with project prioritization. Results from this effort, indicated a community preference for interchange redesign and improvements on the west end and addition or conversion of one-way frontage roads on the east side. **Appendix I – UTP Scoring** provides further insight into the factors and weights involved in the production of the score.

While the UTP scoring system accounts for safety, traffic and connectivity aspects, technical scores were included in the project scoring process to better reflect the particular needs of the I-30 corridor**. Table 7.1** lists the criteria used for each improvement type. The UTP scores were applied to all improvements along with the Working Group priority, which reflects the results of the 3rd Working Group meeting. Interchange redesigns and Bridge improvements were also scored based on their structural soundness (BRINSAP score) and routing potential for oversized and overweight vehicles (OS/OW). Scores for projects addressing Access Improvements included the design rating produced for all ramps along the corridor.

Expansions and frontage road projects were all scored based in a combination of Working Group preferences and UTP scores. The total score after the two assessments reflects the urgency of the proposed improvement while accounting for the communities preferences.

Table 7.1 Scoring criteria per Improvement Type.

	Interchange Redesign	Bridge Improvement	Access Improvement	Frontage Rd Construction or Modification
Working Group Priority	x	x	x	x
UTP Score	x	x	x	x
BRINSAP Score	x	x		
Routing Potential OS/OW	x	x		
Access Ramp Rating	x		x	

Each score was then rated as "High", "Medium" and "Low" according to the values specified in **Table 7.2**, to achieve and overall score for each project.

Table 7.2 Rate criteria per Improvement Type.

Rate	Working Group Priority*	UTP Score	BRINSAP Score	Access Ramp Rating	Routing Potential OS/OW
N/A	-	-	-	-	Does not require routing (vertical clearance > 16'6")
High	4+|*6+*	>60	>90	D or E	Needs alternative routing/ No options
Medium	2-3|*4-5*		89 -70	C	Needs alternative routing/ other options
Low	0-1|*0-3*		<70	A or B	Needs alternative routing/ has frontage rds

*Threshold for Paris District / *Threshold for Atlanta District* *Source: Jacobs*

A rated list of improvements is included in **Table 7.3** which summarizes priority projects by county based on the previously described process. Programmed, under construction or expansion projects were not included in Table 6.3. The remaining projects were rated according to five different criteria depending on the type of improvement being scored (**see Table 7.1**).

Table 7.3 Prioritization of Projects

LOCATION (Limits)		WORKING GROUP PRIORITY	WG SCORE	UTP RANKING	UTPR SCORE	BRINSAP	BRINSAP SCORE	ROUTING	ROUTING SCORE	RAMP RATING	RATING SCORE	SUM OF SCORES	TOTAL POSSIBLE SCORE	PRIORITIZATION SCORE
HUNT COUNTY														
FM 36		Medium	2	High	3	Low	1	Medium	2	High	3	11.0	15.0	**73**
FM 1570		High	3	Low	1	Medium	2	Medium	2	High	3	11.0	15.0	**73**
SH 34		Medium	2	High	3	Low	1	Low	1	Low	1	8.0	15.0	**53**
US 69 / BUS 69		Low	1	High	3	Low	1	Low	1	Low	1	7.0	15.0	**47**
Lamar St		Low	1	Medium	2	Medium	2	Low	1	High	3	9.0	15.0	**60**
SH 24		Medium	2	Medium	2	High	3	Low	1	High	3	11.0	15.0	**73**
FM 1565		Low	1	Medium	2	Low	1	Medium	2			6.0	12.0	**50**
FM 1903		Low	1	High	3	Medium	2	Medium	2			8.0	12.0	**67**
Division St	SPUR 302/Lee St	Low	1	High	3							4.0	6.0	**67**
SPUR 302/Lee St	SH 24	Low	1	Medium	2							3.0	6.0	**50**
HOPKINS COUNTY														
SH 19		Low	1	Low	1	Medium	2	Low	1	Medium	2	7.0	15.0	**47**
SH 154		Low	1	High	3	Medium	2	N/A	0	Low	1	7.0	12.0	**58**
College St / FM 1870		Low	1	Medium	2	High	3	Low	1			7.0	12.0	**58**
BUS 67 / TX-LOOP 301		Medium	2	Medium	2	Medium	2	Low	1			7.0	12.0	**58**
US 67		Low	1	Medium	2	Medium	2	Medium	2			7.0	12.0	**58**
CR 4131 / Mill St		Low	1	Low	1					High	3	5.0	9.0	**56**
FM 2653		Low	1	High	3					High	3	7.0	9.0	**78**
FM 2297		Low	1	High	3					Medium	2	6.0	9.0	**67**
CR 3451		Medium	2	Low	1					Medium	2	5.0	9.0	**56**
FRANKLIN COUNTY														
SPUR 423		High	3	Low	1	Low	1	Medium	2			7.0	12.0	**58**
SH 37 – SPUR 423		Medium	2	Medium	2					High	3	7.0	9.0	**78**
TITUS COUNTY														
US 271		High	3	Low	1	Low	1	Medium	2	Low	1	8.0	15.0	**53**
SPUR 185		Low	1	Low	1	Medium	2	Low	1			5.0	12.0	**42**
US 67		Low	1	Medium	2	Medium	2	Medium	2			7.0	12.0	**58**
CR 3445		Low	1	Medium	2	Medium	2	High	3			8.0	12.0	**67**
FM 1402		Medium	2	Medium	2					Low	1	5.0	9.0	**56**
FM 1001	FM 1993	Low	1	Low	1							2.0	6.0	**33**
MORRIS COUNTY														
NO LOCALIZED IMPROVEMENTS IDENTIFIED														

LOCATION (Limits)		WORKING GROUP PRIORITY	WG SCORE	UTP RANKING	UTPR SCORE	BRINSAP	BRINSAP SCORE	ROUTING	ROUTING SCORE	RAMP RATING	RATING SCORE	SUM OF SCORES	TOTAL POSSIBLE SCORE	PRIORITIZATION SCORE
BOWIE COUNTY														
FM 561		Low	1	Low	1	Medium	2	Low	1			5.0	12.0	**42**
CR 4204		Low	1	Low	1	Low	1	High	3			6.0	12.0	**50**
CR 4107		Low	1	Low	1	Medium	2	High	3			7.0	12.0	**58**
FM 1840		Low	1	Low	1	Low	1	Medium	2			5.0	12.0	**42**
FM 992		Low	1	Low	1	Medium	2	Medium	2			6.0	12.0	**50**
SH 8		Low	1	Medium	2	Medium	2	Low	1			6.0	12.0	**50**
SPUR 86		Low	1	Low	1	Medium	2	Low	1			5.0	12.0	**42**
FM 1398 W		Low	2	Low	1	Low	1	Medium	2			6.0	12.0	**50**
FM 3419		Low	2	Low	1	Medium	2	Medium	2			7.0	12.0	**58**
CR 2003		Low	1	Low	1					Low	1	3.0	9.0	**33**
FM 559		Low	2	High	3					Low	1	6.0	9.0	**67**
SH 93		High	1	Medium	2					Low	1	4.0	9.0	**44**
SH 8	SPUR 86	Medium	2	Medium	2							4.0	6.0	**67**
FM 560	FM 1398 E	Low	2	High	3							5.0	6.0	**83**
FM 1398 E	FM 3419	Medium	3	High	3							6.0	6.0	**100**

Improvement Categories

- Interchange Redesign
- Bridge Modification
- Access Improvement
- 2-way Frontage Rd
- 1-way Frontage Rd

Expansion segments, on the other hand, were prioritized based on the previously mentioned lane capacity analysis, (see **Section 3.1.4.c** Cross Section Alternatives). An analysis was performed based on the capacity of the current 4-lane divided cross section for a rural scenario and an assumed 32 percent of truck traffic. **Map 7.2 Lane Capacity Analysis** depicts the recommended implementation timeframes based on forecasted traffic and existing lane capacity.

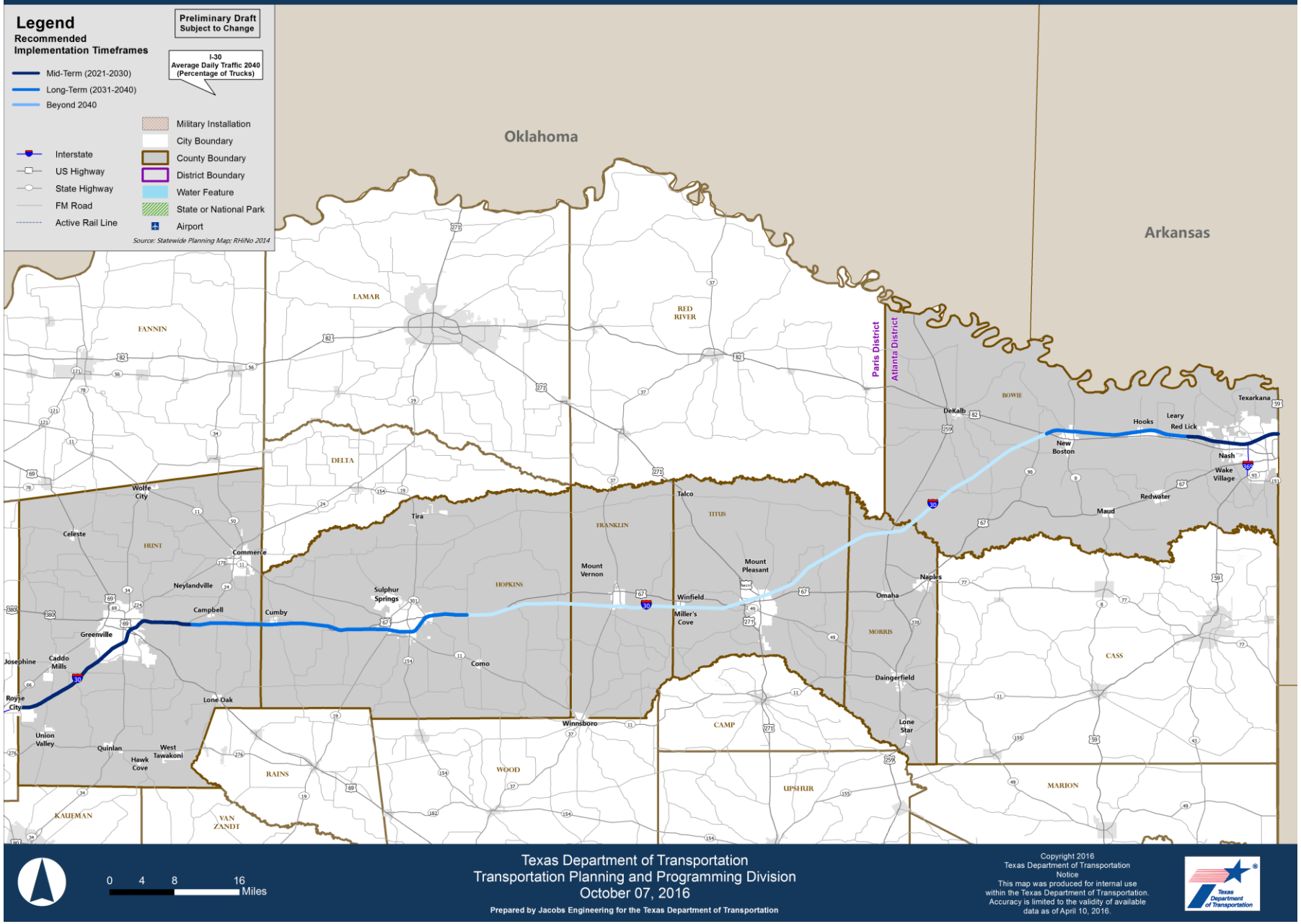
The results corroborated Working Group input when showing a need for additional capacity in the near future from the Hunt County line through Hopkins County and past the eastern city limit of Sulphur Springs. Beyond the year 2030, segments from US 82 to the Texas/Arkansas State line in Bowie County are also expected to reach capacity.

According to the results, traffic in the segment from east of Hopkins County to the west rural section of Bowie County will not reach the existing lane capacity before 2040. At this time, based on available information for traffic forecasts, it does not appear prudent to invest funds in the expansion of these segments of I-30 to a six-lane cross section during the current planning horizon of 2040. But in the intervening years, conditions may change. As a result, a reevaluation of the need for expansion through rural segments of Franklin, Titus and Morris is recommended within the next 25 years as growth occurs.

One additional caveat needs to be provided with this identification of I-30 expansion needs. It is based solely on capacity needs. Portions of the I-30 pavement is now more than 45 years old – well past its expected service life. The standard measurement of pavement condition is related to what is happening on the surface. The use of surface condition ratings is relatively easy to accomplish, and can provide early warning signs of pavement problems which actually run deeper.

Unfortunately, as both Districts have noted, the use of surface condition ratings tends to focus limited maintenance dollars on strategies like routine pavement overlays. Such strategies do not always solve the deeper problems of pavement aging. A more rigorous pavement testing process should be conducted throughout the corridor as soon as possible to determine which pavements most need to be completely replaced. In order to safely and cost-effectively maintain two lanes of traffic in each direction of travel on I-30 while replacing existing pavements, the third lane might have to be constructed first. Such needs could dramatically alter the sequence/priority provided to this initial ranking of segments needing expansion.

Map 7.1 - Lane Capacity Analysis



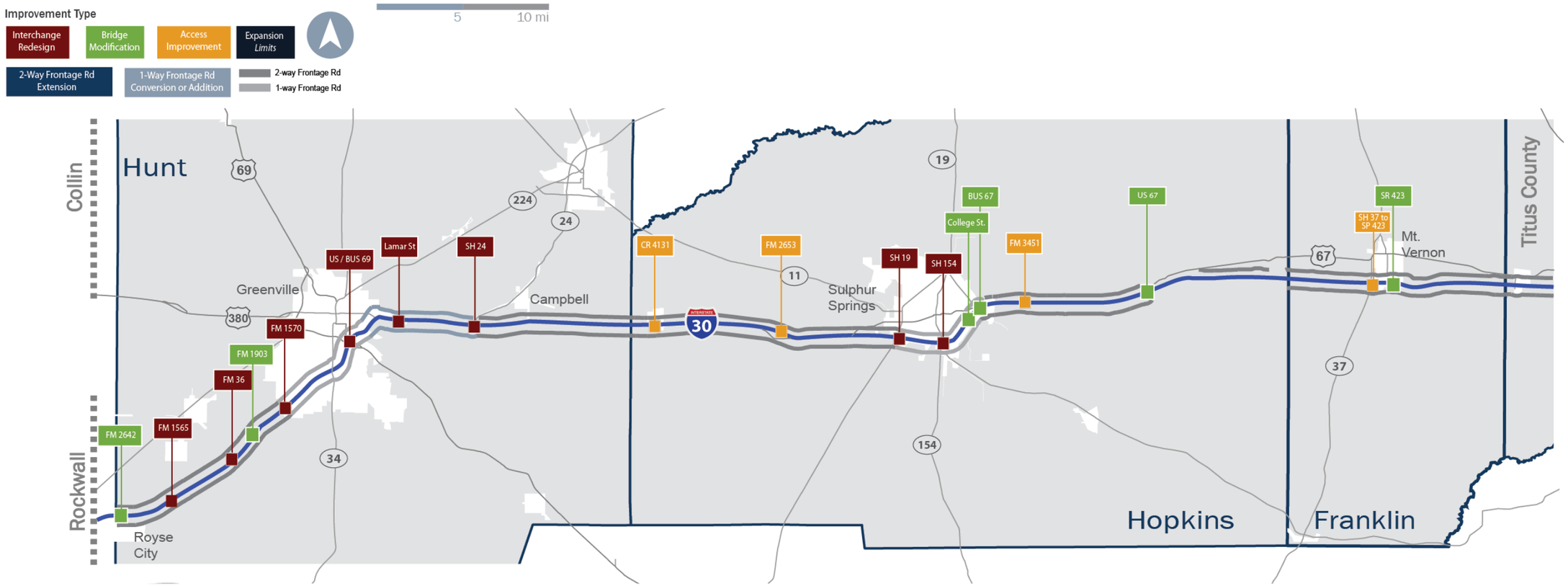
7.2 Recommended Development Strategy

The following strategy describes recommendations arranged by timeframes for localized improvements alongside previously described expansion recommendations. Projects classified as *Near Term* are recommended to be completed before 2020. They are considered to be "shovel ready" meaning they are either immediately implementable or part of an approved transportation plan. Projects in the *Mid Term* category are considered for development in the 2021 to 2030 interval. Taking into account conceptual project scopes, environmental clearances and funding availability, Mid Term projects would not require an extended period of time to implement. *Long Term* projects are recommended to be completed between 2031 and 2040. Projects considered for the time beyond 2040 are included for broader understanding of ultimate need. These projects should be reassessed and programmed in greater detail closer to 2040.

The majority of the localized improvements are included in the Near or Mid Term classification. This strategy gives safety improvements at ramps and interchanges/intersections some of the highest priorities. Because of their relatively low cost, these improvements can be funded quickly. Because they require less rigorous environmental reviews, they can be advanced to construction in the least amount of time. Designs should be developed for these localized improvements so that they are built to the standards of the chosen ultimate cross section. Doing so should result in the most cost-effectiveness by minimizing the need to reconstruct these localized improvements when more extensive corridor-wide improvements are added.

Figures 7.1 and 7.2 depict the proposed timeframe for each of the proposed projects along with their geographical location and approximate cost estimate.

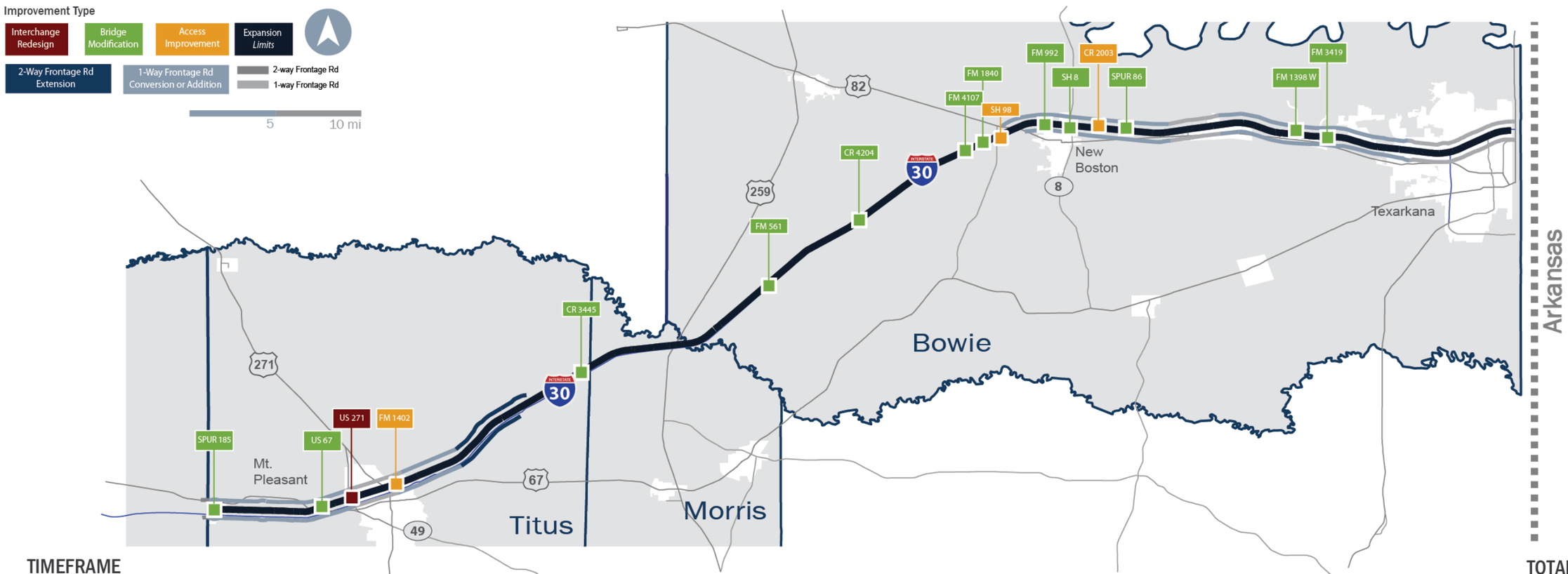
Development Strategy - Paris District



TIMEFRAME	Hunt	Hopkins	Franklin	TOTAL $
2017 - 2020	FM 2642 $ 19.6 M; FM 1565 $ 7.9 M; FM 1903 $ 9.0 M; Lamar St $ 1.3 M; FM 36 $ 23.3 M; FM 1570 $ 2.4 M	CR 4131 $ 1.4 M; FM 2653 $ 1.8 M; SH 19 $ 6.0 M; SH 154 $ 3.2 M; CR 3451 $ 2.7 M; College St $ 1.4 M; BUS 67 $ 1.2 M; US 67 $ 7.6 M	SH 37 to SP 423 $ 11.0 M; SPUR 423 $ 7.7 M	$107.5 M
2021 - 2030	Expansion FM 2642 - FM 1570 $ 89.1 M; Frontage Rd Division St - SP 302 $ 13.1 M; US / BUS 69 $ 34.9 M; Expansion FM 1570 - US 69 $ 75.0 M; Expansion US 69 - SH 24 $95.5M			$307.6M
2031 - 2040	SH 24 $ 15.5 M; Frontage Rd SPUR 302 - SH 24 $ 3.9 M; Expansion SH 24 - Hopkins C/L $ 85.4 M	Expansion Hunt C/L - FM 2653 $ 112.2 M; Expansion FM 2653 - FM 69 $ 237.2 M		$454.2M
Beyond 2040		Expansion FM 69 - Franklin C/L $ 85.0 M	Expansion Hopkins C/L- Titus C/L $ 84.7 M	$169.7M

Date: 11. 14. 2016

I-30 East Texas Corridor Study
Development Strategy- Atlanta District



TIMEFRAME	Titus	Morris	Bowie	TOTAL $
2017 - 2020	SPUR 185 $ 1.0 M; US 67 $ 16.0 M; US 271- TSM $ 0.39 M; FM 1402 $ 3.0 M; CR 3445 $ 1.8 M; Frontage Rd SPUR 185 - US 271 $ 35.7M; Frontage Rd FM 1402-FM 1001 $ 30.4 M		SH 98 $ 0.24 M; SPUR 86 $ 2.0 M; FM 1398 W $ 10.8 M; FM 3419 $ 1.5 M; Expansion FM 2253 - US 71 $ 127.6 M; Frontage Rd FM 560-FM 1398 E $ 24.3 M; Frontage Rd FM 1398 E - FM 3419 $ 16.4 M; Frontage Rd FM 3419-FM 989 $ 19.0M	$290.1M
2021 - 2030	Frontage Rd FM 1001 - FM 1993 $ 25.1 M		FM 561 $ 2.2 M; CR 4204 $ 1.8 M; FM 1840 $ 1.7 M; FM 992 $ 1.2 M; Frontage Rd US 82 - SPUR 86 $ 44.3; CR 2003 $ 5.8 M; FM 4107 $ 1.7 M; SH 8 $ 4.0 M; Expansion US 82 - FM 2253 $124.4 M	$212.2M
2031 - 2040				$ 0.0M
Beyond 2040	Expansion Franklin C/L - US 67 $ 50.7 M; Expansion US 67- FM 1001 $ 61.4 M; Expansion FM 1001-Morris C/L $ 63.3 M	Expansion Titus C/L - US 259 $ 50.2 M	Expansion US 259 - FM 44 $ 92.6 M; Expansion FM 44 - US 82 $ 90.3 M	$408.5M

Date: 11. 09. 2016

c. Development Strategy Cost Summary

The development strategy included in this plan proposes a total of $1.9 billion dollars in improvements, including widening to a six-lane cross section and making all of the previously described localized improvements. The following costs are expressed in 2016 dollars, which could be higher due to inflation in future years.

Localized improvements costs are estimated at $ 425.2 million, including:

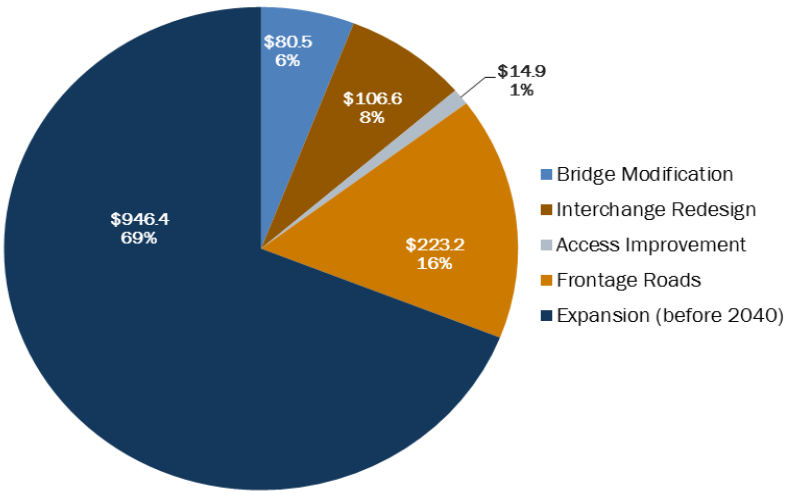
- $106 million for interchange redesign projects
- $ 14.9 million for access improvement projects
- $ 80.5 million in bridge modifications, and
- $ 223.2 million for investment in frontage road construction and improvements.

Cost estimates for expansion segments were calculated assuming widening of the existing pavement and amounted to a total of $1.5 billion. If future pavement evaluations are deemed necessary, a complete reconstruction of the main lanes would raise the cost of the corridor wide Interstate widening to an estimated $ 3.1 billion. The estimated cost would increase to $3.6 billion if localized improvements are also included. For specific estimates and more details refer to ***Appendix L –Cost Estimates and Methodology.***

When taking into consideration the proposed development timeframes, a number of improvements could be delayed beyond 2040. From the total estimated $1.9 Billion, $ 578 million identified for expansion would potentially be spent beyond 2040.

Figure 7.3 summarizes projected spending in each improvement category as a percentage of the total for all improvements within the study 25-year timeframe.

Figure 7.3 - Cost Totals per Improvement Type for the next 25 years (2016$ in Millions)



Tables 7.4 and 7.5 summarize project costs by development timeframe, county and TxDOT Districts.

Table 7.4 Development Strategy Costs - Paris District

Paris District					
No	From	To	Project Description	Length (mi)	Cost
Near-Term Improvements 2017-2020					
Hunt County					
1	At FM 2642	.	Replace existing bridge facilities	3.9	$19,600,000*
2	At FM 36	.	Interchange redesign	N/A	$23,300,000
3	At FM 1570	.	Interchange redesign	N/A	$2,400,000
4	At Lamar St	.	Interchange redesign	N/A	$1,300,000
5	At FM 1565	.	Increase overhead clearance to 18'6"	N/A	$7,900,000
6	At FM 1903	.	Increase overhead clearance to 18'6"	N/A	$9,000,000
Hopkins County					
7	At SH 19	.	Interchange redesign	N/A	$6,000,000
8	At SH 154	.	Interchange redesign	N/A	$3,200,000
9	At College St/FM 1870	.	Increase overhead clearance to 18'6"	N/A	$1,400,000
10	At BUS67/TX-Loop 301	.	Increase overhead clearance to 18'6"	N/A	$1,200,000
11	At US 67	.	Increase overhead clearance to 18'6"	N/A	$7,600,000
12	At CR 4131/Mill St	.	Improve access ramps	N/A	$1,400,000
13	At FM 2653	.	Extend acceleration and deceleration lanes	N/A	$1,800,000
14	At CR 3451	.	Modify into a diamond interchange	N/A	$2,700,000
Franklin County					
15	At SPUR 423	.	Increase overhead clearance to 18'6" and extend acceleration lane on EB entrance ramp	N/A	$7,700,000
16	At SH 37	SPUR 423	Widen frontage roads and improve ramps	1.0	$11,000,000
				TOTAL	$107,500,000

Paris District					
No	From	To	Project Description	Length (mi)	Cost
Mid-Term Improvements 2021-2030					
Hunt County					
17	At US 69 and BUS 69	.	Interchange redesign	N/A	$34,900,000
18	Division St	SPUR 302/Lee St	Construct new one-way frontage roads	0.9	$13,100,000
19	FM 2642	FM 1570	Expand roadway to six-lane divided	10.4	$89,100,000
20	FM 1570	US 69	Expand roadway to six-lane divided	4.7	$75,000,000
21	US 69	SH 24	Expand roadway to six-lane divided	6.9	$95,500,000
				TOTAL	$307,600,000
Long-Term Improvements 2031-2040					
Hunt County					
22	At SH 24	.	Interchange redesign	N/A	$15,500,000
23	SPUR 302/Lee St	SH 24	Restripe two-way to one-way frontage roads	6.9	$3,900,000
24	SH 24	Hopkins County Line	Expand roadway to six-lane divided	7.6	$85,400,000
Hopkins County					
25	Hunt County Line	FM 2653	Expand roadway to six-lane divided	7.5	$112,200,000
26	FM 2653	FM 69	Expand roadway to six-lane divided	14.5	$237,200,000
				TOTAL	$454,200,000
Beyond 2040					
Hopkins County					
27	FM 69	Franklin County Line	Expand roadway to six-lane divided	10.9	$85,000,000
Franklin County					
28	Hopkins County Line	Titus County Line	Expand roadway to six-lane divided	10.8	$84,700,000
				TOTAL	$169,700,000
				PARIS DISTRICT TOTAL	$1,039,000,000

* based on TxDOT cost estimates obtained from Project Tracker (does not indicate that projects are funded or programmed)

Table 7.5 Development Strategy Costs - Atlanta District

Atlanta District					
No.	From	To	Project Description	Length (mi)	Cost
Near-Term Improvements 2017 -2020					
Titus County					
1	At US 271	.	Interchange redesign- Traffic System Management recommended.	N/A	$390,000
2	At SPUR 185	.	Increase overhead clearance to 18'6"	N/A	$1,000,000
3	At US 67	.	Increase overhead clearance to 18'6"	N/A	$16,000,000
4	At CR 3445	.	Increase overhead clearance to 18'6"	N/A	$1,800,000
5	At FM 1402	.	Remove EB ramp and construct Collector-Distributor	N/A	$3,000,000
6	SPUR 185	US 271	Construct/reconstruct frontage roads	7.1	$35,700,000*
7	FM 1402	FM 1001	Construct/reconstruct frontage roads	3.1	$30,400,000*
Bowie County					
8	1.0 Mi West of SH 98	SH 98	Install cable barrier in median	1.0	$240,000
9	At SPUR 86	.	Increase overhead clearance to 18'6"	N/A	$2,000,000
10	At FM 1398 W	.	Increase overhead clearance to 18'6"	N/A	$10,800,000
11	At FM 3419	.	Increase overhead clearance to 18'6"	N/A	$1,500,000
12	FM 560	FM 1398 E	Construct new frontage roads	4.2	$24,300,000
13	FM 1398 E	FM 3419	Construct new frontage roads	3.0	$16,400,000
14	FM 3419	FM 989	Construct new frontage roads, ramps, and turnarounds	2.4	$19,000,000*
15	FM 2253	US 71	Expand roadway to six-lane divided	9.5	$127,600,000
				TOTAL	$290,130,000

Atlanta District					
No.	From	To	Project Description	Length (mi)	Cost
Mid-Term Improvements 2021-2030					
Titus County					
16	FM 1001	FM 1993	Construct new two-way frontage roads	4.8	$25,100,000
Bowie County					
17	At FM 561	.	Increase overhead clearance to 18'6"	N/A	$2,200,000
18	At CR 4204	.	Increase overhead clearance to 18'6"	N/A	$1,800,000
19	At CR 4107	.	Increase overhead clearance to 18'6"	N/A	$1,700,000
20	At FM 1840	.	Increase overhead clearance to 18'6"	N/A	$1,700,000
21	At FM 992	.	Increase overhead clearance to 18'6"	N/A	$1,200,000
22	At SH 8	.	Increase overhead clearance to 18'6"	N/A	$4,000,000
23	At CR 2003	.	Construct new EB and WB ramps	N/A	$5,800,000
24	US 82	SPUR 86	Construct new frontage roads	4.3	$44,300,000
25	US 82	FM 2253	Expand roadway to six-lane divided	15.0	$124,400,000
				TOTAL	$212,200,000
Beyond 2040					
Titus County					
26	Franklin County Line	US 67	Expand roadway to six-lane divided	6.2	$50,700,000
27	US 67	FM 1001	Expand roadway to six-lane divided	6.1	$61,400,000
28	FM 1001	Morris County Line	Expand roadway to six-lane divided	8.4	$63,300,000
Morris County					
29	Titus County Line	US 259	Expand roadway to six-lane divided	4.6	$50,200,000
Bowie County					
30	US 259	FM 44	Expand roadway to six-lane divided	10.4	$92,600,000
31	FM 44	US 82	Expand roadway to six-lane divided	10.5	$90,300,000
				TOTAL	$408,500,000
				ATLANTA DISTRICT TOTAL	$910,830,000

* based on TxDOT cost estimates obtained from Project Tracker (does not indicate that projects are funded or programmed)

Table 7.6 Development Strategy Costs by Type of Improvement and Planning Range (in Millions)

County	Category	Near-Term (2017-2020)	Mid-Term (2021-2030)	Long-Term (2031-2040)	Beyond 2040	Total
Paris	Corridor-wide expansion	-	$259.6	$434.8	$169.7	$864.1
	Localized Improvements	$107.5	48.0	$19.4	-	$174.9
	Subtotal	$107.5	$307.6	$454.2	$169.7	$1,039.0
Atlanta	Corridor-wide expansion	$127.60	$124.4	-	$408.5	$660.5
	Localized Improvements	$162.5	$87.8	-	-	$250.3
	Subtotal	$290.1	$212.2	$0.0	$408.5	$910.8
	TOTAL	$397.6	$519.8	$454.2	$578.2	$1,949.8

8. Other Recommendations

The I-30 East Texas Working Group has adopted a 24-year, $ 1.9 billion Development Strategy to be sent to the Texas Transportation Commission. Other aspects of the development strategy and study findings are either emerging trends, or less common project needs. These items are the subject of a brief discussion in this chapter.

8.1 Long Term Pavement Strategy

TxDOT uses the typical performance standards related to surface condition to describe I-30 pavement condition. Structural adequacy of the pavement is not part of these ratings, and is not usually improved by overlays and resurfacing strategies. Given the age of the Interstate pavement (45 years, or double the expected life), an in-depth study into the overall pavement condition throughout the corridor is recommended because of the advanced age of the pavement (the last segment of this corridor was opened to traffic in 1971).

Figure 8.1 – Pavement Failure

Source: TranBC

A pavement's ability to support current or future traffic loadings is measured with a pavement structural condition evaluation. Knowledge of the pavement structural condition provides valuable information in the selection and design of feasible alternatives to rehabilitate that pavement before or in case of pavement failure (**Figure 8.1**).

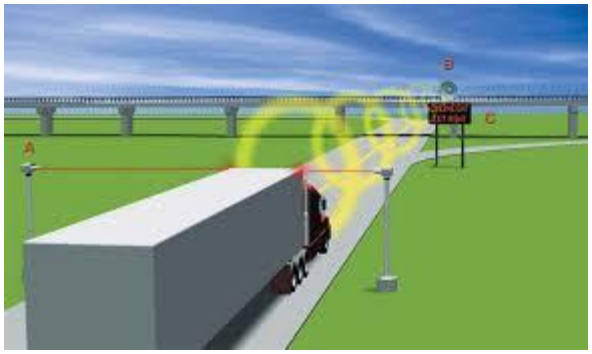
Research may conclude that the pavement is approaching its maximum service life, and the most effective solution would be to completely replace some or all pavement. Recognizing that possibility, the current development strategy for Interstate widening contemplates the cost that would be associated with simple widening ($1.5 billion), as well as a combination of widening and pavement rehabilitation/replacement ($ 3.5 billion). By coordinating the two improvements, more cost-effective and safe construction/maintenance of traffic procedures can be utilized. In such a Long Term Pavement Strategy there would be an opportunity to create a consistent pavement strategy (no more mismatch of pavement types), one that addresses the amount of heavy traffic in the corridor and permits long term pavement improvement programming by minimizing delay and safety issues for motorists in the corridor, while making the most cost-effective use of construction and maintenance dollars.

8.2 Addressing Oversized Vehicles

Vertical clearances for 62 structures along I-30 do not meet the minimum federal or state standards. An alternative route analysis was performed using frontage roads and local streets to evaluate the additional time and miles trucks would have to travel to avoid constrained underpasses. While 43 out of the 62 structures can be avoided by driving on the frontage roads, 19 have no alternative route or a long detour through local streets or require a completely different route.

While the Texas Department of Public Safety (DPS), does have a permitting process, not all oversized vehicles utilize it, or follow the proposed routing. Specialized Intelligent Transportation System (ITS) technologies such as pole mounted radar or laser devices can identify such vehicles in advance of the vertical constraints (**Figure 8.2**), but current communication practices involve use of sirens, horns, and flashing lights to broadcast a broad warning. With the development of Vehicle-to-Infrastructure (V2I) technologies in both truck cabs and roadside cabinets, it will be possible to more accurately identify such conflicts and generate personalized communications to move trucks to alternate routes.

Figure 8.2 - Specialized Intelligent Transportation System (ITS)



Source: USDOT

These strategies could alleviate problems until vertical clearances along I-30 can be modified to meet new state polices. Dedicated Short Range Communications (DSRC) is a two-way short- to- medium-range wireless communications technology that permits very high data transmission critical in communications-based active safety applications. DSRC technologies could guide truckers with personalized messages, advising them of upcoming conflicts and routing them to safe routes. If the shorter range DSRC applications were to be connected throughout the corridor with a fiber optic cable, it would be possible for trucks to identify themselves to the system well in advance of the conflict. With advanced notification it would be possible to provide more timely guidance. For more details see ***Appendix P – Future Implications.***

8.3 Corridor Task Force Monitoring of Truck Parking Supplies

As demand continues to grow in the corridor, new truck parking facilities may be required. This study has determined that this is particularly important in the central segment of the corridor which is already experiencing shortages of parking, as well as the western segment where growth in truck traffic along with its proximity to the Metroplex may require additional truck parking facilities. For the eastern segment, additional truck parking opportunities should be considered near the TexAmericas Center/Red River Army Depot in New Boston.

While private development (**Figure 8.3**) may provide additional parking to satisfy some or all of this demand, it would be useful for some subgroup of parties associated with the I-30 Working Group to meet on a regular basis with TxDOT personnel perhaps from the Freight Branch and/or Maintenance Division's Safety Rest Area Program to review truck parking concerns. Besides monitoring demand, the task force could provide appropriate assistance to the private sector in developing additional facilities, or as a last resort make improvements along existing TxDOT ROW to increase the supply of truck parking safely. As part of this study, preliminary concepts for such parking facilities were developed for US 259 at I-30 and are included in **Appendix N—Improvement Conceptual Layouts.**

Figure 8.3 - Truck parking facility along I-30

Source: Jacobs

8.4 Smart Parking Applications for Truckers

While Hours of Service (HOS) requirements can interrupt truck operations at any point, the provisions for core hours of rest create the biggest demands for parking during the night. The ability of truck drivers to find parking during those hours is frequently constrained by darkness and heavy use of facilities If there was a system for drivers to communicate directly with parking facilities to identify available parking spaces, driver stress could be reduced and safe operations improved. The Michigan Department of Transportation has created a truck parking information system on 129 miles of the I-94 corridor. The system identifies available truck parking in selected facilities along the route and provides that information to drivers, permitting them to plan stops by making informed decisions.

The use of fiber optic cable and DSRC as mentioned in the discussion on advanced warning for vertical clearances above, could provide truck drivers with the ability to identify available parking and even possibly obtain reservations for specific locations. For more details see ***Appendix P – Future Implications.***

8.5 The Need for an ITS Master Plan along I-30

The movement towards Connected Vehicle (CV) and in the longer term to Automated Vehicles (AV) strategies is happening. Unfortunately, no one knows exactly when or to what extent the market will develop. In this corridor, these advances could generate opportunities for TxDOT to collect incredible amounts of valuable data on vehicle movements (Type, Size, Quality of Flow, and Location of Incidents for example). Additionally, TxDOT and other public agencies could disseminate critical information to motorists, including advanced warning about traffic congestion, weather impacts, clearance issues, or even parking availability.

TxDOT does not need to invest large sums of money now - at a time that there is great uncertainty over what technologies will eventually emerge in vehicles, or when they will occur. TxDOT can make cost effective investments today that will prepare it to take advantage of such technologies as they are developed in the future. At a minimum, a fiber optic backbone should be added in the median of the interstate whenever widening occurs. Current thought suggests that adding "drops" every half mile would permit the most cost-effective use/development of the system. These "drops" could be alternated between the north and south sides of the road, and would feature as little as a conduit carrying fiber cable from the backbone to a small cabinet off the roadway. A corridor-wide cost estimate of approximately $ 31.1 million for such a "backbone" has been developed. Providing low cost DSRC stations at critical locations (vertical clearance constraints and parking/rest facilities as an example) would also position the agency to be able to provide services as the technologies emerge to support them. For more details see ***Appendix P – Future Implications.***

Creating a comprehensive blueprint for TxDOT districts and even local governments to use during corridor expansion would be a farsighted idea. This could be accomplished with the development of an ITS Master Plan for this corridor.

8.6 Connected/Automated Vehicle Provisions

While the benefits of connected (CV) and automated vehicles (AV) are beginning to emerge (**Figure 8.4**), governments have major challenges. These challenges include the timing of new vehicle technologies, changes to transportation infrastructure, funding considerations, security and timelines to implementation. CV and AV must be planned in our infrastructure. The vast majority of automobiles – the traditional ones must also be accommodated. How? Where do we begin? What timeline should be considered?

Figure 8.4 - Connected / Automated Vehicle Provisions

Source: ITS International

The TTI Texas Truck Platooning Demonstration[11], driving-support equipped trucks closely following each other, will be used to assess the feasibility of deploying 2-vehicle truck platoons on specific corridors in Texas over the next 5 to 10 years. Based on the study, suitable corridors are those that have the following characteristics:

- rural interstate highways
- four or more lanes

[11] http://tti.tamu.edu/group/connected-vehicles/files/2015/12/0-6836-Truck-Platooning-Project-Summary-2-pager.pdf

- low AADT
- high truck percentages (at least 15 percent of the AADT)
- relatively long stretches of highway between urban centers
- posted speed limit greater or equal to 65 MPH

Based on the above criteria, I-30 meets the requirements for the implementation of truck platooning and was selected as a candidate for the Demonstration. For other details see ***Appendix P – Future Implications.***

8.7 Rail Service

Interstate 30 is a major freight connection between Texas and the Eastern United States. As, a result the last two decades have seen an effort to advance economic development along it through rail improvements. The Northeast Texas Rural Transportation District (NETEX) is the most notable of those efforts. The District was formed in 1995, and includes six East Texas counties, four of which are part of the study area. Its interests were represented by Working Group members from Titus County and the Sulphur River RMA, who also serve on the District's Board of Directors.

Investments on the NETEX District have resulted in the rehabilitation of their existing track (MP 489.4 to MP 555) in order to reestablish rail service and the acquisition of abandoned ROW (MP 555 at Simtrott - MP 575.4 near Wylie) as a possibility for connecting to the Dallas Area Rapid Transit (DART) system ROW. Although no development initiatives are currently underway, NETEX is open to business inquiries that would foster economic development opportunities.

Passenger rail has been explored throughout Texas, but the Dallas Metroplex - Little Rock route scores the lowest out of the 11 nationwide corridors considered for high speed rail development in the 2016 Texas Rail Plan Update [12]. This finding is understandable given that the total population of the six counties containing this portion of I-30 is just over 250,000[13]. Further analysis also suggests private vehicle trips have origins and destinations within the study area. As a result, there is not a very large market for passenger services of any mode or technology within this corridor today. With modest population growth expected over the next 25 years, potential changes in this market are not promising. For more details refer to ***Appendix O –Rail Implications Memorandum.***

[12] http://ftp.dot.state.tx.us/pub/txdot-info/rail/2016-rail-plan/chapter-3.pdf

[13] 2014 County Estimates: http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk