

US 190/I-10 Feasibility Study

El Paso to Louisiana State Line



Executive Summary

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Prepared for:
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Transportation Planning and Programming

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TxDOT Districts



Study Purpose and Background

US 190 and I-10 are major east-west highways that span and serve the entire state of Texas and other states further west and east. The US 190/I-10 Feasibility Study evaluated the impacts and feasibility of alternative transportation improvements along this major corridor in the state of Texas. The study area for this project includes the US 190/I-10 corridor from El Paso, Texas to the Louisiana state line, which is approximately 900 miles in length and provides important access and connections to numerous cities, counties, intermodal facilities, military installations, and major developments.

This study originated following the proposed interstate highway from Natchez, Mississippi to Augusta, Georgia, referred to as the 14th

Amendment Highway, which was introduced into Federal congressional legislation in 2004. The study of the 14th Amendment Highway was eventually incorporated into the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) of 2005.

In addition, the Gulf Coast Strategic Highway Coalition was formed in 2001 to promote the need for improved access and connections to military installations along the US 190/I-10 corridor and regional highways that serve as deployment routes between the major army bases and designated ports along the Gulf Coast. These routes would be a continuation of the 14th Amendment Highway further west through Louisiana and Texas. The current routes being promoted by the Gulf Coast Strategic Highway Coalition from El Paso, Texas to Natchez, Mississippi are shown in orange in the figure below. The primary route in Texas is the US 190/I-10 corridor which is the focus of this feasibility study.



US 190/I-10 Feasibility Study and Other Relative Projects



In January of 2007, the Texas Transportation Commission approved Minute Order 110815 which authorized feasibility and route studies for the US 190/I-10 corridor in the state of Texas to evaluate the potential strategic, economic, emergency, and environmental benefits of implementing various transportation improvements. This US 190/I-10 Feasibility Study was initiated by the Texas Department of Transportation (TxDOT) in response to this minute order. This study does not recommend a preferred alternative, but provides sufficient technical information and comparisons of the impacts and feasibility of various improvements that could be considered to address existing and future transportation needs along the study corridor. The study results will be used by TxDOT and other involved agencies to assist in prioritizing potential projects along the US 190/I-10 corridor. These projects would need to be examined in further detail as part of subsequent project development phases.

Goals and Objectives of the Study

Goals

- Prepare for the future
- Enhance safety
- Maintain transportation system
- Relieve congestion
- Enhance connectivity
- Work with partners to identify funding strategies

Objectives

- Assess the feasibility of a freeway or interstate type facility within a 15-mile corridor generally centered on the existing US 190 facility from Bon Wier to a terminus at I-10 and continuing along I-10 to El Paso. Analyze any associated improvements to ancillary corridors such as US 69 necessary to provide access to the major Texas Gulf ports.
- Evaluate adequacy of existing rail corridors from El Paso to Bon Wier for existing and projected freight and military movements.
- Assess the need to smooth the existing alignment.
- Assess the feasibility of a four-lane divided trunk system standard facility if a freeway is not feasible.
- Evaluate the impact of the enlargement of Fort Bliss and Fort Hood as well as any other military deployment issues associated with connecting the military bases and posts.
- Evaluate what, if any, advantage there is to connecting military bases and posts to each other.
- Evaluate the impact to the corridor of the development of SAFETEA-LU Sec. 1927 Corridors (14th Amendment and 3rd Infantry Division Highways).
- Identify economic development and institutional issues related to the development and construction of the corridor including identification of potential funding and revenue sources.
- Provide public involvement through an outreach program and public meetings.



Corridor Needs

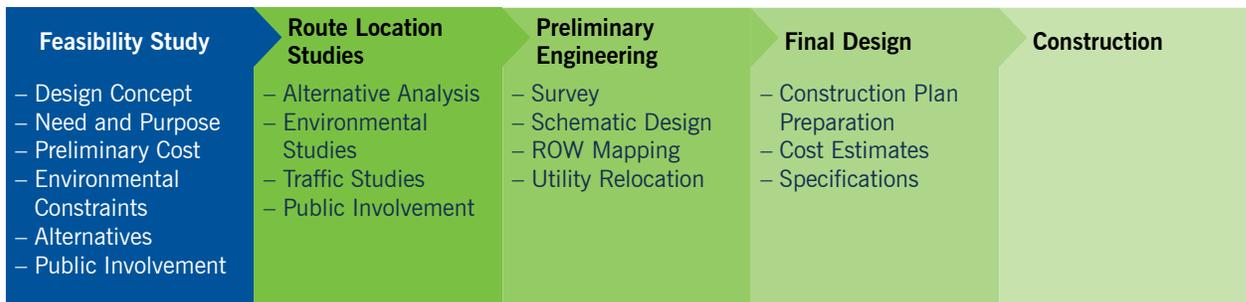
The existing and future needs along the study corridor were identified based on comprehensive analysis of existing conditions, existing and future traffic and freight demands, and input from stakeholders. The corridor needs identified included:

- Transportation Mobility
- Safety
- System Connectivity

Project Development Process

This feasibility study is the first phase of TxDOT's project development process, and does not include environmental documentation, design, right-of-way acquisition, or construction of proposed improvements. These are all future implementation activities dependent on transportation needs and available funding.

TxDOT's Project Development Process



Public Involvement

Public involvement and outreach activities were a critical component of the US 190/I-10 Feasibility Study. The primary purpose of the public outreach program was to provide information and solicit comments on the corridor's needs and issues and the study's evaluation process and findings. The primary activities of the public outreach program included:

- **Stakeholder Meetings:** Meetings and discussions were held with Fort Bliss (El Paso), Fort Hood (Killeen), Fort Polk (Leesville, Louisiana), Port of Beaumont, Port of Corpus Christi, Union Pacific Railroad, Burlington Northern Santa Fe, and Kansas City Southern Railroad during the course of the study. The primary purpose of these meetings was to receive their issues and concerns about the corridor, as well as their planned developments.
- **Public and Local Outreach Group Meetings:** Two series of public and Local Outreach Group meetings were conducted during the course of the study. The first series of meetings was held

in February/March 2011 and the second (final) series was held in September/October 2011. Each series included meetings held at eight locations throughout the study corridor. The first series of meetings presented the study purpose, schedule, goals and objectives, public involvement process, and evaluation process.

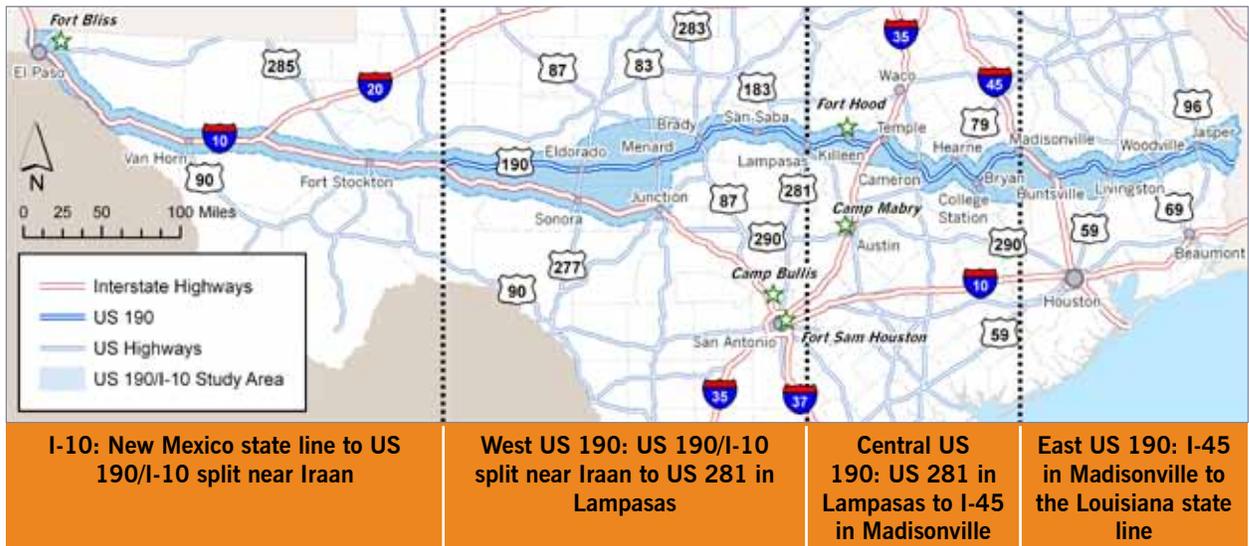
The second series of meetings summarized the comments received at the first series of public meetings, the ten Conceptual Alternatives that were selected for detailed evaluation, potential localized improvements, and overall evaluation results for alternative improvements.

- **Project Newsletters:** Two newsletters were distributed during the study to provide project updates and locations of public meetings. The third and final newsletter was distributed at the conclusion of the study to provide a summary of findings. Additional communication venues established for citizens to provide their comments and input throughout the study included a toll free telephone line, postal mail address, and a project website.



Existing and Future Conditions

The study corridor was divided into four sections to facilitate reporting and analysis efforts.



Corridor Characteristics

The study corridor traverses nine TxDOT Districts, three Metropolitan Planning Organizations (El Paso, Killeen-Temple, and Bryan-College Station) and 34 counties, and intersects and/or connects to numerous interstate and US highways. General corridor characteristics are summarized in the table on the following page.



General Corridor Characteristics

Category	I-10 (NM to US 190)	West US 190 (I-10 to US 281)	Central US 190 (US 281 to I-45)	East US 190 (I-45 to LA)
Length	307 miles	254 miles	175 miles	158 miles
TxDOT Districts	El Paso and Odessa	San Angelo and Brownwood	Austin, Waco, and Bryan	Lufkin and Beaumont
MPOs	El Paso	None	Killeen-Temple and Bryan/College Station	None
Counties	Culberson, El Paso, Hudspeth, Jeff Davis, Reeves, and Pecos	Concho, McCulloch, Crockett, Kimble, Menard, San Saba, Schleicher, Sutton, Tom Green, Lampasas, and Pecos	Bell, Brazos, Burleson, Burnet, Coryell, Grimes, Leon, Milam, Robertson, Lampasas, and Madison	Grimes, Jasper, Newton, Polk, San Jacinto, Trinity, Tyler, Walker, and Madison
Cities	Anthony, El Paso, Fort Stockton, and Van Horn	Brady, Eldorado, Iraan, Lampasas, Lometa, Menard, Richland Springs, and San Saba	Belton, Bryan, Buckholts, Cameron, Copperas Cove, Harker Heights, Hearne, Kempner, Killeen, Kurten, Lampasas, Rogers, Wixon Valley, Madisonville, Nolanville, Milano, and Temple	Huntsville, Jasper, Livingston, Newton, Onalaska, Point Blank, and Woodville
Major Facilities	I-20; Ports of Entry along Mexico border	Port of Corpus Christi (via I-10/I-37)	I-35; I-45; Port of Corpus Christi (via I-35/I-37)	LA 8/28; Port of Beaumont (via US 287/US 69)
Evacuation Routes	NA	NA	Hurricane Evacuation: US 190 (Hearne to Bryan) US 190/I-45 (Madisonville to Huntsville); Connecting Routes: US 281, I-35, SH 21, and SH 6	Connecting Routes: I-45, US 59, SH 146, US 69/US 287, FM 92, US 96, and SH 87
Military Facilities	Fort Bliss and Biggs Army Airfield (18,000 personnel)	NA	Fort Hood and Robert Gray Army Airfield (52,000 personnel)	Fort Polk (East of Louisiana state line – 8,000 personnel)
Rail	Rail Connectivity to Port of Los Angeles; UP ¹ between NM/El Paso and Alpine; Texas Pacific Railroad between Alpine and Fort Stockton west of US 190	Texas Pacifico between Fort Stockton and Santa Ana; BNSF ² Railway between Santa Ana and Lampasas; Gulf, Colorado, and San Saba Railway between Lometa and Brady	BNSF ² between Lampasas and Conroe	BNSF ² between Conroe and Kirbyville; Timber Rock Railroad between Kirbyville and Merryville, LA
Distance to Parallel Facilities	I-20: 0 to 75 miles	I-10: 0 to 123 miles; I-20: 85 to 105 miles	I-10: 65 to 98 miles; I-20: 110 to 137 miles	I-10: 60 to 81 miles; I-20: 110 to 121 miles

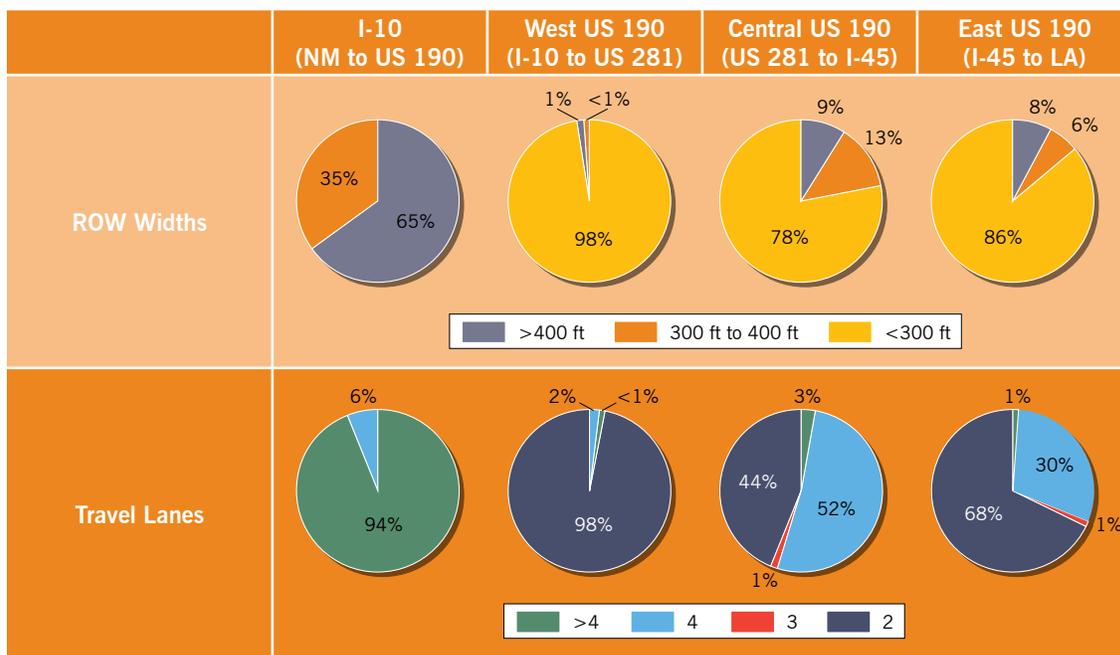
Source: CDM Smith Team, 2008

¹ = Union Pacific; ² = Burlington Northern Santa Fe



Major east-west parallel interstates include I-10 (West, Central, and East US 190 sections) and I-20 (all sections). National and statewide roadway initiatives include the National Highway System (NHS), Strategic Highway Network (STRAHNET), and Texas Trunk System. Approximately 60 percent of the study corridor is part of the NHS in Texas, 50 percent is part of the STRAHNET system, and 60 percent is part of the Texas Trunk System. Existing number of travel lanes and right-of-way (ROW) widths for the US 190/I-10 corridor are summarized below.

Roadway Characteristics by Corridor Section



Military Installations

The study corridor is an essential military deployment and inter-base travel route. Two US Army bases are within the US 190/I-10 corridor study area and include Fort Hood (Central US 190 Section) and Fort Bliss (I-10 Section). US 190 provides connectivity from Fort Hood to Temple, Killeen, and I-35. I-10 connects Fort Bliss to the western US, I-20, and the strategic ports in Corpus Christi and Beaumont. Rail service is provided by the UP to Fort Bliss, and Fort Hood is served by the BNSF. A third US Army base, Fort Polk, is located east of the study corridor in western Louisiana, just north of US 190. The roadways between the forts and ports have enough capacity to address the travel demand the forts generate and are projected to do so through year 2040. The issue has been the lack of capacity at the ports; however, due to recent and planned expansion projects at both the Ports of Beaumont and Corpus Christi this is not anticipated to be a future constraint.



The study corridor connects with major strategic and trade ports in Corpus Christi via I-35 and I-10/I-37 and Houston via I-45/I-10. There is no direct interstate connection from the corridor to the Port of Beaumont; however, the port is accessible via US 96 and US 287. I-10 connects the corridor to the international trade and border crossings at El Paso/Ciudad Juarez, Mexico and Laredo/Guadalupe, Mexico via I-35.

Major Forts and Deployment Ports



Transportation Demand

An evaluation of the existing and future traffic volumes, level-of-service (LOS), and crash data was conducted for the study corridor.

Traffic Volumes

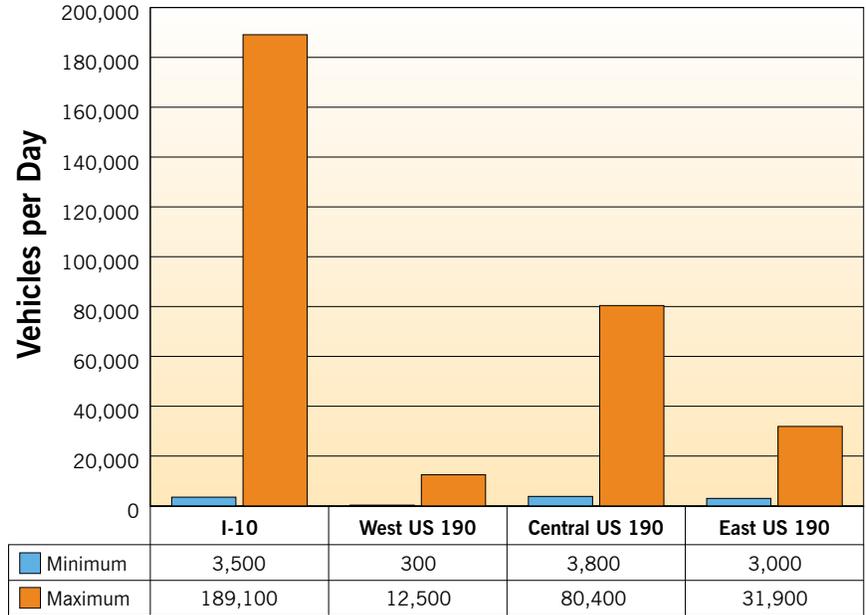
The Average Annual Daily Traffic (AADT) on I-10 from the New Mexico state line to US 190 ranges from 3,500 vehicles per day (vpd) near Fort Stockton to 189,100 vpd in El Paso. The AADT range on US 190 from I-10 to the Louisiana state line is 300 vpd near Menard to 80,400 vpd on I-35 in Temple. This yields an AADT range for the entire corridor of a minimum of 300 vpd to a maximum of 189,100 vpd.

The range of truck volumes along I-10 is 2,100 trucks per day near Fort Stockton to 15,700 trucks per day in El Paso, with truck volumes along US 190 ranging from 100 trucks per day near Menard to

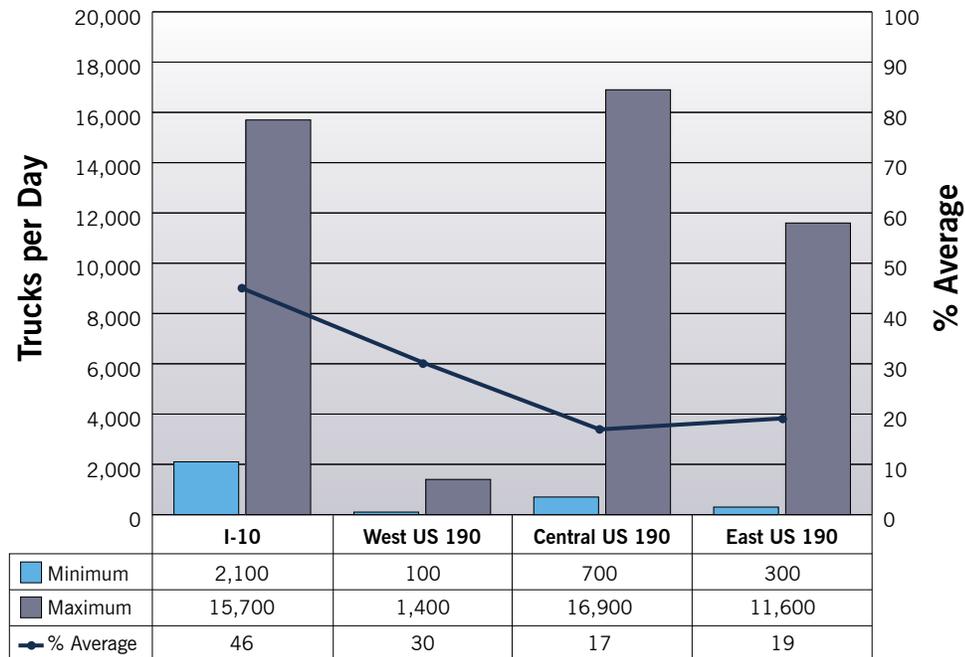


16,900 trucks per day on I-35 in Temple. I-10 has the greatest percentage of truck traffic (46 percent) with the Central US 190 having the lowest percentage of truck traffic (17 percent) followed closely by the East US 190 (19 percent).

Existing Daily Traffic Volumes



Existing Daily Truck Volumes



Traffic volumes are projected to increase at average annual growth rates ranging from 1.5 percent to 3.0 percent along the corridor between the years 2007 and 2040. The I-10 Section is projected to experience a 2.0 percent increase, West US 190 Section a 3.0 percent increase, Central US 190 Section a 1.0 to 2.5 percent increase, and East US 190 Section a 1.5 to 3.0 percent increase.

Level-of-Service (LOS)

Existing and future traffic conditions along the study corridor were evaluated by conducting capacity/LOS analyses. LOS is a qualitative measure of traffic operating conditions on a roadway. The LOS of a roadway is rated using quantitative traffic operation measures such as travel speed, delay and density. LOS ratings range from A to F where A is the best level of service, E represents operations with traffic volumes approaching the capacity of the roadway, and F represents congested operations where traffic exceeds roadway capacity. LOS C-D is generally considered acceptable traffic operation.

Level-of-Service		
A 	Excellent Highest quality of service. Free flow conditions with minor traffic disruptions.	 <p style="color: green; font-weight: bold;">Free Flow</p> <p style="color: brown; font-weight: bold;">Severe Congestion</p>
B 	Good Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted.	
C 	Average Stable traffic flow. Freedom to maneuver is noticeably restricted.	
D 	Acceptable Speeds decline and density increases. Freedom to maneuver is severely limited.	
E 	Congested Vehicles are closely spaced with little room to maneuver. Travel demand approaching or at roadway capacity.	
F 	Severely Congested Very congested traffic with traffic jams. Travel demand exceeds roadway capacity.	

Source: CDM Smith, 2009

Existing LOS C-D occurs in the urban areas and some rural areas of the corridor including sections of I-10 in El Paso; sections of US 190 in Brady and Richland Springs; sections between Killeen and Milano; US 190/I-45 from Madisonville to Huntsville; from Onalaska to Livingston; in Woodville; and in Newton.

LOS E-F occurs in urban areas including El Paso, Brady, San Saba, and Lampasas; various locations along US 190 between Copperas Cove and Killeen; and in Temple and Madisonville.

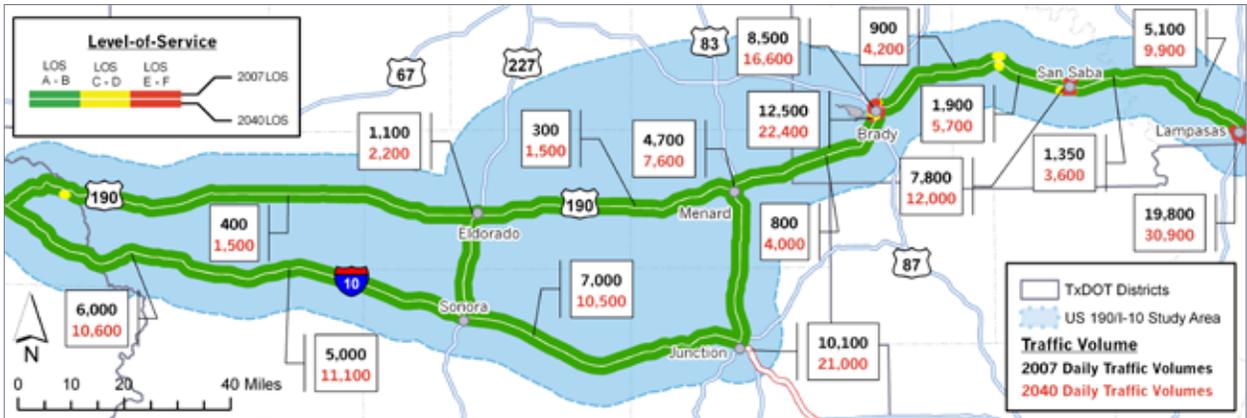
Most of the traffic congestion (LOS E-F) by 2040 is projected to occur along I-10 around El Paso from the New Mexico state line to south of the city; in Brady, San Saba, and Lampasas in the West US 190 Section; from Copperas Cove to Cameron, Hearne, and Bryan in the Central US 190 Section; and along I-45 and the Livingston area in the East US 190 Section.



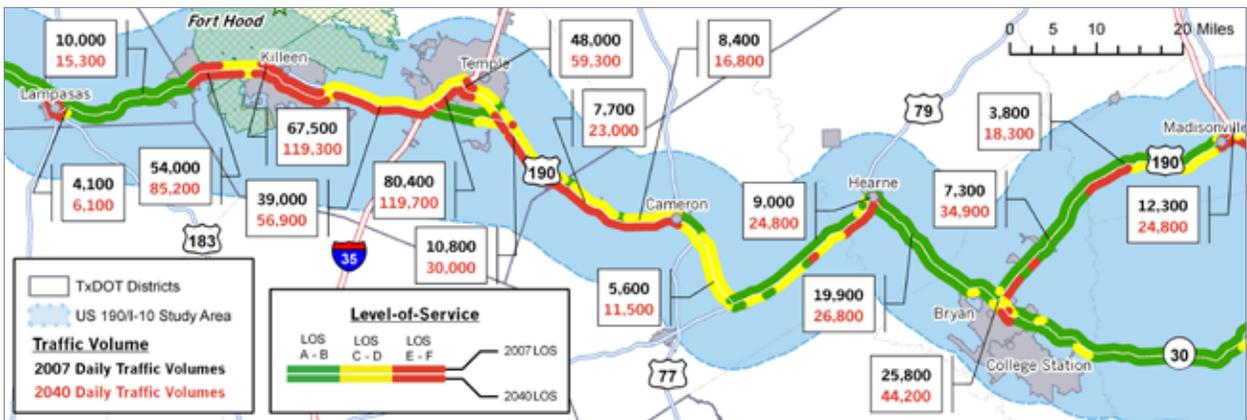
I-10 Travel Demand and Level-of-Service



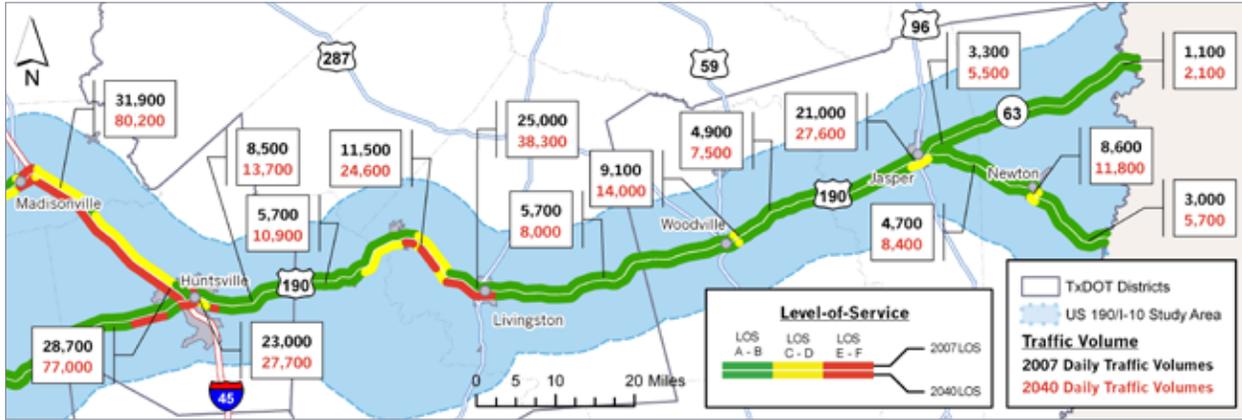
US 190 West Travel Demand and Level-of-Service



US 190 Central Travel Demand and Level-of-Service



US 190 East Travel Demand and Level-of-Service



Additional Travel Lanes Needed

Additional travel lanes were assumed to be needed at locations where the LOS degraded below LOS D based on the forecasted 2040 travel demand. Within the study corridor, additional capacity needs were identified along US 190 between the Killeen area to US 59 in Livingston. Also, additional capacity is needed along I-10 in the El Paso metropolitan area. Currently, there are plans to widen I-10 in various sections in El Paso. However, since this is a highly urbanized area, future traffic needs were not identified in El Paso as part of this high-level feasibility study.

2040 Additional Capacity Needs



Crash Evaluation

Available crash data along the study corridor was used to compare the roadway’s actual crash rate averaged over four years (2006 - 2009) to the statewide crash rate for a similar highway. The evaluation of crash data for each corridor section indicated the crash rate was above the statewide average in and east of Fort Stockton, sections between Iraan and Eldorado, in Temple, Madisonville, and between Onalaska and Livingston.



Environmental Conditions

The environmental analysis primarily relied on existing environmental databases supplemented by inventory information obtained during field reconnaissance. Additional data pertaining to demographic and socioeconomic conditions along the corridor were obtained from Woods and Poole, Texas Workforce Commission, and the US Census Bureau.

Summary of Existing Environmental Conditions and Locations

Category	I-10 (NM to US 190)	West US 190 (I-10 to US 281)	Central US 190 (US 281 to I-45)	East US 190 (I-45 to LA)
Ecologically Significant Streams	2 including Little Aguja Canyon* and Leon Creek**	6 including Pecos River, Live Oak Creek, two segments of San Saba River, South Llano River, and Colorado River	2 including Rocky Creek and Little River	8 including Nelsons Creek, Hammons Creek, East Fork San Jacinto River, Menard Creek, Sandy Creek, Beech Creek, Angelina River, and Neches River
Wetlands	No areas > 20% coverage	No areas > 20% coverage	<ul style="list-style-type: none"> Navasota River (between Bryan and Madisonville) > 50% coverage Bedias Creek (Trinity River tributary, upstream of Lake Livingston) 	<ul style="list-style-type: none"> Neches River north and south of B.A. Steinhagen Lake (between Tyler and Woodville) Sabine River at the Texas/Louisiana border
Air Quality	El Paso County is in non-attainment for CO and PM-10			
Wildlife Habitat	Majority \geq 50% coverage except for portions of El Paso, between I-10 and Texas/Mexico border, and few areas west of Fort Stockton	<ul style="list-style-type: none"> Majority \geq 50% coverage Small areas around Eldorado, Junction, Eden, Menard, and San Saba < 50% coverage 	<ul style="list-style-type: none"> Least coverage Portion of area between US 281 and I-35 mostly > 50% coverage except for areas around Lampasas and Killeen Area just east of I-35 and portion from Hearne to Madisonville < 50% coverage 	Majority \geq 50% coverage except for areas around Madisonville and Huntsville on I-45
Hazardous Waste	<ul style="list-style-type: none"> 1 location between El Paso and Van Horn 1 location near Van Horn 1 location in Balmorhea and Saragosa area Few locations in Fort Stockton area and between Fort Stockton and I-10/US 190 junction 	<ul style="list-style-type: none"> Most sites indicate one industry/land area in 1 km² 1 site at I-10/US 190 junction (indicating 4 or more industries/land areas in 1 km²) Generally scattered with more sites near towns 	<ul style="list-style-type: none"> Largest concentration of sites near Bryan and College Station Groupings of listed sites in Killeen, Belton, Temple, and Hearne 	Sites are scattered; areas with multiple sites are Woodville and Jasper

* Little Aguja Canyon contains only known location of endangered plant, Little Aguja pondweed

**Leon Creek bears substantial population of endangered fish, Pecos Gambusia



Summary of Existing Environmental Conditions, Continued

Category	I-10 (NM to US 190)	West US 190 (I-10 to US 281)	Central US 190 (US 281 to I-45)	East US 190 (I-45 to LA)
Threatened & Endangered Species	<ul style="list-style-type: none"> 7 non-adjacent 1-km locations in El Paso 5 non-adjacent 1-km locations and 1 location which includes 2 km² in Balmorhea and Saragosa area 1 site on I-10 west of Fort Stockton 3 sites north of Fort Stockton 1 site on I-10 just west of US 67/I-10 interchange 	<ul style="list-style-type: none"> 3 1-km sites near Iraan 1 site along and 1 site adjacent to US 190 Several sites near Junction 1 site west of Menard on US 190 1 site between Menard and Brady 	<ul style="list-style-type: none"> Small scattering of sites in Kemper/Copperas Cove/Killeen area Few 1-km sites south of Hearne Few sites between Bryan and the Navasota River 	<ul style="list-style-type: none"> Few 1-km sites south of Madisonville Larger area west of Huntsville Few locations east of Lake Livingston Few sites scattered near Woodville 2 sites along SH 63
Managed Lands	Large portion around El Paso comprised of Fort Bliss, Franklin Mountains State Park, Balmorhea State Park, and Fort Stockton	<ul style="list-style-type: none"> South Llano River State Park is largest site Several small sites indicated in Iraan, Senora, Eldorado, Eden, and just south of US 190 between Eldorado and Menard Few larger areas depicted in Brady and Lampasas 	<ul style="list-style-type: none"> Large portion near Killeen, which is mostly Fort Hood, Belton Lake and Stillhouse Hollow Lake Additional areas are depicted in Cameron, Rockdale, Hearne, and Bryan 	<ul style="list-style-type: none"> Several large areas including Sam Houston National Forest and Lake Livingston (between Huntsville and Lake Livingston) Big Thicket National Preserve south of US 190 between Livingston and Woodville with other portions included south of B.A. Steinhagen Lake B.A. Steinhagen Lake
Agricultural Lands	<ul style="list-style-type: none"> Concentrations between I-10 and Texas/Mexico border (along Rio Grande) Small groupings near Van Horn (Balmorhea and Saragosa area) and west of Fort Stockton 	<ul style="list-style-type: none"> Two larger areas > 50% coverage between Eden and Brady and near San Saba Smaller concentration areas located near Eldorado, Junction, Menard, and between Brady and San Saba 	<ul style="list-style-type: none"> Line along Lampasas River > 50% coverage Majority of area between I-35 and I-45 ≥ 50% coverage 	<ul style="list-style-type: none"> Along I-45 at Madisonville and Huntsville and between Lake Livingston and the city of Livingston > 50% coverage Majority of other land < 50% coverage

Socioeconomic Conditions

Overall, between 1970 and 2007, the fastest growing section of the corridor was the Central US 190 followed by East US 190, I-10, and West US 190. From 2007 to 2040, the fastest growing section of the corridor is expected to be I-10 followed by Central US 190, East US 190, and West US 190. The Hispanic population is projected to have the fastest growth rate in each of the corridor sections through 2040. Average unemployment for the corridor was 5.9 percent in 2008 compared to 5.7 percent in Texas. Unemployment by section ranged from 4.4 percent in West US 190 Section to 6.9 percent for the I-10 Section.



Summary of Demographic and Socioeconomic Characteristics

Category	I-10 (NM to US 190)	West US 190 (I-10 to US 281)	Central US 190 (US 281 to I-45)	East US 190 (I-45 to LA)
Population Growth (1970 – 2007) ¹	398,700 (1970) 770,000 (2007) 1.79% CAGR ²	127,600 (1970) 178,200 (2007) 0.91% CAGR	313,000 (1970) 697,600 (2007) 2.19% CAGR	125,400 (1970) 257,000 (2007) 1.96% CAGR
Population Growth (2007 – 2040) ¹	770,000 (2007) 1,268,200 (2040) 1.52% CAGR	178,200 (2007) 218,400 (2040) 0.62% CAGR	697,600 (2007) 1,045,700 (2040) 1.23% CAGR	257,000 (2007) 364,200 (2040) 1.06% CAGR
2008 Unemployment	6.9%	4.4%	5.1%	6.5%
Per Capita Income (2005)	\$22,998	\$26,683	\$27,622	\$22,735
Housing (PPH) ³	3.2	2.6	2.6	2.5
Percent Minority (2000)	18% Anglo 3% Black 78% Hispanic 1% Other	63% Anglo 3% Black 33% Hispanic 1% Other	64% Anglo 16% Black 16% Hispanic 3% Other	72% Anglo 18% Black 9% Hispanic 1% Other
Minority Populations ⁴	High minority populations: <ul style="list-style-type: none"> • near El Paso • El Paso County • between I-10 and Texas/Mexico border • near Van Horn • Balmorhea • Saragosa 	Large minority population areas: <ul style="list-style-type: none"> • on I-10 just east of I-10/US 190 Junction • north of I-10 near Sonora • on US 190 between Iraan and Eldorado • around Eldorado 	Higher minority populations near Killeen, Calvert, Hearne, and Bryan	Higher minority populations: <ul style="list-style-type: none"> • between Madisonville and Lake Livingston • near Woodville, Jasper, and Newton along US 190 • along most of SH 63 between Jasper and TX/LA border
Percent Minority (2040)	6% Anglo 2% Black 90% Hispanic 2% Other	47% Anglo 3% Black 49% Hispanic 1% Other	48% Anglo 18% Black 28% Hispanic 6% Other	68% Anglo 17% Black 15% Hispanic 1% Other
2000 Poverty Estimates ¹ (% of Pop./HH) ⁵	23.3% individuals 20.6% families	15.6% individuals 12.5% families	15.0% individuals 11.0% families	15.6% individuals 13.3% families
Economically Stressed Households ⁶ (earning less than \$15,000 annually)	<ul style="list-style-type: none"> • Majority of area between I-10 and Texas/Mexico border > 27.6% • Large area near Van Horn range from 45% to 55% • Areas near Balmorhea and Saragosa > 55% • Area in and around Fort Stockton ranges from 27% to 55% 	<ul style="list-style-type: none"> • Half of section has few areas > 55% • Remaining half ranges from 27% to 45% • Higher concentrations around Eldorado, Eden, Brady, northwest of Brady, and southwest of San Saba 	<ul style="list-style-type: none"> • Few areas between Lampasas and I-35 > 27% • Majority of area east of I-35 ranges from 27% to 45% • Cameron, Calvert, Hearne and College Station have areas with concentrations > 45% 	<ul style="list-style-type: none"> • Majority of section > 27% • Around Woodville, Jasper and along SH 63 > 55%

Note:

1. Counties may be overlapped by two or more sections; therefore, section poverty estimates include county data that may also be in other sections and will not be cumulative to Study Area County totals.

2. CAGR – Compound Annual Growth Rates

3. PPH - Person per household

4. Data identifies areas with Minority Populations (all other persons other than White non-Hispanic) > 47.6%.

5. % of Pop./HH - Percent of population/households

6. Data identifies Economically Stressed or low income areas as households earning \$15,000 or less annually.



Existing and Projected Rail Conditions

No single rail line precisely parallels US 190 across Texas. However, a rail line, composed of track segments of various railroads, generally parallels US 190 from Merryville in western Louisiana to El Paso in west Texas. The rail route that generally parallels US 190 is 970 miles long and is made up of segments belonging to four different railroads: Timber Rock Railroad, BNSF, Texas Pacific Railroad, and UP. The eastern terminus of the route is in De Ridder, Louisiana.

Existing Rail Line Segments



Meetings with stakeholders revealed specific rail constraints and bottlenecks that hinder the movement of military shipments between forts and ports:

- Rail congestion in the Houston area
- The bridges over the Gracitas Creek (6.2 miles south of Vanderbilt, Texas) and the Colorado River (1.1 miles north of Buckeye, Texas) which cannot accommodate 286,000 pound loaded car weights
- Inadequate rail infrastructure at the Port of Beaumont and Port of Corpus Christi
- Insufficiency of flat railcar and correct rail equipment to transport military cargo

Rail yard improvements at the Port of Corpus Christi will increase rail capacity eight-fold by 2040 (from 12,000 cars in 2010 to 100,000 cars in 2040). However, the role of Port of Corpus Christi as a military port has diminished as the U.S. Army removed the reserve unit. Inputs from stakeholder interviews indicate that the U.S. Army is starting to utilize the Port of Port Arthur which is near the Port of Beaumont.

Recent capacity improvements at the Port of Beaumont included an expansion project completed in December 2011 which increased the capacity of the rail yard from 100 cars per day to 300 cars per day and additional uploading ramps. By 2040 rail segments that are expected to be operating above capacity without improvements will be located between El Paso and Alpine, McNeil and San Antonio, San Antonio and Flatonia, Flatonia and Houston, west to Spofford and San Antonio, and on UP tracks near Beaumont.

Rail Corridor Level-of-Service - Year 2040



Planned Improvements

Statewide planning programs were reviewed to identify the planned improvements along highways in the US 190/I-10 corridor.

Statewide Program	US 190/I-10 Projects
Texas Statewide Long Range Transportation Plan 2035 (SLRTP)	<ul style="list-style-type: none"> • Most of US 190 from Cameron to Jasper - Design Criteria Needs* Segment, Capacity Needs Segment, or both • US 190 from Menard to Copperas Cove - Design Criteria Needs*Segment.
Draft Texas Rural Transportation Plan 2035 (Draft TRTP)	<ul style="list-style-type: none"> • Widen US 190 in the Livingston area • Widen SH 30 between Bryan and Huntsville, widen US 83 near the Kimble/Menard county line • Grade separations primarily in the El Paso area • Addition of passing lanes on US 83 • New location relief route for Lampasas
2012 Unified Transportation Plan (UTP)	<ul style="list-style-type: none"> • Interchange improvements along I-10 in El Paso • Bridge replacement on US 190 at the Neches River
Statewide Transportation Improvement Program (STIP)	<ul style="list-style-type: none"> • New location relief route for Copperas Cove • Widen US 190 in the Killeen area • Interchange improvements and construction of grade separations along I-10 in the El Paso area

*Design Criteria Needs based on Texas Trunk System, four-lane divided highway section.

Preliminary Alternatives

Preliminary Alternatives were initially developed based on the concept of upgrading the entire corridor to a freeway or four-lane divided highway as required by the study scope. Upgrading the existing freeway sections along I-10, and the common segments of US 190 along I-35 and I-45 were not considered. Sixteen preliminary alternatives were developed and evaluated based on traffic/mobility, engineering, environmental, socioeconomic, and public input criteria. This evaluation resulted in carrying concepts of total freeway, total four-lane divided highway, and combinations of each from the Preliminary Alternatives forward to the detailed evaluation phase.

Conceptual Alternatives

Ten distinct Conceptual Alternatives were developed based on the concepts carried forward from the evaluation of the Preliminary Alternatives. The Conceptual Alternatives are shown on the following pages along with a brief description. These encompass all of the different limits, typical sections, and options within the selected Preliminary Alternative concepts.



Total Freeway – Option 1



Freeway from I-10 to US 277 to US 190 to the Louisiana state line.

Total Freeway – Option 2



Freeway from I-10 to US 83 to US 190 and continues to the Louisiana state line using options along FM 93, SH 30, and SH 63.

Total Four-Lane Highway – Option 1



Follows I-10 to US 190 and considers a four-lane divided highway along US 190 to the Louisiana state line.



Total Four-Lane Highway – Option 2



Follows I-10 to US 277, and continues from US 277 to US 190 as a four-lane divided highway. From its intersection at US 190 it continues eastward as a four-lane divided facility utilizing FM 93, SH 30, and SH 63 to the Louisiana state line.

Total Four-Lane Highway – Option 3



Follows I-10 to US 83, and continues from US 83 to US 190 as a four-lane divided highway. From its intersection at US 190 it continues eastward as a four-lane divided facility utilizing FM 93, SH 30, and SH 63 to the Louisiana state line.

Fort to Port – Option 1



Follows I-10 to US 277, is a freeway along US 277 to US 190, and continues along US 190 as a freeway until I-45. East of I-45, it is a four-lane highway along US 190 and utilizes SH 63 to the Louisiana state line.



Fort to Port – Option 2



Same as Fort to Port – Option 1 except that it extends as a freeway until US 69.

Evacuation



Follows I-10 to US 190, from this point to Constitution Drive outside Killeen it is a four-lane highway, and east of Constitution Drive it is a freeway and utilizes SH 63 to the Louisiana state line.

Mobility/Safety – Option 1



Follows I-10 to US 190, from this point to Constitution Drive outside Killeen as a four-lane highway, east of Constitution Drive it extends as a freeway to US 69, and east of US 69 it is a four-lane highway utilizing SH 63 to the Louisiana state line.



Mobility/Safety – Option 2

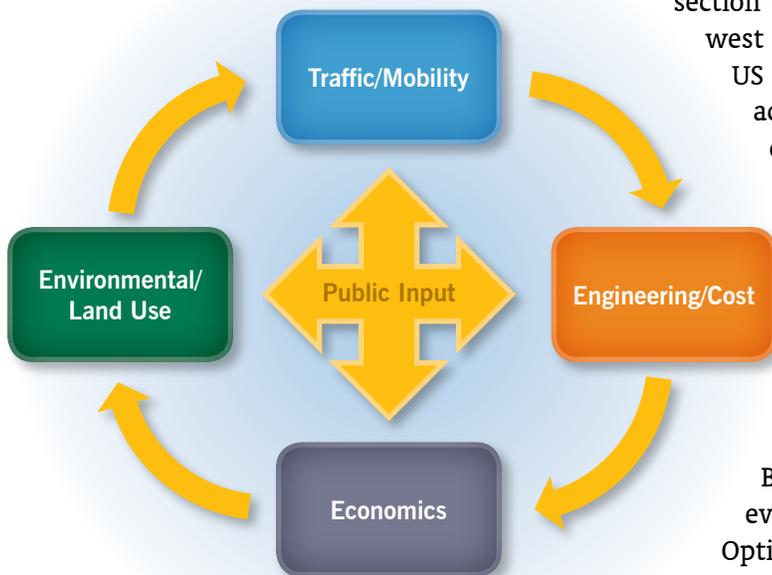


Same as Mobility/Safety – Option 1 except US 190 between US 281 and Constitution Drive is a freeway.

Detailed Evaluation Results

The following sections represent a summary of the Conceptual Alternatives and their respective evaluation results by each major criteria.

Evaluation Criteria



Traffic/Mobility: Based on 2040 traffic needs, no additional travel lanes are warranted on the section of US 190 from its junction with I-10 west of Iraan to US 281 in Lampasas (West US 190). The existing two-lane facility will accommodate the 2040 projected travel demand within these limits. Additional lanes are warranted along US 190 by year 2040 from the Killeen area east to US 59 in Livingston. East of US 59, the existing two-lane facility is adequate to accommodate the projected travel demand at acceptable operating conditions through 2040.

Based solely on the traffic/mobility evaluation, the Four-Lane Highway Options 1, 2, and 3 scored the best considering the entire study corridor. These alternatives did not attract as much travel demand as the freeway alternatives and therefore resulted in better travel times and speeds within the Central and East US 190 Sections.



In the West US 190 Section, the Freeway Options 1 and 2 and the Fort to Port Options 1 and 2 alternatives scored the best (these were closely followed by the Mobility/Safety Options 1 and 2). This is primarily due to upgrading US 190 to a freeway in this section which resulted in better mobility (travel time and speed) compared to other alternatives that included upgrading to a four-lane highway. However, this section currently carries nominal traffic and therefore the projected volumes, even when upgraded to a freeway, carried the lowest projected travel demand in 2040 compared to other sections.

In the Central US 190 Section, the Total Four-Lane Options 2 and 3 scored the best overall. This is primarily because both these alternatives utilize options FM 93 and SH 30 and divert traffic from the congested areas of I-35 in the Killeen/Temple area and US 190/I-45 near Madisonville. This section carries the most traffic along the corridor and upgrading to a four-lane highway attracted manageable traffic volumes whereas a freeway type improvement only exacerbates existing congestion issues because it would attract substantially more traffic.

For the East US 190 Section, all the four-lane highway options and the Fort to Port Option 1 scored most favorably. As discussed earlier, upgrading to a four-lane highway did not attract as much travel demand in this section as it did when upgraded to a freeway. As a result, the lower traffic volumes with the four-lane highway configuration provided better mobility along this section.

Finally, it should be noted that this study focused on examining the need for improving this corridor to four-lane divided highway or a four-lane divided freeway. No improvements were considered along existing freeways in the Central

and East Sections, which includes US 190 in the Killeen area, and the portions of I-35 and I-45 concurrent with US 190. These freeway facilities are currently congested and are projected to further deteriorate in the future. Improvements to these major facilities need to be addressed. US 190 in the Killeen area and I-35 are recommended to be an eight-lane freeway, and I-45 is projected to need six lanes to accommodate the future travel demand at acceptable operating levels.

Engineering/Costs: The estimated costs for the total freeway options were around \$4.8 billion, the total four-lane highway options estimated costs ranged from \$2.4 to \$2.9 billion, and the costs for the alternatives that were combinations of freeway and four-lane highway ranged from \$3.9 to \$4.6 billion. The estimated ROW costs for the total freeway options ranged from \$159 million to \$161 million, the total four-lane highway options estimated costs ranged from \$90 to \$94 million, and the costs for the alternatives that were combinations of freeway and four-lane highway ranged from \$119 to \$161 million.

Overall, the Four-Lane Highway Options 1, 2, and 3 scored the best from an engineering and cost evaluation. A four-lane highway is considerably less expensive to construct than a freeway. For the West US 190 Section, the Total Four-Lane Option 3 scored the best since it was the shortest improvement corridor (utilizes US 83) with a four-lane highway typical section. In the Central US 190 Section, the Total Four-Lane Option 1 scored the best in all engineering/cost categories. This alternative remained on US 190 and no improvements were considered on existing freeway sections which reduced the costs considerably. For the East US 190 Section, all four-lane highway options and the Fort to Port Option 1 received the highest ratings.



Environmental: Overall, Four-Lane Highway Option 1 scored the best as it had the lowest number of potential impacts to both its natural and human environment. Generally, the smaller the footprint of the alternative (i.e., the four-lane highway typical section) and the greater distance the alternative follows the existing US 190 provided fewer impacts to the environment. For the West US 190 Section, Four-Lane Highway Option 3 scored the best as there were fewer impacts following US 83 than US 277. In the Central Section, Four-Lane Highway Option 1 received the best rating. In the East US 190 Section, all four-lane highway options received the most favorable rating.

Economics: In evaluating the economic feasibility of the Conceptual Alternatives, via a comparison of the societal benefits to the development costs, all alternatives were determined to be economically infeasible from an entire corridor-wide perspective. Of the alternatives, the Four-Lane Highway Options 1, 2, and 3 yielded the best relative travel efficiency results compared to the other alternatives. None of the alternatives analyzed in the West US 190 Section was found feasible. The freeway alternatives in the Central US 190 Section were marginally feasible and the

four-lane alternatives were very feasible, but any improvements will need to carefully address persistent congestion issues on unimproved segments (i.e. freeway section in Killeen, I-35, and I-45). Certain segments in the East US 190 Section are economically feasible depending on the alternative. The section from I-45 to Livingston is feasible as a four-lane divided section. However, most segments are economically infeasible without the 14th Amendment Highway. With the 14th Amendment Highway, and the associated additional traffic volumes, the US 190 and SH 63 corridor become economically feasible for a four-lane divided section. It must be noted, however, the economic impacts (as measured by employment, economic activity, income, etc. and distinct from the economic feasibility perspective), associated with the alternatives were found to be modest, at best, once the capital expenditures were subtracted from the analysis.

Public Involvement: The public indicated support in varying degrees for all the Conceptual Alternatives. The alternatives that were most “strongly supported” or “supported” were the Total Four-Lane Highway Options 1, 2, and 3, followed by the Mobility/Safety Option 2 alternative.

Overall US 190 Evaluation Results

	Traffic	Engineering	Environmental	Economics	Overall
Total Freeway Option 1	●	●	●	●	●
Total Freeway Option 2	●	○	●	○	●
Total Four-Lane Hwy Option 1	●	●	●	●	●
Total Four-Lane Hwy Option 2	●	●	●	●	●
Total Four-Lane Hwy Option 3	●	●	●	●	●
Fort to Port Option 1	●	●	●	●	●
Fort to Port Option 2	●	○	●	●	●
Evacuation	●	●	●	●	●
Mobility/Safety Option 1	●	●	●	●	●
Mobility/Safety Option 2	●	●	●	●	●

● = Most Favorable
● = Favorable

● = Neutral
● = Unfavorable

○ = Most Unfavorable



Summary: Overall, the Total Four-Lane Options 1, 2, and 3 received the best ranking compared to the other Conceptual Alternatives. These four-lane options generally had lesser costs compared with the freeway and combination alternatives that included both freeway and four-lane divided highway typical sections. They also better accommodated the projected traffic volumes compared to the other alternatives. Environmentally speaking, there were fewer potential impacts when utilizing US 190. Comparing the costs to the derived benefits the four-lane highway alternatives ranked best economically. Finally, from a public involvement perspective, the four-lane highway options received the most support.

14TH Amendment Highway

An evaluation was conducted to determine capacity needs along US 190 if the proposed 14th Amendment Highway was implemented between Augusta, Georgia to Natchez, Mississippi, and extended further west through the state of Louisiana to the Texas state line.

The direct impact associated with the implementation of the 14th Amendment Highway is the additional traffic that would be generated on SH 63 and portions of US 190 generally east of I-45. Year 2040 traffic volumes along the impacted highway sections are projected to be approximately 33,000 vpd along US 190 from I-45 to US 69, and 23,000 vpd along US 190 from US 69 to SH 63 (Jasper), and also on SH 63 from Jasper to the Louisiana state line. These projected volumes along these sections of US 190 and SH 63 warrant the facility to be upgraded to a four-lane highway between I-35 to the Louisiana state line.

Transportation Improvement Strategies

It was determined that various alternatives for improving the entire corridor to a freeway and/or four-lane divided highway was not economically viable. However, mobility and safety issues were identified along the corridor. As a result, potential localized transportation improvements were identified to address these needs.

Additional Capacity on Existing Facilities: Based on the traffic forecasts for 2020, 2030, and 2040, locations were identified along the US 190/I-10 corridor where the LOS on the existing plus committed highway network was projected to degrade below LOS D.

Relief Routes: Potential need for relief routes were evaluated based on existing and forecasted traffic and LOS, accident rates within cities/towns, and impedances (signals, at-grade railroad crossings, school zones).

Passing Lanes: The need for passing lanes were evaluated for existing two-lane roadways based on projected traffic volumes.

Roadway Intersections: Interchanges were recommended as potential improvements based on existing and projected traffic volumes through an intersection, and if the existing intersection posed a potential hazard due to nonstandard interchange configurations.

Railroad Crossings: At-grade highway/railroad crossings were identified and evaluated.

Minimum Roadway Design Criteria: Locations along the corridor which potentially do not meet current design standards were identified.



Intelligent Transportation Systems: Identification of individual ITS projects was not included, but should be considered in the planning and design of any improvement as a design concept and alternative analysis within each of the potential projects.

Public Input: Potential projects suggested via public comments were also evaluated. Projects suggested included additional capacity along US 190 primarily between the Killeen area east to the Louisiana state line. Relief routes were suggested in cities including Menard, Brady, Copperas Cove, Killeen, Huntsville, Livingston, Woodville, Jasper, and Steinhagen Lake. Passing lanes were suggested on US 190 west of Eldorado and roadway design improvements were suggested in various locations along the corridor (US 190 and US 59, SH 30 in Shiro, US 190 and US 96, etc.).

Summary of Recommended Potential Improvements

These analyses resulted in recommended near- to mid-term and long-term potential improvements. These potential improvements along with conceptual construction cost estimates are included in the following tables and also are depicted graphically. Applicable statewide planning programs were reviewed to identify whether any of these potential projects overlap or complement projects identified in any of these plans. This is noted in the tables as well.



Recommended Near- to Mid-Term Potential Improvements

Improvement Type	Roadway	Limits	Existing Facility	Potential Improvement	Conceptual Cost Estimate (\$ Million)
Added Capacity	US 190	Constitution Drive in Copperas Cove to I-35 in Temple ²	4- to 6-lane freeway	6-lane freeway	240
Relief Routes	US 190	Huntsville	N/A	New location 4-lane highway	64
	US 190	Lampasas ¹			30
	US 190	Madisonville			51
	US 190	Hearne ¹			20
	US 190	Cameron		New location 2-lane highway	27
	US 190	Livingston/Onalaska ¹			152
	US 190	Woodville			18
Passing Lanes	US 190	South of Temple to Rogers	2-lane highway	Add passing lanes	3
	US 190	Huntsville to Point Blank ^{1*}			7
	US 190	East of Bryan to Madisonville ^{1*}			14
	US 190	Rogers to Cameron ^{1*}			8
	US 190	East of Milano to Hearne			8
	SH 30	SH 90 to Huntsville ^{1*}			13
	US 190	Woodville to Jasper ¹			14
	US 190	East of Livingston to Woodville ¹			12
	SH 63	Jasper to Newton ¹			6
	US 277	Eldorado to Sonora			11
	US 190	Iraan to Eldorado			47
	US 190	I-10 to Iraan			8
Roadway Design	US 281 at US 190	North of Lampasas	At-grade 3 Leg Intersection	Diamond Interchange	8

¹ - Identified in Draft TRTP * indicates portions include widening to 4-lanes in the Draft TRTP

² - Identified in STIP



Recommended Long-Term Potential Improvements

Improvement Type	Roadway	Limits	Existing Facility	Potential Improvement	Conceptual Cost Estimate (\$ Million)
Added Capacity	US 190	Constitution Drive in Copperas Cove to I-35 in Temple	4- to 6-lane freeway	8-lane freeway	280
	I-35	US 190/I-35 Interchange (S) to US 190/I-35 Interchange (N)	6-lane freeway	8-lane freeway	51
	US 190	Heidenheimer to Hearne	2-lane highway	4-lane highway	266
	US 190	Kurten to I-45	2-lane highway	4-lane highway	118
	I-45	Madisonville to Huntsville	4-lane freeway	6-lane freeway	215
	US 190	I-45 to Livingston ¹	2-lane highway	4-lane highway	168
Relief Routes	US 190	Brady	N/A	New location 2-lane highway	24
	US 190	Jasper			27
	US 190	Menard			11
	US 190	Newton			14
	US 190	Eldorado			21
	US 190	San Saba			21
	US 190	Iraan			18
Passing Lanes	US 83	Menard to Junction ^{1*}	2-lane highway	Add passing lanes	17
	US 190	South of US 77 to Milano			7
	SH 63	Newton to Louisiana			6
	US 190	Richland Springs to San Saba			7
	US 190	Brady to Richland Springs			15
	US 190	Menard to Brady			17
	US 190	San Saba to Lometa			10
	US 190	Jasper to Louisiana			18
US 190	Eldorado to Menard	29			
Roadway Design	US 77 at US 190	East of Cameron	3 Leg Traffic Signal	Trumpet Interchange	3
	FM 2776 at US 190	Wixon Valley	Flasher controlled	Diamond Interchange	7

¹ - Identified in Draft TRTP * indicates portions include widening to 4-lanes in the Draft TRTP

² - Identified in STIP



Recommended Potential Added Capacity and Roadway Design Improvements



Recommended Potential Relief Routes and Passing Lanes



The list of recommended potential improvements is not financially constrained, and local decision makers will need to weigh the needs, benefits, and costs of improvements to the US 190/I-10 corridor against other local needs. Near- to mid-term improvements are those that are recommended to begin the project development process prior to 2030, while long-term improvements are those that are recommended to begin the project development process prior to 2040.



Finance Plan and Institutional Issues

Funding improvements along the entire US 190/I-10 corridor is challenging given the current limitations of traditional funding sources and the limited economic feasibility of proposed improvements. Statewide annual highway and bridge maintenance costs were found to average \$3.6 billion through 2035, and annual improvement and replacement costs average another \$10.7 billion. Combined, total highway needs for Texas through 2035 were found to average \$14.2 billion per year. However, average annual available funding between 2010 and 2012 is only \$3.0 billion. Clearly, Texas is challenged in simply maintaining its existing highway infrastructure. Much discussion has centered on raising the state motor-fuel tax and/or raising/redistributing recurring funding from other sources. Even if additional revenues were generated, many highway improvement projects would be competing for any available funding.

Given these fiscal constraints, only the feasible sections of US 190 or the local transportation improvements have the potential to be funded. Difficult financial times have given rise to increased resourcefulness on the local level with cities and counties using various taxing instruments and inter-governmental agreements to raise funding for road improvements.

Summary of Findings

As previously mentioned, this study does not recommend a preferred alternative, but provides sufficient technical information and comparisons of the impacts and feasibility of various improvements that could be considered to address existing and future transportation needs along the study corridor. The study results will be used

by TxDOT and other involved agencies to assist in prioritizing potential projects along the US 190/I-10 corridor. These projects would need to be examined in further detail as part of subsequent project development phases.

The following is an overall summary of the results of the evaluation of the Conceptual Alternatives.

- As discussed earlier in this Executive Summary, overall, the Total Four-Lane Options 1, 2, and 3 received the best ranking compared to the other Conceptual Alternatives.
- These four-lane options generally cost less compared with the freeway and combination alternatives that included both freeway and four-lane divided highway typical sections.
- They also better accommodated the projected traffic volumes compared to the other alternatives.
- From an environmental standpoint, there were fewer potential impacts with the four-lane options when utilizing US 190.
- The economic evaluation compared the costs incurred and benefits received with the implementation of a transportation improvement project. The four-lane highway options received the most favorable rankings in this category as well.
- Finally, from a public involvement perspective, the four-lane highway options received the most support.

Since it was determined that it was not necessary to widen the entire US 190 from a traffic perspective, mobility and safety issues were identified and potential localized transportation improvements were identified to address these needs. These were classified as short-to mid-term improvements and long-term improvements which local agencies should evaluate and prioritize.



The following is a summary of the general objectives of the study and the findings associated with each of them.

Determine existing and future mobility and safety needs: Overall, the US 190/I-10 study corridor adequately serves existing and future mobility and safety needs with a few exceptions. Additional travel lanes are, or will be, needed along US 190 between I-35 and US 59 in Livingston by 2040. Also, there are several towns/cities experiencing, or projected to experience, unacceptable congestion along the corridor including El Paso, Brady, San Saba, Lampasas, Copperas Cove, and Killeen. The US 190/I-10 corridor has experienced crash rates above the statewide average in the vicinities of Fort Stockton, Eldorado, Temple, Madisonville, and from Onalaska to Livingston.

Evaluate impacts and feasibility of alternative transportation improvements: From a cost effective perspective (benefits versus costs), a freeway/interstate type facility is marginally feasible along US 190 from US 281 in Lampasas to I-45, and from Jasper to the Louisiana state line. A four-lane divided highway is very feasible along US 190 between I-35 and US 59 in Livingston, and from Jasper to the Louisiana state line.

Assess advantages of improved connections to military installations and deployment ports: The existing roadway and rail network is generally adequate to meet the mobility needs between the military installations along the US 190/I-10 corridor and Gulf Coast deployment ports through 2040, based on this high level feasibility

study. The major impediment to deployment was rail capacity in the Houston area and at the Ports of Beaumont and Corpus Christi; however, recent expansion projects at the ports have increased rail capacity to address this issue. Additionally, the existing highway routes connecting the military installations to the deployment ports traverse congested urban areas including Houston and San Antonio.

Identify alternative funding sources: The estimated costs for the Conceptual Alternatives ranged from \$2.4 to \$4.8 billion. Due to limited funding, Texas is challenged in maintaining its existing highway infrastructure. The currently available funding is less than half of the total estimated highway needs for Texas through 2035.

Develop a prioritized implementation plan: It was determined that widening the entire US 190/I-10 corridor was not needed. However, potential local improvements were identified and prioritized into near- to mid-term and long-range projects. These potential improvements should be considered along with other transportation needs to maximize limited available transportation funding.

Obtain public/stakeholder input: Two series of public and Local Outreach Group meetings and numerous stakeholder meetings were conducted during the study. Public/stakeholder comments were collected during these meetings as well as via comment forms, the project website, toll free telephone line, and postal mail.



US 190/I-10 Feasibility Study



El Paso to Louisiana State Line