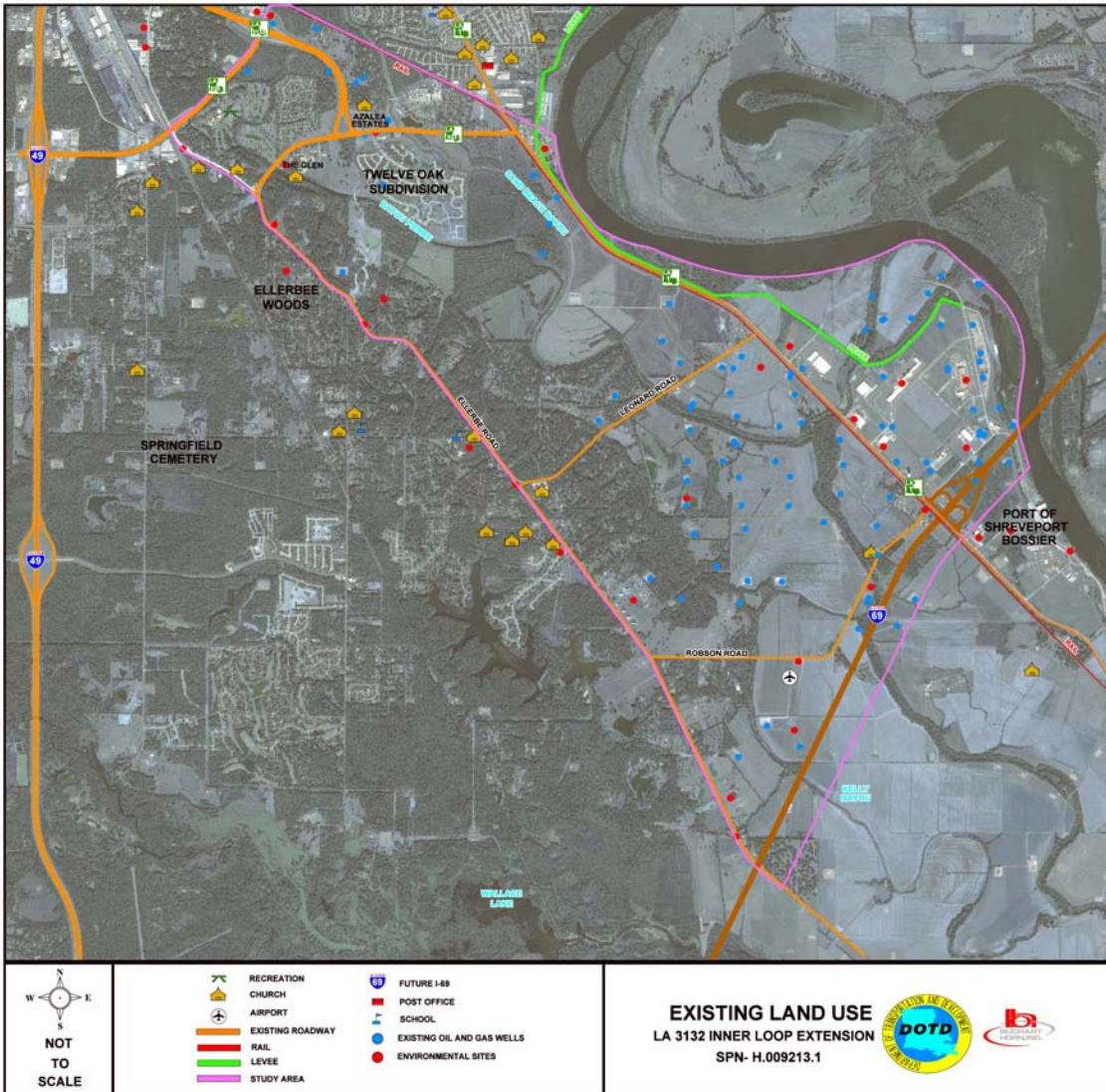


# Stage 0 Report



LA 3132 Inner Loop Extension

Stage 0 Feasibility Study



State Project No: H.009213.1

Prepared For:



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## Executive Summary

A comprehensive Stage 0 Feasibility Study, in accordance with the LADOTD Stage 0 Manual of Standard Practice, has been conducted for the extension of the Inner Loop Expressway (LA 3132) in Caddo Parish, Shreveport, Louisiana. The proposed build alternatives for the extension of LA 3132 will begin east of the interchange at LA 526. The established logical termini to be evaluated are Youree Drive (LA 1) and the future I-69 corridor to the south.

The purpose of this study is the identification, collection of data, and an environmental inventory of the proposed actions or the no build action for the extension of LA 3132.

The following three project objectives were identified for the extension of LA 3132:

- Identify viable alternatives with the goal of improving the overall performance of the transportation network;
- Facilitate modal interrelationships with port facilities and the major operations along the corridor;
- Facilitate long-term economic development for the City of Shreveport through the connectivity with I-69 linking Indianapolis, Indiana to Houston, Texas through Memphis, Tennessee and Shreveport-Bossier City, Louisiana.

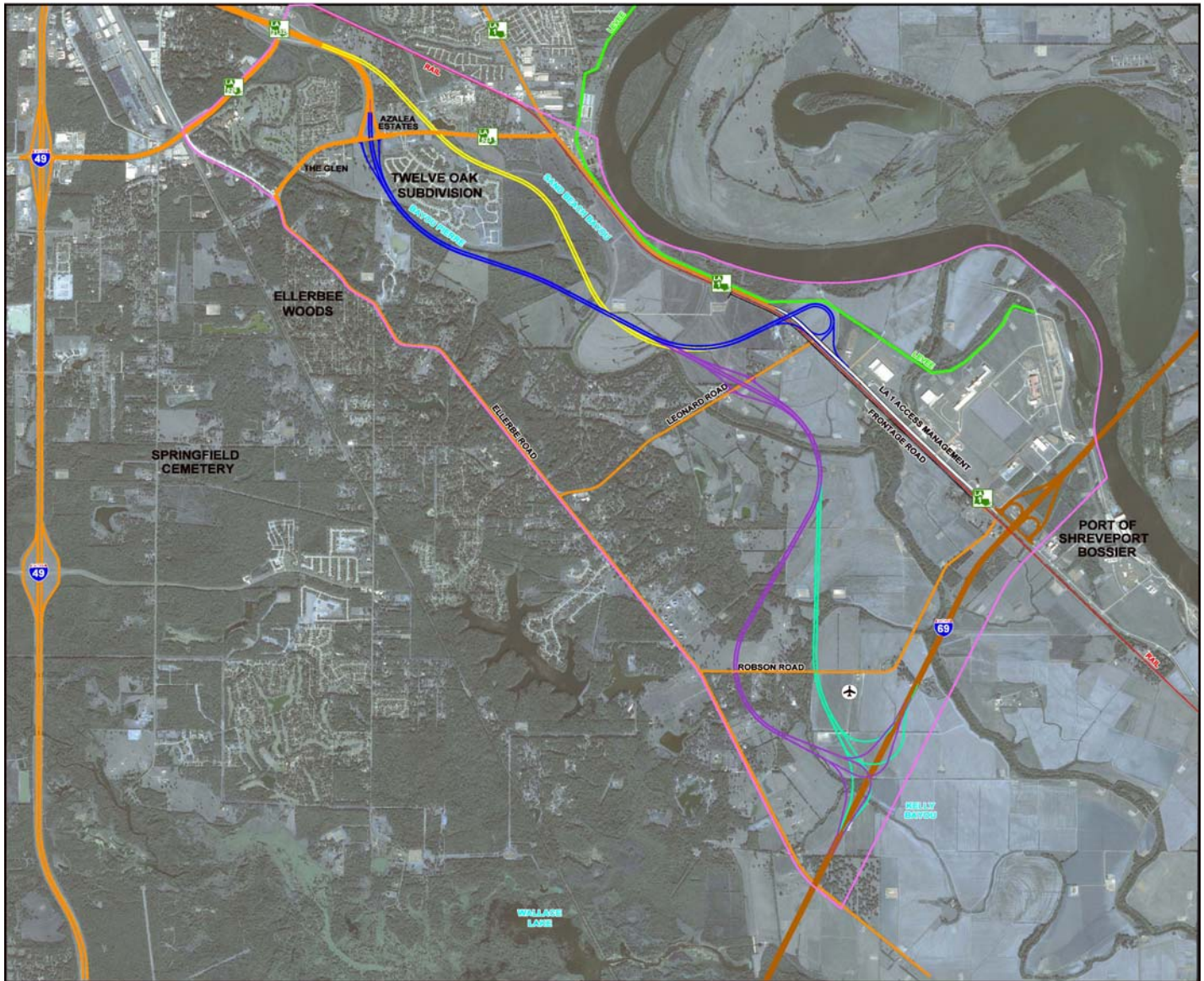
The development of the project needs were generated through a review of existing and projected data (traffic, land use and development), review of several transportation plans and prior reports, and discussions with the project team and interested stakeholders.

The following needs have been identified and will be addressed through the completion of the LA 3132 extension:

- System Linkage
- Intermodal Connectivity
- Economic Development
- Consistency with Statewide/Metropolitan Transportation Plans

Four (4) build alternatives were developed in accordance with LADOTD Freeway (F-2) design criteria. Build alternatives A, B1, and B2 were also evaluated with a single point urban interchange (SPUI) at LA 523. Alternative C was not evaluated with a SPUI option. The four (4) evaluated build alternatives are shown in the figure on the following page.





<p>NOT TO SCALE</p>	AIRPORT EXISTING ROADWAY RAIL LEVEE STUDY AREA FUTURE I-69	ALTERNATIVE A ALTERNATIVE B1 ALTERNATIVE B2 ALTERNATIVE C LA 1 ACCESS MANAGEMENT	<p><b>BUILD ALTERNATIVES</b>                  LA 3132 INNER LOOP EXTENSION                  SPN- H.009213.1</p>
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The preliminary cost estimate for each build alternative was prepared in accordance with the LADOTD Project Delivery Manual. These totals include construction, right-of-way, engineering, survey, and contingency. The total cost for each build alternative is shown below:

- Alternative A- \$100,741,610
- Alternative B1- \$155,842,756
- Alternative B2- \$166,609,056
- Alternative C- \$139,645,144

Based on the conducted analysis for each alternative, it was determined that the mainline for all build alternatives has a Level of Service (LOS) of A. LOS is a term used to represent the perspective of drivers and is an indication of the comfort and convenience associated with driving. The LOS of a roadway is also based on the density of vehicles on a road, intersection, or at an interchange, which is expressed in passenger cars per mile, per lane. Also, the results of the environmental summary and preliminary cost estimate determine that Alternative A has the least amount of environmental impacts and the lowest overall cost.

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## 1.0 Introduction

A comprehensive Stage 0 Feasibility Study, in accordance with the LADOTD Stage 0 Manual of Standard Practice, has been conducted for the extension of the Inner Loop Expressway (LA 3132) in Caddo Parish, Shreveport, Louisiana. LA 3132 is currently constructed from the western interchange of Interstate 220 (I-220) and Interstate 20 (I-20) and extends southeasterly. From west to east, LA 3132 has interchanges at West 70<sup>th</sup> Street, Walker Road, Jewella Avenue, Mansfield Road (US 171), Interstate 49 (I-49), Line Avenue/Ellerbe Road, and Bert Kouns Industrial Loop (LA 526), before reaching its eastern terminus at East Flournoy Lucas Road (LA 523). The concepts for the extension of LA 3132 developed in this study will begin east of the interchange at LA 526. The established logical termini to be evaluated in this study are Youree Drive (LA 1) and the future I-69 corridor to the south. See **Figure 1** below for the project area.

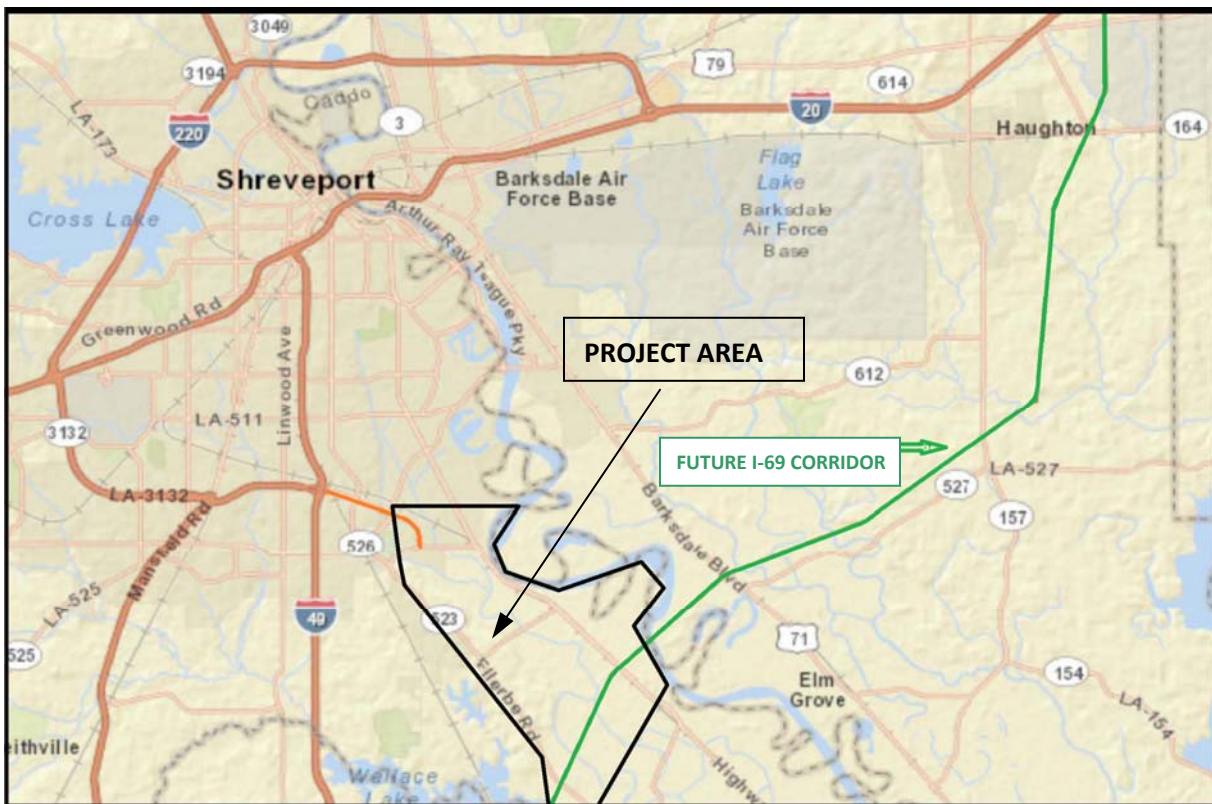


Figure 1: Project Area



The purpose of this study is the identification, collection of data, and an environmental inventory of the proposed actions or the no build action for the extension of LA 3132. Data was collected by document and records reviews, meetings with the public, local and state officials, stakeholders, the Port Commission, and site surveys. The concepts evaluated as part of this study were developed for the purpose of determining practical feasibility. The concepts were developed to an appropriate level of detail as to provide a rational basis for the evaluation and comparison of the technical, environmental, and financial aspects of each concept. However, any concepts presented in this report will be further evaluated per the National Environmental Policy Act (NEPA) requirements. Additionally new concepts can be derived during the NEPA process. It should be noted that a topographic survey of the area was not included in the scope of this study effort; and to that end, there are design elements such as cross-sectional drainage areas and cut and fill volumes that were not developed to the level of detail necessary in subsequent stages of the project delivery process. Contingencies have been incorporated into the cost estimates to account for the use of limited information in this study.

The following three project objectives were identified for the extension of LA 3132:

- Identify viable alternatives with the goal of improving the overall performance of the transportation network;
- Facilitate modal interrelationships with port facilities and the major operations along the corridor;
- Facilitate long-term economic development for the City of Shreveport through the connectivity with I-69 linking Indianapolis, Indiana to Houston, Texas through Memphis, Tennessee and Shreveport-Bossier City, Louisiana.

## 2.0 Background

The proposed extension of LA 3132 has evolved over a number of years with several studies of the project area. In July of 1991, the City of Shreveport obtained professional services to develop a corridor study for the extension of LA 3132 from its terminus (in 1992) at Bert Kouns Industrial Loop (LA 526), over the Red River, and to Interstate 20 near Haughton, LA. Development in this area of the city has taken place since this study and has made corridor preservation difficult. In 1995, the 2,000 acre Caddo-Bossier Parish Port Facility was constructed along the Red River and LA 1, approximately four miles south of the limits of the City of Shreveport. Azalea Gardens Assisted Living and Retirement Communities, located on north side of LA 523, approximately one mile to the west of the intersection of LA 523 and LA 1, was developed in 1996. In 2003, the Caddo-Bossier Metropolitan Area Transportation Plan Update was developed. The development of Twelve Oaks Subdivision, located on the south side of LA 523, approximately one mile to the west of the intersection of LA 523 and LA 1, began in 2005. In May of 2005, a Draft Environmental Impact Study on a proposed 35 mile four-lane divided highway (Interstate 69) on new location between US Highway 171 and Interstate 20 in Bossier Parish was published in the Federal Registry. In 2007, the extension of

LA 3132 from LA 526 to its current terminus, LA 523, was constructed. In 2010, the widening of LA 523 to a 5-lane facility was constructed.

### 3.0 Need

The project needs were developed through a review of existing and projected data (traffic, land use and development), review of several transportation plans and prior reports, and discussions with the project team and interested stakeholders.

Four primary needs have been identified that the completion of the extension of LA 3132 would address:

- System Linkage- Enhance connectivity between Interstate routes;
- Intermodal Connectivity- Facilitate the movement of goods to and from rail and port facilities;
- Economic Development- Advance fiscal development in this region through transportation access to major economic areas west of Shreveport, LA through a better connection of LA 3132 to the future I-69 corridor;
- Consistency with Statewide/Metropolitan Transportation Plans- The extension of LA 3132 would be in concurrence with state and local transportation and economic plans. This project was categorized in the High Priority Transportation Improvement Projects Program in the *Northwest Louisiana Long Range Transportation Plan Update (2009-2030)*. Also, the project was mentioned in the Port's *2011 Annual Report* as having adopted a resolution of support for the completion of Louisiana Highway 3132 to the Port. The Report states that "as Port activity increases, there will be a need for an area loop that will eventually tie into I-69". Also, "extending 3132 from its current terminus at Flournoy Lucas Road is the next step and the Port has supported completion of the steps to facilitate the 3132 extension".

### 4.0 Existing Conditions

#### 4.1 Land Use

The identified land use within the study area is a combination of residential, commercial, industrial and agricultural development. Residential developments throughout the study area are predominately single-family homes located within subdivisions or accessed directly from local roads. The Acadiana Place and Twelve Oaks Subdivisions, both of which are accessed from LA 523, are situated northwest and southeast of the current LA 3132 Inner Loop terminus. In an effort to maintain the

integrity of the subdivision, attention was given toward minimizing impact to this area from the proposed alignments.

Multiple family and retirement facilities also exist along LA 523 near the current LA 3132 Inner Loop terminus. The Glen Retirement System and the Azalea Estates Assisted Living Community, both of which are adjacent to the LA 3132 terminus, were taken into consideration when evaluating traffic operations for the proposed alignments and maintaining access to driveways on LA 523. Commercial businesses are primarily located north of LA 523 along LA 1 and Ellerbe Road. However, additional commercial properties can also be found in other parts of the study area.

Oil and gas fields and gas pipelines are scattered throughout the study area in a variety of land use settings. After discussions with local agencies and evaluating the results of the Environmental Data Resource (EDR), it was determined that the majority of the active gas wells were placed between LA 523 and Leonard Road. In addition to oil and gas wells, a network of natural gas pipelines has also been identified throughout the project area. The majority of the underground pipelines travel along the banks of Pierre Bayou and Sand Beach Bayou. The southern portions of the pipeline occupy developed farmland south of Robson Road.

The Port of Caddo-Bossier utilizes land located on the Red River waterway for industrial operations. The land used within the port is mainly occupied by warehouse facilities and other infrastructure for commodity fabrication and shipping. The port also owns over 2,300 acres of industrial zoned property to accommodate for future port expansion.

Agricultural developed land can be found throughout the project study area. The majority of this land is south of Robson Road. Other portions are located between Leonard Road and Robson Road. After collecting data from aerial photography and site visits, it is evident that the majority of the developed land serves a variety of purposes. The land is not only used for farmland but also gas wells, airport runways and other commercial and industrial facilities. **Figure 2**, page 5 shows the land usage within the project area.

LA 3132 EXTENSION STAGE 0 REPORT

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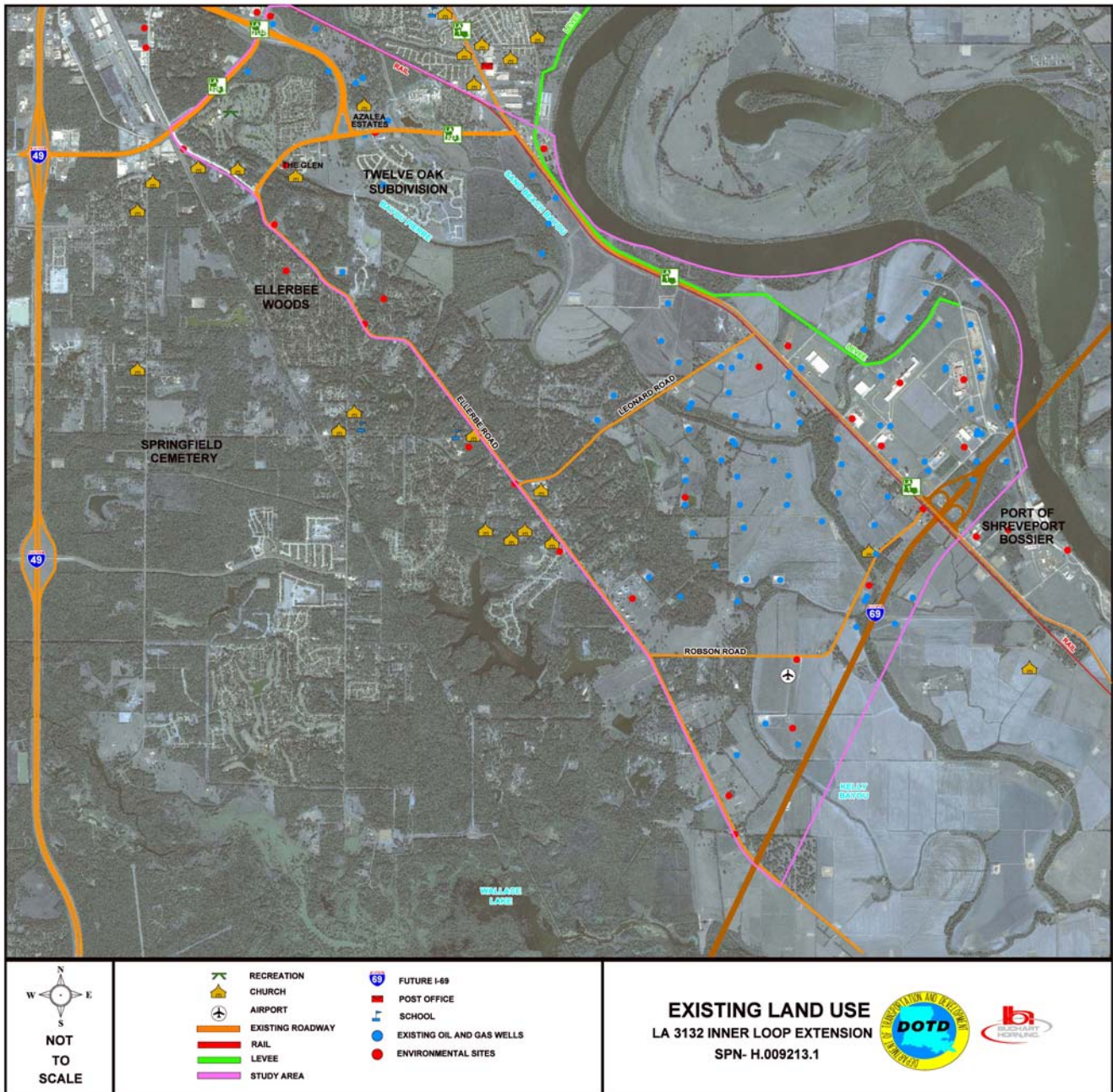


Figure 2: Land Usage





## 4.2 Geometric Layout

The existing LA 3132 extension to LA 523 was constructed in January 2005. The project extended the existing LA 3132 from its existing terminus at Bert Kouns Industrial Loop (LA 526) to Flournoy Lucas Road (LA 523). LA 3132 follows LADOTD Freeway-2 design criteria with a 60 MPH design speed.

Youree Drive (LA 1) is an urban arterial roadway with a design speed of 45 MPH. It is a 4-lane divided highway with 12' lanes and a median that varies in width. The roadway intersects with LA 523 at a signalized intersection where a dedicated left turn lane and protected left turn signal is provided. The roadway also provides access to commercial businesses and facilities for the Port of Caddo-Bossier and other roadways such as the Bert Kouns Industrial Loop (LA 526) and Interstate 20.

According to the *Draft Environmental Impact Statement – Interstate 69* developed by the Federal Highway Administration (FHWA) and the Louisiana Department of Transportation and Development (LADOTD), the future I-69 roadway will be a four-lane, divided, fully controlled access facility on new construction and designed to freeway standards. The new road will have a 70 MPH design speed with 12' lanes, 4' inside shoulders and 10' outside shoulders. The proposed I-69 interchange at LA 1 has a cloverleaf configuration.

## 4.3 Existing Traffic

In early November 2011, seven day, twenty-four (24) hour tube counts and one day AM and PM peak hour turning movement counts were performed in various locations within the study area. The collected traffic data was used to develop traffic models in Synchro software for the existing conditions. The results of each traffic model provided the existing Level of Service (LOS), Delay and Volume-to-Capacity ratio for the analyzed intersections. This data was then used for the evaluation of all future traffic conditions. HCS software was also used to determine the existing density and LOS for LA 3132 and LA 1.

LOS is a term used to represent the perspective of drivers and is an indication of the comfort and convenience associated with driving. The LOS of a roadway is also based on the density of vehicles on a road, intersection, or at an interchange, which is expressed in passenger cars per mile, per lane. **Figure 3**, page 7 describes the methodology defined by the Transportation Research Board (TRB) Highway Capacity Manual for Level of Service (LOS).

Level of Service			
A	Represents free-flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high.		Excellent
B	Within the range of stable flow, but the presence of others in the traffic stream begins to be noticeable. Freedom to select desired speed is relatively unaffected, but there is slight decline in the freedom to maneuver within the traffic stream.		Good
C	Within the range of stable flow, but LOS C marks the beginning of the range of flow in which operation of individual users becomes significantly affected by interactions with others in the traffic stream.		Acceptable
D	LOS D represents high-density, but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.		Congested
E	LOS E represents operating conditions at or near capacity levels. Freedom to maneuver within the traffic stream is extremely difficult. Comfort and convenience levels are extremely poor, and driver frustration is generally high.		Severely Congested
F	LOS F is used to define forced or breakdown flow. This condition exists when the amount of traffic approaching a point exceeds the amount which can traverse the point.		Failure

**Figure 3: Level of Service (LOS)**

According to the Highway Capacity Manual, delay is defined as the additional travel time experienced by a driver, passenger, or pedestrian. Density is the number of vehicles on a roadway segment averaged over space, usually expressed as vehicles per mile or vehicles per mile per lane. Both parameters are used to characterize the quality of traffic operations.

The vehicle-to-capacity ratio (v/c ratio) indicates the percentage of total available roadway capacity that is being used during the peak traffic period. This performance standard for highways varies according to location, category and function of the highway.

The LA 3132 Stage 0 Traffic Study Report, which is provided in **Appendix D**, presents the results of the HCS analysis, the locations of each evaluated intersection, and the corresponding Synchro traffic model results based on the 2011 traffic data.

## 5.0 Description of Build Alternatives

The as-built plans for the existing LA 3132 extension along with the improvements at LA 523 were reviewed to identify necessary geometry and elevations needed to develop the proposed build alternatives. The majority of the existing ground elevations are based on Light Detection and Radar (LIDAR) data. It should be noted that finished grades of the alignment should be re-evaluated when topographic survey is complete. Following the review of existing data and the incorporation of both technical and public input, four (4) build alternatives were developed in accordance with LADOTD Freeway-2 design criteria. The feasibility of each alternative was examined in reference to its capability of meeting the purpose and need. In addition to evaluating the four (4) build alternatives, the “No Build” alternative assessed the effects on the LA 3132 study area without the proposed improvements. **Figure 4**, page 9 shows the four (4) build alternatives described in this section of the report.



LA 3132 EXTENSION STAGE 0 REPORT

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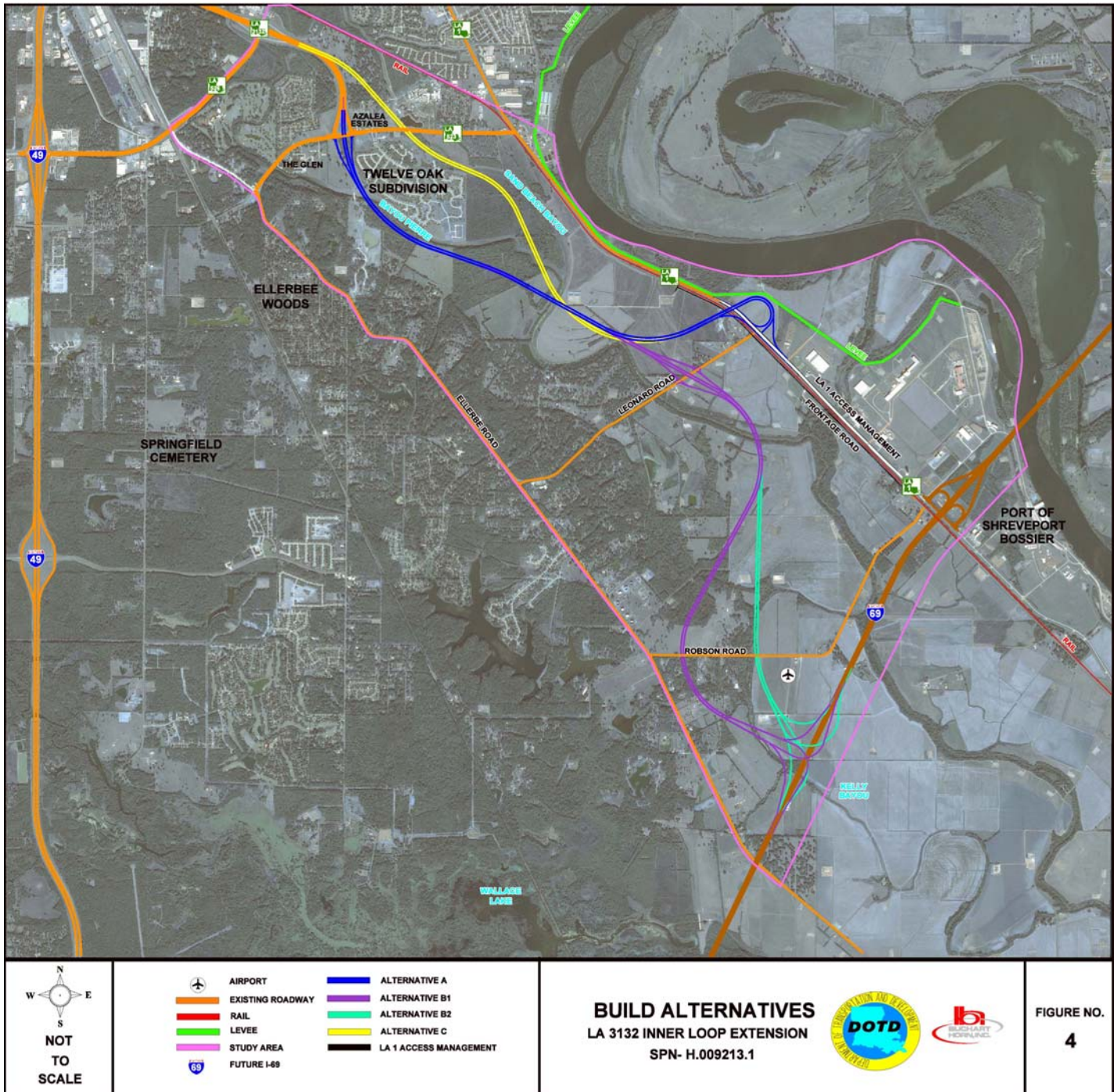


Figure 4: Build Alternatives





The conceptual design of the roadway, ramps and bridges for each build alternative complies with the LADOTD Freeway-2 (F-2) design criteria and the LADOTD Road Design Manual. All build at-grade portions of the alternatives have 4 – 12’ lanes, a 68’ depressed median, and open ditches. **Table 1** lists the design criteria.

**Table 1: Design Criteria**

DESIGN FEATURES		Urban Freeway-2		
		MAINLINE	RAMP <sup>1</sup>	RAMP <sup>2</sup>
Design Speed		60 mph	45 mph	30 mph
Travel Lane Width		12 Ft.	15 Ft.	15 Ft.
Shoulders	Inside	6 Ft.	4 Ft.	4 Ft.
	Outside	10 Ft.	8 Ft.	8 Ft.
Pavement Cross-Slope	Normal	2.5%	2.5%	2.5%
	Maximum	8.0%	8.0%	8.0%
Stopping Sight Distance		570 Ft.	250 Ft.	200 Ft.
Minimum Radius with Full Superelevation		1,100 Ft.	700 Ft.	235 Ft.
Maximum Grade	Down	3.0%	4.0%	4.0%
	Up	3.0%	5.0%	7.0%
Minimum Vertical Clearance	Roadways	16'-6"	16'-6"	16'-6"
	Railroads	23'-6"	23'-6"	23'-6"
Fore Slope Ratio		1:6	1:6	1:6
Back Slope Ratio		1:4	1:4	1:4
Bridge Design Load		HS-20	HS-20	HS-20
Design Specifications	Roadway Design	AASHTO / DOTD Road Design Manual	AASHTO / DOTD Road Design Manual	AASHTO / DOTD Road Design Manual
	Bridge Design	AASHTO / DOTD Bridge Design Manual	AASHTO / DOTD Bridge Design Manual	AASHTO / DOTD Bridge Design Manual

1.) Applies to ramp curvature at LA 523, Leonard Road, and the future I-69 and proposed LA 3132 extension interchanges.

2.) Applies to ramp curvature for the interchange at LA 1 and the proposed LA 3132 extension.



The following sections will describe the geometric layout of each build alternative, along with a brief summary of the key traffic findings from the Traffic Report completed for this study by Alliance Transportation Group, Inc. Please refer to **Appendix D** for this report.

### 5.1 Build Alternative A

Alternative A (shown in blue in **Figure 4**) proposes to extend LA 3132 from its existing terminus at LA 523 to LA 1. The extension of LA 3132 is a 3.3-mile, 4-lane divided roadway on new location. The existing intersection at LA 523 and LA 3132 will become a full diamond interchange. South of the interchange with LA 523, the depressed median transitions from the existing 64' width to the minimum 68' width, as required in the LADOTD F-2 design criteria. The proposed location of the overpass and corresponding ramps minimizes impact to the Twelve Oaks subdivision east of the LA 3132 off-ramp and maintains access for local property owners west of the on-ramp. In order to further minimize impact to these surrounding residential areas, noise mitigation should be evaluated during the NEPA process.

South of the interchange with LA 523, the alignment crosses Pierre Bayou with an at-grade bridge and then shifts eastward along Pierre Bayou. The alignment then continues southeasterly, crossing Sand Beach Bayou; it then continues for approximately 2500' and then shifts northeast towards Youree Road (LA 1). Once the new alignment shifts northeast towards LA 1, the LA 3132 mainline terminates and ramps for the trumpet interchange at LA 1 begin. The location of the trumpet interchange provides access to LA 1 while minimizing impact to existing rail and port facilities. Refer to **Appendix A – Alternative A** for Exhibits.

Ramp A is elevated to overpass LA 1, Union Pacific rail and frontage road; it provides access to LA 1 northbound towards LA 523. Ramp B is elevated to overpass Union Pacific rail and a frontage road and provides access to travel south on LA 1. Access to Ramp C begins from a designated yield controlled left turn lane from southbound LA 1. The ramp overpasses LA 1, Union Pacific rail and a frontage road to westbound LA 3132. Access to Ramp D is via an auxiliary lane from LA 1 northbound. The ramp overpasses LA 1, Union Pacific rail and a frontage road travel west on LA 3132 mainline. Refer to **Appendix A – Alternative A & C Ramps** for Exhibits.

### 5.1.1 Traffic

All roadway segments evaluated for Build Alternative A were projected to acceptable levels of operation. **Table 2** shows the density and level of service (LOS) for the studied corridors for Alternative A.

**Table 2:** Alternative A Summary of Traffic

Roadway Segment	Limits	Direction	MOEs	Projected 2015		Projected 2032	
				AM Peak	PM Peak	AM Peak	PM Peak
LA 3132	Between LA 526 & LA 523	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	8.5	5.6	10.5	6.9
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	6.4	7.3	7.6	9.3
	Between LA 523 & LA 1	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	3.6	2.2	4.4	2.4
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	2.3	2.8	2.6	3.5
LA 1	Between LA 523 & LA 3132 Extn.	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	4.4	3.6	6.0	4.0
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	3.2	3.7	4.8	5.1

### 5.2 Build Alternative B1

Alternative B1 (shown in purple in **Figure 4**) proposes to extend LA 3132 from its existing terminus at LA 523 to I-69. The extension of LA 3132 is a 6.6-mile, 4-lane divided roadway on new location. Alike Alternative A, the existing intersection at LA 523 and LA 3132 will become a full diamond interchange. South of interchange with LA 523, the depressed median transitions from the existing 64' width to the minimum 68' width, as required in the LADOTD F-2 design criteria. Alternative B1 then continues southeasterly for approximately 2000' to intersect Leonard Road with a diamond interchange. The new 4-lane divided roadway is extended to overpass Leonard Road with a new fixed span bridge. The eastbound and westbound exit ramps provide access to and from Leonard Road and the LA 3132 mainline. The interchange is located to minimize impact and maintain access for local driveways along Leonard Road. However, it should be

noted that re-routing access roads for property owners near the exit ramps on the eastern side of Leonard Road should be considered in later stages of the project delivery process.

Following the diamond interchange at Leonard Road, the alignment crosses Sand Beach Bayou and continues south for approximately 1.6 miles through portions of agricultural and forested areas. The proposed alignment then crosses over Robson Road with a proposed overpass. The roadway then continues for approximately 2000' where the mainline for LA 3132 terminates and ramps for the semi directional interchange at the future I-69 begin. Refer to **Appendix A – Alternative B1** for Exhibits.

The semi directional interchange at this location provides free flow access from LA 3132 to I-69 northbound and southbound and from I-69 to LA 3132 eastbound and westbound. The location of the mainline and interchange minimizes impact to a major oil well and Naylor Airport, located to the east of this proposed interchange. Also, to comply with policies established by LADOTD for interchange access and spacing, the LA 3132 interchange at I-69 was spaced at a minimum of two (2) miles from the proposed I-69 interchange at LA 1. This allows for standard uniform highway signage to be established where necessary. Refer to **Appendix A – Alternative B1 Ramps** for Exhibits.

Phasing of the proposed alignment is recommended in order to allow the completion of I-69. Phasing can also be beneficial if funding is insufficient to fully construct the proposed extension to I-69. Phase I will extend the diamond interchange at LA 523 and terminate at Leonard Road. For Phase I, a comprehensive evaluation of Leonard Road is recommended in further stages of project planning. Upgrading, additional capacity, and/or intersection improvements may be required on Leonard Road between this interchange to LA 1. Phase II will commence upon the completion of I-69 and consists of the extension of the diamond interchange at Leonard Road to the interchange with I-69.

Refer to **Figure 5**, page 14 for Alternative B1 Phasing.



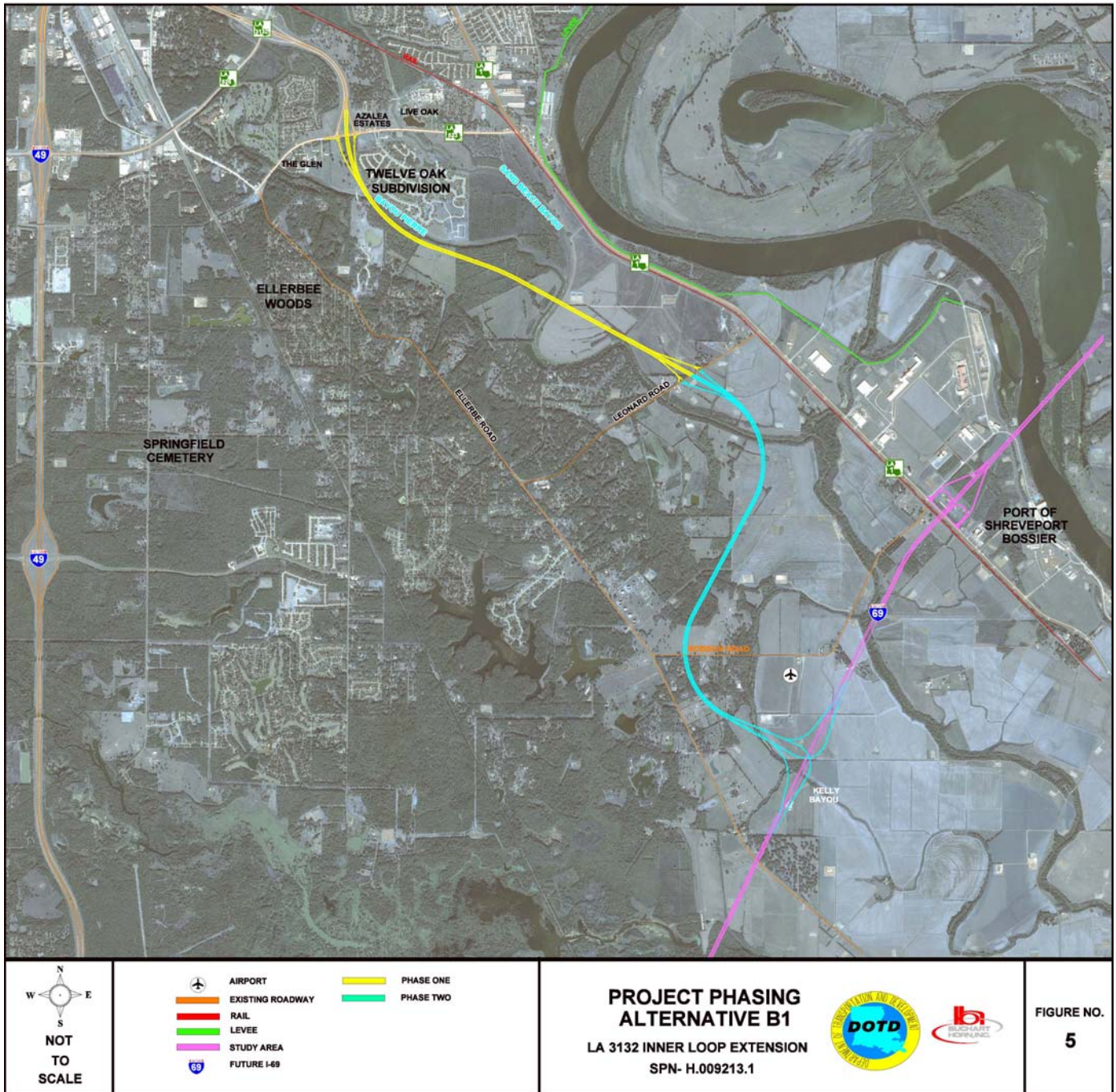


Figure 5: Alternative B1 Phasing

### 5.2.1 Traffic

All roadway segments evaluated for Build Alternative B1 were projected to acceptable levels of operation. **Table 3** shows the density and level of service (LOS) for the studied corridors for Alternative B1.

**Table 3:** Alternative B1 Summary of Traffic

Roadway Segment	Limits	Direction	MOEs	Projected 2015		Projected 2032	
				AM Peak	PM Peak	AM Peak	PM Peak
LA 3132	Between LA 526 & LA 523	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	7.6	5.3	10.5	6.8
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	6.3	7.0	7.4	9.0
	Between LA 523 & Leonard Rd	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	0.4	0.3	0.7	0.3
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	0.3	0.4	0.3	0.5
LA 1	Between Leonard Rd & future I-69	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	0.2	0.2	0.3	0.3
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	0.2	0.2	0.3	0.3
	Between LA 523 & Leonard Rd	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	7.5	5.7	9.9	6.8
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	5.9	6.8	6.9	9.4

### 5.3 Build Alternative B2

Alternative B2 (shown in turquoise in **Figure 4**) proposes to extend LA 3132 from its existing terminus at LA 523 to I-69. The extension of LA 3132 is a 5.9-mile, 4-lane divided roadway on new location. Alike Alternative A and B1, the existing intersection at LA 523 and LA 3132 will become a full diamond interchange. South of the interchange with LA 523, the depressed median transitions from the existing 64' width

to the minimum 68' width, as required in the LADOTD F-2 design criteria. North of the Leonard Road interchange, Alternative B2 shares the same geometric alignment as Alternative B1.

South of the interchange, Alternative B2 crosses Sand Beach Bayou and continues south for approximately 1.3 miles through portions of agricultural developed land and forested areas. The proposed alignment then crosses Robson Road at grade and a new elevated overpass is proposed for Robson Road. The determination of whether the overpass at Robson Road should be separated or included in this project, the type and location of the bridge, and all associated costs should be further evaluated in the NEPA process. The roadway then continues for approximately 1500' where the mainline for LA 3132 terminates and ramps for the semi directional interchange at the future I-69 begin. By realigning the portions of the alignment between Robson Road and the future I-69, Alternative B2 reduces its overall length and impact to residential property within this area. However, this alternative has a higher potential to impact the Naylor Airport and local gas wells. Also, the position of the mainline approaching the future I-69 creates a skew angle that changes the configuration of the semi directional interchange found on Alternative B1. Refer to **Appendix A – Alternative B2 Ramps** for Exhibits.

The semi directional interchange at this location provides free flow access from LA 3132 to I-69 northbound and southbound and from I-69 to LA 3132 eastbound and westbound. Also, to comply with policies established by LADOTD for interchange access and spacing, the LA 3132 interchange at I-69 was spaced at a minimum of two (2) miles from the proposed I-69 interchange at LA 1. This allows for standard uniform highway signage to be established where necessary. Refer to **Appendix A – Alternative B2 Ramps** for Exhibits.

Phasing of the proposed alignment is recommended in order to allow the completion of I-69. Phasing can also be beneficial if funding is insufficient to fully construct the proposed extension to I-69. Phase I will extend the diamond interchange at LA 523 and terminate at Leonard Road. For Phase I, a comprehensive evaluation of Leonard Road is recommended in further stages of project planning. Upgrading, additional capacity, and/or intersection improvements may be required on Leonard Road between this interchange to LA 1. Phase II will commence upon the completion of I-69 and consists of the extension of the diamond interchange at Leonard Road to the interchange with I-69.

Refer to **Figure 6**, page 17 for Alternative B2 Phasing.



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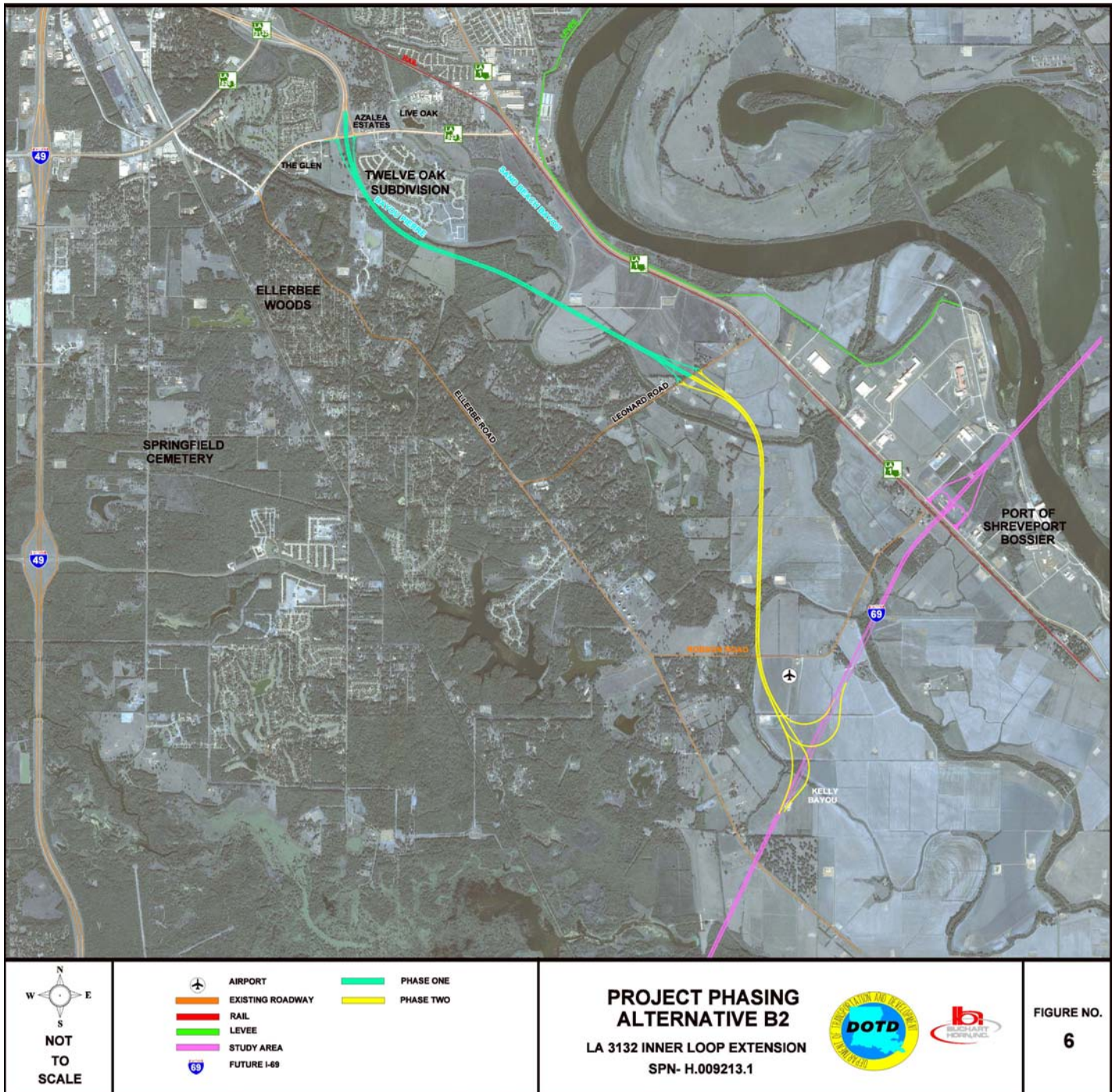


Figure 6: Alternative B2 Phasing





### 5.3.1 Traffic

Operational differences between Alternative B1 and Alternative B2 were found to be almost negligible, as this route was found to only be 30 seconds faster than Alternative B1. Therefore, all roadway segments evaluated for Build Alternative B2 were projected to acceptable levels of operation as previously stated in Alternative B1.

## 5.4 Build Alternative C

Alternative C (shown in yellow in **Figure 4**) proposes to extend LA 3132 from approximately 400' east of the diamond interchange at the Bert Kouns Industrial Loop (LA 526) to LA 1. The extension of LA 3132 is a 3.8-mile, 4-lane divided roadway on new location.

The existing LA 3132 extension and ramps that terminate at LA 523 will be removed or modified to become part of the local street network. This modification of the existing LA 3132 to LA 523 should comply with DOTD design standards for local roads and should be further evaluated in later stages. At the location of the proposed crossing of Alternative C with LA 523, constraints such a power substation and retirement communities and a residential pond exist. These impacts were taken into consideration and based on their significance, it was determined that an interchange at this location would not be developed at this time.

The alignment then proceeds south for approximately 1500' through a portion of forested area and then on elevated structure to overpass LA 523 and Sand Beach Bayou. The alignment then turns south to cross both Sand Beach Bayou and Pierre Bayou and continues east for approximately 2500'. The new alignment then shifts northeast towards LA 1, the LA 3132 mainline terminates, and ramps for the trumpet interchange at LA 1 begin. Refer to **Appendix A – Alternative C** for Exhibits.

Build Alternatives C shares the same ramp configuration as Alternative A. Refer to **Appendix A – Alternative A & C Ramps** for Exhibits.

### 5.4.1 Traffic

All roadway segments evaluated for Build Alternative C were projected to acceptable levels of operation. **Table 4** shows the density and level of service (LOS) for the studied corridors for Alternative C.

**Table 4:** Alternative C Summary of Traffic

Roadway Segment	Limits	Direction	MOEs	Projected 2015		Projected 2032	
				AM Peak	PM Peak	AM Peak	PM Peak
LA 3132	Between LA 526 & LA 1	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	3.7	2.3	4.4	2.3
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	2.1	2.6	2.2	3.3
LA 1	Between LA 523 & Leonard Rd	Northbound	LOS	A	A	A	A
			Density (pc/mi/ln)	3.9	3.5	6.0	4.1
		Southbound	LOS	A	A	A	A
			Density (pc/mi/ln)	3.7	3.8	4.0	5.1

### 5.5 Alternative A & B Single Point Urban Interchange (SPUI) Option

The single-point urban interchange (SPUI) at Flournoy Lucas Road (LA 523) implements the overpass design option where the major roadway (LA 3132) crosses the minor roadway (LA 523). The corresponding ramps provide access to and from LA 523 and the LA 3132 mainline. Vehicles performing left turns to and from LA 523 are controlled by a single traffic signal. This provides the opportunity for less right-of-way acquisition. In addition, the footprint of the SPUI allows for right turn movements to be performed while maintaining access to existing drives and property development along LA 523. Refer to **Appendix A – SPUI Option** for Exhibits.

#### 5.5.1 Traffic

The proposed interchange of LA 3132 and LA 523 was analyzed as a Single Point Urban Interchange (SPUI). The operations with this proposed configuration are projected to be acceptable for AM as well as PM peak periods in the years 2015 and 2032.

## 5.6 LA 1 Access Management

In order to provide a better connection to the future I-69 corridor, access management is suggested for the portion of LA 1 between the future LA 1/I-69 interchange and the proposed LA 1/LA 3132 interchange. Access management techniques should be further evaluated in later stages of the project. Refer to **Appendix A – Alternative A&C Ramps** for an exhibit of LA 1 Access Management.

The following are suggestions for limiting access along LA 1:

- Western side of LA 1: On the western side of the Union Pacific Rail, all drives and local roads will tie into a frontage road. Traffic should be diverted along the frontage road to the north/south sides of the two referenced interchanges by means of an at-grade crossing to LA 1. Two at-grade crossings that currently exist to the north and south sides of these interchanges will be used for access to LA 1. All existing at-grade rail crossings on this portion of LA 1 between the interchanges will be removed.
- Eastern side of LA 1: Drives with direct access to LA 1 should be re-routed to tie into one of the three Port gates along the portion of LA 1 between the future LA 1/I-69 interchange and LA 1/LA 3132 interchange.

## 6.0 Impacts

The right-of-way and utility relocation impacts, along with potential impacts to the environment associated with the proposed alternatives will be summarized below.

### 6.1 Right-of-Way Acquisition

The required right-of-way acquisition for each build alternative was identified. The right-of-way for at-grade roadways and bridge sections of each build alternative were based on standards established by LADOTD and existing right-of-way widths from the LA 3132 extension to Flourney Lucas Road (LA 523) as-built plans.

**Table 5** provides the overall length and the required right-of-way for each build alternative.

**Table 5: Required Right-of-Way**

Build Alternative	Length (Miles)	Required Right-of-Way (Acres)
Alternative A	3.27	122
Alternative B1	6.58	268
Alternative B2	5.88	239
Alternative C	3.75	142
Alternative A with SPUI option	3.27	117
Alternative B1 with SPUI option	6.58	263
Alternative B2 with SPUI option	5.88	234

It should be noted that the required right-of-way listed is approximate and will require further evaluation in later stages.

## 6.2 Utility Impacts

As previously discussed in **Section 4.1**, 24 underground pipelines were located within the project boundaries along the banks of Pierre Bayou and Sand Beach Bayou. Based on the proposed locations for Build Alternatives A, B1, B2, and C, portions of these existing pipelines are crossed by the proposed alignments. Conducting a thorough assessment of any potential impacts to underground pipelines will require additional information from pipeline companies (pipeline depths, pipe material, encasements, etc.) in subsequent stages of the planning phase for the project. This information will assist in identifying the appropriate guidelines and standards to be used relative to the pipe design and use. Once specific pipeline information is available, standards established within the LADOTD EDSM IV.2.1.9, the Code of Federal Regulations (subpart D 195.256) and other directives should be reviewed to identify appropriate policies.

## 6.3 Environmental

A summary of the potential environmental impacts for each of the build alternatives is summarized below. Refer to **Appendix B** for the Environmental Checklist and **Appendix C** for the full Environmental Summary Report completed for this Stage 0 Study.

Potential environmental impacts for Alternative A:

- Two (2) potential residential relocations;
- Two (2) archaeological sites;
- One (1) underground storage tank, one (1) oil and gas well and three (3) water wells located within 50 feet of the required right-of-way;
- 74.4 acres of prime farmlands.
- A transmission tower is located approximately 100' from a structural ramp for Alternative A, but it is not anticipated that this tower will need relocation.

Potential environmental impacts for Alternative B1:

- Nine (9) potential residential relocations;
- Two (2) potential commercial relocations;
- Six (6) archaeological sites;
- Seven (7) oil and gas wells and seven (7) water wells located within 50 feet of the required right-of-way;
- 13.9 acres of the 100-year flood plain and 187.9 acres of prime farmlands.

Potential environmental impacts for Alternative B2:

- Two (2) potential residential relocations;
- Two (2) potential commercial relocations;
- Potential relocation of a gas meter station and Naylor Airport (landing strip located 1,000 feet east of required right-of-way);
- Six (6) archaeological sites;
- Six (6) oil and gas wells and seven (7) water wells located within 50 feet of the required right-of-way;
- 9.3 acres of the 100-year flood plain and 211.5 acres of prime farmlands.



Potential environmental impacts for Alternative C:

- Two (2) potential residential relocations;
- Two (2) archaeological sites;
- One (1) underground storage tank, two (2) oil and gas wells and three (3) water wells located within 50 feet of the required right-of-way;
- 79.5 acres of prime farmlands.
- A transmission tower is located approximately 100' from a structural ramp for Alternative C, but it is not anticipated that this tower will need relocation.

Although the required right-of-way is slightly less for the SPUI option with each of the alternatives, the potential environmental impacts were found to be the same for the alternatives with or without the SPUI option.

It should be noted that there was an oil spill near Leonard Road and LA 1. In August of 2006, the remediation process began for the spill. This should be further researched in subsequent stages of planning. All information and documentation pertaining to this file can be researched and tracked using the LA DEQ Agency Interest Number 142411.

## 7.0 Preliminary Cost Estimates

A preliminary cost estimate has been prepared for the alternatives using average cost information in accordance with the LADOTD Project Delivery Manual. The cost includes construction, right-of-way, engineering, survey, and contingency as expressed in 2012 dollars.

It should be noted that the intention for the preliminary cost estimate is to provide an initial review of the commitment required to construct the project. Also, any adjustments to these alignments in more detailed studies and survey in future stages in the LADOTD project development process may result in major changes to the cost estimate of these alternatives presented on pages 24 and 25. See **Table 6 – Table 9** for Build Alternative Cost Estimates, page 24-25.

**Table 6: Alternative A Cost Estimate**

Preliminary Conceptual Cost Estimate	
Alternative A <sup>1</sup>	
Cost Category	Estimated Cost
Engineering Design (8% of Construction)	\$5,286,400
Environmental Assessment (EA)	\$400,000
Right-Of-Way & Control of Access Acquisition <sup>(A)</sup>	\$6,835,000
Utility Relocation	\$9,000,000
Construction	\$66,080,000
<i>Mainline (At-Grade Roadway)</i>	\$8,080,000
<i>Mainline (Bridge Structure)</i>	\$8,000,000
<i>LA 523 Diamond Interchange Extension<sup>(B)</sup></i>	\$10,000,000
<i>Trumpet Interchange at LA 1</i>	\$40,000,000
<b>Subtotal</b>	<b>\$87,601,400</b>
<b>Contingency (15%)</b>	<b>\$13,140,210</b>
<b>Total</b>	<b>\$100,741,610</b>

<sup>1</sup>When considering a Single Point Urban Interchange at LA 523 for this Alternative:

<sup>(A)</sup> Replace this line item with a cost of \$6,760,000;

<sup>(B)</sup> Replace this line item with a cost of \$20,000,000.

**Table 7: Alternative B1 Cost Estimate**

Preliminary Conceptual Cost Estimate	
Alternative B1 <sup>1</sup>	
Cost Category	Estimated Cost
Engineering Design (8% of Construction)	\$8,377,440
Environmental Assessment (EA)	\$400,000
Right-Of-Way & Control of Access Acquisition <sup>(A)</sup>	\$9,020,000
Utility Relocation	\$13,000,000
Construction	\$104,718,000
<i>Mainline (At-Grade Roadway)</i>	\$16,718,000
<i>Mainline (Bridge Structure)</i>	\$12,000,000
<i>LA 523 Diamond Interchange Extension<sup>(B)</sup></i>	\$10,000,000
<i>Leonard Road Diamond Interchange</i>	\$13,000,000
<i>Semi-Directional Interchange at I-69</i>	\$53,000,000
<b>Subtotal</b>	<b>\$135,515,440</b>
<b>Contingency (15%)</b>	<b>\$20,327,316</b>
<b>Total</b>	<b>\$155,842,756</b>

<sup>1</sup>When considering a Single Point Urban Interchange at LA 523 for this Alternative:

<sup>(A)</sup> Replace this line item with a cost of \$8,945,000;

<sup>(B)</sup> Replace this line item with a cost of \$20,000,000.



**Table 8: Alternative B2 Cost Estimate**

Preliminary Conceptual Cost Estimate	
Alternative B2 <sup>1</sup>	
Cost Category	Estimated Cost
Engineering Design (8% of Construction)	\$8,769,440
Environmental Assessment (EA)	\$400,000
Right-Of-Way & Control of Access Acquisition <sup>(A)</sup>	\$9,090,000
Utility Relocation	\$17,000,000
Construction	\$109,618,000
<i>Mainline (At-Grade Roadway)</i>	\$14,618,000
<i>Mainline (Bridge Structure)</i>	\$12,000,000
<i>LA 523 Diamond Interchange Extension<sup>(B)</sup></i>	\$10,000,000
<i>Leonard Road Diamond Interchange</i>	\$13,000,000
<i>Semi-Directional Interchange at I-69</i>	\$60,000,000
<b>Subtotal</b>	<b>\$144,877,440</b>
<b>Contingency (15%)</b>	<b>\$21,731,616</b>
<b>Total</b>	<b>\$166,609,056</b>

<sup>1</sup>When considering a Single Point Urban Interchange at LA 523 for this Alternative:

<sup>(A)</sup> Replace this line item with a cost of \$9,015,000;

<sup>(B)</sup> Replace this line item with a cost of \$20,000,000.

**Table 9: Alternative C Cost Estimate**

Preliminary Conceptual Cost Estimate	
Alternative C	
Cost Category	Estimated Cost
Engineering Design (8% of Construction)	\$7,770,560
Environmental Assessment (EA)	\$400,000
Right-Of-Way & Control of Access Acquisition	\$7,128,000
Utility Relocation	\$9,000,000
Construction	\$97,132,000
<i>Mainline (At-Grade Roadway)</i>	\$7,577,000
<i>Mainline (Bridge Structure)</i>	\$49,555,000
<i>Trumpet Interchange at LA 1</i>	\$40,000,000
<b>Subtotal</b>	<b>\$121,430,560</b>
<b>Contingency (15%)</b>	<b>\$18,214,584</b>
<b>Total</b>	<b>\$139,645,144</b>

## 8.0 Public Participation and Community Outreach

*(Public Informational Meeting- Louisiana State University- Shreveport January 24, 2012)*

On January 24, 2012, the Louisiana Department of Transportation and Development (LADOTD) and the project team provided the opportunity for the public to participate in an interactive workshop informational meeting regarding the LA 3132 extension to Flournoy Lucas Road (LA 523). The objective of the meeting was to provide information regarding the status of the proposed project and obtain input from the public regarding possible alternatives. No preliminary layouts were presented during the meeting; however, an exhibit with aerial photography and existing roadways was developed for discussion purposes.

The project team conducted a brief presentation on the parameters of the Stage 0 study to be conducted and provided a project timeline that covered all major milestones that lead up to the public meeting. The interactive exercise was then distributed to all public meeting participants. The participants were divided into groups and given a handout displaying the project boundary so that individuals could sketch what they felt was the best route to connect LA 3132 to the future I-69. Based on the results of each group, the consensus was to connect LA 3132 to LA 1. In addition to the interactive exercise, the public was also given the opportunity to populate comment forms. The comments received mainly focused on the need to complete the extension to provide additional access to major roadways and facilities.

*(Public Information Meeting - Louisiana State University - Shreveport August 2, 2012)*

On August 2, 2012, the Louisiana Department of Transportation and Development (LADOTD) and the project team provided the opportunity for the public to view and comment on the DRAFT findings and report. The Public Meeting was an open house format with five informational stations staged throughout the ballroom with representatives from the project team, LADOTD, and the NLCOG to answer project related questions. The five informational stations were arranged on each side of the ballroom and consisted of the following:

Station 1: Sign-In Table - A handout explaining the meeting, providing the link to the DRAFT Stage 0 Report, and describing each station was distributed at this station.

Station 2: Build Alternative Exhibits - Alternatives A, B1, B2, C, and Single Point Urban Interchange (SPUI) design option



Station 3: Traffic and Land Use Exhibits - AM and PM Peak Hour Traffic Counts for all build alternatives

Station 4: Traffic and Land Use Exhibits - Build Alternatives Comparison Matrix

Station 5: Comments Table - written comment forms were submitted and also accepted via mail postmarked on or before August 12, 2012. An exhibit highlighting the Stage 0 Process was also displayed.

Over 180 participants attended the Public Meeting consisting of concerned and interested citizens, stake holders, land owners, public officials, and government bodies. The LADOTD, NLCOG, and project team interacted with all participants answering questions, explaining the Stage 0 process and planning efforts, describing challenges and reasoning of the alignments, and encouraging written comments. The comments received mainly focused on alternative preference with the majority in favor of Alternative A; however, all other alternatives had support. Land owners and developers also stressed their concerns of pros and cons for each alternative.

**Appendix E** displays the following from both Public Information Meetings:

- Public Meeting #1
- Public Information Meeting Notice
- Proof of Publication and Scanned Newspaper notices
- Power point presentation slides
- Public Comment Forms
  
- Public Meeting #2
- Public Information Meeting Notice
- Proof of Publication and Scanned Newspaper notices
- Public Meeting Handout
- Exhibits Layout
- Public Comment Forms

## 9.0 Alternative Comparison Summary

Refer to **Table 10** for Build Alternatives Comparison Matrix for a comparison of Build Alternatives A, B1, B2, and C. For more information or information on the SPUI option in combination with these alternatives, please refer to previous sections of this report.

**Table 10:** Build Alternatives Comparison Matrix

EVALUATION CRITERIA	BUILD ALTERNATIVE SCENARIOS			
	Alternative A	Alternative B1	Alternative B2	Alternative C
Mainline Length (miles)	3.3	6.6	5.9	3.8
Direct Access to LA 523 from Proposed LA 3132	Yes	Yes	Yes	No <sup>(A)</sup>
Traffic - Mainline Level of Service (LOS)	A	A	A	A
Right-of-Way Acquisition (Acres)	118	261	232	142
Project Cost	\$112,690,340	\$237,136,348	\$282,678,648	\$139,645,144
<b>Structures <sup>(B)</sup></b>				
Residential	2 <sup>(C)</sup>	9 <sup>(D)</sup>	2 <sup>(E)</sup>	2 <sup>(C)(F)</sup>
Commercial	0	2 <sup>(G)</sup>	2 <sup>(G)</sup>	0
Other Structures	0	0	1 <sup>(H)</sup>	0
<b>Crossings</b>				
Water Body Crossings	4	10	8	10
Railroad Crossings	3 <sup>(I)</sup>	0	0	3 <sup>(I)</sup>
Identified Pipeline Crossings	2	4	6	2
<b>Cultural Resources</b>				
Potential to Impact Historic Structures	0	0	0	0
Potential to Impact Archaeological Sites	2	6	6	2
<b>Potential Environmental Liability <sup>(K)</sup></b>				
Underground Storage Tanks	1 <sup>(K)</sup>	0	0	1 <sup>(K)</sup>
Oil and Gas Wells	1	7	6	2
Water Wells	3	7	7	3
<b>Natural Resources</b>				
100-year Flood Plain (acres)	0.0	13.9	9.3	0.0
Potential Hydric Soils (acres)	0.0	0.0	0.0	0.0
Potential Prime Farmlands (acres)	74.4	187.9	211.5	79.5

**NOTES:**

<sup>(A)</sup> This alternative is proposed to overpass LA 523 without providing an interchange with direct access to LA 523 from LA 3132. The existing connection from LA 526 to LA 523 is proposed to be removed or modified to become part of the local street network.

<sup>(B)</sup> These structures were first identified using aerial photography. Field confirmation was made where ROW was accessible; however, due to the new alignment and limited public access, some structures may not be accounted for. These numbers are an estimate, and the actual number depends on which of the alternative routes would be selected and how much redevelopment occurs prior to Stage 1.

<sup>(C)</sup> One residential structure is associated with required ROW for the new LA 1 frontage road. The other structure is north of the levee and is associated with control of access for the LA 1 northbound traffic entrance ramp. The drive may be relocated to a Port Gate in the vicinity.

<sup>(D)</sup> Two residential structures are associated with the interchange at Leonard Road. One structure on Robson Road may fall within the ROW; however, due to canopy coverage, the exact location in relation to the ROW is unknown. Six structures near Station No. 418+00 fall within the required ROW. One structure is a residence and the remaining five are unknown.

<sup>(E)</sup> Two residential structures are associated with the interchange at Leonard Road.

<sup>(F)</sup> A potential third structure may be impacted based on construction activity observed during field observation at The Oaks, adjacent to beginning of the mainline.

<sup>(G)</sup> One commercial structure falls within the required ROW for the LA 3132 entrance ramp from the future I-69 eastbound traffic. The other commercial structure will be affected by control of access along Jeter Road.

<sup>(H)</sup> A meter station is located within the required ROW south of Robson Road. Naylor Airport was also identified in Google Earth off Robson Road. Field confirmations confirmed the runway strip at the Petrohawk Facility approximately 1,000 feet east of the required ROW.

<sup>(I)</sup> These railroad crossings are associated with the interchange at LA 1.

<sup>(J)</sup> Data is based on sites identified in the EDR report and the LDNR SONRIS database within required ROW or within 50 feet. A Phase I Environmental Site Assessment will be conducted as part of the Stage 1 process.

<sup>(K)</sup> The Relay Station Port, located at 10281 LA 1 South, is adjacent to the entrance ramp for LA 1 northbound traffic.

## 10.0 References

American Association of State Highway Transportation Officials. *Geometric Design of Highways and Streets 2004, Fifth Edition*. Washington, D.C: 2004.

NTB, Incorporated. *Inner Loop Extension Corridor Study- Final Report Study of Selected Alignments*. Shreveport, LA: August 1992.

National Archives and Records Administration. *subpart 195.256-Crossing of Railroads and Highways*.