

# STAGE 0 FEASIBILITY STUDY - HOOPER ROAD EXTENSION



East Baton Rouge and Livingston Parishes, LA  
State Project No. H.005403

Prepared for the



Louisiana Department  
of Transportation  
and Development

Final Report – August 2011

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State Project No. H.005403

Prepared for:



**The Louisiana Department  
of Transportation  
and Development**

Prepared by:



in association with:

- Urban Systems Associates, Inc.
- Coastal Environments, Inc.

**Final Report – August 2011**

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# CHAPTER I

## INTRODUCTION

### BACKGROUND

The Louisiana Department of Transportation and Development (LADOTD), in cooperation with East Baton Rouge and Livingston Parishes, determined the need for a Stage 0 Feasibility Study for the proposed extension of Hooper Road (LA 408) from its current terminus at Greenwell Springs Road (LA 37/64) in East Baton Rouge Parish to LA 16 in Livingston Parish. The extension would require a new bridge crossing of the Amite River. The proposed extension is part of the Metropolitan Transportation Plan for the Baton Rouge region.

### PROJECT HISTORY AND JUSTIFICATION

In 1997, Louisiana House Resolution #75(1) called for a feasibility study of constructing a new bridge crossing the Amite River to extend La 408 to LA 16. As listed in the resolution, the purposes of the study included rapid growth in the community (now City) of Central, LA, and the heavy traffic volumes that correspond to such growth. The resolution noted the heavy traffic volumes on the Magnolia Bridge over the Amite River, the nearest vehicular crossing to a possible extension of Hooper Road. To that end, the LADOTD completed in 2000 a feasibility study for the Hooper Road extension. That report was a preliminary evaluation of the several alternatives to aid in determining the feasibility of constructing the extension.

As the first decade of the new century progressed, it became more clear to local leaders and elected officials that the Hooper Road extension was needed, even despite the planned replacement of the existing Magnolia Bridge with a new four-lane structure. The area experienced a residential building boom, generating additional daily traffic -- most of it commuter traffic to and from Baton Rouge. Extension of Hooper Road, along with already planned widening of the road in East Baton Rouge Parish, was seen by local officials as way to create a new four-lane artery for commuters who live in Livingston Parish and work in East Baton Rouge Parish. This new east-west connection is anticipated to relieve congestion not only on the Magnolia Bridge, but also on other east-west arteries, such as Florida Blvd (US 190) and I-12.

The proposed project remained very important to local residents and officials. The City of Central completed a Master Plan in 2010 which called for the extension of Hooper Road as a future transportation improvement (proposed collector road). Similarly, during a March 2011 meeting to prioritize road projects for Livingston Parish, elected officials, community leaders and residents listed the Hooper Road bridge and extension as the number 2 ranked priority for

the Parish (behind the widening of I-12 overpass/one-mile extension of La. 447 South at Walker).

This Stage 0 Feasibility Study and Environmental Inventory was, in fact, initiated jointly by the City of Central and Livingston Parish, who each received an appropriation from the state for a feasibility and traffic study for the Hooper Road extension to Livingston Parish. The two communities matched their funds to funds supplied by LADOTD in order to have this Stage 0 study-- the first step in the environmental phase as required under the National Environmental Policy Act (NEPA) – undertaken and completed. The purpose of the Stage 0 study is to reach a decision regarding the project’s feasibility and whether the project should continue further through the project development process.

Two feasible alternatives have been developed for the Hooper Road Extension. These alternatives are presented in *Chapter III* and are described in **Section B** of the *Checklist for Stage 0, Preliminary Scope and Budget Worksheet* found in the Appendices. These alternatives were developed in close coordination with LADOTD staff.

## **REPORT ORGANIZATION**

### **CHAPTER I – INTRODUCTION**

### **CHAPTER II - ENVIRONMENTAL INVENTORY**

The Environmental Inventory chapter identifies and maps all major environmental concerns, issues, and sites within the study area. The Inventory is based on secondary data such as field surveys, EPA and state databases, National Wetland Inventory maps, infrared photography, aerial photography, cultural resources data, wildlife areas, literary research, coordination and interviews with local, state and federal agencies and officials, U.S. Geological Surveys, and soil surveys. Both text descriptions and maps are used to provide a brief environmental inventory of the study area. The chapter concludes with a section listing areas of environmental concern or constraint.

### **CHAPTER III - ENGINEERING FEASIBILITY STUDY**

This chapter begins with an in-depth look at the development process of feasible alternatives for the extension of Hooper Road. The geometric analysis of these alternatives to determine construction feasibility in accordance with state and federal standards is reviewed. Traffic analyses using traffic simulation (projected conditions) models are also described (the full traffic study is presented in a separate stand-alone report).

This chapter then fully describes the two final alternatives. First presented are the design criteria and design concepts of the three final alternatives. Conceptual construction costs for each alternative are then presented and followed by a brief evaluation and comparison of the two final alternatives in terms of cost, right of way acquisitions and likely relocations, traffic impacts, and comparative environmental impacts.

The chapter ends with a presentation of the design concepts as plan view layouts on aerial base maps at 1"= 200' scale, including apparent and proposed right of way. Typical sections are also presented.

#### CHAPTER IV – AGENCY COMMENTS/COORDINATION

This chapter describes the coordination efforts associated with development of the project including contacts such as those made with LADOTD; FHWA; local, state and federal agencies; and elected officials.

#### APPENDICES

A set of existing site pictures is included as **Appendix A**. The *Checklist for Stage 0, Preliminary Scope and Budget Worksheet* and the *Stage 0 Environmental Checklist* are included as **Appendix B**. **Appendix C**, the stand-alone *Traffic Study*, is presented under separate cover.



## CHAPTER II

### ENVIRONMENTAL INVENTORY

#### PURPOSE AND SCOPE

The project consultant team led by N-Y Associates, Inc. conducted an Environmental Inventory within a proposed project area approximately 2.5 miles long for the proposed extension of Louisiana Highway 408 (Hooper Road), from LA Hwy 37/64 (Greenwell Springs Rd.) in East Baton Rouge Parish, Louisiana, to LA Hwy 16 in the community of Watson, Livingston Parish, Louisiana.

As part of the Stage 0 Feasibility Study, the consultant team was responsible for (1) researching all potential environmental “show stopping” constraints or issues that influence early determinations of the project’s feasibility, timing, and cost to both the natural and human environment; (2) identifying any major community issues impacted by the project during the construction and operational phases of the project; and (3) assessing any potential mitigation cost that could possibly be incurred in future stages of the development of the project for each project alternative studied in the report. The Louisiana Department of Transportation and Development’s (LDOTD) *Stage 0 Environmental Checklist* was utilized to document the results of the preliminary environmental review and is included in **Appendix B** of this report.

#### METHODOLOGY

The consultant team conducted reviews of numerous environmental and cultural resource databases and readily-available information maintained by both state and Federal agencies such as the Louisiana Department of Environmental Quality (DEQ), Louisiana Department of Natural Resources (DNR), Louisiana Department of Wildlife and Fisheries (LDWF), Louisiana Division of Historic Preservation (DHP), Louisiana Division of Archaeology (DOA), LADOTD, and the U.S. Environmental Protection Agency (EPA). Field investigations to assess environmental issues or impacts were accomplished by conducting site reconnaissance and windshield surveys.

#### RESULTS OF ENVIRONMENTAL DATABASES REVIEW

##### NATURAL AND SCENIC RIVERS

According to the LDWF website, the Amite River is not a scenic stream at the proposed project crossing.

## THREATENED AND ENDANGERED SPECIES

A review of data on USFWS classified threatened and endangered species in East Baton Rouge Parish and Livingston Parish revealed that these two parishes contained six species that were ranked as threatened or endangered on USFWS and Louisiana Department of Wildlife and Fisheries, Natural Heritage Program (LDWF, NHP) lists and one species that was a candidate species on the USFWS list (**Table II-1**). A letter, along with a map of the proposed project location, was sent to the USFWS for further information regarding the potential for the project to adversely affect threatened and endangered species. A windshield survey was performed on June 22, 2011, to search for potential habitat for these listed species. The USFWS response indicates that the project will not affect any federally listed species (Rieck, Jan. 20, 2011). No individuals of any of the species nor preferred habitat of these species were found during the survey.

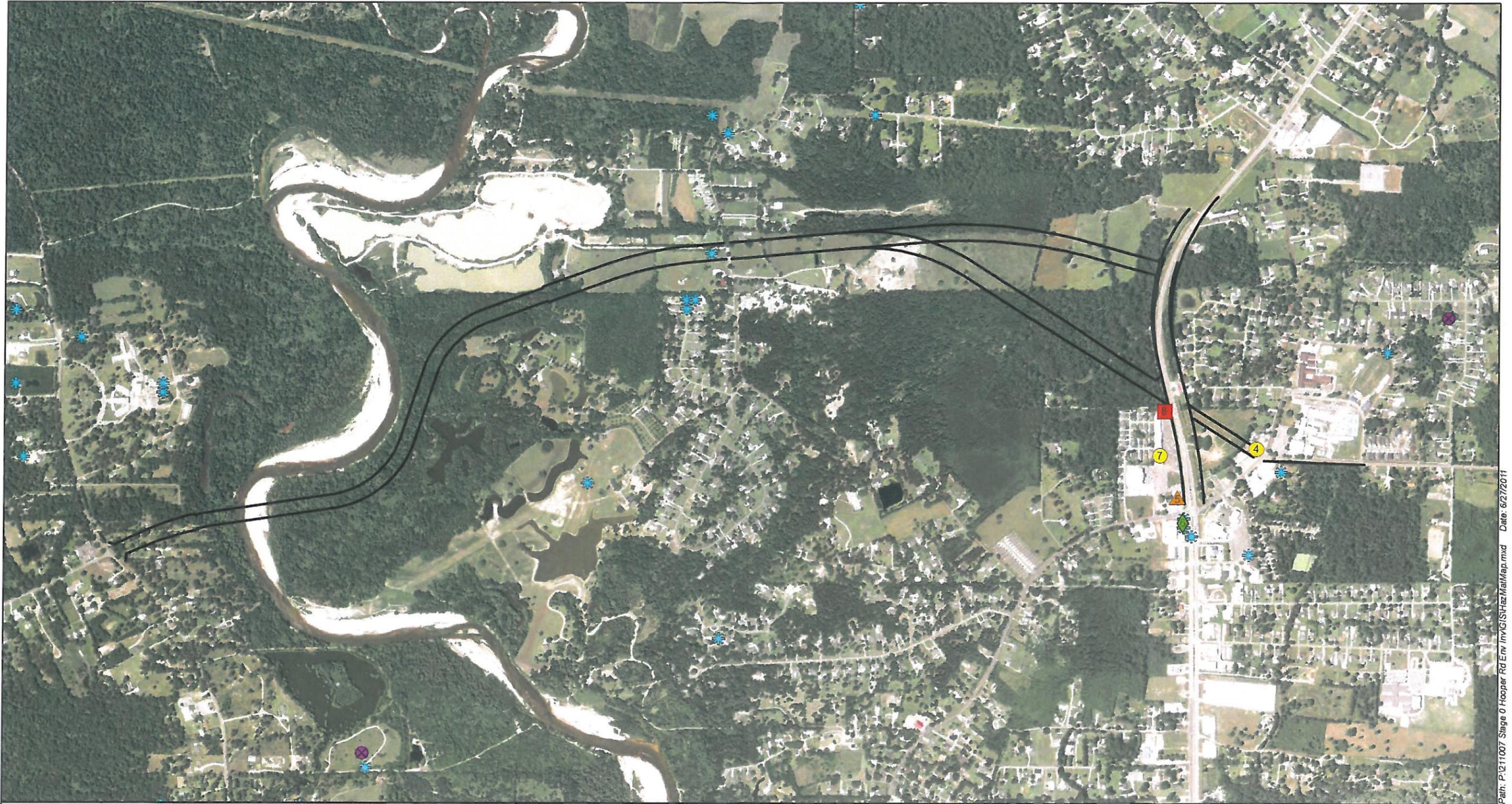
**Table II-1 Threatened and Endangered Species**

Scientific Name	Common Name	State Rank	Federal Status
<i>Haliaeetus leucocephalus</i>	Bald eagle	E	D
<i>Potamilus inflatus</i>	Inflated heelsplitter	T	T
<i>Scaphirhynchus albus</i>	Pallid sturgeon	E	E
<i>Trichechus manatus</i>	West Indian Manatee	E	E
<i>Acipenser oxyrinchus desotoi</i>	Gulf sturgeon	T	T
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	E
<i>Alosa alabamae</i>	Alabama shad		C

## HAZARDOUS WASTE AND STORAGE TANK DATABASES REVIEW

EPA, LDEQ, and U. S. Coast Guard databases were reviewed in reference to search distances as prescribed by the American Society for Testing and Materials (ASTM), *Designation E 1527-05 Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process*. **Table II-2** contains a summary of the agencies, databases, and number of facilities that were identified. No additional comments are contained in this document on databases in which there were no identified facilities.

Table II-2 is followed by a text description of the identified facilities. **Figure II-1** on the opposite page provides a map showing the location of the identified facilities.



Path: P:\211007 Stage 0 Hooper Rd Em\m\GIS\SHazMap.mxd Date: 6/27/2011



SOURCE: Aerial Photos consists of USDA-FSA 2010 NAIP 1m True Color Aerial Data  
CEI Drive by Reconnaissance Survey JUN 22, 2011

### Hazardous Waste, Underground Tanks, Water Wells And Oil & Gas Wells

<ul style="list-style-type: none"> <li><span style="color: yellow;">●</span> FACILITY OF INTEREST</li> <li><span style="color: red;">■</span> RCRA/UST (Removed)</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: orange;">▲</span> RCRA (CESQG)/ECHO</li> <li><span style="color: green;">◆</span> LUST/UST (Removed)</li> <li><span style="border-bottom: 2px solid black; width: 20px; display: inline-block;"></span> ROW REQUIRED</li> </ul>	<ul style="list-style-type: none"> <li><span style="color: purple;">⊗</span> OIL &amp; GAS WELLS</li> <li><span style="color: blue;">✱</span> WATER WELL REGISTRATION</li> </ul>
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**NY ASSOCIATES, INC.**  
• ENGINEERS • ARCHITECTS • PLANNERS  
• PROGRAM & PROJECT MANAGERS

in association with:  
**Coastal Environments, Inc.**  
**Urban Systems Associates, Inc.**

**Figure  
II-1**

**Table II-2 EPA and LDEQ Databases Reviewed**

<u>Agency &amp; Database</u>	<u>Facilities Identified</u>
U. S. Environmental Protection Agency	
CERCLIS	
Consolidated Facility Info	0
CERCLIS Facility Info (Superfund)	0
National Priority List (NPL) Sites (Superfund)	0
EPA Regulated Facilities in Envirofacts (Map)	1
TRI	0
Cleanups in My Community (Map)	
Brownfield Properties	0
Hazardous Waste	0
Superfund	0
Multiple Listings	0
Enforcement & Compliance History (ECHO)	0
RCRA	
Large Quantity Generators	0
Small Quantity Generators (SQG)	0
Conditionally Exempt SQG	1
(Same facility identified on Envirofacts Map)	
Subject to Corrective Action (all categories)	0
ERNS	0
U. S. Coast Guard	
National Response Center	0
Louisiana Department of Environmental Quality	
Inactive Abandoned Sites	
Confirmed	0
Potential	0
Voluntary Remediation Program	0
Underground Storage Tanks	
Registered	2
Leaking	1
Solid Waste Landfills (Type 1, 2, and/or 3)	0
Commercial Waste Transporters	0
Medical Waste Transporters	0
Waste Tire Transporters	0

The following descriptions are provided for the five facilities that were identified during the investigation:

One facility was identified in the EPA ECHO List as follows:

- Live Oak Tire & Automotive, 34905 LA HWY 1019, Denham Springs, LA 70706. Conditionally Exempt Small Quantity Generator of hazardous waste, EPA ID No. LAD9815966398. **No. 5 on Figure II-1.**

Review of the ECHO compliance report did not indicate any problems or enforcement actions with facility noted as being in compliance.

One facility was identified in the EPA RCRA List as follows:

- Live Oak Tire & Automotive, 34905 LA HWY 1019, Denham Springs, LA 70706. Conditionally Exempt Small Quantity Generator of hazardous waste, EPA ID No. LAD9815966398. **No. 5 on Figure II-1.**

In addition, a second RCRA with no generator status was identified through review of the EPA database as follows:

- Watson Diesel, 35039 HWY 16, Watson, LA 70786. Inactive status. EPA ID No. LAR000006072, LDEQ AI No. 25747. **No. 8 on Figure II-1**

Two facilities were identified in the LDEQ UST List as follows:

- Broadway's Mobil, 34914 HWY 16 (also listed as HWY 1019), Watson, LA 70786. UST removed. Site is current location of Walgreen's Pharmacy. LDEQ AI No. 71733. **No. 6 on Figure II-1**
- Watson Diesel, 35039 HWY 16, Watson, LA 70786. UST removed. LDEQ AI No. 25747. **No. 8 on Figure II-1.**

One facility was identified in the LDEQ LUST List as follows:

- Broadway's Mobil, 34914 HWY 16 (also listed as HWY 1019), Watson, LA 70786. UST removed. Site is current location of Walgreen's Pharmacy. LDEQ AI No. 71733, **No. 6 on Figure II-1.** During the UST closure of the former facility in September of 2005, soil samples indicated a hydrocarbon release and soil contamination. Approximately 150 tons of contaminated soil was removed and followed by the construction of Walgreen's Pharmacy. Three monitoring wells, installed between the pharmacy and the intersection of HWYS 16 and 1019, are currently in place for continued monitoring of attenuation at the site.

Two facilities of interest that were not detected on the databases that were reviewed, but were identified during the June 22, 2011 include:

- Quick-N-Handy Dry Cleaners, 35055 HWY 16, Suite ID, Watson, LA 70786. Dry cleaning business apparently not included on EPA RCRA facility list. **No.7 on Figure II-1.**
- Tommy's Automotive, Automobile repair facility apparently not included or need for regulation as EPA RCRA facility. **No 4 on Figure II-1.**

### **Results of Agency/Database(s) Reviewed for Water Wells**

A review of the water well database indicates that there is one, registered water well adjacent to the project area (<http://www.dotd.state.la.us/intermodal/wells/home.asp>):

Owner/Name: Louisiana Public Works  
Well Number: -931  
LAT/LONG: 30.3452 / -91.0313

### **Results of Agency/Database(s) Reviewed for Oil and Gas Wells**

According to a review of the DNR Oil and Gas Wells database no oil and gas wells are located within or adjacent to the project area.

## **CULTURAL RESOURCES DATABASE REVIEW AND RESEARCH**

Prior to a windshield survey of the proposed project, background research was conducted at the Louisiana Division of Historic Preservation (DHP) and the Louisiana Division of Archaeology (DOA). The DHP is the repository for Louisiana Historic Resource Inventory (LHRI) forms and maps, as well as National Register of Historic Places (NRHP) files. Eight LHRI properties have been previously inventoried in the vicinity of the project, none are considered eligible for listing on the NRHP. No NRHP properties are located within the vicinity of the proposed project.

The DOA maintains archaeological site files and maps. A review of those files indicates that there is one known archaeological site (16LV30) located on the east bank of the Amite River in the vicinity of the proposed project. Recorded in 1960, its exact location is unclear. The extent and NRHP eligibility of that site is currently undetermined, as well. The relatively high lands found throughout the project area flank the Amite River and Clayton Bayou. This geographic setting indicates that there is a potential of prehistoric archaeological sites throughout the project area. In addition, the areas along Greenwell Springs Road (LA 37) are considered to possess a potential of historic archaeological sites.

## OTHER FINDINGS - NATURAL ENVIRONMENT

### SIGNIFICANT TREES

No significant trees were noted during the windshield survey.

### WETLANDS / WATERS OF THE U.S.

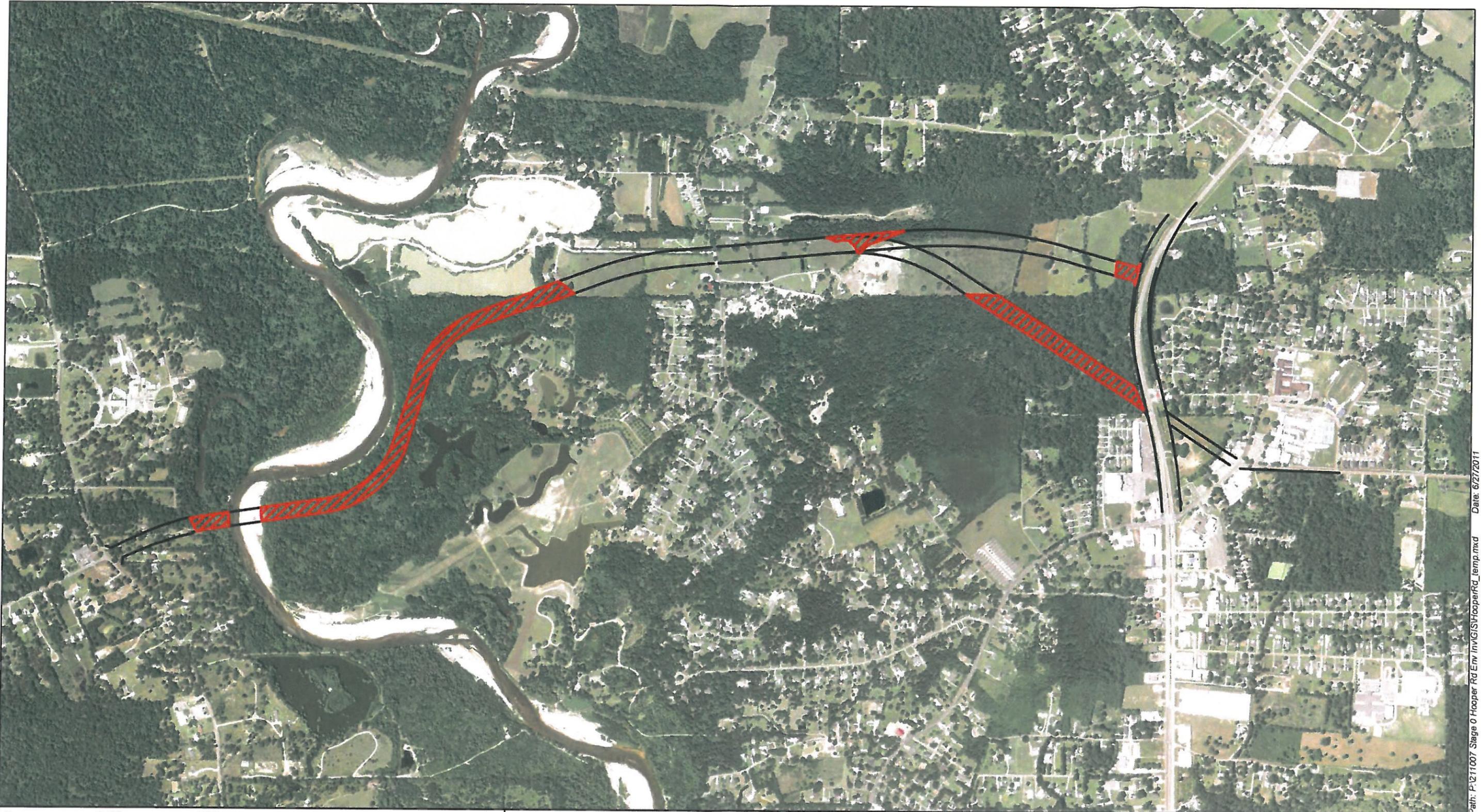
According to the District Conservationist for the East Baton Rouge and Livingston Parish NRCS offices, there are no properties enrolled in the Wetland Reserve Program (WRP) in the project area.

To determine the locations of potential wetlands within the proposed project location, the consultant team reviewed U. S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, Natural Resource Conservation Service (NRCS) soil survey maps, U. S. Geological Service (USGS) topographic maps, and true color aerial imagery (U. S. Department of Agriculture [USDA] 2010), and conducted a “windshield survey” of the proposed route. Correspondence with the USFWS (Rieck, Jan. 20, 2011) revealed that there was a potential for wetlands to be located within the proposed project footprint. Results from these database reviews and the “windshield survey” were used to identify on a recent aerial photobase map (USDA 2010) areas of potential wetlands (see **Figure II-2** on the adjoining page). The area of potential wetlands totals approximately 27.6 acres in the following mapped polygons:

- Western Wetland: 1.37 ac
- “S” Curved Wetland: 15.96 ac
- North Central Wetland: 1.47 ac
- North East Wetland: 0.90 ac
- South East Wetland: 7.90 ac

### FLOOD ZONES

The Hooper Road Extension project corridor contains three distinct flood zones, “X”, “A” and “AE” as defined by the Federal Emergency Management Agency (FEMA) which administers the



Path: P:\211007 Stage 0 Hooper Rd Env Inv\GIS\HooperRd\_temp.mxd Date: 6/27/2011



SOURCE: Aerial Photos consists of USDA-FSA 2010 NAIP 1m True Color Aerial Data  
CEI Drive by Reconnaissance Survey JUN 22, 2011

## POTENTIAL WETLANDS

Possible Wetlands      ROW Required

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in association with:  
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Urban Systems Associates, Inc.

**Figure  
II-2**

flood insurance program and determines base flood elevations and flood risk zones for participating communities.

Nearly the entire western side of the project area (that portion within east Baton Rouge Parish) lies within flood Zone A and AE, which are defined by FEMA as a Special Flood Hazard Area (SFHA). Mandatory flood insurance purchase requirements and floodplain management standards apply.

The Hooper Road corridor on the eastern side of the Amite River (in Livingston Parish) runs through zones indicated as A, AE and X. Zone X Areas are areas of moderate or minimal hazard from the principal source of flood in the area. Flood insurance is available in participating communities but is not required by regulation in the Zone X areas.

## **ZONING AND LAND USE**

### **METHODOLOGY**

The methodology employed in this analysis consists of discussions with local planning officials, review of future land use plans, and windshield surveys of the study area.

Zoning is discussed first, being the determining factor for land use. A consideration of the land use and prevailing development patterns follows the zoning description. Both zoning and land use and are described from west (Greenwell Springs Road) to east (LA 16/Old LA 16).

### **FINDINGS**

#### **Zoning**

On the western side of the Amite River, zoning is controlled by the City of Central. Most of the zoning in the vicinity of the intersection of Greenwell Springs Road and Hooper road is Rural (R-1); however, the parcels on the northwest and southwest corners of the intersection are zoned LC-1 and LC-2, respectively (light commercial).

On the eastern side of the Amite River, Livingston Parish does not have zoning in place.

#### **Land Use**

Beginning in the western portion of the corridor, at the intersection of Hooper Road and Greenwell Springs Road, we see mostly rural residential land uses. Exceptions include the small commercial center on the northwest corner of the intersection and the East Louisiana Mental Health Hospital complex located a short distance northeast of the intersection. The area bordering the Amite River on both sides is floodplain and remains undeveloped. Continuing

east, rural residential uses predominate until approaching LA 16. The LA 16 corridor in the study area is developed with commercial uses, including small scale strip malls and stand-alone retail establishments. Public and community uses serving the community of Watson are also present, including churches, cemeteries and schools.

### **Possible Impacts**

The extension of Hooper Road in the City of Central and in Livingston Parish may eventually have some effect on the zoning and land use along the corridor. Central in fact anticipates such changes, as their recently adopted *Land Use Plan* calls for the area around the intersection of Hooper Road and Greenwell Springs Road to be developed as a “town center” with general commercial land uses. With the extension of Hooper Road to the east and planned increases in Hooper Road capacity, more vehicles will begin to travel the road, and these areas close to the intersection will be seen as more desirable for commercial development, particularly those that are currently vacant and zoned rural or those areas zoned for single family homes that currently front on Hooper or Greenwell Springs Road Road. Owners of these parcels may petition the City to re-zone to allow roadside commercial development on their site, as is called for in the *Land Use Plan*.

On the Livingston Parish side, where zoning is not present, the extension may eventually have some effect on the land use along the corridor. With the new extension in place, vacant areas near the intersections of LA 16 / Old LA 16 may be seen as more desirable for commercial development. Vacant areas along the main portion of the route (between LA 16 and the Amite River) may be seen as ripe for additional residential development.

### **ENVIRONMENTAL CONSTRAINTS OR CONCERNS**

As a result of the Environmental Inventory, several areas of environmental concern or constraint have been identified within the project corridor. As described in this chapter, there is no apparent presence of endangered or threatened species in project area. Additionally, there is very little in the manner of possible Phase 1 ESA issues (hazardous waste, leaky fuel tanks, etc.). As noted in the previous section, the extension of Hooper Road may have some effect on land use and zoning, possibly spurring development and/or redevelopment and requests for changes to existing zoning. However, while cultural resource research and site reconnaissance did not reveal any NRHP sites, there is one documented archaeological site in the project area vicinity, and the geographic setting indicates that there is a potential of prehistoric archaeological sites throughout the project area.

The most notable issue that might arise in further project development is in regards to potential wetlands. Approximately 27.6 acres of potential wetlands have been identified, mainly along floodplains associated with the Amite River and Clayton Bayou. Depending on construction techniques and the amount of right-of-way required, these potential wetlands may be affected by the proposed project and may require mitigation measures. Onsite mitigation of wetland impacts

could include clearing and maintenance of the minimum area of right-of-way. Installing adequate cross-drains underneath roadway sections will facilitate maintenance of current surface water movement. Mitigation of unavoidable wetland impacts could also be achieved through a monetary contribution, as determined by the regulatory agencies, to the Louisiana Nature Conservancy that maintains several wetland mitigation areas in the Florida Parishes.



# CHAPTER III

## ENGINEERING FEASIBILITY STUDY

This chapter begins with an in-depth look at the development process of feasible alternatives for the extension of Hooper Road from LA 37/64 (Greenwell Springs Road) to LA 16. The geometric analysis of these alternatives to determine construction feasibility in accordance with state and federal standards is reviewed. Traffic analyses using traffic simulation (projected conditions) models are also described (the full traffic study is presented in a separate stand-alone report).

This chapter then fully describes the final alternatives. First presented are the design criteria and design concepts of the two final preferred alternatives. The conceptual construction cost for each alternative is then presented, and followed by a brief evaluation and comparison of the two final alternatives in terms of cost, right-of-way acquisitions and likely relocations, traffic impacts, and comparative environmental impacts.

The chapter ends with a presentation of the design concepts as plan view layouts on aerial base maps at 1"= 200' scale, including all roadway geometry as well as apparent and proposed right of way. Typical sections are also presented.

### ALTERNATIVE DEVELOPMENT PROCESS

#### EXISTING GEOMETRIC CONDITIONS

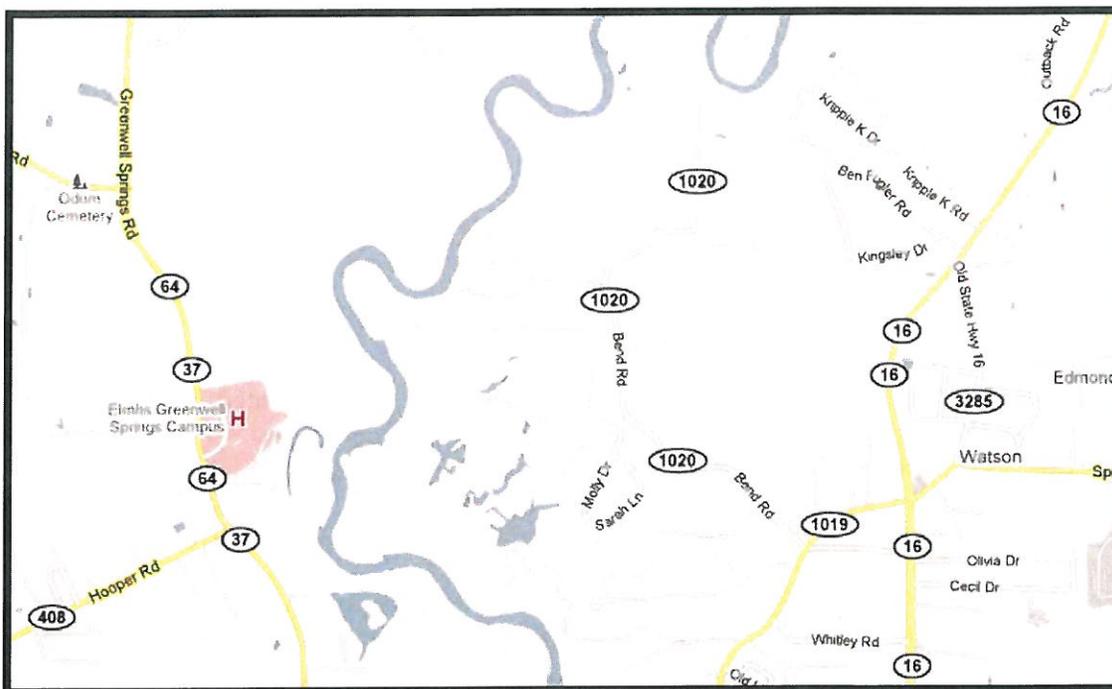
The development of alternatives began with an assessment of existing geometric conditions. A vicinity map indicating the project corridor is presented in **Figure III-1** on the following page. As shown, the Hooper Road extension would provide greater connectivity to the core area of Baton Rouge for Livingston Parish residents.

The following provides a description of the individual roadways included in the study area.

#### **Hooper Road (LA 408)**

Hooper Road is a four-lane divided roadway to the west of Joor Road and a two-lane undivided roadway east of Joor Road. Hooper Road provides connectivity between LA 67 (Plank Road) and LA 64/37 (Greenwell Springs Road) and services residential and commercial traffic.

**Figure III-1  
Vicinity Map of LA 408 (Hooper Road Extension) Study Area**



Source: Google Maps

### **LA 16**

LA 16 is a two-lane undivided roadway north of its intersection with LA 1019 and widens to a four-lane divided roadway south of the intersection. LA 16 is oriented in a general north-south direction and is surrounded by mostly commercial developments in the study area.

### **Springfield Road (LA 1019)**

LA 1019 is a two-lane undivided roadway with open drainage and no shoulders. LA 1019 is oriented in a general east-west direction and is surrounded mostly by residential housing in the study area.

### **Greenwell Springs Road (LA 64/37)**

#### **Old LA 16 (LA 3285)**

#### **Bend Road (LA 1020)**

These three state highways are two-lane undivided roadways oriented in a general north-south direction. All of the roadways have open drainage, no shoulders and are lined with residential housing.

## EXISTING TRAFFIC CONDITIONS

One of the first steps in the feasibility study was to determine existing traffic conditions. Existing traffic volume data was collected within the project study area in March and April 2011. Twenty-four hour traffic counts were collected at the following locations:

- LA 408 (Hooper Road) west of LA 64 (Greenwell Springs Road)
- LA 64 (Greenwell Springs Road) on both sides of LA 408 (Hooper Road)
- LA 16 (Robby Lane) north of LA 1019 (Springfield Road)
- Two (2) locations on Bend Road
- LA 1019 (Springfield Road) on both sides of LA 3285
- LA 3285 north of LA 1019 (Springfield Road)

Intersection turning movement counts were collected during the AM peak period (6:45-8:45 AM) and the PM peak period (4:15-6:15 PM) at the following intersections:

- LA 408 (Hooper Road) at LA 64 (Greenwell Springs Road)
- LA 16 (Robby Lane) at LA 1019 (Springfield Road)
- LA 1019 (Springfield Road) at Bend Road
- LA 1019 (Springfield Road) at LA 3285

The peak hours for the study area were determined to be 7:00 AM to 8:00 AM and 4:30 PM to 5:30 PM. The data collected in 2011 was used as the 2012 base traffic volumes for the study. **Figure III-2** presents the 2012 base peak hour intersection turning movement counts and 24 hour daily traffic counts collected within the study area. The 24 hour tube counts were not adjusted using seasonal factors and are presented as measured.

## DEVELOPMENT OF ALTERNATIVES

### **Planned Projects**

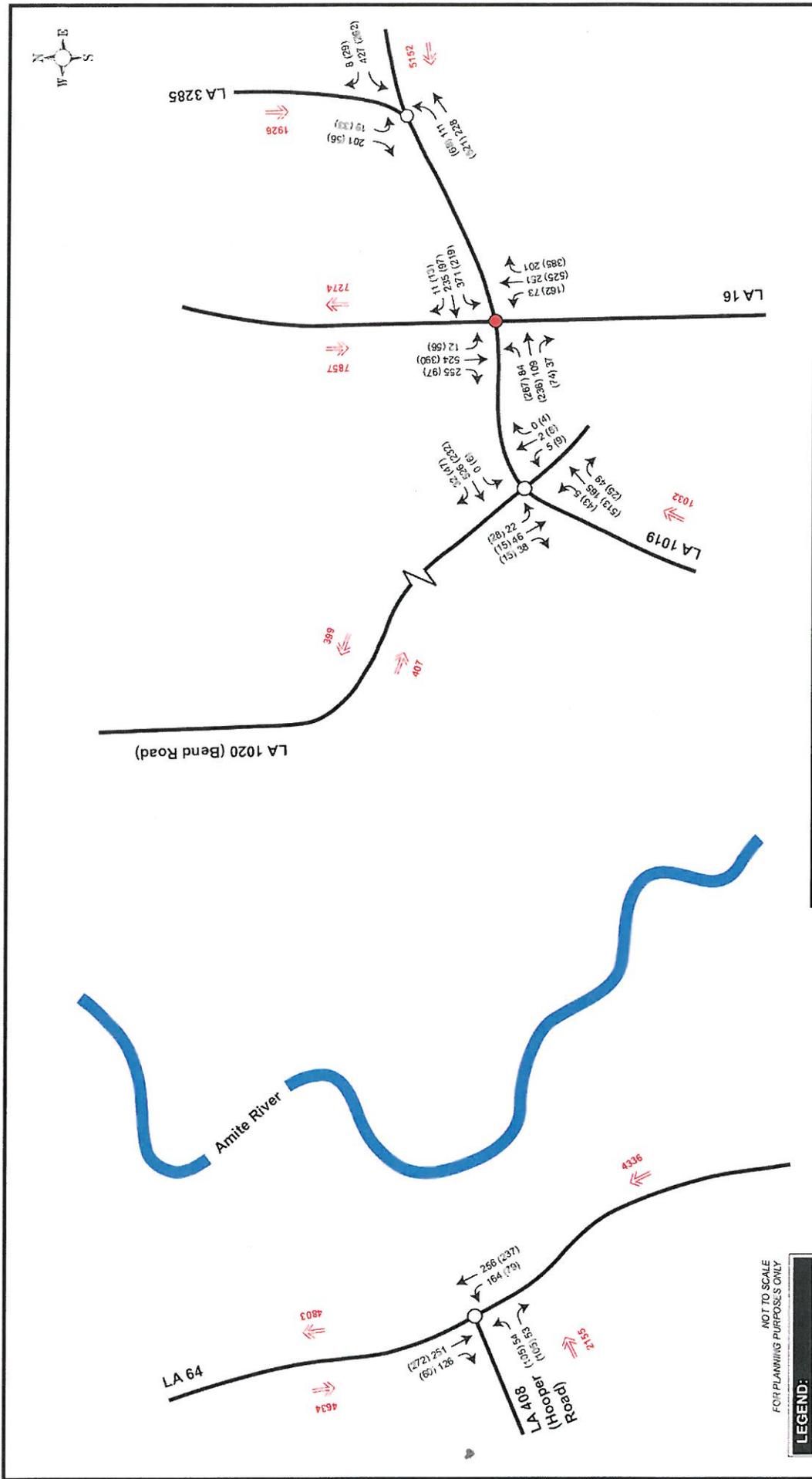
The first step in the development of alternatives was to examine any planned projects that may affect the design of the alternatives. There were two such projects to be considered:

#### *Hooper Road Widening*

Plans are in the final stages of development for the widening of Hooper Road from Joor Road to Sullivan Road from two lanes to four lanes. Sullivan Road is also planned to be widened south of Hooper Road.

#### *Magnolia Bridge Widening*

Magnolia Bridge is currently under construction to be widened from a two-lane bridge to a four-lane bridge. Construction of the bridge is expected to be completed approximately two years from the time of this report.



**Figure III-2**

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**HOOPER ROAD EXTENSION**  
 East Baton Rouge & Livingston Parishes, LA  
 State Project No. H.005403

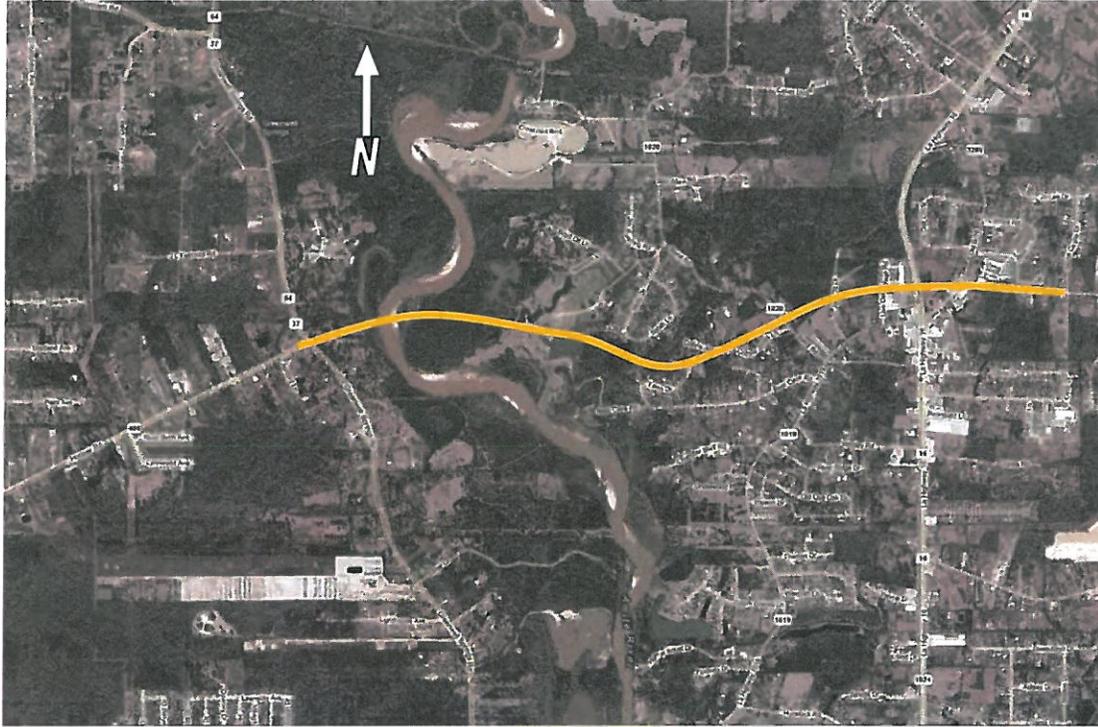
**Existing Traffic Volumes**



## Review of Previous Alternatives

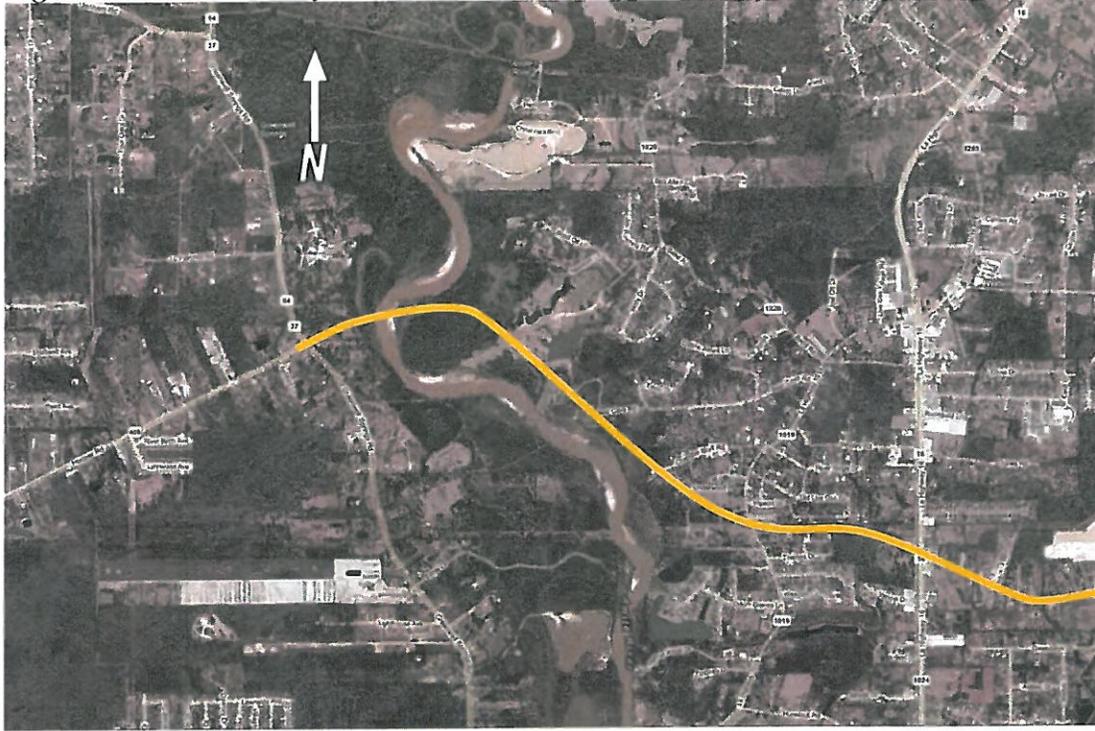
As mentioned in Chapter I, a previous feasibility study, *LA 408 (Hooper Road) Extension*, was conducted by LADOTD in July 2000 that analyzed five (5) alternatives for the Hooper Road extension. It was noted in that document that when the study began, it was decided in order to provide optimal use of a Hooper Road extension that it should tie into LA 16 at or near existing intersection of LA routes which continue eastward. The two routes used in the study were LA 1019 and LA 1024. Below is a description of each of the 2000 report alternates along with a graphic of each route:

**Figure III-3 - 2000 Study Alternate # 1:**



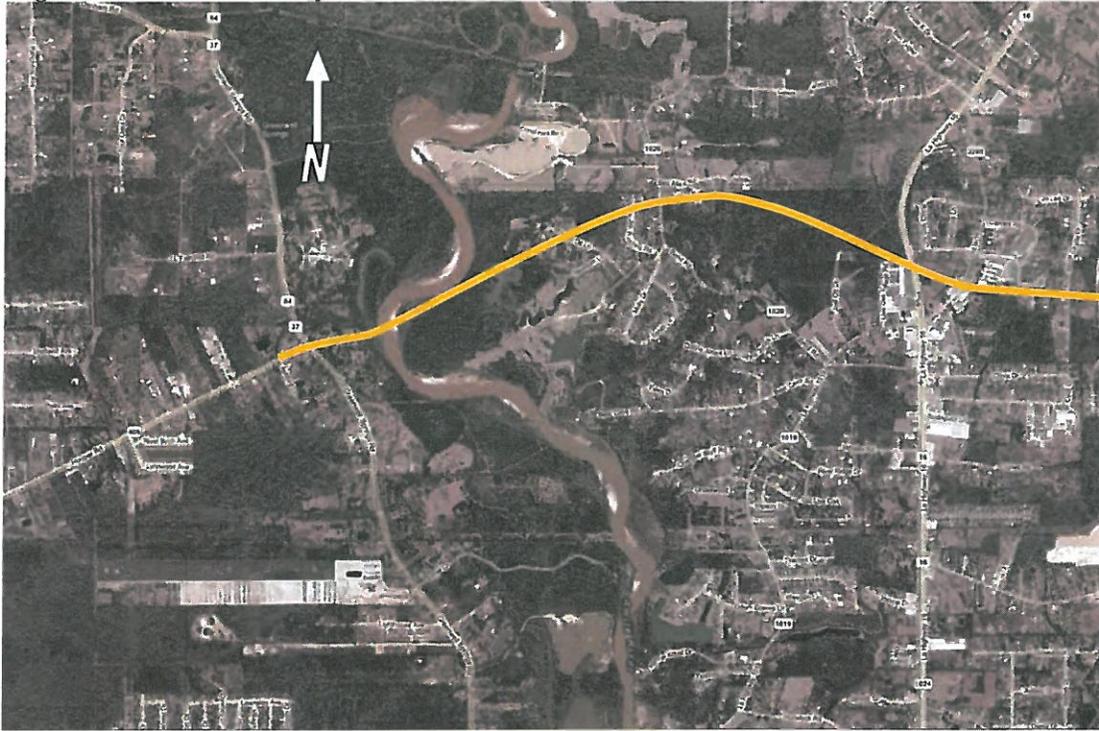
After crossing the Amite River, Alternate # 1 would turn almost due east, before taking a northwesterly direction after the end of the proposed bridge section of the extension. The extension would tie into LA 16 north of the existing LA 16/LA 1019 intersection. This alternate was developed to attempt to minimize impacts on residential properties. The gravel pits west of Watson near the Amite River would be impacted.

*Figure III-4 – 2000 Study Alternate # 2*



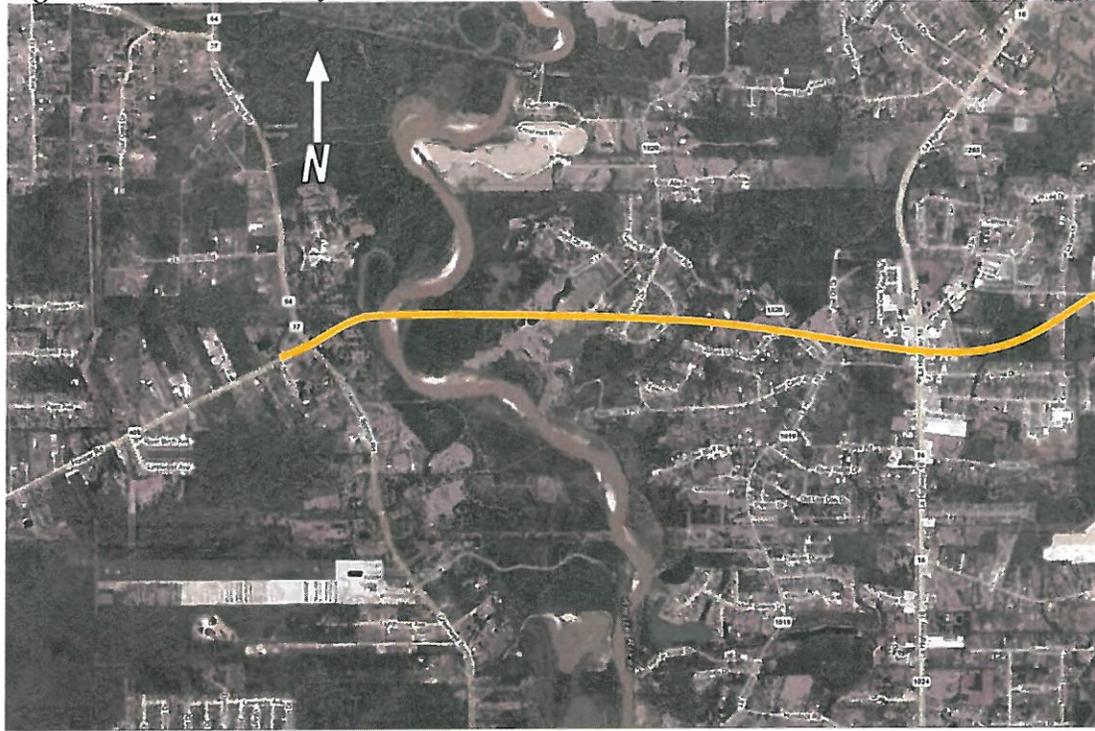
Alternate # 2 was developed in order to provide a connection with LA 1024. This alternate would turn in a southeasterly direction beyond the Amite River and parallel the river before turning eastward then intersecting LA 1019 and continuing eastward until intersecting LA 16/LA 1024. No widening of LA 16 should be required under this alternate. This alternate would impact the gravel pits and would require the longest bridge structure of the alternates.

*Figure III-5 – 2000 Study Alternate # 3*



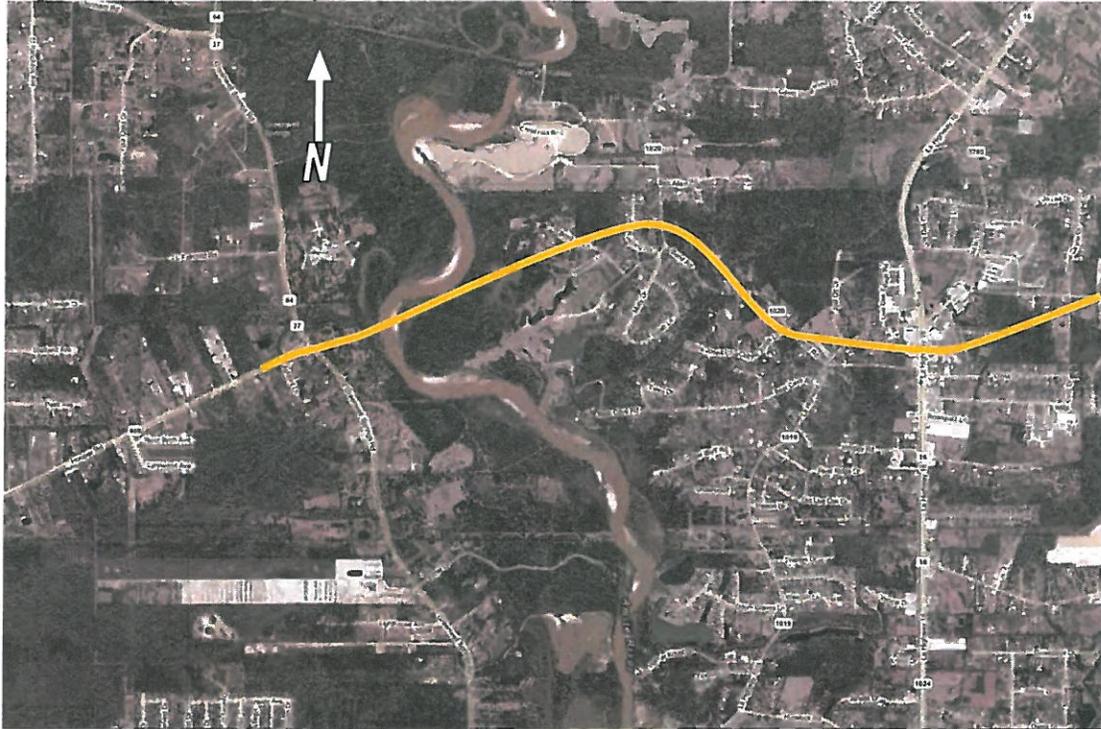
Alternate # 3 was developed to tie into LA 1019 north of the current LA 1019/LA 16 intersection, near where alternate #1 intersects LA 16. Alternate 3 takes a more northerly approach than Alternate # 1 and avoids the gravel pits. Under this alternate LA 408 would be extended in a northeast tangent similar to its current alignment, before turning eastward and intersecting LA 16 north of Lakeside Village subdivision and continuing eastward to LA 1019.

*Figure III-6 - 2000 Study Alternate # 4*



Alternate # 4 was developed to cross LA 1019 south of the existing LA 16/LA 1019 intersection in order to avoid the church/school. This alternate would turn almost due east beyond the Amite River, then tie into LA 16 at a right angle, before bearing northeast and intersecting LA 1019. This alternate would impact the gravel pits, bisect the subdivisions located between the Amite River and LA 16, impact business along LA 16 including Hancock Bank, and Pinewood Mobile Home Park. Some realignment of LA 1019 will be required. This alternate would provide one of the more direct connections from LA 408 to LA 16.

**Figure III-7 - 2000 Study Alternate # 5**

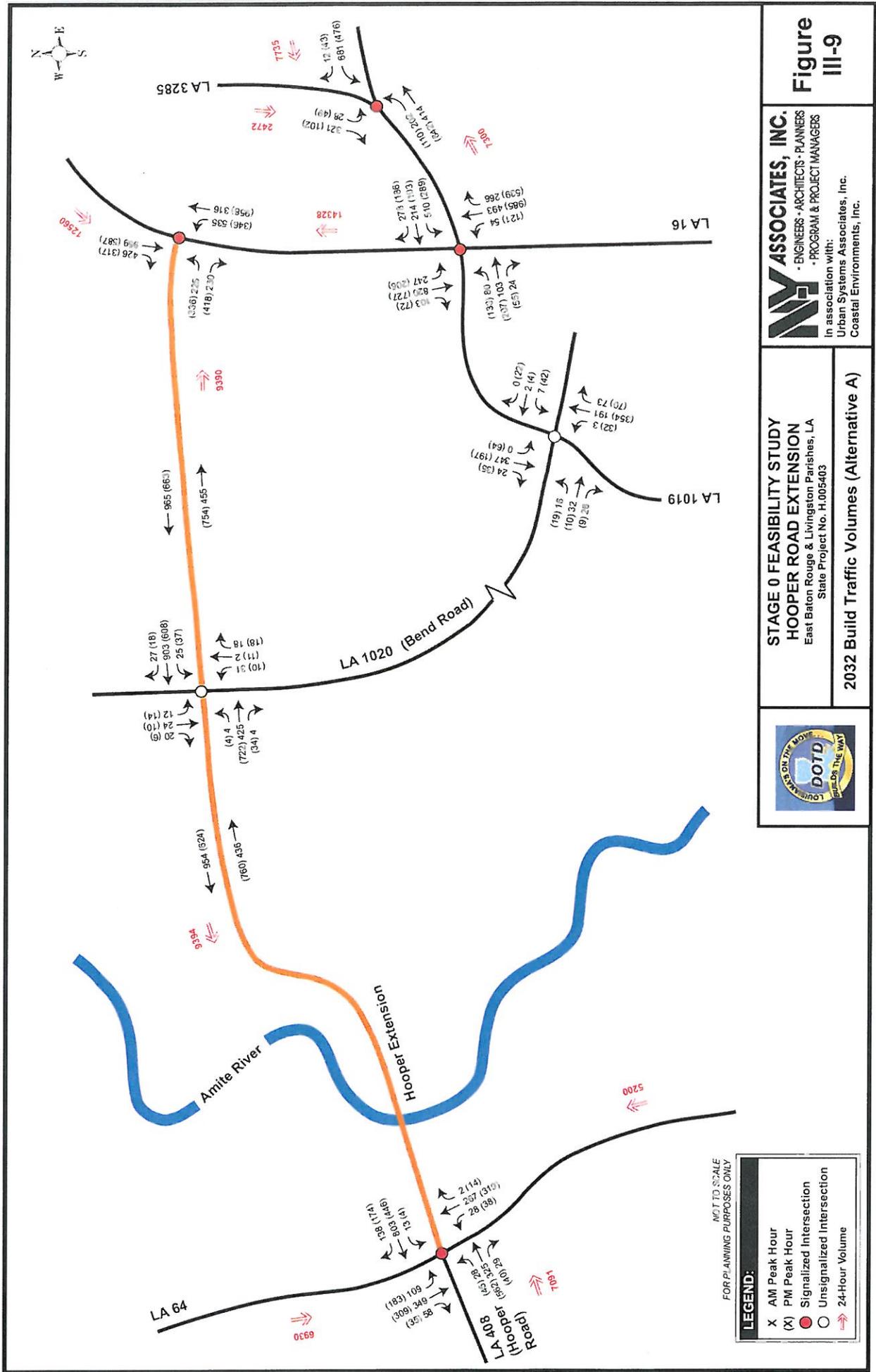


Alternate # 5 was developed in order to avoid the gravel pits and tie into LA 1019 south of the current LA 16/ LA 1019 intersection avoiding the church and cemetery. Alternate # 5 follows the same alignment as Alternate # 3, before turning southeast and then following the alignment of Alternate # 4. Realignment of LA 1020, LA 1019 and closure of a section of LA 1020 will be required.

Additionally, the consultant team at the beginning of the Stage 0 study was presented with a new alternative alignment, which was very similar to that of Alternate # 3 from the 2000 study.

#### **Addition of New Alternative**

At a Project Initiation Meeting held on March 2, 2011, an overview was presented of the five alternates from the 2000 study, as well as the currently discussed alignment. Following the end of the formal meeting, several attendees gathered around the aerial map and discussed developments in the area and routing options. There was a general concurrence that the currently discussed alternative was superior to the previous five alternates shown in the 2000 study, in that it limits residential takings and relocations. Another idea that had some support as an option was a more southerly route that would link to LA 1024, using an existing power line servitude easement. It was noted that a new Wal-Mart Super Center was slated to be constructed on the eastern side of the intersection of LA 16 and LA 1024, but the power line is located along the northern edge of the Wal-Mart Super Center footprint. It was also noted that the power line alignment



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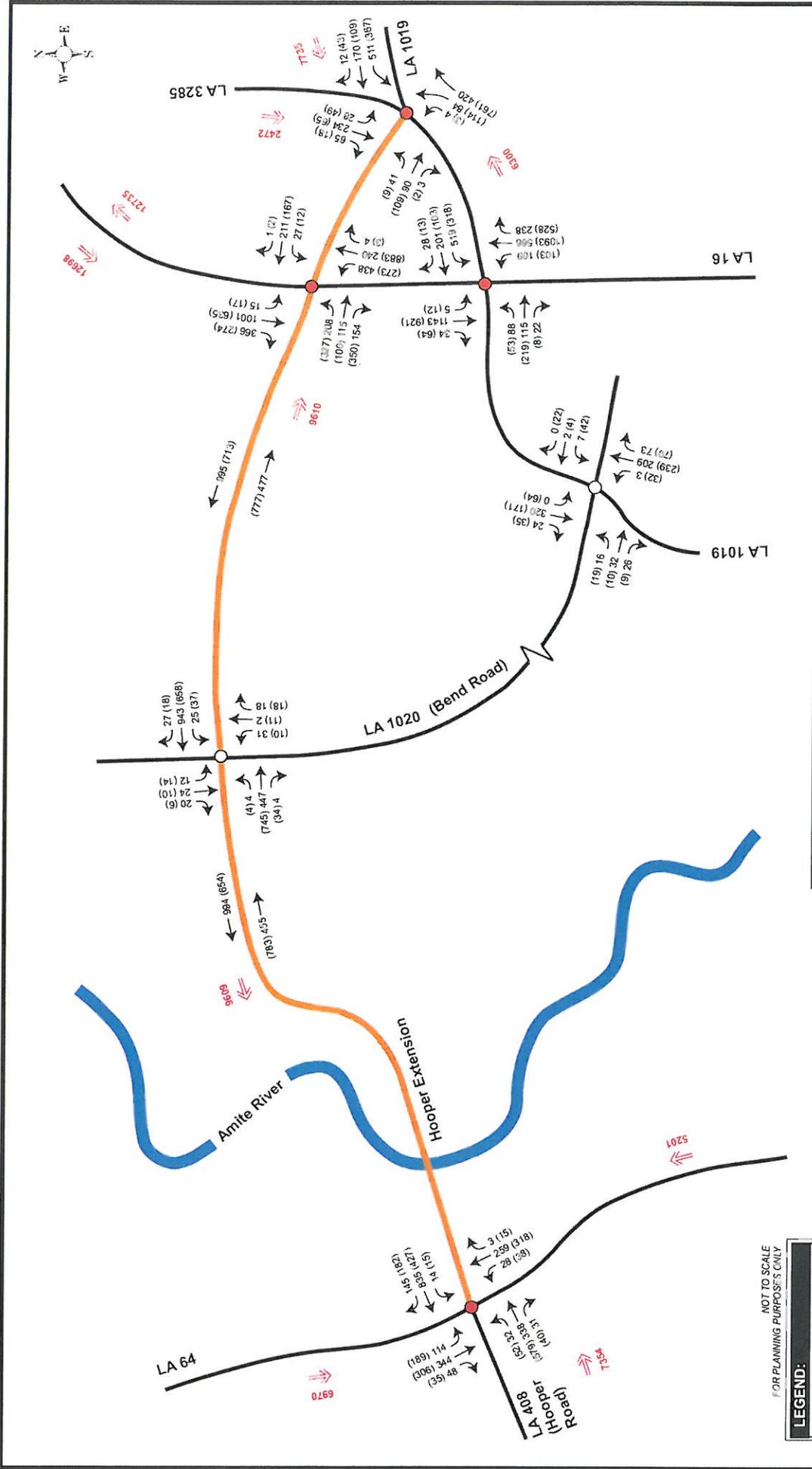
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**Figure III-9**

**2032 Build Traffic Volumes (Alternative A)**



NOT TO SCALE  
 FOR PLANNING PURPOSES ONLY



**Figure III-10**

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**2032 Build Traffic Volumes (Alternative B)**



2032 No Build Conditions Analysis

The existing intersection control and geometry with projected 2032 “No Build” volumes was input into HCS Software to determine the expected LOS and delay. The results of the analysis are presented in Table III-2.

**Table III-2**  
**Level of Service Analysis - 2032 No Build Conditions**

Intersection/Approach	AM Peak		PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
<b>Hooper Road at LA 64*</b>	-	-	-	-
<i>Hooper Road northbound</i>	A	9.5	A	8.7
<i>LA 64 eastbound</i>	E	48.9	F	56.3
<b>LA 16 at LA 1019</b>	E	<b>75.2</b>	F	<b>113.1</b>
<i>LA 1019 eastbound</i>	E	77.8	F	151.4
<i>LA 1019 westbound</i>	E	74.6	F	84.1
<i>LA 16 northbound</i>	D	38.7	F	131.1
<i>LA 16 southbound</i>	F	98.9	D	54.5
<b>LA 1019 at LA 3285*</b>	-	-	-	-
<i>LA 3285 southbound</i>	A	8.7	B	10.5
<i>LA 1019 westbound</i>	F	473.0	F	187.3

\*Overall LOS not reported by HCS+ for two-way stop controlled intersections.

Table III-2 indicates that the existing operation is expected to deteriorate to failing conditions during the PM peak for each of the subject intersections by the year 2032.

*Traffic Signal Warrant Analyses*

The following intersections currently operate under unsignalized control. Traffic signal warrant analysis was performed under 2032 projected conditions for the following intersections:

- Hooper Road at LA 64
- Hooper Ext at LA 16
- Hooper Ext at LA 1019/3285

The MUTCD, Section 4C.01 gives the following standards for justifying traffic control signals:

*“An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.*”

*The investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants and other factors related to existing operation and safety at the study location:*

- Warrant 1, Eight-Hour Vehicular Volume.*
- Warrant 2, Four-Hour Vehicular Volume.*
- Warrant 3, Peak Hour.*
- Warrant 4, Pedestrian Volume.*
- Warrant 5, School Crossing.*
- Warrant 6, Coordinated Signal System.*
- Warrant 7, Crash Experience.*
- Warrant 8, Roadway Network.*

*The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic signal”*

For the purposes of this study, only Warrants 1, 2, and 3 (vehicular volume warrants) were considered. Crash experience and physical characteristics of the intersections were not included in this study.

Projected volumes were distributed throughout the day for each approach of the subject intersections based on historical data in the area and engineering judgment. The resulting volumes were input into PC-Warrants software. The results of the traffic signal warrant analyses for the 2032 “Build” projected volume demand are presented in **Tables III-3 through III-5**.

**Table III-3**  
**Traffic Signal Warrant Analysis Results - Hooper Road at LA 64/LA 37**

<b>Warrant</b>	<b>2032 Conditions</b>
<b>Warrant 1</b>	Satisfied
<b>1A</b>	Satisfied
<b>1B</b>	Satisfied
<b>1A+B</b>	Satisfied
<b>Warrant 2</b>	Satisfied
<b>Warrant 3</b>	Satisfied
<b>3A</b>	Not Satisfied
<b>3B</b>	Satisfied

**Table III-4**

**Traffic Signal Warrant Analysis Results - Hooper Extension at LA 16**

<b>Warrant</b>	<b>2032 Conditions</b>
<b>Warrant 1</b>	Satisfied
<b>1A</b>	Satisfied
<b>1B</b>	Satisfied
<b>1A+B</b>	Satisfied
<b>Warrant 2</b>	Satisfied
<b>Warrant 3</b>	Satisfied
<b>3A</b>	Not Satisfied
<b>3B</b>	Satisfied

**Table III-5**

**Traffic Signal Warrant Analysis Results - Hooper Extension at LA 1019/3285**

<b>Warrant</b>	<b>2032 Conditions (Alt A)</b>	<b>2032 Conditions (Alt B)</b>
<b>Warrant 1</b>	Satisfied	Satisfied
<b>1A</b>	Satisfied	Satisfied
<b>1B</b>	Not Satisfied	Satisfied
<b>1A+B</b>	Not Satisfied	Satisfied
<b>Warrant 2</b>	Satisfied	Satisfied
<b>Warrant 3</b>	Satisfied	Satisfied
<b>3A</b>	Not Satisfied	Not Satisfied
<b>3B</b>	Satisfied	Satisfied

Based on projected traffic volumes, the installation of a traffic signal at each of the intersections will likely be required by 2032. Based on EDSM VI.3.1.6 – “Installation of New Traffic Signals” issued by the LADOTD which states that all new signals shall meet Warrant 1A or Warrant 7 (crash experience), must be spaced at least ½ mile from an adjacent signal and service a public road on the minor approach, design exceptions would be required for the Alternative B intersections of Hooper Extension at LA 16 and Hooper Extension at LA 1019/3285 due to their close proximity to the existing signal at LA 16 and LA 1019.

*Turn Lane Warrants*

An evaluation was conducted for left turn lanes and right turn lanes at the proposed signalized intersections. The Highway Capacity Manual (HCM) Exhibit 10-13 indicates that a left turn lane at a signalized intersection should be considered if the volume exceeds 100 vehicles per hour (vph), dual lefts for volumes that exceed 300 vph and a right turn lane should be considered if the volume exceeds 300 vph. Based on these criteria, the following turn lanes would be warranted based on volume alone:

- LA 64 Southbound Left at Hooper Road
- Hooper Ext Westbound Right at LA 64
- LA 16 Southbound Right at Hooper Ext
- LA 16 Northbound Left at Hooper Ext
- Hooper Ext Left and Right at LA 16
- LA 1019 Westbound Dual Lefts at LA 16
  - LA 1019 Northbound Right at Hooper Ext/LA 3285 (Alt B only)
  - LA 1019 Westbound Dual Lefts at Hooper Ext/LA 3285 (Alt B only)

These turning lanes were considered for inclusion in the 2032 “Build” analyses. Adjustments to the phasing and timing were included to account for the additional lanes.

*2032 Build Conditions Analysis*

The 2032 projected build volumes were input into HCS Software to determine the expected LOS and delay. The intersection control and geometry was based on the results of traffic signal warrant analysis, turn lane warrant analysis, preliminary analysis and engineering judgment. Signal timing and phasing was adjusted to provide optimal operation. The results of the analyses for Alternatives A and B as compared to the existing and no build conditions is presented for the AM and PM peaks in **Tables III-6 and III-7**, respectively.

**Table III- 6**  
**Level of Service Analysis - Comparison of AM Peak**

Intersection/Approach	Base Conditions		2032 No Build		2032 Build Alternative A		2032 Build Alternative B	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
<b>Hooper Rd at LA 64</b>	-	-	-	-	<b>B</b>	<b>16.9</b>	<b>B</b>	<b>16.9</b>
<i>Hooper Road eastbound</i>	C	21.1	E	48.9	B	11.6	B	11.8
<i>Hooper Road westbound</i>					B	15.7	B	16.3
<i>LA 64 northbound</i>	A	8.8	A	9.5	C	20.1	B	19.5
<i>LA 64 southbound</i>					C	21.4	C	20.6
<b>LA 16 at LA 1019</b>	<b>C</b>	<b>33.3</b>	<b>E</b>	<b>75.2</b>	<b>D</b>	<b>45.2</b>	<b>D</b>	<b>41.0</b>
<i>LA 1019 eastbound</i>	D	41.8	E	77.8	E	57.1	D	52.0
<i>LA 1019 westbound</i>	C	30.3	E	74.6	E	58.4	D	43.0
<i>LA 16 northbound</i>	C	27.1	D	38.7	D	38.4	D	43.5
<i>LA 16 southbound</i>	D	37.3	F	98.9	D	36.6	C	33.0
<b>LA 1019 at LA 3285</b>	-	-	-	-	<b>B</b>	<b>14.7</b>	<b>C</b>	<b>20.2</b>
<i>Hooper Road eastbound</i>							C	22.2
<i>LA 1019 westbound</i>	F	54.1	F	473.0	C	24.0	C	23.0
<i>LA 1019 northbound</i>					A	4.4	B	10.0
<i>LA 3285 southbound</i>	A	8.1	A	8.7	B	13.2	C	27.7
<b>Hooper Ext at LA 16</b>					<b>C</b>	<b>34.0</b>	<b>D</b>	<b>41.0</b>
<i>Hooper Road eastbound</i>					C	33.5	D	36.5
<i>Hooper Road westbound</i>							D	42.7
<i>LA 16 northbound</i>					C	34.3	D	35.7
<i>LA 16 southbound</i>					C	34.0	D	44.9
<b>Hooper Ext at Bend*</b>					-	-	-	-
<i>Hooper Road eastbound</i>					B	10.4	B	10.6
<i>Hooper Road westbound</i>					A	8.4	A	8.5
<i>Bend Road northbound</i>					C	17.0	C	17.6
<i>Bend Road southbound</i>					C	22.6	C	23.8

**Table III- 7**  
**Level of Service Analysis -Comparison of PM Peak**

Intersection/Approach	Base Conditions		2032 No Build		2032 Build Alternative A		2032 Build Alternative B	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
<b>Hooper Rd at LA 64</b>	-	-	-	-	<b>B</b>	<b>17.4</b>	<b>B</b>	<b>17.6</b>
<i>Hooper Road eastbound</i>	C	20.5	F	56.3	B	13.1	B	13.5
<i>Hooper Road westbound</i>					B	12.7	B	12.8
<i>LA 64 northbound</i>	A	8.3	A	8.7	C	25.4	C	25.2
<i>LA 64 southbound</i>					C	22.4	C	23.1
<b>LA 16 at LA 1019</b>	<b>D</b>	<b>40.5</b>	<b>F</b>	<b>113.1</b>	<b>D</b>	<b>53.0</b>	<b>D</b>	<b>40.3</b>
<i>LA 1019 eastbound</i>	D	46.3	F	151.4	D	49.0	D	48.5
<i>LA 1019 westbound</i>	D	38.8	F	84.1	D	53.4	D	50.8
<i>LA 16 northbound</i>	D	40.6	F	131.1	D	53.8	C	26.7
<i>LA 16 southbound</i>	D	35.3	D	54.5	D	52.9	D	42.3
<b>LA 1019 at LA 3285</b>	-	-	-	-	<b>A</b>	<b>8.2</b>	<b>C</b>	<b>22.4</b>
<i>Hooper Road eastbound</i>							B	18.7
<i>LA 1019 westbound</i>	C	22.3	F	56.3	B	18.6	B	19.0
<i>LA 1019 northbound</i>					A	1.8	C	24.8
<i>LA 3285 southbound</i>	A	9.0	A	8.7	B	11.3	C	24.3
<b>Hooper Ext at LA 16</b>					<b>C</b>	<b>28.1</b>	<b>C</b>	<b>28.8</b>
<i>Hooper Road eastbound</i>					D	35.2	C	33.5
<i>Hooper Road westbound</i>							D	40.2
<i>LA 16 northbound</i>					C	20.7	C	21.6
<i>LA 16 southbound</i>					C	33.4	C	31.6
<b>Hooper Ext at Bend*</b>					-	-	-	-
<i>Hooper Road eastbound</i>					A	9.0	A	9.2
<i>Hooper Road westbound</i>					A	9.8	A	9.9
<i>Bend Road northbound</i>					C	17.8	C	18.6
<i>Bend Road southbound</i>					C	20.8	C	22.0

Tables III-6 and III-7 indicate that with the proposed intersection configurations and operation each of the subject intersections are expected to operate acceptably during both the AM and PM peaks for Alternatives A and B

*2032 Build Roadway Analysis*

**Tables III-8 and III-9** present a summary of the capacity analysis results for the Hooper Extension highway segments under each alternative for a two-lane and four-lane divided roadway. The level of service for the highway segments is based on delay which is measured in a volume to capacity ratio for the two-lane analysis and in passenger cars per mile per lane (pc/mi/lane) for the multi-lane analysis.

**Table III-8**  
**Level of Service Analysis - Two-Lane Roadway**

Hooper Ext between	AM Peak		PM Peak	
	LOS	V/C	LOS	V/C
<b>Alternative A</b>				
<i>LA 64 and Bend Road</i>	E	0.48	E	0.48
<i>LA 16 and Bend Road</i>	E	0.50	E	0.49
<b>Alternative B</b>				
<i>LA 64 and Bend Road</i>	E	0.50	E	0.50
<i>LA 16 and Bend Road</i>	E	0.51	E	0.52

Table III-8 indicates that a two-lane roadway is expected to operate at approximately half the capacity and LOS E. LOS E indicates that the expected “time spent following” exceeds 80% which indicates difficulty passing and intense platooning.

**TABLE III-9**  
**Level of Service Analysis - Multi-Lane Roadway**

Hooper Ext between:		AM Peak		PM Peak	
		LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)
<b>Alternative A</b>					
<i>LA 64 and Bend Road</i>	<i>Eastbound</i>	A	5.5	A	9.6
	<i>Westbound</i>	B	12.0	A	7.9
<i>LA 16 and Bend Road</i>	<i>Eastbound</i>	A	5.7	A	9.5
	<i>Westbound</i>	B	12.2	A	8.4
<b>Alternative B</b>					
<i>LA 64 and Bend Road</i>	<i>Eastbound</i>	A	5.7	A	9.9
	<i>Westbound</i>	B	12.6	A	8.3
<i>LA 16 and Bend Road</i>	<i>Eastbound</i>	A	6.0	A	9.8
	<i>Westbound</i>	B	12.6	A	9.0

Table III-9 indicates that a four-lane roadway is expected to operate at LOS B or better during the AM and PM peaks for both alternatives.

### Conclusions

Analysis indicates that each of the subject intersections under the No Build Scenario are expected to operate acceptably during the existing conditions but are expected to deteriorate to failing operation by the design year of 2032.

The subject intersections with the proposed intersection configurations and operation are expected to operate acceptably for both Alternatives A and B in the design year of 2032.

Roadway analysis indicated that in the design year of 2032, the Hooper Road Extension as a two-lane roadway is expected to operate at LOS E; however, the volumes are well below capacity. As a four-lane roadway, the Hooper Extension is expected to operate as LOS B or better.

## **Recommendations**

Based on the traffic analysis conducted in this study, either of the alternatives is expected to meet the purpose and need of this study. It is recommended that the Hooper Extension be a four-lane divided roadway to adequately service the expected traffic volumes. As presented in **Figures III-11 and III-12**, the following intersection configurations along with signal timing and phasing adjustments to accommodate new traffic and geometry are recommended for the indicated alternative:

### ***Alternatives A and B***

#### Hooper Road at LA 64 (Signalized)

- Eastbound and Westbound: Shared Left-Through and Through-Right Lanes
- Northbound: Single Shared Left-Through-Right Lane
- Southbound: Exclusive Left Turn Lane and Shared Through-Right Lane

#### Hooper Extension at Bend Road (Unsignalized)

- Eastbound and Westbound: Shared Left-Through and Through-Right Lanes
- Northbound and Southbound: Single Shared Left-Through-Right Lane

### ***Alternative A***

#### Hooper Extension at LA 16 (Signalized)

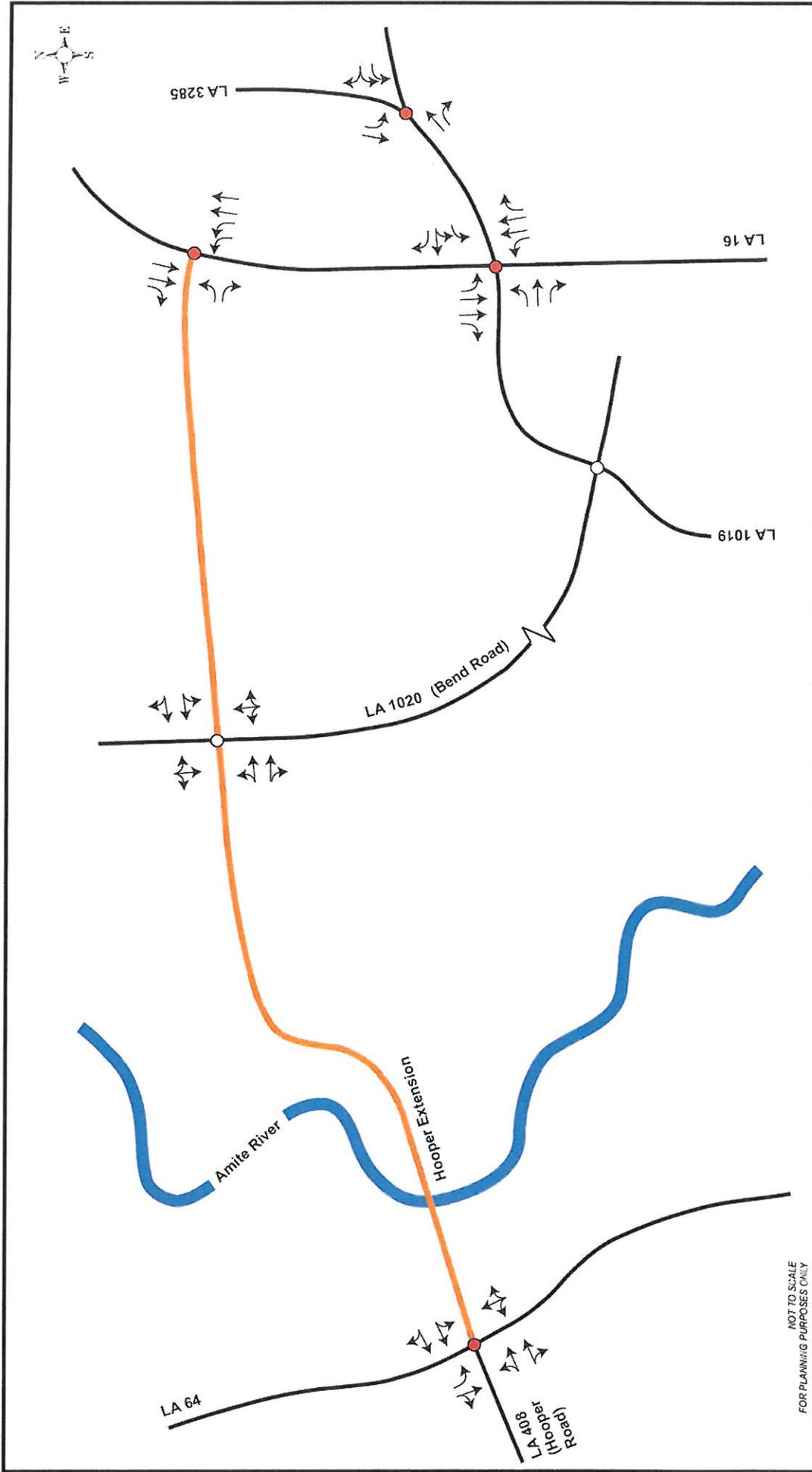
- Eastbound: Exclusive Left Turn and Right Turn Lanes
- Northbound: Dual Left Turn Lanes and Two Through Lanes
- Southbound: Two Through Lanes and an Exclusive Right Lane

#### LA 16 at LA 1019 (Signalized)

- Eastbound: Exclusive Left Turn, Through and Right Turn Lanes
- Westbound: Exclusive Left Turn, Shared Left-Through and an Exclusive Right Turn Lanes
- Northbound and Southbound: Exclusive Left Turn, Dual Through and an Exclusive Right Turn Lanes

#### Hooper Extension at LA 3285 (Signalized)

- Westbound: Exclusive Left Turn and Shared Left-Right Lanes
- Northbound: Exclusive Through and Right Turn Lanes
- Southbound: Exclusive Left and Through Lanes



NOT TO SCALE  
FOR PLANNING PURPOSES ONLY

LEGEND:	
X	AM Peak Hour
(X)	PM Peak Hour
●	Signalized Intersection
○	Unsignalized Intersection

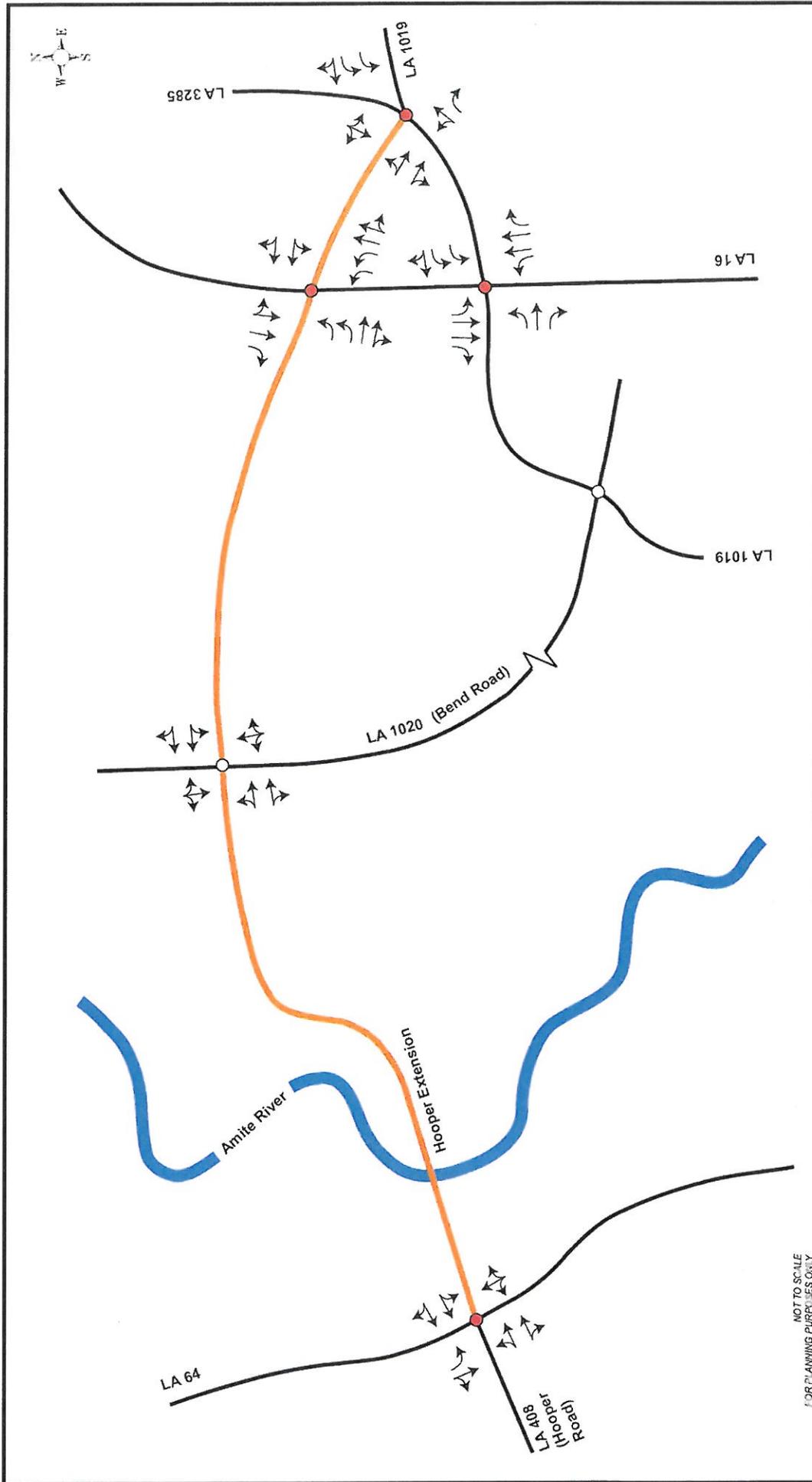


**STAGE 0 FEASIBILITY STUDY  
HOOPER ROAD EXTENSION**  
East Baton Rouge & Livingston Parishes, LA  
State Project No. H.005403

**NY ASSOCIATES, INC.**  
- ENGINEERS - ARCHITECTS - PLANNERS  
- PROGRAM & PROJECT MANAGERS  
in association with:  
Urban Systems Associates, Inc.  
Coastal Environments, Inc.

**Figure  
III-11**

**2032 Build Lane Configuration (Alternative A)**



NOT TO SCALE  
FOR PLANNING PURPOSES ONLY

**LEGEND:**

X	AM Peak Hour
(X)	PM Peak Hour
●	Signalized Intersection
○	Unsignalized Intersection



**STAGE 0 FEASIBILITY STUDY  
HOOPER ROAD EXTENSION**  
East Baton Rouge & Livingston Parishes, LA  
State Project No. H.005403

**2032 Build Lane Configuration (Alternative B)**

**NY ASSOCIATES, INC.**  
- ENGINEERS - ARCHITECTS - PLANNERS  
- PROGRAM & PROJECT MANAGERS  
In association with:  
Urban Systems Associates, Inc.  
Coastal Environments, Inc.

**Figure  
III-12**

## *Alternative B*

### Hooper Extension at LA 16 (Signalized)

- Eastbound: Dual Left Turn Lanes, Through and Shared Through-Right Lanes
- Westbound: Single Shared Left-Through-Right Lane
- Northbound: Dual Left Turn Lanes, Through and Shared Through-Right Lanes
- Southbound: Shared Left-Through, Through Lanes and an Exclusive Right Lane

### LA 16 at LA 1019 (Signalized)

- Eastbound: Exclusive Left Turn, Through and Right Turn Lanes
- Westbound: Dual Left Turn and Shared Through-Right Lanes
- Northbound and Southbound: Exclusive Left Turn, Dual Through and an Exclusive Right Turn Lanes

### Hooper Extension at LA 3285 (Signalized)

- Eastbound: Shared Left-Through and Through-Right Lanes
- Westbound: Dual Left Turn Lanes and Shared Through-Right Lane
- Northbound: Shared Left-Through and an Exclusive Right Turn Lanes
- Southbound: Single Shared Left-Through-Right Lane

Due to right-of-way constraints, environmental impacts, and/or other limitations, the improvements required based on projected traffic conditions may not be included in the final recommended geometry.

## OTHER DESIGN CONSIDERATIONS

### **Phased Implementation**

The Traffic Impact Analysis focused in detail on the design year of 2032, as the Scope of Work did not require analysis of interim years to see if the project may be built in phases. The roadway analysis did indicate that in the design year of 2032, the Hooper Road Extension, if developed as a two-lane roadway, was expected to operate at LOS E; however, the volumes are well below capacity, which may indicate that a phased implementation plan might be used.

To that end, the bridge sections were designed such that the first span (either the eventual westbound or eastbound span) would be able to function on an interim basis as a two-way bridge. The bridges were developed with 10 foot outside shoulders (2 feet wider than required) and 6 foot inside shoulders, so that initially, the span could function as a two-way bridge with an 8 foot shoulder on each side. Once the second parallel span is built, the first bridge would be re-stripped to 6 foot inside shoulders and 10 foot outside shoulders.

Similarly, the at-grade section could easily be developed on one side initially, operate as a two-lane roadway and when traffic conditions merit, the other two lanes could be constructed and the initial two lanes become one direction of a divided highway.

It is anticipated that all necessary right-of-way for a four-lane facility would be acquired at the beginning of the project.

In addition to phased implementation in terms of capacity, the Hooper Road extension also offers opportunities in terms of segmented construction. The first possible segment would include the bridge over the Amite River, and link the current terminus of Hooper Road at Greenwell Springs Road to Bend Road (LA 1020). A second segment phase would be between Bend Road and LA 16, and for Alternative B, a third segment would be the short link from LA 16 to the LA 1019/3285 intersection.

### **Complete Streets Policy**

In July of 2010, the Louisiana Department of Transportation and Development enacted a *Complete Streets Policy*. In short, the Complete Streets Policy addresses the needs of pedestrians and bicyclists, and calls for the LADOTD to consider and include (where appropriate) sidewalks and bicycle accommodations along new and reconstruction roadway projects.

The Complete Streets Policy was addressed and considered in the development of these alternatives during this early Stage 0 process, although at this stage of project development no specific facilities are shown or are included in cost estimates. The following items provide some specific points relating to Hooper Road Extension and the Complete Streets Policy:

- As written in the policy, DOTD will provide bicycle accommodations appropriate to the context of the roadway. As the roadway portion of this project features a divided highway (and bridge) with 10 foot paved outside shoulders running through a predominantly rural area, it is anticipated that this would suffice for bicycle accommodations.
- The UA-2 Design Criteria used for this project allows ample right-of-way for construction of sidewalks and/or other pedestrian facilities. As noted in the Policy, the appropriate facility type will be determined by the context of the roadway, possibly during Stage 1 or Design Engineering Phase of this project.
- The possibility of phased implementation may affect the provision of dedicated bicycle/pedestrian facilities on the bridge portion of the project. The policy notes that it is generally inappropriate to provide bicycle and pedestrian facilities where it would be excessively disproportionate to the need or probable use, with excessively disproportionate being defined as exceeding twenty percent (20%) of the cost of the project. Recent bridges built in areas such as the Mississippi Gulf Coast have featured a shared bicycle/pedestrian lane separated from vehicular traffic and shoulders by a concrete barrier. These lanes are typically 12 feet in

width. If such a lane were to be built as part of a four-lane parallel bridge, the cost would not exceed the 20% threshold, but if built as part of the initial phase of implementation—as part of a two-lane bridge—it would likely exceed the 20% threshold of the bridge portion of the project.

- The need for and appropriateness of including a dedicated bicycle/pedestrian lane for the bridge segment of the project, as well as the decision of a providing a dedicated bicycle lane vs. use of shoulder on roadway sections, and decision as to whether or not to include sidewalks along roadway sections, should be addressed in both the Stage 1 Phase and Design Phase of the project.

## **DESCRIPTION OF THE FINAL ALTERNATIVES**

### **DESIGN CRITERIA**

The concept design of the roadway of the proposed project meets LADOTD UA-2 (urban arterial) criteria for roadway design.

**Table III-10**, on the following page, lists the design criteria.

### **DESIGN CONCEPTS**

Both design concepts are described below, with descriptions beginning in the west (at the Greenwell Springs Road intersection) and ending in the east. As the two alternatives share a common section, the common section is first described, followed by the eastern terminus of Alternative A and the eastern terminus of Alternative B. Plan view layouts (including apparent right-of-way), u-turn detail, and typical sections for the alternatives are presented at the end of this chapter.

#### **Common Section**

Both alternatives begin at the intersection of Hooper Road and Greenwell Springs Road. This conceptual design of the extension assumes that Hooper Road has not been widened to four lanes. A free-flow right turn lane from northbound Greenwell Springs Road will become the right hand lane for eastbound Hooper Road extension, while a free flow right turn lane from westbound Hooper Road extension will serve as the end of the extension's right hand lane. The existing east and west bound lanes of Hooper Road will continue on as the inside lanes of the extension. The east and west bound traffic lanes will diverge as they move westward, creating a divided median. Right-of-way will need to be acquired on the east side of Greenwell Springs Road, with an estimated three residential relocations.

**Table III-10  
Hooper Road Extension  
Project Design Criteria**

DESIGN FEATURES		UA-2 (MAINLINE)
Design Speed		45 mph
Travel Lane Width		12 Ft.
Shoulders	Inside (Left Side)	N/A
	Outside (Right Side)	10 ft. or curb
Width of Raised Median on Multi-lane Facilities		30 ft.
Pavement Cross-Slope	Normal	.025 Ft./Ft.
	Maximum	.04 Ft./Ft.
Minimum Stopping Sight Distance		360 Ft.
Minimum Radius	With normal crown	1,000 ft.
	With 2.5% superelevation	750 ft.
	With full superelevation	700 ft.
Minimum Length of Vertical Curve		3X Design Speed
Maximum Grade		6%
Maximum K Value		167 (for subsurface drainage in urbanized area)
Minimum Longitudinal Grade		0.40% (for curb & gutter with subsurface drainage)
Minimum Vertical Clearance		16'
Minimum Horizontal Clearance	From edge of travel lane	24'
	Outside (from back of curb)	6' (minimum) – 22' (desired)
	Median (from back of curb)	4' minimum – 18' (desired)
Fore Slope Ratio		1V:3H (min.); 1V4H (desired)
Back Slope Ratio		1V:3H
Bridge Design Load		AASHTO HL-93
Minimum Width		Traveled way plus 8'
Design Specifications	Roadway Design	AASHTO policy on geometrical design of highways and as modified by LADOTD Roadway Design Procedures
	Bridge Design	AASHTO Bridge Design Specifications and as modified by LADOTD Bridge Design Manual

As the land slopes down to the floodplain of the Amite River, the at-grade roadway will transition to two (2) parallel bridge structures. Over the main portion of the river, Type IV AASHTO girder spans are expected to be used, assumed with 95' spans. The bridge height is designed to handle a maximum water surface elevation of approximately 53 feet. The Hooper Road extension will remain on bridge structure as it heads east over the spoil bank floodplains; however, spans will transition down to quad beam bridge spans (assumed with 40' spans) as the structure leaves the main river channel area. The bridge structure will turn to the north, following the curve of the river, then back to the east before transitioning to an at-grade roadway between the residences at the end of Boyd Ott Lane and the gravel pits on the eastern side of the river.

Heading eastward, the divided highway will cross an area of cleared land, avoiding residences before intersecting Bend Road (LA 1020) between Ben Allen Road and John Hancock Road. The divided 4-lane roadway then continues east for about 1200 feet before reaching the point where Alternatives A and B diverge.

### **Alternative A Terminus**

From the point of divergence, Alternative A continues almost due east, with the median width lessening and divided lanes converging until the Hooper Road extension's "T" intersection with LA 16. One U-turn is planned between Bend Road and LA 16. As indicated in the traffic analysis section, the intersection would be signalized. The outside (right hand) eastbound lane of the Hooper Road extension will be a right-turn only lane, directed to a free-flow right turn to southbound LA 16. The inside (left hand) eastbound lane will be the dedicated left turn lane for traffic heading north on LA 16.

LA 16's existing four-lane status at the intersection south of the LA 1019 intersection will be extended north to the intersection with the Hooper Road extension. It will transition back to two lanes about 1,000 ft north of the new intersection with Hooper Road. A dedicated left turn lane for northbound LA 16 traffic heading west onto Hooper Road is included in the intersection design, along with a free-flow right turn lane for southbound LA 16 vehicles wishing to head west on Hooper Road.

While the extension of Hooper Road and widening of LA 16 under Alternative A will require the acquisition of right-of-way in Livingston Parish, no residential acquisitions are expected. The widening of LA 16 will require modifications to commercial parking lots and will likely affect one (1) commercial structure, possibly requiring acquisition.

### **Alternative B Terminus**

From the point of divergence from the common section, Alternative B begins a curve to the southeast, crossing a cleared area and entering a wooded area. One U-turn is planned between Bend Road and the Alternative B intersection with LA 16. The extension

continues southeasterly, with the median width lessening and divided lanes converging until the Hooper Road extension's intersection with LA 16.

The full intersection occurs just north of the strip shopping center on the northwest corner of LA 1019 and LA 16. As indicated in the traffic analysis section, this would be a signalized intersection. The outside (right hand) eastbound lane of the Hooper Road Extension will be a right-turn only lane, directed to a free-flow right turn to southbound LA 16. The inside (left hand) eastbound lane will have the option of taking a left turn to northbound LA 16, or continuing eastward as the Hooper Road extension will continue past LA 16 as a two lane facility, connecting with the existing "T" intersection of Old LA 16/ LA 1019/3285 and Springfield Road/ LA 1019 to form a full intersection.

LA 16's existing four-lane status at the intersection south of the LA 1019 intersection will be extended north to the intersection with the Hooper Road extension. It will transition back to two lanes about 1,000 ft north of the new intersection with Hooper Road. A dedicated left turn lane for northbound LA 16 traffic heading west onto Hooper Road is included in the intersection design, along with a free-flow right turn lane for southbound LA 16 vehicles wishing to head west on Hooper Road. In addition, a dedicated left turn lane for southbound LA 16 traffic wishing to head east on the Hooper road extension to Springfield Road/ LA 1019 is included in the intersection design.

While the extension of Hooper Road and widening of LA 16 under Alternative A will require the acquisition of right-of-way in Livingston Parish, no residential acquisitions are expected. Alternative B will require modifications to commercial parking lots and will likely result in the acquisition of two (2) commercial structures, one of which is currently vacant.

## CONCEPTUAL CONSTRUCTION COSTS

### **General**

Construction quantities for the preferred alternatives were derived from the typical sections shown at the end of this chapter. Unit prices were based on Louisiana Department of Transportation and Development (LADOTD) 2011 unit prices.

### **At Grade Roadway**

The at-grade roadway cost estimate includes clearing and grubbing, earthwork (excavation and embankment), installation of base course and geotextile fabric, new pavement, pavement striping, drainage, and seeding and silt fencing. The cost is presented on a square foot basis.

## **Bridge Structure**

The bridge structure cost estimate includes the elevated sections of the project. Using quantities from the typical sections and LADOTD unit costs, a square foot unit construction cost was calculated. The cost of bridge drainage was included in the average square foot unit costs. The square foot unit costs vary due to the girder type. The square foot costs were used to estimate the cost of the Bridge Structure.

## **Miscellaneous Items**

Miscellaneous items include removal of structures and obstructions, traffic maintenance aggregate, removal of existing roadways and base, temporary signs & barricades, and driveways.

## **Utility Relocation**

Research was completed to ascertain what public utility lines were located in areas of roadway widening, where utilities would be running parallel to the roadway and would need to be moved to accommodate roadway widening. Private utilities, such as electrical and telecommunications would be responsible for their own relocation costs.

Public utilities which would likely require relocation are all located in Livingston Parish and include water, sewer and gas (City of Walker). The areas where these are affected include along LA 16 and LA 1019 south of Live Oak High School. A 6" sewer force main planned for construction along the west side of LA 16 was also included for cost estimation purposes.

Estimated costs were developed based on linear measurements, established criteria for spacing of valves, hydrants, and service connections, and recent unit costs.

## **Mobilization**

A conceptual cost for mobilization was estimated and included.

## **ADDITIONAL PROJECT COSTS**

Prior to actual construction, there will be other costs associated with the project, including environmental costs (environmental clearance and mitigation) engineering design costs, and right-of-way and relocation. These are discussed below.

## **Environmental Costs**

The next stage of project development will be Stage 1, which will likely include completion of an environmental document such as an Environmental Assessment or Environmental Impact Statement. Depending on the amount and degree of severity of anticipated impacts and the size of the project area, completion of such documents can run between hundreds of thousands of dollars up to millions of dollars. The funding source for Stage 1 of Hooper Road will be state bonds in the amount of \$1,000,000 in Priority 1 bonds, which would appear appropriate and adequate for a project of this nature.

A second type of environmental cost would be cost of mitigation of any unavoidable impacts. The Stage 0 step in the process is too early to determine exact impacts and estimate the dollar amount required to mitigate those impacts, a possible cost of mitigation has already been identified: Approximately 27.6 acres of potential wetlands have been identified in the project area. Mitigation of unavoidable wetland impacts on similar projects in the past has been achieved through a monetary contribution, as determined by the regulatory agencies, to the Louisiana Nature Conservancy that maintains several wetland mitigation areas in Louisiana.

## **Engineering Design Costs**

Prior to construction, the project will need to be fully engineered, not only including actual design, but also including testing, surveying, and geotechnical investigation. Using a baseline estimate of 8% of construction cost, engineering design costs would be roughly \$4.28 million for Alternative A, or \$4.37 million for Alternative B.

## **Right of Way and Relocations**

This cost estimate includes the cost for land acquisition in two categories: *at-grade roadway*, which is considered developable land, and *bridge structure*, which is considered floodplain/undevelopable land. Costs are also estimated for residential acquisitions/relocations as well as commercial acquisitions/relocations. Cost were based on similar "for sale" properties at the time of the study and professional experience.

## **CONTINGENCIES**

A 25% cost contingency was included for this concept-level study.

## CONCEPTUAL COST ESTIMATES

Itemized conceptual cost estimates for each alternative are presented in Tables III-11 and Table III-12 on the following two pages.

**Table III-11**  
**Hooper Road Extension Project**  
**Alternative A**  
**Conceptual Construction Cost Estimate**

ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
<b>ENVIRONMENTAL COSTS</b>	Lump	\$1,000,000	1	\$1,000,000
<b>ENGINEERING DESIGN COSTS</b>	Lump	\$4,279,189	1	\$4,279,189
<b>RIGHT-OF WAY AND RELOCATIONS</b>				
Right-of-Way - At Grade Roadway	Acres	\$29,000.00	33.430	\$969,470
Right-of Way – Bridge Structure	Acres	\$1500.00	17.192	\$25,788
Residential Acquisition /Relocation	Ea.	\$400,000	3	\$1,200,000
Commercial Acquisition /Relocation	Ea.	\$375,000	1	\$375,000
<b>AT-GRADE ROADWAY</b> Includes clearing and grubbing, earthwork, installation of base course and geotextile fabric, new pavement, pavement striping, drainage, and seeding & silt fencing	Sq. Ft.	\$18.00	736,528	\$13,257,504
<b>BRIDGE STRUCTURE</b>	Ea.	\$33,386,600	1	\$33,386,600
<b>MISCELLANEOUS ITEMS</b>				
Removal of Structures & Obstructions	Lump	\$50,000.00	1	\$50,000
Traffic Maintenance Aggregate	Cu. Yds.	\$60.00	400	\$24,000
Removal of Existing Roadway and Base	Sq. Yd.	\$10.00	10,000	\$100,000
Temporary Signs and Barricades	Lump	\$40,000	1	\$40,000
Driveways	Sq. Yd.	\$80.00	500	\$40,000
<b>MOBILIZATION</b>	Ea.	\$2,393,000	1	\$2,393,000
<b>UTILITY RELOCATION</b>				
Water	Ea.	\$901,750	1	\$901,750
Sewer Force Main	Ln. Ft..	\$90.00	4,275	\$384,750
Gas Line	Ln. Ft..	\$80.00	4,275	\$342,000
<b>SUBTOTAL</b>				<b>\$58,769,051</b>
Contingencies	25%			\$14,692,263
<b>GRAND TOTAL</b>				<b>\$73,461,314</b>

**Table III-12**  
**Hooper Road Extension Project**  
**Alternative B**  
**Conceptual Construction Cost Estimate**

ITEM	UNIT	UNIT PRICE	QUANTITY	AMOUNT
<b>ENVIRONMENTAL COSTS</b>	Lump	\$1,000,000	1	\$1,000,000
<b>ENGINEERING DESIGN COSTS</b>	Lump	\$4,371,230	1	\$4,371,230
<b>RIGHT-OF WAY AND RELOCATIONS</b>				
Right-of-Way - At Grade Roadway	Acres	\$29,000.00	36.859	\$1,068,911
Right-of Way - Bridge Structure	Acres	\$1500.00	17.192	\$25,788
Residential Acquisition /Relocation	Ea.	\$400,000	3	\$1,200,000
Commercial Acquisition /Relocation	Ea.	\$375,000	2	\$750,000
<b>AT-GRADE ROADWAY</b> Includes clearing and grubbing, earthwork, installation of base course and geotextile fabric, new pavement, pavement striping, drainage, and seeding & silt fencing	Sq. Ft.	\$18.00	787,454	\$14,174,172
<b>BRIDGE STRUCTURE</b>	Ea.	\$33,386,600	1	\$33,386,600
<b>MISCELLANEOUS ITEMS</b>				
Removal of Structures & Obstructions	Lump	\$50,000.00	1	\$50,000
Traffic Maintenance Aggregate	Cu. Yds.	\$60.00	400	\$24,000
Removal of Existing Roadway and Base	Sq. Yd.	\$10.00	10,000	\$100,000
Temporary Signs and Barricades	Lump	\$40,000	1	\$40,000
Driveways	Sq. Yd.	\$80.00	500	\$40,000
<b>MOBILIZATION</b>	Ea.	\$2,393,000	1	\$2,393,000
<b>UTILITY RELOCATION</b>				
Water	Ea.	\$677,600	1	\$677,600
Sewer Force Main	Ln. Ft..	\$90.00	2,730	\$245,700
Sewer Gravity Line	Ea	\$246,200	1	\$246,200
Gas Line	Ln. Ft..	\$80.00	2730	\$218,400
<b>SUBTOTAL</b>				<b>\$60,011,601</b>
Contingencies	25%			\$15,002,900
<b>GRAND TOTAL</b>				<b>\$75,014,501</b>

## PROJECT FUNDING

As of the date of this document, there is no current funding source identified for designing or constructing this project. Following the completion of this Stage 0 process, it is the intent of the LADOTD to complete a Toll Evaluation Study to see if building the roadway as a toll facility may be able to assist in funding. Other possible funding sources include state bonds, state capital outlays or federal highway monies.

## TRANSFER OF OWNERSHIP

This project will be adding miles to the state highway system. A transfer of ownership will need to be initiated in the future, should the project go to construction, by the appropriate entities.

## EVALUATION AND COMPARISON OF THE ALTERNATIVES

While the Scope of Work for the project does not require selection of a preferred alternative among the two alternatives, it does call for an evaluation and comparison. The below matrix presents a comparison in terms of (1) cost, (2) right-of-way acquisitions, (3) likely required relocations, (4) traffic impacts, and (5) comparative environmental impacts.

**Table III-13**  
**Evaluation/Comparison Matrix**

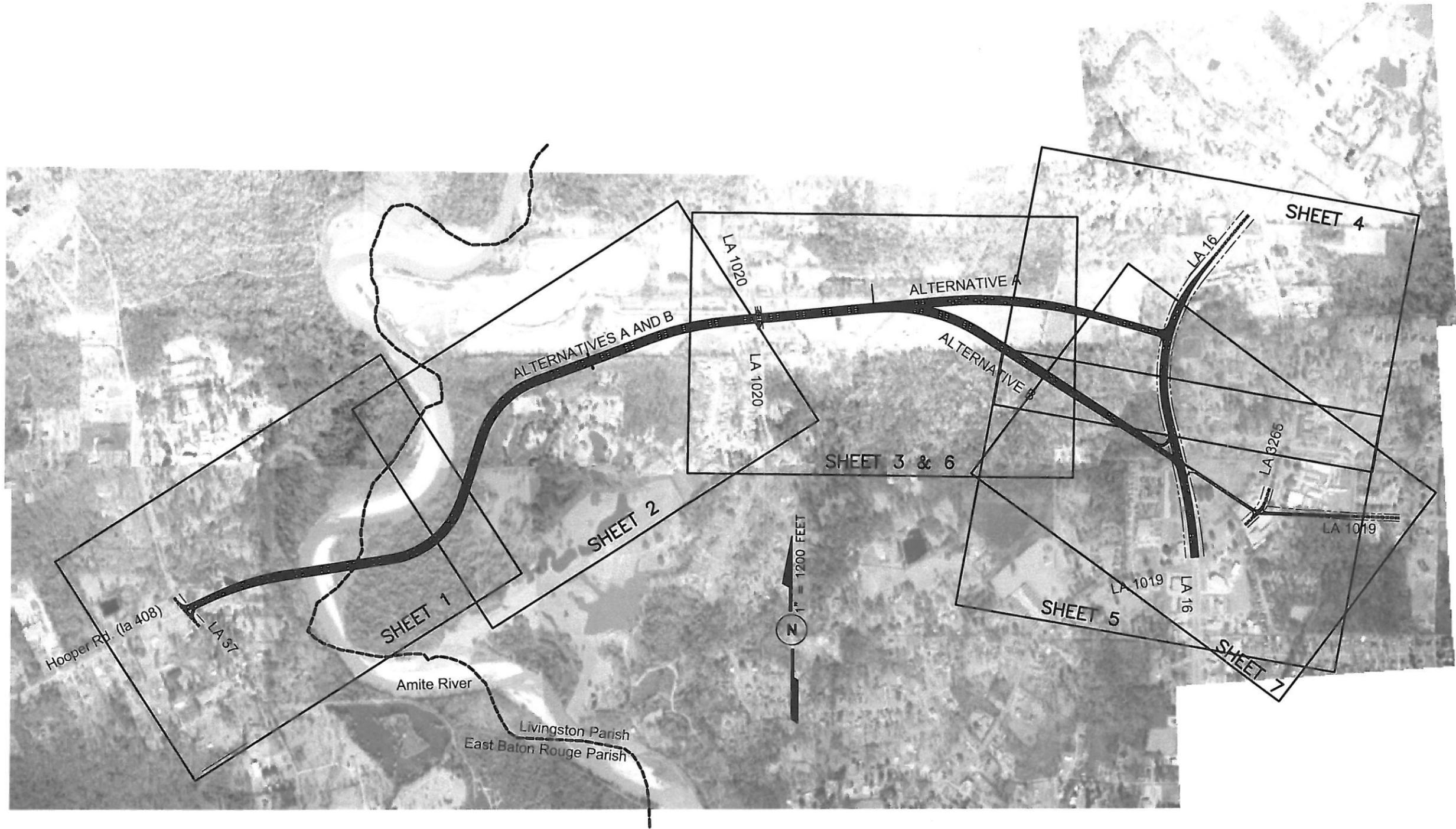
	<b>Alternative A</b>	<b>Alternative B</b>
Project Cost	\$73,461,314	\$75,014,501
Total Right of Way to be acquired (in acres)	50.622	54.051
Likely required relocations	3 residential, 1 commercial	3 residential, 2 commercial
Traffic Impacts	Acceptable LOS	Acceptable LOS
Comparative Environmental Impacts	Likely wetland impacts along Amite River floodplains and other areas, potential of prehistoric archaeological sites likely pressures for land use/zoning changes	Likely wetland impacts along Amite River floodplains and other areas, potential of prehistoric archaeological sites likely pressures for land use/zoning changes

# ALTERNATIVE EXHIBITS

## Index

Alternative A:	Sheets III-1 through III-5
Alternative B:	Sheets III-1 through III-3; Sheets III-6 and III-7
Typical Sections:	Sheets TS-1 and TS-2





SHEET  
INDEX

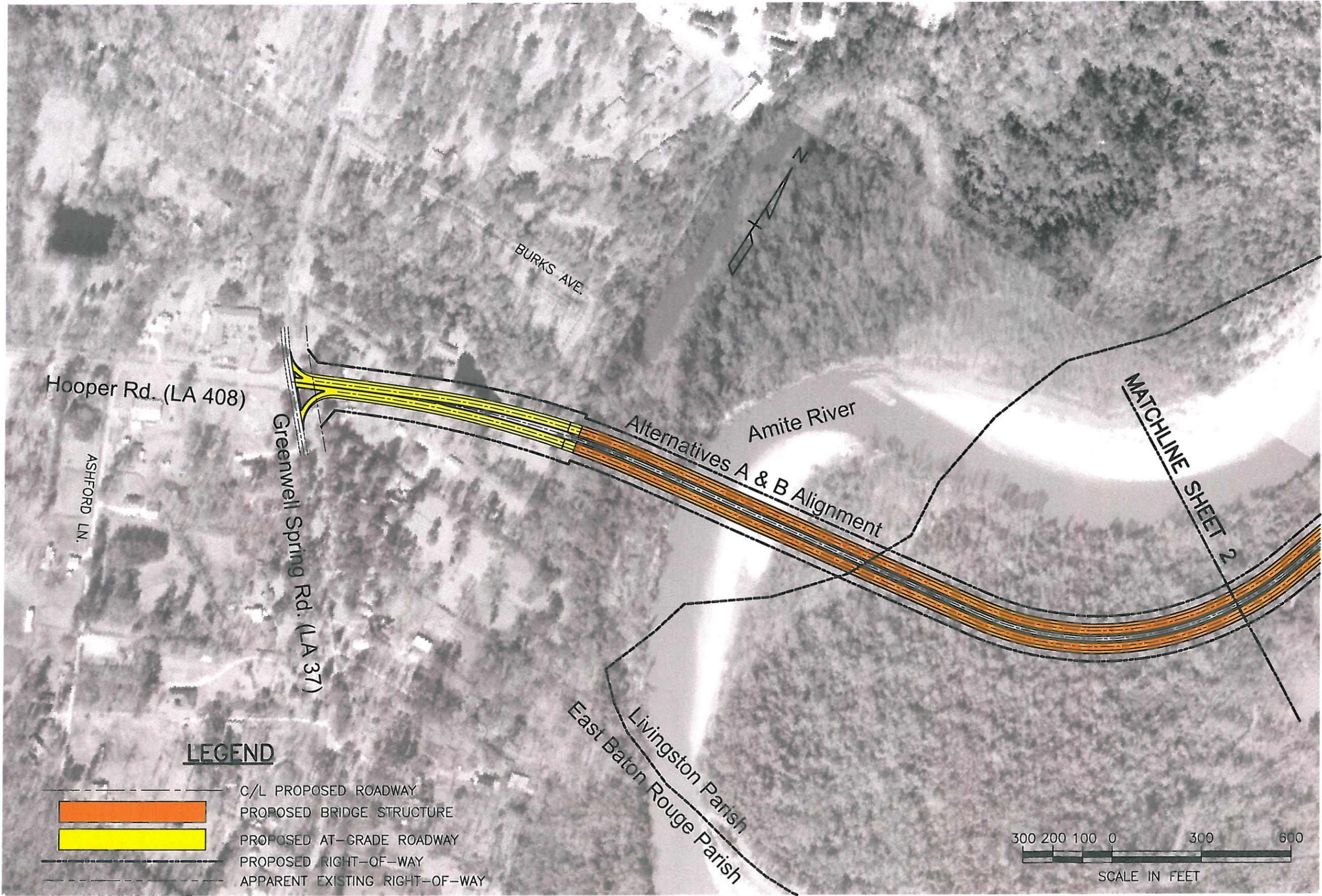
**HOOPER ROAD EXTENSION - LA 408  
ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
EAST BATON ROUGE & LIVINGSTON PARISHES**

STATE PROJECT No. H-005403

ALTERNATIVE LAYOUTS AND PLAN SHEET INDEX

**WY ASSOCIATES, INC.**  
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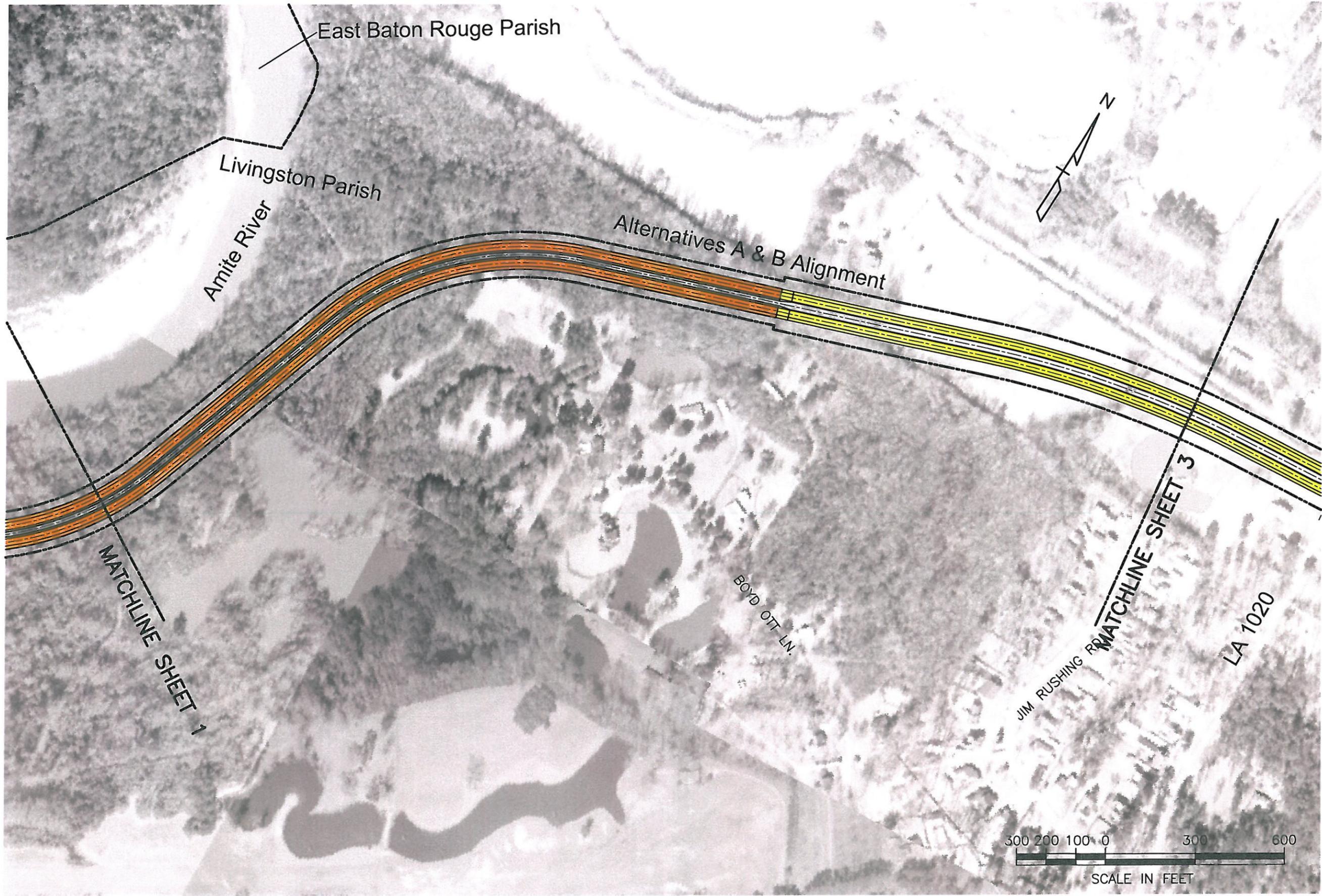




**LEGEND**

-  C/L PROPOSED ROADWAY
-  PROPOSED BRIDGE STRUCTURE
-  PROPOSED AT-GRADE ROADWAY
-  PROPOSED RIGHT-OF-WAY
-  APPARENT EXISTING RIGHT-OF-WAY





East Baton Rouge Parish

Livingston Parish

Amite River

Alternatives A & B Alignment

MATCHLINE SHEET 1

MATCHLINE SHEET 3

LA 1020

BOYD OTT LN.

JIM RUSHING RD

300 200 100 0 300 600

SCALE IN FEET

SHEET III-2

HOOPER ROAD EXTENSION - LA 408  
 ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
 EAST BATON ROUGE & LIVINGSTON PARISHES  
 STATE PROJECT NO. H-005403

**NY ASSOCIATES, INC.**  
 • ENGINEERS • ARCHITECTS • PLANNERS  
 • PROGRAM & PROJECT MANAGERS



PLAN LAYOUT - ALTERNATIVES A AND B ALIGNMENT

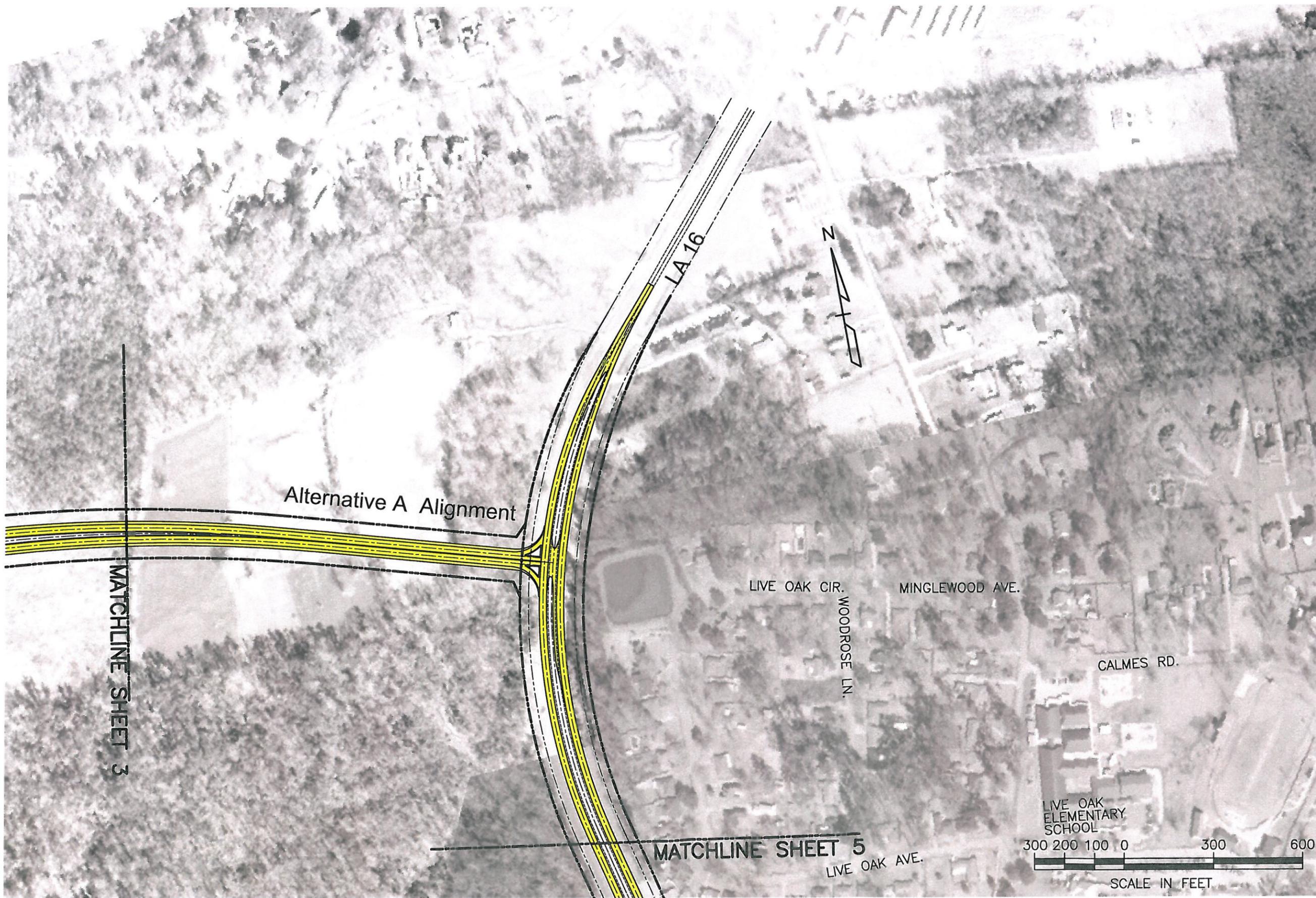


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HOOPER ROAD EXTENSION - LA 408  
 ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
 EAST BATON ROUGE & LIVINGSTON PARISHES  
 STATE PROJECT No. H-005403

PLAN LAYOUT - ALTERNATIVE A ALIGNMENT

SHEET  
 III-3



MATCHLINE SHEET 3

MATCHLINE SHEET 5

300 200 100 0 300 600

SCALE IN FEET

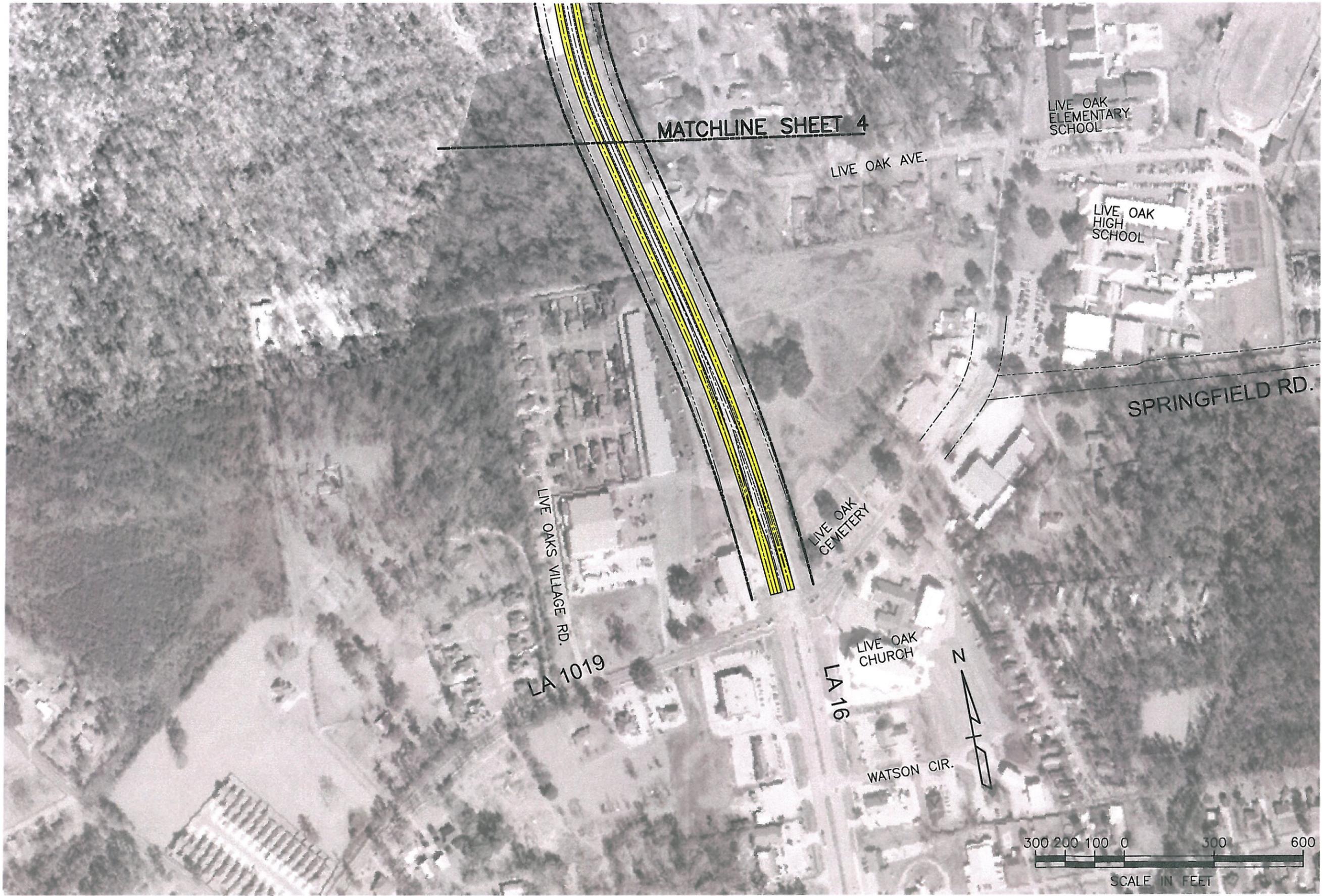
SHEET  
III-4

HOOPER ROAD EXTENSION - LA 408  
 ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
 EAST BATON ROUGE & LIVINGSTON PARISHES  
 STATE PROJECT No. H-005403

PLAN LAYOUT - ALTERNATIVE A ALIGNMENT

**WY ASSOCIATES, INC.**  
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MATCHLINE SHEET 4

LIVE OAK AVE.

LIVE OAK  
ELEMENTARY  
SCHOOL

LIVE OAK  
HIGH  
SCHOOL

SPRINGFIELD RD.

LIVE OAKS VILLAGE RD.

LA 1019

LIVE OAK  
CEMETERY

LA 16

LIVE OAK  
CHURCH

N

WATSON CIR.



SCALE IN FEET

SHEET

III-5

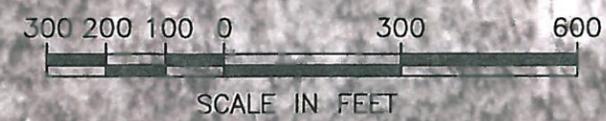
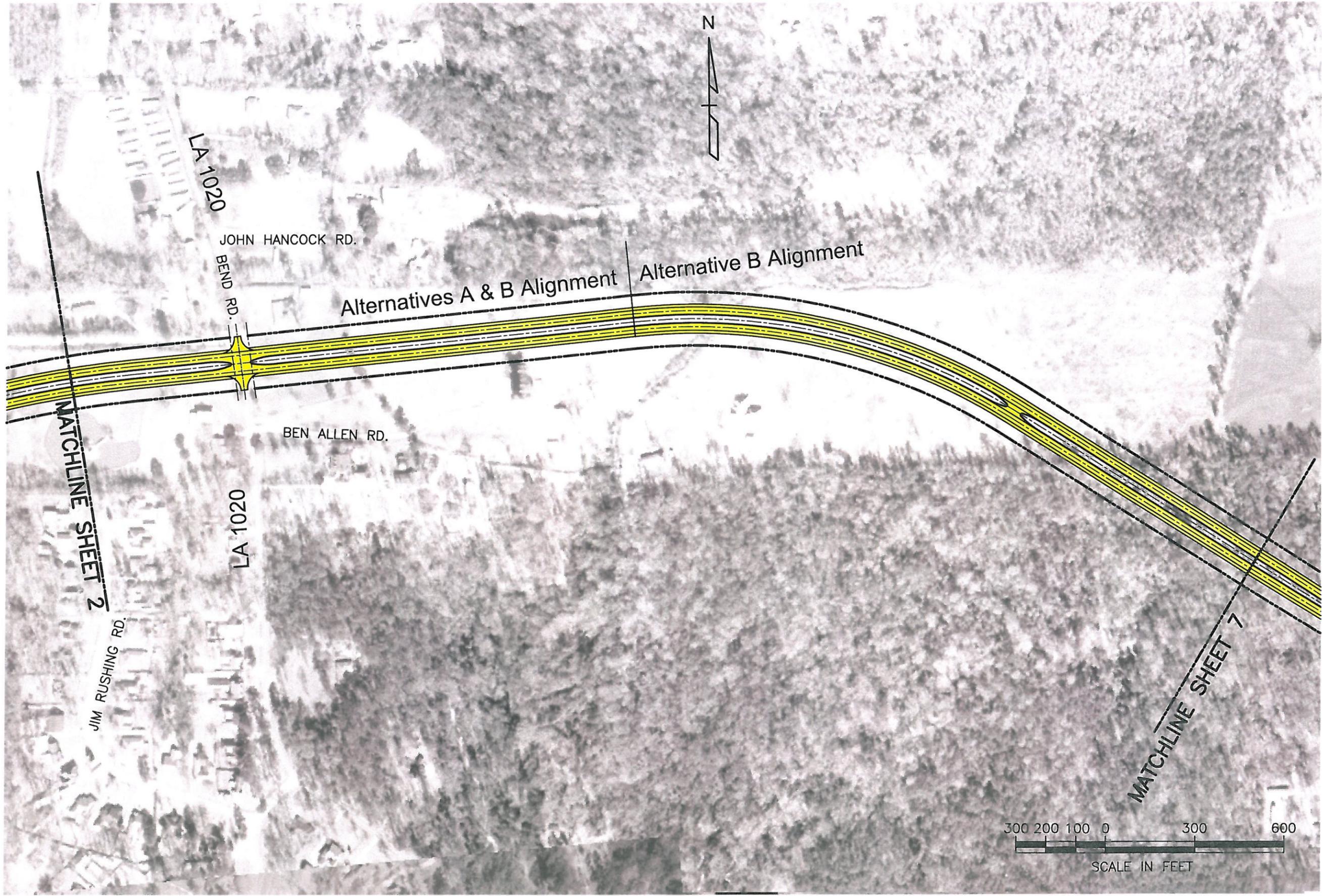
HOOPER ROAD EXTENSION - LA 408  
 ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
 EAST BATON ROUGE & LIVINGSTON PARISHES

STATE PROJECT No. H-005403

PLAN LAYOUT - ALTERNATIVE A ALIGNMENT

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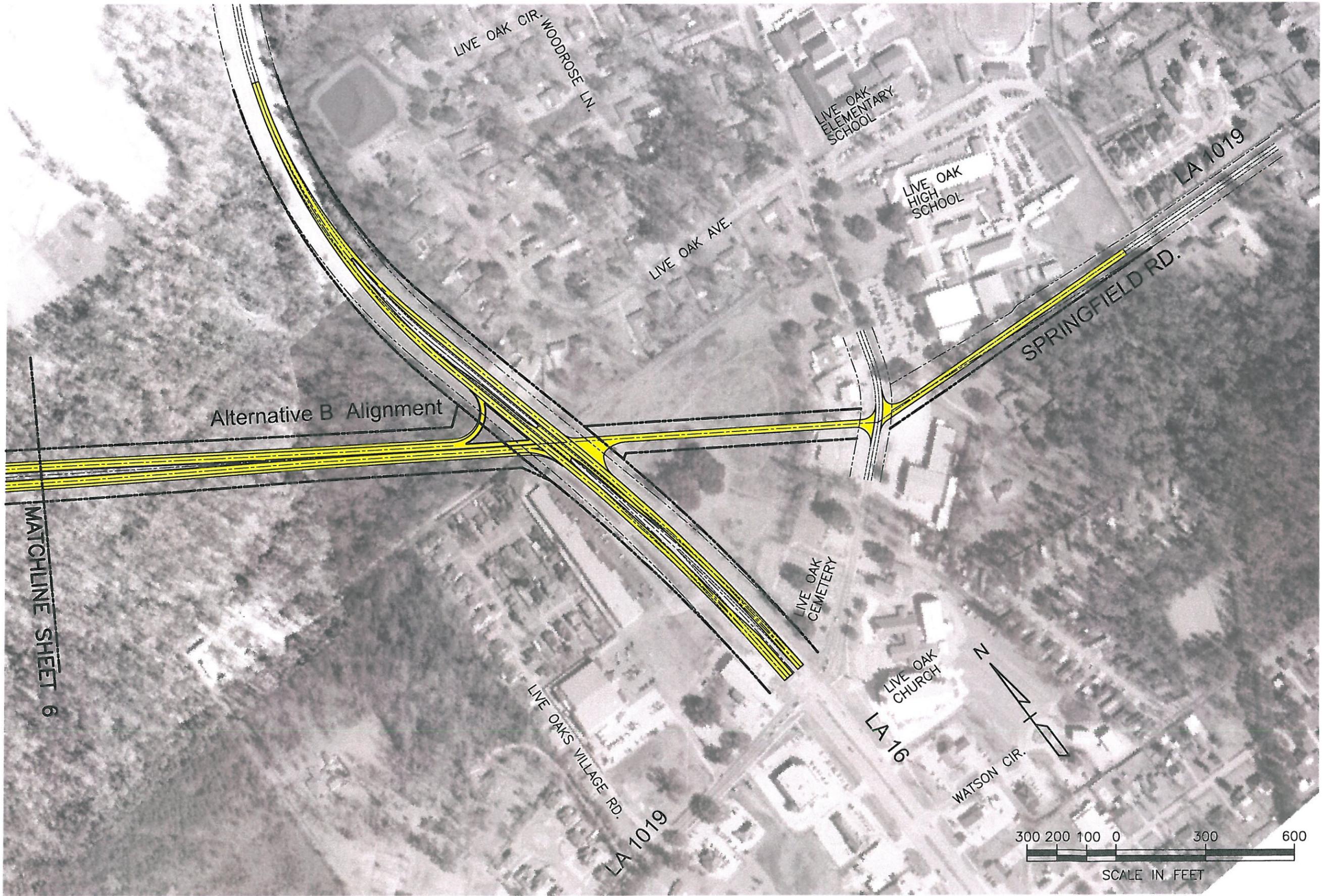
SHEET III-6

HOOPER ROAD EXTENSION - LA 408  
 ENVIRONMENTAL IMPACT STATEMENT - STAGE 0  
 EAST BATON ROUGE & LIVINGSTON PARISHES  
 STATE PROJECT NO. H-005403

PLAN LAYOUT - ALTERNATIVE B ALIGNMENT

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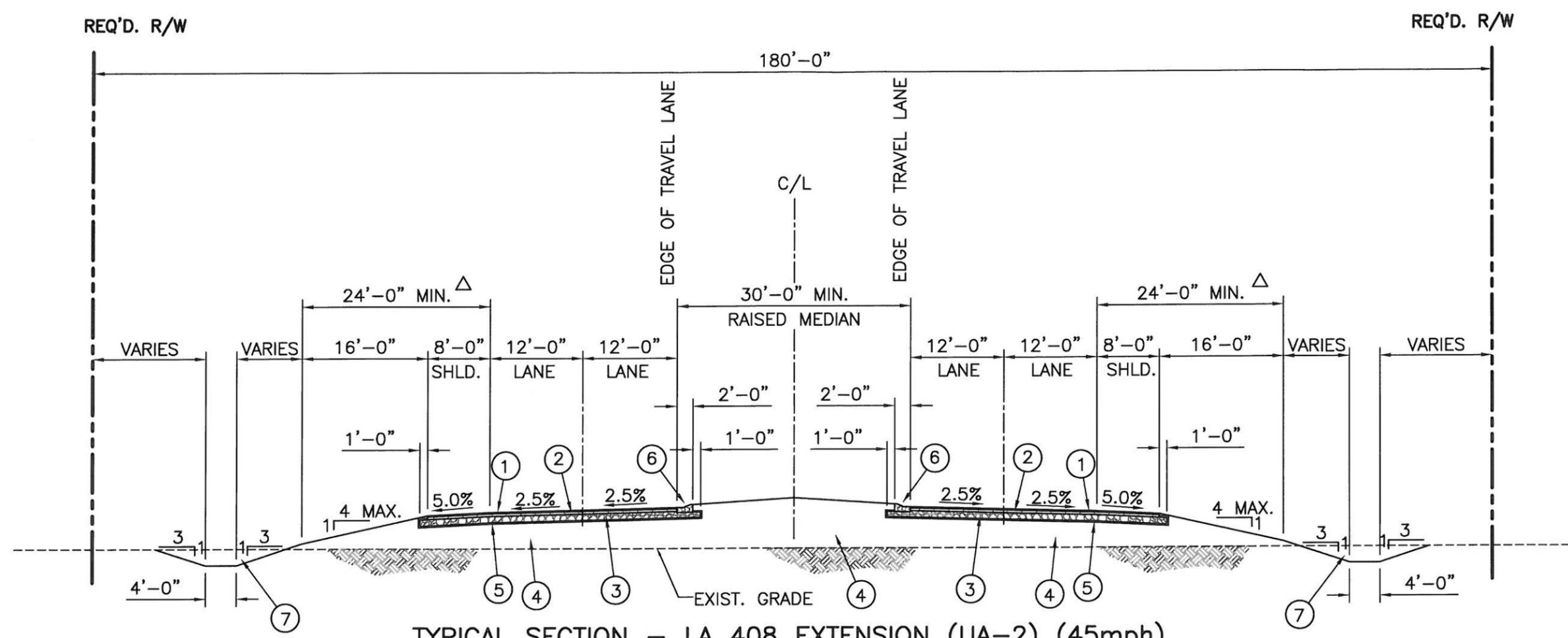




MATCHLINE SHEET 6

Alternative B Alignment

SHEET	III-7
<b>HOOPER ROAD EXTENSION - LA 408</b> <b>ENVIRONMENTAL IMPACT STATEMENT - STAGE 0</b> <b>EAST BATON ROUGE &amp; LIVINGSTON PARISHES</b> <small>STATE PROJECT No. H-005403</small>	
<b>PLAN LAYOUT - ALTERNATIVE B ALIGNMENT</b>	
 <b>ASSOCIATES, INC.</b> <small>• ENGINEERS • ARCHITECTS • PLANNERS</small> <small>• PROGRAM &amp; PROJECT MANAGERS</small>	
 <small>DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT</small> <b>DOTD</b> <small>STATE OF LOUISIANA</small>	



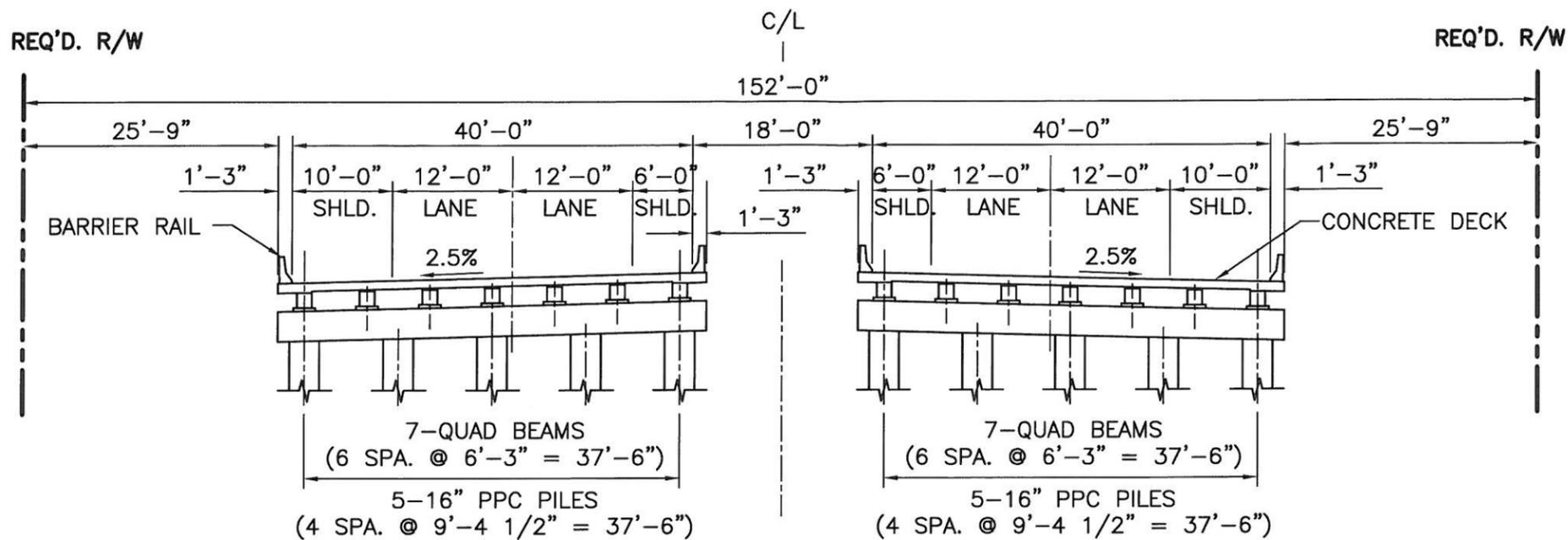
TYPICAL SECTION - LA 408 EXTENSION (UA-2) (45mph)  
 AT-GRADE ROADWAY

**LEGEND**

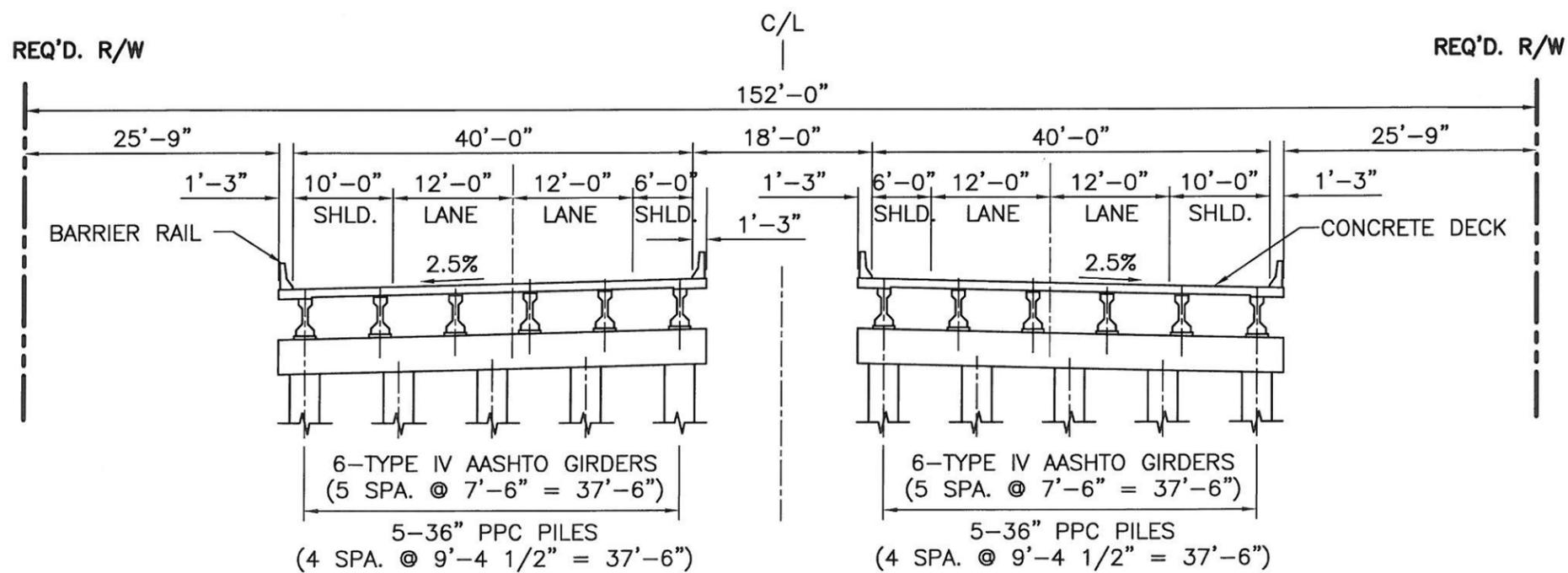
- ① 2" SUPERPAVE ASPHALTIC CONCRETE (WEARING COURSE).
- ② 6" SUPERPAVE ASPHALTIC CONCRETE (BINDER COURSE).
- ③ 10" CLASS II BASE COURSE (CRUSHED STONE OR RECYCLED PCCP).
- ④ EMBANKMENT MATERIAL.
- ⑤ GEOTEXTILE FABRIC
- ⑥ CONCRETE CURB AND GUTTER (MOUNTABLE TYPE)
- ⑦ EXCAVATION

Δ TO BE CONSTRUCTED FREE OF OBSTRUCTIONS





TYPICAL SECTION - LA 408 EXTENSION (UA-2) (45mph)  
 QUAD BEAM BRIDGE SPAN - ASSUME 40' SPANS



TYPICAL SECTION - LA 408 EXTENSION (UA-2) (45mph)  
 TYPE IV AASHTO GIRDER SPAN - ASSUME 95' SPANS



# CHAPTER IV

## AGENCY COMMENTS/COORDINATION

This chapter describes the coordination efforts associated with development of the project including contacts such as those made with LADOTD, FHWA, agencies and elected officials. A complete record of all comments and coordination is located in the project files of the LADOTD.

### PROJECT INITIATION MEETING

Agency comments and coordination began with a *Project Initiation Meeting* held on March 2, 2011. In addition to members of the project consultant team and LADOTD staff, invitees included representatives of the City of Baton Rouge/Parish of East Baton Rouge (Dist. 4 Council Office, Planning Commission, Public Works Department, and the Capital Area Transit System), Livingston Parish Officials (Planning Department, Public Works, and Dist 2 Council Office), the East Baton Rouge Parish Green Light Plan; the Capital Region Planning Commission (CRPC); and the Federal Highway Administration. Twenty-two (22) persons attended the project initiation meeting.

The Project Initiation Meeting began with the consultant's project manager, Mr. Bruce Richards, giving a welcome and allowing everyone to give a self introduction. He then gave a short PowerPoint presentation on the project, first describing what is involved in a "Stage 0 Feasibility Study", giving a brief explanation of the Project Location and Description. Mr. Richards provided the attendees with an overview of the five alternates explored and presented in the earlier 2000 study, as well as the more recent LADOTD alignment. He then ended the presentation with a description of the project "Game Plan" (what the team would be doing in this particular project).

The meeting then shifted to a discussion as to what types of data or information were available from the agencies to assist in the completion of this project. In particular, GIS or printed maps relating to utilities or zoning, comprehensive plans, previous documents; and knowledge of ongoing or planned developments were deemed to be helpful.

The meeting then progressed to an open discussion and question/answer period. Key points discussed included:

- Allison Catarella-Michel of project subconsultant Urban Systems shared that they had just received TRANS model data from the CRPC to be used in the study, and that in their discussions with CRPC they noted that they can run additional model changes.

- Josh Taylor, planning manager of Livingston Parish, noted that he could provide planning maps for Livingston Parish. He could also provide utility contacts for the Parish.
- Bob Mahoney of the FHWA inquired as to how the proposed project tied into the idea of the Baton Rouge loop highway, in particular asking if the loop was in the CRPC model. Jason Taylor of the CRPC stated that it wasn't.
- A question of the time frame was asked, to which the reply was that the Stage 0 Feasibility Study had a time frame of six (6) months.
- Ford Galtney of the LADOTD asked what the proposed number of lanes would be. Craig Rabalais of the Green Light program noted that Hooper Road was currently planned to be four-laned to Sullivan Road. Four-laning was originally planned to Greenwell Springs Road, but there were some sewer line issues. Bruce Richards and Jim Simmons of N-Y noted that the 2000 study showed 4 (or 5) lane sections, but stated that the stand-alone traffic study would have a lot of say in determining the number of proposed lanes. It may be designed with sufficient right-of way to do two lanes now and four lanes later.
- Ford Galtney then discussed an earlier Plank Road / I-110 access study, the idea of the "Central Thruway" and widening of O'Neal, and impacts they may have on the project and vice-versa.
- Mr. Galtney also mentioned the recent EDSM for limiting access, which also prescribes distance between intersections. This may have some bearing on any new roadway's intersection with LA 16 in the 1019 area. Both Jim Simmons and Ford Galtney noted that there may be design exceptions, however.
- The representatives from Livingston Parish noted that their Parish President and elected officials were behind the project and would help in any way they could to help it come to fruition.
- Karen Wicker of project subconsultant Coastal Environments, Inc. asked if the aerials and data from LADOTD was or could be geo-referenced, to which LADOTD staff stated they could be geo-referenced.
- David Barrow, assistant to the mayor of Central, was suggested as a contact, with the additional note that the City of Central was completing or had just completed a new master plan.

Following the end of the formal meeting, several representatives gathered around the aerial map and discussed developments in the area and routing options. There was a general concurrence that the currently discussed alternative was superior to the previous five alternates shown in the 2000 study, in that it limits residential takings and relocations. Another idea that had some support as an option was a more southerly route that would link to LA 1024, using an existing power line servitude easement. It was noted that a new Wal-Mart Super Center is slated to be constructed on the east side of the intersection of LA 16 and LA 1024, but the power line is located along the northern edge of the Wal-Mart footprint. It was also noted that the power line alignment would not link directly to Hooper Road on the west side. The project team agreed to explore this option.

## **ADDITIONAL COORDINATION**

During the development of alternatives and drafting of the Stage 0 Feasibility Study, there were several additional contacts with LADOTD, local agencies and governments, as well as federal and state agencies. These are summarized below:

- N-Y staff coordinated with LADOTD staff in March 2011 to obtain maximum water surface elevation information necessary to set the bridge profile.
- Both N-Y and sub-consultant Urban Systems staff coordinated with CRPC staff in order to obtain volume projections from the CRPC traffic model.
- N-Y and Urban Systems staff met with LADOTD staff (planning, geometric and bridge design sections) in April of 2011 to review the two proposed conceptual alternatives and to confirm them as acceptable, which enabled further traffic analysis and full conceptual development of the alternative to be undertaken.
- Coastal Environments, Inc. staff directly coordinated with the US Fish and Wildlife Service as part of their environmental analysis relating to wetlands and endangered species in the project area.
- N-Y staff coordinated with Josh Taylor of Livingston Parish Planning in regards to zoning and parcel information for the Parish in the project area.
- N-Y staff coordinated with City of Central planning director Woodrow Muhammed on zoning information within the project area.
- N-Y received comments on the draft report from various agencies of the LADOTD during the months of July and August and incorporated their comments in the final report.



**APPENDIX A**

**EXISTING SITE PICTURES**





Hooper Road (LA 408) intersecting Greenwell Springs Road (LA 37/64)



Home # 1 on Greenwell Springs Road possibly in line of Hooper Road extension



Home # 2 on Greenwell Springs Road possibly in line of Hooper Road extension



Home # 3 on Greenwell Springs Road possibly in line of Hooper Road extension



Bend Rd (LA 1020) at Hooper Road extension area, looking east



Bend Road (LA 1020) at Hooper Road extension area, looking west



LA 16 at Alternative B alignment, looking southeast



LA 16 at Alternative B alignment, looking northwest



Commercial use building and parking lot on LA 16 that would be affected by LA 16 widening



Commercial strip center parking lot on LA 16 that would be affected by LA 16 widening



Old 16 (LA 3285) - LA 1019 interchange, looking East



Old 16 (LA 3285) - LA 1019 interchange, looking NW. Note vacant Live Oak Commercial Site (former Supermarket)

**APPENDIX B**

**CHECKLISTS**



**STAGE 0**  
**Preliminary Scope and Budget Checklist**

District 61 Parish: East Baton Rouge Parish/Livingston Parish Route: LA 408 (Hooper Road)

Control Section: new Total Project Length (miles): 2.5

Begin Project (CS Log Mile) \_\_\_\_\_ End Project (CS Log Mile) \_\_\_\_\_

Project Category (Safety, Capacity, etc.): Capacity and Safety Date Prepared: August 2011

A. Purpose and Need for the Project:

The need for the project is based on the rapid growth in the community (now City) of Central, LA, and the heavy traffic volumes that correspond to growth --most of it commuter traffic between Livingston Parish and Baton Rouge.. There are currently heavy traffic volumes on the Magnolia Bridge over the Amite River. The purpose of the extension of Hooper Road, along with already planned widening of the road in East Baton Rouge Parish, is to create a new four-lane artery for commuters who live in Livingston Parish and work in East Baton Rouge Parish. In addition to lessening traffic on the Magnolia Bridge, this new east-west connection is anticipated to relieve congestion on other east-west arteries, such as Florida Blvd (US 190) and I-12.

B. Project Concept

**Description of existing facility (functional class, ADT, number of lanes, etc):**

Hooper Road is a four-lane divided roadway to the west of Joor Road and a two-lane undivided roadway east of Joor Road. Hooper Road provides connectivity between LA 67 (Plank Road) and LA 64/37 (Greenwell Springs Road) and services residential and commercial. Current ADT approaching the current eastern terminus of Greenwell Springs Road is 2155 vehicles per day. Greenwell Springs Road is a two-lane undivided roadway with open drainage, no shoulders lined with residential housing. Its current ADT approaching the Hooper Road intersection is 4336 (northbound) and 4634 (southbound).

On the eastern side of the project area, LA 16 is a two-lane undivided roadway north of its intersection with LA 1019 and widens to a four-lane divided roadway south of the intersection. LA 16 is surrounded by mostly commercial developments in the study area and has an ADT of 7274 northbound and 7857 southbound..

**Major Design Features/Criteria of the proposed facility (attach aerial photo w/concept if applicable):**

Two alternatives are studied in this report for extension of LA 408 (Hooper Road) from Greenwell Springs Road to LA 16

The two alternatives only differ at their end points on the east. Each alternative includes a new four-lane roadway between Greenwell Springs Road and LA 16. Each alternative is proposed to extend from the existing intersection of Hooper Road at Greenwell Springs Road, cross the Amite River on a new bridge structure and curve north before turning east. Alternative A is proposed to terminate at LA 16 approximately 0.5 miles north of the intersection of LA 1019 and LA 16, creating a T-intersection and meeting the EDSM requirements. Alternative B is proposed to intersect with LA 16 approximately 0.25 miles north of the intersection of LA 1019 and LA 16, continue southeasterly and tie into the intersection of LA 1019 at LA 3285, creating a four-way intersection.

Under both Alternatives, LA 16 would be widened to 4 lanes for some distance north of its intersection with LA 1019.

**Projected Impacts:**

Right of way will need to be acquired with both alternatives. Alternative A would require 50.62 acres, while Alternative B would require 54.05 acres. Alternatives A & B would likely require the acquisition and relocation of three residential properties along Greenwell Springs Road and both would likely require the acquisition/relocation of a commercial property along LA 16. Alternative B would also require the acquisition of a commercial building on LA 1019 that is vacant.

- Design Exceptions: Alternative A would likely require no design exceptions. Alternative B would require a design exception for violation of the EDSM standards regarding distance between u-turns and/or intersections—there would be a distance of only .25 miles between the three intersections forming a triangle: LA 408 at LA 16, LA 16 at LA 1019, and LA 408 at LA 1019/LA 3285.
- Technical Analyses (traffic analysis, safety analysis, etc): See Attached *Stage 0 Feasibility Report* as well as *Stage 0 Feasibility Study Traffic Report* under separate cover.
- Alternatives to Project Concept: None
- Future ITS / Traffic Considerations: None

- Construction Traffic Management/Property Access Considerations: none

C. Potential environmental impacts: See the attached Stage 0 Environmental Checklist

D. Construction Cost Estimate

**Alternative A:**

• Engineering Design:	\$4,279,189
• Environmental (document, mitigation, etc.):	\$1,000,000
• R/W Acquisition & Relocation:	\$2,570,258
• Utility Relocations:	\$1,628,500
• Construction (including const. traffic management):	\$49,291,104
• Contingency (25%):	\$14,692,263

**TOTAL PROJECT COST: \$73,461,314**

**Alternative B:**

• Engineering Design:	\$4,371,230
• Environmental (document, mitigation, etc.):	\$1,000,000
• R/W Acquisition & Relocation:	\$3,044,699
• Utility Relocations:	\$1,387,900
• Construction (including const. traffic management):	\$50,207,772
• Contingency (25%):	\$15,002,900

**TOTAL PROJECT COST: \$75,014,501**

E. Expected Funding Source(s) (Highway Priority Program, CMAQ, Urban Systems, Fed/State earmarks, etc.)

Unknown at this time. It should also be noted that this project will be adding miles to the state highway system. A transfer of ownership will need to be initiated in the future, should the project go to construction, by the appropriate entities.

**ATTACH ANY ADDITIONAL DOCUMENTATION**

Prepared By: Bruce Richards, N-Y Associates, Inc.

**Disposition (circle one):** (1) Advance to Stage 1 (2) Hold for Reconsideration (3) Shelve



## Stage 0 Environmental Checklist

C.S. Extension of Hooper Rd Parish: East Baton Rouge and Livingston  
Route LA HWY 408 Begin Log mile \_\_\_\_\_ End Log mile \_\_\_\_\_

**ADJACENT LAND USE:** The land adjacent to the proposed project consists of bottomland hardwood forests, upland forests, agricultural land, residential areas, and commercial developments.

**Any property owned by a Native American Tribe?**

(Y or N or Unknown) If so, which Tribe? Unknown

**Any property enrolled into the Wetland Reserve Program?**

(Y or N or Unknown) If so, give the location. No. According to Sam Willis (Personal Conservation June 20, 2011), District Conservationist for the East Baton Rouge and Livingston Parish NRCS offices, there are no properties enrolled in the WRP program in the project area.

**Community Elements: Is the project impacting or adjacent to any:**

(Y or N) Cemeteries Widening of LA 16 adjacent to Live Oak Cemetery

(Y or N) Churches No

(Y or N) Schools Improvements to LA 1019 adjacent to Live Oak High School

(Y or N) Public Facilities (i.e., fire station, library, etc.) No

(Y or N) Community water well/supply No

**Section 4(f) issue: Is the project impacting or adjacent to any:**

(Y or N) Public recreation areas No

(Y or N) Public Parks No

(Y or N) Wildlife Refuges No

(Y or N) Historic Sites No

**Is the project impacting, or adjacent to, a property listed on the National Register of Historic Places? (Y or N) Is the project within a historic district or a national landmark district? (Y or N)** If the answer is yes to either question, list names and locations below:

**Do you know of any threatened or endangered species in the area? (Y or N)**

If so, which species? According to USFWS and LDWF, NHP species lists, several species listed as threatened or endangered occur in the project area. The pallid sturgeon and West Indian manatee are listed as endangered, and the Gulf sturgeon is listed as threatened, but since the project will not impact the Mississippi, Atchafalaya or Red Rivers; or Lakes Ponchartrain or Maurepas, no adverse impacts are expected. The inflated heelsplitter is listed as threatened, but according to the USFWS (Rieck Jun. 20, 2011) no adverse impacts are expected. Since the project will not impact the habitat of or encroach within 1,500 feet of any known nest of the bald eagle or red-cockaded woodpecker habitat, no adverse effects are anticipated. Correspondence from the USFWS (Rieck Jun. 20, 2011) confirms that no adverse effects on threatened and endangered species are anticipated as a result of this project.

**Does the project impact a stream protected by the Louisiana Scenic Rivers Act? (Y or N)**

If yes, name the stream. No. According to the LDWF website, the Amite River is not a scenic stream at the proposed project crossing.

**Are there any Significant Trees as defined by EDSM I.1.1.21 within proposed ROW?(Y or N)**

If so, where? No significant trees were noted during the windshield survey.

**What year was the existing bridge built? No existing bridge -- a new bridge is proposed.**

## Stage 0 Environmental Checklist

**Are any waterways impacted by the project considered navigable? (Y or N)** If unknown, state so, list the waterways: Yes. The Amite River is navigable at the proposed crossing location.

**Hazardous Material: Have you checked the following DEQ and EPA databases for potential problems?**

(Y or N) Leaking Underground Storage Tanks: Yes, one facility/site was identified as follows: Broadway's Mobil, 34914 HWY 16 (also listed as HWY 1019), Watson, LA. Site is currently occupied by Walgreen's Pharmacy. UST removed, site remediated, and groundwater monitoring program is ongoing.

(Y or N) CERCLIS: Yes, no facilities/sites identified

(Y or N) ERNS: Yes, in addition, NRC database was reviewed. No incidents were identified in either database

(Y or N) Enforcement and Compliance History: Yes, one facility was identified

If found site, give the name and location: Live Oak Tire & Automotive, 34905 LA HWY 1019, Denham Springs, LA 70706. Conditionally Exempt Small Quantity Generator of hazardous waste, EPA ID No. LAD9815966398

**Underground Storage Tanks (UST): Are there any Gasoline Stations or other facilities that may have UST on or adjacent to the project? (Y or N)** Yes, two facilities were identified

If so, give the name and location: (1) Broadway's Mobil, 34914 HWY 16 (also listed as HWY 1019), Watson, LA. UST Removed. Site is current location of Walgreen's Pharmacy (2) Watson Diesel, 35039 HWY 16, Watson, LA. Facility no longer in existence with UST removed.

**Any chemical plants, refineries or landfills adjacent to the project? (Y or N):** No

**Any large manufacturing facilities adjacent to the project? (Y or N):** No

**Dry Cleaners? (Y or N):** Yes, one facility identified that is apparently not on EPA RCRA List

If yes to any, give names and locations: Quick-N-Handy Dry Cleaners, 35055 HWY 16, Suite 1D, Watson, LA 70786

**Oil/Gas wells: Have you checked DNR database for registered oil and gas wells? (Y or N)**

List the type and location of wells being impacted by the project. Yes; no wells impacted by the project

**Are there any possible residential or commercial relocations/displacements? (Y or N)** Yes

How many? An estimated three (3) residential relocations/displacements and one possible commercial relocation/displacement

**Do you know of any sensitive community issues related to the project? (Y or N)** No

If so, explain \_\_\_\_\_

**Is the project area population minority or low income? (Y or N)** No

**What type of detour/closures could be used on the job?** Unknown at present

**Did you notice anything of concern during your site/windshield survey of the area? If so, explain below.**

**Bruce J. Richards**

**Point of Contact**

**504-885-0500**

**Phone Number**

**3 August 2011**

**Date**

## Stage 0 Environmental Checklist

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### Threatened & Endangered Species Information

<http://www.wlf.louisiana.gov/experience/threatened/speciesfactsheets/>  
<http://www.wlf.louisiana.gov/experience/threatened/threatenedandendangeredtable/>  
<http://www.wlf.louisiana.gov/experience/threatened/>

### LA Wildlife Refuge Information

<http://www.wlf.louisiana.gov/experience/wmas/refuges/>

### Louisiana Scenic Rivers Act (R.S. 56:1840-1856)

Louisiana Natural and Scenic Rivers (R.S. 56:1847)

<http://www.legis.state.la.us/lss/lss.asp?doc=104995>

Louisiana Historic and Scenic Rivers (R.S. 56:1856)

<http://www.legis.state.la.us/lss/lss.asp?doc=105004>

<http://www.wlf.louisiana.gov/experience/scenicrivers/>

### Significant Tree Policy (EDSM I.1.1.21)

EDSMs can be found on DOTD's intranet site: <http://ladotnet/>

(Live Oak, Red Oak, White Oak, Magnolia or Cypress, aesthetically important, 18" or greater in diameter at breast height and has form that separates it from surrounding or that which may be considered historic.)

### LA Historic Sites and Districts

<http://www.crt.state.la.us/hp/nhl/default.htm>

### Hazardous Waste Site Information

<http://www.deq.louisiana.gov/portal/tabid/71/Default.aspx>

<http://www.epa.gov/superfund/sites/cursites/index.htm>

<http://www.epa.gov/superfund/sites/npl/la.htm>

[http://www.deq.louisiana.gov/portal/Portals/0/permits/ust\\_facility\\_owner.pdf](http://www.deq.louisiana.gov/portal/Portals/0/permits/ust_facility_owner.pdf)

[http://www.deq.louisiana.gov/portal/Portals/0/remediation/form\\_5222\\_r01.xls](http://www.deq.louisiana.gov/portal/Portals/0/remediation/form_5222_r01.xls)

[http://www.nrc.uscg.mil/wdbcgi/wdbcgi.exe/WWWUSER/WEBDB.foia\\_query.show\\_parms](http://www.nrc.uscg.mil/wdbcgi/wdbcgi.exe/WWWUSER/WEBDB.foia_query.show_parms)

<http://www.epa.gov/echo/>

### DNR Oil & Gas Well Information

[http://sonris-www.dnr.state.la.us/www\\_root/sonris\\_portal\\_1.htm](http://sonris-www.dnr.state.la.us/www_root/sonris_portal_1.htm)

### Environmental Justice (minority & low income)

<http://www.fhwa.dot.gov/environment/ej2000.htm>

### Demographics

<http://www.louisiana.gov/wps/wcm/connect/Louisiana.gov/About+Louisiana/Demographics%3A+Census+Info/Census+2000+Information/>

<http://www.census.gov/>

### Water Wells

<http://www.dotd.state.la.us/intermodal/wells/home.asp>

### FHWA's Environmental Website (Just a good reference for understanding NEPA)

<http://www.fhwa.dot.gov/environment/index.htm>

### Additional Databases Checked

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### Other Comments:

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## Stage 0 Environmental Checklist

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### General Explanation:

To adequately consider projects in Stage 0, some consideration must be given to the human and natural environment which will be impacted by the project. The Environmental Checklist was designed knowing that some environmental issues may surface later in the process. This checklist was designed to obtain basic information, which is readily accessible by reviewing public databases and by visiting the site. It is recognized that some information may be more accessible than other information. Some items on the checklist may be more important than others depending on the type of project. It is recommended that the individual completing the checklist do their best to answer the questions accurately. Feel free to comment or write any explanatory comments at the end of the checklist.

### The Databases:

To assist in gathering public information, the previous sheet includes web addresses for some of the databases that need to be consulted to complete the checklist. As of October 2006, these addresses were accurate.

Note that you will not have access to the location of any threatened or endangered (T&E) species. The web address list only the threatened or endangered species in Louisiana. It will generally describe their habitat and other information. If you know of any species in the project area, please state so, but you will not be able to confirm it yourself. If you feel this may be an issue, please contact the Environmental Section. We have biologist on staff who can confirm the presence of a species.

### Why is this information important?

Land Use? Indicator of biological issues such as T&E species or wetlands.

Ownership? Tells us whether coordination with tribal nations will be required.

WRP properties? Farmland that is converted back into wetlands. The Federal government has a permanent easement which cannot be expropriated by the State. Program is operated through the Natural Resources Conservation Service (formerly the Soil Conservation Service).

Community Elements? DOTD would like to limit adverse impacts to communities. Also, public facilities may be costly to relocate.

Section 4(f) issues? USDOT agencies are required by law to avoid certain properties, unless a prudent or feasible alternative is not available.

Historic Properties? Tells us if we have a Section 106 issue on the project. (Section 106 of the National Historic Preservation Act) See <http://www.achp.gov/work106.html> for more details.

Scenic Streams? Scenic streams require a permit and may require restricted construction activities.

Significant Trees? Need coordination and can be important to community.

Age of Bridge? Section 106 may apply. Bridges over 50 years old are evaluated to determine if they are eligible for the National Register of Historic Places.

Navigability? If navigable, will require an assessment of present and future navigation needs and US Coast Guard permit.

Hazardous Material? Don't want to purchase property if contaminated. Also, a safety issue for construction workers if right-of-way is contaminated.

Oil and Gas Wells? Expensive if project hits a well.

Relocations? Important to community. Real Estate costs can be substantial depending on location of project. Can result in organized opposition to a project.

Sensitive Issues? Identification of sensitive issues early greatly assists project team in designing public involvement plan.

Minority/Low Income Populations? Executive Order requires Federal Agencies to identify and address disproportionately high and adverse human health and environmental effects on minority or low income populations. (often referred to as Environmental Justice)

Detours? The detour route may have as many or more impacts. Should be looked at with project. May be unacceptable to the public.