



# Environmental Assessment

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## SH 146, Houston District

From BS 146E to Ferry Road

CSJs: 0389-13-039

Harris County, Texas

April 2016

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT

# Table of Contents

PROPOSED ACTION .....	6
A. Existing Facility .....	6
B. Proposed Facility .....	6
C. Funding .....	8
D. Need and Purpose .....	8
E. Bicycle and Pedestrian Accommodations .....	9
F. Logical Termini and Independent Utility .....	10
G. Alternatives .....	10
No Build .....	10
Build .....	10
H. Right-of-Way Requirements .....	10
SURROUNDING AREA .....	10
SPECIFIC AREAS OF ENVIRONMENTAL CONCERN .....	11
A. Socioeconomics .....	11
Community Impacts .....	11
B. Environmental Justice .....	11
C. Limited English Proficiency .....	16
D. Section 4(f) Resources .....	16
E. Public Facilities and Services .....	16
F. Cultural Resources .....	17
<i>Archeological Resources</i> .....	17
<i>Historic Structures</i> .....	17
G. Water Resources .....	18
Section 404 of the Clean Water Act: Waters of the United States .....	18
Section 401 of the Clean Water Act: Water Quality Certification .....	18
Executive Order 11990 .....	18
Section 303(d) of the Clean Water Act .....	19
Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Construction General Permit .....	19
Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Municipal Separate Storm Sewer System (MS4) .....	19
Floodplains .....	19
Texas Coastal Management Program .....	19
Wild and Scenic Rivers .....	20
H. Biological Resources .....	20
Migratory Bird Treaty Act .....	20
Bald and Golden Eagle Protection Act .....	21
Magnuson-Stevens Fishery Conservation and Management Act .....	21
Fish and Wildlife Coordination Act .....	21

Invasive Species and Beneficial Landscaping Practices .....	21
I.    Vegetation.....	22
Farmland Protection Policy Act.....	23
J.    Air Analysis .....	23
Mobile Source Air Toxics.....	24
Project-Specific MSAT Information .....	25
Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis.....	27
Conclusion.....	28
Construction-Related Impacts to Air Quality .....	28
K.    Noise Analysis .....	28
Noise Abatement Criteria .....	29
Noise Analysis Summary.....	30
Environmental Consequences.....	31
Construction Noise .....	33
Local Coordination.....	33
L.    Hazardous Materials .....	33
M.    Visual Impacts and Aesthetics .....	35
N.    Construction Impacts .....	35
O.    Indirect and Cumulative Impacts.....	36
Indirect Impacts .....	36
Cumulative Impacts.....	42
PERMITS AND COMMITMENTS .....	50
A.    Section 303(d) of the Clean Water Act .....	50
B.    Section 402 of the Clean Water Act.....	50
C.    Section 404/401 of the Clean Water Act.....	50
D.    Section 9 and 10 of the Rivers and Harbors Act.....	50
E.    Improving Access for Limited English Proficiency .....	50
F.    Unanticipated Archeological Deposits .....	50
G.    Migratory Bird Treaty Act .....	51
H.    Invasive Species and Beneficial Landscaping Practices .....	51
I.    Minimization of Construction Impacts .....	51
PUBLIC INVOLVEMENT .....	51
Recommendations for Implementation of the Build Alternative and for a FONSI .....	52

**List of Tables**

Table 1: Average Daily Traffic (ADT) for 2024 and 2035 .....	8
Table 2: Minority Populations in 2010 .....	13
Table 3: Median Household Income for Proposed Project in 2010.....	15
Table 4: Limited English Proficiency Comparison for Proposed Project in 2010 .....	16
Table 5: Vegetation Impacts.....	23
Table 6: PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050 .....	25
Table 7: VMT Summary.....	26

Table 8: Noise Abatement Criteria (NAC) .....	29
Table 9: Traffic Noise Levels (dB(A) Leq) .....	31
Table 10: Proposed Barrier Description .....	32
Table 11: Noise Impact Contours .....	33
Table 12: Steps for Conducting an Indirect Impact Analysis.....	37
Table 13 Steps for Identifying and Assessing Cumulative Impacts .....	43
Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis.....	45

**FIGURES**

Figure 1	Vicinity Map
Figure 2A	2008 Aerial Photograph with Project ROW and Project Layout Data Overlays
Figure 2B	2008 Aerial Photograph with Project ROW and Project Layout Data Overlays
Figure 2C	2008 Aerial Photograph with Project ROW and Project Layout Data Overlays
Typical Sections	
Figure 3A	Existing Typical Sections
Figure 3B	Proposed Typical Sections
Figure 4A	2008 Aerial Photograph with Project ROW and Preliminary Jurisdictional Determination Data Overlays
Figure 4B	2008 Aerial Photograph with Project ROW and Preliminary Jurisdictional Determination Data Overlays
Figure 4C	2008 Aerial Photograph with Project ROW and Preliminary Jurisdictional Determination Data Overlays
Figure 5	2008 Aerial Photograph with Project ROW and Noise Receivers Data Overlays
Figure 6	Area of Influence (AOI)
Figure 8	FEMA Floodplain Map

**APPENDICES**

Appendix A	PROJECT PHOTOGRAPHS
Appendix B	AGENCY CORRESPONDENCE
Appendix C	CONSISTENCY & TRANSPORTATION PLANS
Appendix D	POTENTIAL ARCHEOLOGICAL LIABILITY MAP
Appendix E	BIOLOGICAL EVALUATION FORM

# Acronyms, Abbreviations, and Terms

<b>ACHP</b>	Advisory Council on Historic Preservation	<b>NATA</b>	National Air Toxics Assessment
<b>ADT</b>	Average Daily Traffic	<b>NCHRP</b>	National Cooperative Highway Research Program
<b>AOI</b>	Area of Influence	<b>NDD</b>	Natural Diversity Database
<b>APE</b>	Area of Potential Effects	<b>NEPA</b>	National Environmental Policy Act
<b>ASTM</b>	American Society for Testing and Materials	<b>NHPA</b>	National Historic Preservation Act
<b>BGEPA</b>	Bald and Golden Eagle Protection Act	<b>NMFS</b>	National Marine Fisheries Service
<b>BMP</b>	Best Management Practice	<b>NOI</b>	Notice of Intent
<b>BS</b>	Business Highway	<b>NOx</b>	Nitrogen Oxide
<b>CAA</b>	Clean Air Act	<b>NRCS</b>	Natural Resources Conservation Service
<b>CAAA</b>	Clean Air Act Amendments	<b>NRHP</b>	National Register of Historic Places
<b>CEQ</b>	Council on Environmental Quality	<b>NWI</b>	National Wetlands Inventory
<b>CFR</b>	Code of Federal Regulations	<b>PALM</b>	Potential Archeological Liability Map
<b>CGP</b>	Construction General Permit	<b>PATU</b>	Programmatic Agreement for Transportation Undertakings
<b>CLI</b>	Closed Landfill Inventory	<b>PCB</b>	Polychlorinated Biphenyl
<b>CMAQ</b>	Congestion Mitigation and Air Quality	<b>POTW</b>	Publicly-Owned Treatment Works
<b>CMP</b>	Congestion Management Process	<b>RCRA</b>	Resource Conservation and Recovery Act
<b>CMS</b>	Congestion Management System	<b>REC</b>	Recognized Environmental Condition
<b>CNRA</b>	Coastal Natural Resource Area	<b>ROW</b>	Right-of-Way
<b>CO</b>	Carbon Monoxide	<b>RSA</b>	Resource Study Area
<b>CWA</b>	Clean Water Act	<b>RTHL</b>	Recorded Texas Historic Landmarks
<b>dB</b>	Decibel	<b>RTP</b>	Regional Transportation Plan
<b>dB(A)</b>	Decibel (A-weighted)	<b>SAL</b>	State Archeological Landmarks
<b>EFH</b>	Essential Fish Habitat	<b>SH</b>	State Highway
<b>EA</b>	Environmental Assessment	<b>SHPO</b>	State Historic Preservation Officer
<b>EO</b>	Executive Order	<b>SIP</b>	State Implementation Plan
<b>EIOD</b>	Element of Occurrence Identification number	<b>SOV</b>	Single Occupancy Vehicle
<b>EPA</b>	Environmental Protection Agency	<b>STIP</b>	Statewide Transportation Improvement Program
<b>FEMA</b>	Federal Emergency Management Agency	<b>SW3P</b>	Storm Water Pollution Prevention Plan
<b>FHWA</b>	Federal Highway Administration	<b>TCAA</b>	Texas Clean Air Act
<b>FIRM</b>	Flood Insurance Rate Map	<b>TCEQ</b>	Texas Commission on Environmental Quality
<b>FM</b>	Farm-to-Market	<b>TCMP</b>	Texas Coastal Management Program
<b>FPPA</b>	Farmland Protection Policy Act	<b>TERP</b>	Texas Emissions Reduction Plan
<b>FWCA</b>	Fish and Wildlife Coordination Act	<b>THC</b>	Texas Historical Commission
<b>FTA</b>	Federal Transportation Agency	<b>TIP</b>	Transportation Improvement Program
<b>HAP</b>	Hazardous Air Pollutant	<b>TMDL</b>	Total Maximum Daily Load
<b>HAS</b>	Historical Auto Stations	<b>TNM</b>	Traffic Noise Modeling software
<b>HEI</b>	Health Effects Institute	<b>TPDES</b>	Texas Pollutant Discharge Elimination System
<b>HGB</b>	Houston-Galveston-Brazoria	<b>TPWD</b>	Texas Parks and Wildlife Department
<b>H-GAC</b>	Houston-Galveston Area Council	<b>TSS</b>	Total Suspended Solids
<b>IRIS</b>	Integrated Risk Information System	<b>TxDOT</b>	Texas Department of Transportation
<b>ISA</b>	Initial Site Assessment	<b>U.S.</b>	United States
<b>LEP</b>	Limited English Proficiency	<b>USACE</b>	United States Army Corps of Engineers
<b>L<sub>eq</sub></b>	Equivalent Sound Level	<b>USCG</b>	United States Coast Guard
<b>LOS</b>	Level of Service	<b>USDA</b>	United States Department of Agriculture
<b>LPST</b>	Leaking Petroleum Storage Tank	<b>USFWS</b>	United States Fish and Wildlife Service
<b>MBTA</b>	Migratory Bird Treaty Act	<b>USGS</b>	United States Geological Survey
<b>MOA</b>	Memorandum of Agreement	<b>UST</b>	Underground Storage Tank
<b>MOU</b>	Memorandum of Understanding	<b>VMT</b>	Vehicle Miles Traveled
<b>mph</b>	Miles per hour	<b>VOC</b>	Volatile Organic Compound
<b>MPO</b>	Metropolitan Planning Organization	<b>vpd</b>	Vehicles per day
<b>MS4</b>	Municipal Separate Storm Sewer System		
<b>MSAT</b>	Mobile Source Air Toxics		
<b>MSL</b>	Mean Sea Level		
<b>MTP</b>	Metropolitan Transportation Plan		
<b>NAAQS</b>	National Ambient Air Quality Standards		
<b>NAC</b>	Noise Abatement Criteria		
<b>NAPL</b>	Non-Aqueous Phase Liquids		

## PROPOSED ACTION

The City of Baytown, in conjunction with the Texas Department of Transportation (TxDOT), proposes to improve State Highway (SH) 146 with the construction of four main lanes over 0.87 miles in the existing right-of-way (ROW) between Business Highway (BS) 146 and Ferry Road in Baytown, Harris County, Texas. The proposed project limits, including areas of restriping, extend approximately 1.45 miles and include the construction of a grade separation for the main lanes of SH 146 over North Alexander Drive. A depiction of the location of the proposed project can be found in **Figure 1 – Vicinity Map**.

### A. Existing Facility

The existing SH 146 facility begins as a six-lane arterial roadway divided by a concrete median barrier approximately 0.34 mile west of West Elvinta Road. Traveling east, the main lanes taper from three lanes in each direction to two-lane ramps that connect the unfinished main highway to the existing three-lane curb-and-gutter frontage roads constructed in 1984, separated by a wide grassy median. The eastbound and westbound frontage roads are signalized at North Alexander Drive. East of North Alexander Drive, the frontage roads taper from three lanes to two lanes and traffic is routed to the existing main lanes via two-lane ramps. The existing SH 146 facility at the eastern project terminus is a four-lane divided arterial section within a 120-foot ROW. This section includes a continuous two-way left turn lane and no frontage roads. The existing frontage roads were constructed in a 300-foot to 336-foot-wide ROW with a wide mowed and maintained median provided for the anticipated future main lanes between West Elvinta Road and Ferry Road. The existing facility and project design are detailed in **Figures 2A, 2B, and 2C**. Typical sections of the existing and proposed roadways are depicted in **Figures 3A and 3B**. Existing and proposed lane, shoulder, and ROW widths are detailed below.

#### ***From East of BS 146 to West of North Alexander Drive***

The existing SH 146 from East of BS 146 to West of North Alexander Drive consists of six 12-foot frontage lanes (three in each direction) within a 300-foot ROW.

#### ***From West of North Alexander Drive to East of North Alexander Drive***

The existing SH 146 from West of North Alexander Drive to East of North Alexander Drive consists of six 12-foot frontage lanes (three in each direction) within a 300 to 336 foot-ROW.

#### ***From East of North Alexander Drive to Ferry Road***

The existing SH 146 from East of North Alexander Drive to Ferry Road consists of four 12-foot frontage lanes (two in each direction) within a 300-foot ROW.

#### ***From Ferry Road to East of Massey Tompkins Road***

The existing SH 146 from Ferry Road to East of Massey Tompkins Road consists of four 12-foot (two in each direction) with 10-foot outside shoulders, all within a 120-foot ROW.

### B. Proposed Facility

The proposed project would improve SH 146 through the construction of four main lanes between BS 146 and Ferry Road, connecting to the existing main lanes and providing a continuous four-lane typical freeway section throughout the proposed project limits. The proposed project would also include a grade separation at SH 146 and North Alexander Drive. No new ROW would be acquired.

The proposed project plan includes the following:

- Construction of two 12-foot-wide main lanes in each direction
- Construction of 10-foot-wide shoulders in each direction
- Construction of a grade separation for the main lanes over North Alexander Drive with a minimum clearance of 16 feet, 6 inches above the existing roadway
- Removal of one eastbound ramp from the existing feeder to the existing main lanes at Ferry Drive

***From East of BS 146 to West of North Alexander Drive***

The proposed SH 146 from East of BS 146 to West of North Alexander Drive would consist of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders and six 12-foot frontage lanes (three in each direction) within a 300-foot ROW.

***From West of North Alexander Drive to East of North Alexander Drive***

The proposed SH 146 from West of North Alexander Drive to East of North Alexander Drive would consist of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders and six 12-foot frontage lanes (three in each direction) within a 300-foot ROW.

***From East of North Alexander Drive to Ferry Road***

The proposed SH 146 from East of North Alexander Drive to Ferry Road would consist of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders and six 12-foot frontage lanes (three in each direction) within a 120 to 300-foot ROW.

***From Ferry Road to East of Massey Tompkins Road***

The proposed SH 146 from Ferry Road to East of Massey Tompkins Road would consist of four 12-foot main lanes (two in each direction) with 10-foot outside shoulders and six 12-foot frontage lanes (three in each direction) within a 300-foot ROW.

The functional classification of SH 146 is an urban freeway and the design speed limit is 65 miles per hour (mph). The proposed project would add capacity to the existing roadway which would affect the projected average daily traffic (ADT) for SH 146. The 2011 ADT and the projected ADT for SH 146 in the design year 2035 are reported in **Table 1** and in the **TxDOT Traffic Study Memorandum dated March 29, 2010**, included in **Appendix B**. Estimated morning and evening peak traffic volumes are reported in the updated schematics included in the **TxDOT Traffic Study Memorandum dated February 27, 2013**, also included in **Appendix B**.

Table1: Average Daily Traffic (ADT) for 2024 and 2035								
	Existing Facility				Proposed Facility			
	Main Lanes		Frontage Lanes		Main Lanes		Frontage Lanes	
	2024 ADT	2035 ADT	2024 ADT	2035 ADT	2024 ADT	2035 ADT	2024 ADT	2035 ADT
<b>At BS 146</b>	40,100	49,800	11,000	13,600	41,000	50,900	10,300	12,800
<b>At Elvinta Street</b>	--	--	51,100	63,400	38,600	47,900	12,800	15,800
<b>West of Ferry Road</b>	--	--	--	--	47,700	59,200	3,600	4,500
<b>East of Ferry Road</b>	--	--	54,200	67,200	47,700	59,200	6,700	8,300
<b>At U-turn at northern end of project</b>	52,000	64,700	2,000	2,500	51,800	64,300	2,600	3,200
<b>Average</b>	<b>46,100</b>	<b>57,250</b>	<b>29,700</b>	<b>36,675</b>	<b>45,360</b>	<b>56,300</b>	<b>7,200</b>	<b>8,320</b>

Source: TxDOT - Houston District Memorandum dated March 29, 2010 (**Appendix B**).

### C. Funding

The estimated cost of the proposed project as of April 2014 is \$47,090,744. The proposed project is currently not funded; however, it is listed in Appendix D of the Houston-Galveston Area Council's (H-GAC) 2015-2018 Transportation Improvement Program (TIP) (Metropolitan Planning Organization [MPO] ID No. 526), H-GAC's 2040 Regional Transportation Plan (RTP) Update, under CSJ 0389-13-039 as a project including construction of four main lanes and a grade separation. The proposed project is currently scheduled for letting in 2024. Copies of the applicable pages of the *2015-2018 TIP* and *2040 RTP* are included in **Appendix C**.

It should be noted that the proposed project design in the outdated *2011-2014 TIP* describes the project as constructing six main lanes versus four main lanes. The number of main lanes to be constructed has been reduced following extensive coordination with TxDOT staff. The *2015-2018 TIP* reflects this change.

### D. Need and Purpose

The need for the proposed project is demonstrated by the following existing conditions:

- **Future demand exceeds current capacity** – The ADT is expected to increase by approximately 37.5 percent between 2011 and 2035 (from 37,000 in 2011 to 59,200 in 2035).
- **Discontinuous freeway network** – Traffic is currently routed to frontage roads that do not meet design criteria for a freeway.
- **Anticipated operational issues at North Alexander Drive** – Traffic flow along SH 146 is currently interrupted by the existing signalized intersection; the predicted ADT increase is anticipated to exacerbate related timing and flow issues.
- **Emergency evacuation** – SH 146 is a designated hurricane route. Additional lanes would allow for greater capacity during hurricane evacuation efforts.

All land located in the project area is either developed or platted for development. The proposed project is a response to the projected capacity and access needs for planned development in the area. The most recent available traffic count data indicate that there are 37,000 vehicles per day (vpd) on the existing roadway. According to the *Baytown 2025 Comprehensive Plan*, the existing level of service (LOS) in the year 2002 was “E” (where “A” is the best and “F” is the worst). Level E service indicates unstable flow at or near the capacity of the roadway. No roadway improvements have been implemented within the project area since that time. There is an established trend of increasing traffic on SH 146, and the demand for travel on SH 146 is expected to increase further due to anticipated future development in the area. If the No Build Alternative is implemented, the LOS is expected to worsen as traffic demand increases.

The purpose of the proposed project is to address the capacity and design deficiencies listed above by developing SH 146 into a continuous major thoroughfare up to current freeway design criteria standards between BS 146 and Ferry Road. This will accommodate the ADT increase expected through 2035 and improve LOS. The construction of a grade separation over North Alexander Drive will reduce expected operational issues at this intersection by allowing continuous flow of east-west traffic. The addition of lanes will also increase potential emergency carrying capacity of the roadway in the event of hurricane evacuation.

### **E. Bicycle and Pedestrian Accommodations**

No bicycle and pedestrian accommodations currently exist along the frontage roads and main lanes. For safety reasons, the appropriate location of bike and pedestrian infrastructure is the frontage road system, rather than main freeway lanes. No expansion or structural alterations are planned for the frontage roads within this project, and reconstruction of the frontage roads to allow sufficient width for pedestrian or bicycle lanes is beyond the scope of this project. The current footprint does not allow for restriping to accommodate a bicycle lane without removing a vehicle lane, which would undermine the project goal of alleviating vehicular congestion. Only minor restriping will occur to accommodate new ramps entering and exiting the main freeway lanes. However, the current project design would not prevent bicycle or pedestrian accommodations as part of future development to the frontage road system.

The crossing at North Alexander Drive is currently a signalized intersection without crosswalk infrastructure for pedestrian traffic. North Alexander Drive will be widened to allow for a 14-foot-wide outside lane (15-foot-wide, including a 1-foot curb offset) to accommodate bicyclists wishing to cross SH 146. In addition, sidewalk access ramps will be added at the intersection to accommodate pedestrian traffic across SH 146 and North Alexander Drive. Sidewalks and crosswalks 6 feet in width will be added across median strips and under the proposed SH 146 overpass. These accommodations are depicted in the proposed typical sections included in the Figures attachment to this document.

## **F. Logical Termini and Independent Utility**

The construction limits for the proposed project extend from BS 146 to Ferry Road. However, in order to provide an adequate evaluation of social, economic and environmental impacts, logical termini limits were established. The logical termini is BS 146 to Farm-to-Market (FM) 565.

The proposed project would involve construction of four 12-foot main lanes between West Elvinta Road and Ferry Road. This typical section would match the four-lane typical section of SH 146 at the intersection with Ferry Road, and would integrate smoothly into the six-lane typical section at West Elvinta Road. The creation of a single continuous freeway between these endpoints, with a grade separation at the North Alexander Drive intersection, would address the congestion and mobility issues that currently exist in the project area.

## **G. Alternatives**

### **No Build**

The No Build Alternative would leave the configuration of the existing roadway intact. This alternative would not meet the stated need and purpose of the proposed project because it would not increase mobility, relieve traffic congestion in the area, or allow for the projected capacity of the roadway in the design year 2035. However, the No Build Alternative is carried forward as a baseline against which to evaluate the proposed Build Alternative. The No Build Alternative would not directly result in impacts specific areas of environmental concern within the project study area.

### **Build**

The Build Alternative would address the capacity and design deficiencies of the existing facility by constructing four main lanes and a grade separation at the intersection of SH 146 and North Alexander Drive. This alternative would improve roadway capacity, driver safety and connectivity, and hurricane evacuation route and travel times by providing a continuous four-lane freeway between BS 146 and Ferry Road. Congestion along the existing frontage roads would be reduced, mobility through the area would increase, and accessibility to adjacent properties would improve. The Build Alternative would meet the stated need and purpose of the proposed project.

## **H. Right-of-Way Requirements**

The existing ROW width varies between 120 feet and 336 feet. The proposed project would be constructed entirely within the existing ROW; no new ROW would be required. No temporary or permanent easements would be required for the construction of the proposed project.

## **SURROUNDING AREA**

The proposed project is located in an urban setting in eastern Harris County, Texas. The land in the project vicinity is utilized for light industrial, commercial, institutional, and residential purposes. The proposed project is located within the Cedar Bayou watershed and within the Trinity-San Jacinto Coastal Basin. Cedar Bayou is located southeast of the proposed project site and flows in a southward direction from its headwaters in Liberty County to its mouth in Galveston Bay. The watershed covers approximately 202 square miles, with Cedar Bayou being the primary water body. There are approximately 128 miles of open streams within the watershed, including Cedar Bayou and associated tributaries. The estimated population within the Harris County portion of the watershed is just over 32,000. Much of the Cedar Bayou watershed is undeveloped with the exception of the City of Baytown, located in Harris and Chambers Counties, and Mont Belvieu, located in Chambers County. The watershed is primarily rural and agricultural, with the most development activity related to large commercial grass farming operations. Cedar Bayou and its floodplain are environmentally sensitive due to saltwater marshlands in the lower reaches and

undeveloped riparian areas surrounding the natural channels in the upper reaches. The Texas Parks and Wildlife Department (TPWD) considers the area around the mouth of Cedar Bayou to be critical wildlife habitat.

According to *The Vegetation Types of Texas*, the project area is within the Crops (Number 44) vegetation type. The vegetation type present within the project area does not exhibit the vegetative communities typically found in the Crops vegetation type and would be better described as the Urban vegetation type.

The soil mapping units located within the project area are Lake Charles-Urban land complex, Lake Charles clay (0-1% slopes), and Bernard-Urban land complex.

All of the land within the project area is either developed or platted for development. Several single-family homes are adjacent to the project ROW and are mainly located north of the intersection of Ferry Road and North Alexander Drive. One large subdivision, Hunter's Ridge, is located adjacent to the proposed project. Commercial operations in the project vicinity include Veolia Environmental Services, Bay Star Ambulance Services, Mass Flow Technologies, Bear Land Surveying, Cedar Bayou Animal Clinic, Baytown Chevron, Newman's Homes, Eddy RV & Tractor Sales, Kab Recycling Center, and H&H Tractor & Lawn Equipment.

Public facilities in the project vicinity include Cedar Bayou Junior High School and Stephen F. Austin Elementary School. There are several churches adjacent to the project limits, including the Eastside Church of Christ, the Church of New Beginnings, and the Cedar Bayou Church of Christ. One cemetery, Cedarcrest Cemetery & Monument, is located south of Ferry Road and Hayes Lane.

## **SPECIFIC AREAS OF ENVIRONMENTAL CONCERN**

### **A. Socioeconomics**

#### **Community Impacts**

There are no established neighborhoods or communities that will be bisected or isolated by the proposed project. No displacements or relocations would occur, and no additional ROW would be required for the proposed project.

During construction of the proposed project, the inside lane of the existing SH 146 feeder road in each direction would be closed to accommodate the construction of the proposed main lanes. It is anticipated that two of the three existing lanes in each direction would remain open. North Alexander Drive would be temporarily closed during installation of the SH 146 grade separation. This road closing is anticipated to temporarily alter traffic patterns within the area, but it is not anticipated to separate or isolate any distinct neighborhoods, ethnic groups, or other specific groups. Upon completion of the proposed main lanes, traffic patterns would return to pre-construction conditions, with increased traffic flow on SH 146 provided by the proposed project improvements.

### **B. Environmental Justice**

Executive Order (EO) 12898, entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations*, requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." The Federal Highway Administration (FHWA) has identified three fundamental principles of environmental justice:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations
2. To ensure full and fair participation by all potentially affected communities in the transportation decision-making process
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations

Disproportionally high and adverse human health or environmental effects are defined by FHWA as adverse effects that meet one of the following criteria:

1. Are predominately borne by a minority population and/or a low-income population
2. Will be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority population and/or non-low-income population

A population is defined as “minority” or “low-income” when the percentage of the population that is minority and/or low-income is 50 percent or more, or the minority and/or low-income population percentage in the affected area is meaningfully greater than the minority or low-income population percentage in an appropriate comparison group (FWHA Order 6640.23, DOT Order 5610.2).

The proposed project is located within Census Tract 2358, Block Group 3 and Census Tract 2359, Block Groups 1 and 2 in Harris County, Texas. Four of the 28 blocks in the study area report over 50 percent minority populations. **Table 2** depicts the demographic data for the proposed project area. Based on the census data, minority populations are present in several blocks surrounding the project site.

**Table 2: Minority Populations in 2010**

Table 2: Minority Populations in 2010									
		Non-Hispanic or Latino							
		Population of One Race							
Census Tract, Block Group, Block	Total Population	White Alone	Black or African American Alone	American Indian & Alaska Native Alone	Asian Alone	Native Hawaiian & Pacific Islander Alone	Other	Two or More Races	Hispanic or Latino
CT 2358, BG 3, Block 3001	2	2	--	--	--	--	--	--	--
		100.0%	--	--	--	--	--	--	--
CT 2358, BG 3, Block 3002	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2358, BG 3, Block 3003	812	274	103	4	--	--	4	16	411
		33.74%	12.68%	0.49%	--	--	0.49%	1.97%	50.62%
CT 2358, BG 3, Block 3007	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2358, BG 3, Block 3013	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2358, BG 3, Block 3022	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1001	19	18	--	--	--	--	--	--	1
		94.74%	--	--	--	--	--	--	5.26%
CT 2539, BG 1, Block 1002	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1003	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1004	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1005	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1007	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--

**Table 2: Minority Populations in 2010**

Table 2: Minority Populations in 2010									
		Non-Hispanic or Latino							
		Population of One Race							
Census Tract, Block Group, Block	Total Population	White Alone	Black or African American Alone	American Indian & Alaska Native Alone	Asian Alone	Native Hawaiian & Pacific Islander Alone	Other	Two or More Races	Hispanic or Latino
CT 2539, BG 1, Block 1008	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1009	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1010	278	123	6	1	--	--	--	3	145
		44.24%	2.16%	0.36%	--	--	--	1.08%	52.16%
CT 2539, BG 1, Block 1014	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1015	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 1, Block 1016	18	14	--	--	--	--	--	1	3
		77.78%	--	--	--	--	--	5.56%	16.67%
CT 2539, BG 2, Block 2002	24	10	--	1	--	--	--	--	13
		41.67%	--	4.17%	--	--	--	--	54.17%
CT 2539, BG 2, Block 2009	27	14	--	--	--	--	--	--	13
		51.85%	--	--	--	--	--	--	48.15%
CT 2539, BG 2, Block 2013	5	--	5	--	--	--	--	--	--
		--	100.00%	--	--	--	--	--	--
CT 2539, BG 2, Block 2015	59	47	--	--	--	--	--	3	9
		79.66%	--	--	--	--	--	5.08%	15.25%
CT 2539, BG 2, Block 2016	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 2, Block 2017	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--

Table 2: Minority Populations in 2010									
		Non-Hispanic or Latino							
		Population of One Race							
Census Tract, Block Group, Block	Total Population	White Alone	Black or African American Alone	American Indian & Alaska Native Alone	Asian Alone	Native Hawaiian & Pacific Islander Alone	Other	Two or More Races	Hispanic or Latino
CT 2539, BG 2, Block 2018	35	5	2	--	--	--	--	5	23
		14.29%	5.71%	--	--	--	--	14.29%	65.71%
CT 2539, BG 2, Block 2028	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
CT 2539, BG 2, Block 2031	3	3	--	--	--	--	--	--	--
		100.0%	--	--	--	--	--	--	--
CT 2539, BG 2, Block 2032	0	--	--	--	--	--	--	--	--
		--	--	--	--	--	--	--	--
<b>TOTAL</b>	<b>1282</b>	<b>510</b>	<b>116</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>28</b>	<b>618</b>
		<b>39.78%</b>	<b>9.05%</b>	<b>0.47%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.31%</b>	<b>2.18%</b>	<b>48.21%</b>

The US Department of Health and Human Services 2016 poverty guideline for a family of four is \$24,300. The median household incomes for all block groups in the proposed project area are above poverty level, shown in **Table 3**.

Table 3: Median Household Income for Proposed Project in 2010		
	Census Tract 2538	Census Tract 2539
<b>Median Household Income</b>	\$57,955	\$61,250

Individual minority or low-income populations are not anticipated to be affected by the construction of the proposed project. The implementation of the proposed project would not cause disproportionate adverse impacts to minority or low-income populations. The proposed project would not cause any displacements, permanent changes to access or travel patterns, and would not affect community cohesion. There are no permanent negative impacts to the community as a whole, including minority populations. The project will benefit area residents by relieving vehicular congestion in the area as anticipated economic development takes place in subsequent years. The requirements of EO 12898 appear to be satisfied.

### C. Limited English Proficiency

EO 13166 “Improving Access with Limited English Proficiency” requires agencies to examine the services they provide, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system to provide those services so that LEP persons can have meaningful access to them. No indicators of LEP populations were observed in the field during the windshield survey. Census tract and block group data was obtained from the Census Bureau for the population five years of age and over with the ability to speak English “Less than Very Well.” **Table 4** provides a summary of the LEP Comparison for the proposed project.

<b>Table 4: Limited English Proficiency Comparison for Proposed Project in 2010</b>			
<b>Census Tract, Block Group</b>	<b>Total Population</b>	<b>Population Who Speak English "Less Than Very Well"</b>	<b>Percentage of Population Who Speak English "Less than Very Well"</b>
CT 2538	7151	2240	31.32%
CT 2539	3777	612	16.2%

No LEP populations would be discriminated against as a result of the proposed project. Public involvement and outreach have been conducted in a manner so that all interested parties were able to provide both oral and written comments concerning the proposed project. Translation services and translated materials were provided at the public meeting held in November 2010. This meeting was advertised in the Spanish-language publication *La Voz*, in addition to two notices published in English in the *Houston Chronicle* and the *Baytown Sun*. Reasonable steps, such as provision of special communication interpreters or accommodation of other language needs, would continue to be taken to ensure such persons have meaningful access to the programs, services, and information that TxDOT provides. The requirements of EO 13166 appear to be satisfied. The notice to afford an opportunity for a public hearing (NAOPH) was published in Spanish in the *La Subasta* newspaper.

### D. Section 4(f) Resources

The proposed project would not impact any wildlife or waterfowl refuges, publicly-owned parklands, or significant historic sites; therefore, a Section 4(f) statement is not required. In addition, the proposed project would not impact any area of unique scenic beauty or other lands of national, state, or local importance.

### E. Public Facilities and Services

In the short term, an increase in traffic congestion and potential changes in travel patterns would be expected during roadway construction. In the long term, the proposed project would improve mobility in the project area, having a positive impact for citizens living in nearby neighborhoods and/or trying to access community and public facilities. As the regional population grows and congestion on SH 146 increases, improved access to the area would have a positive impact for residents in the vicinity of the proposed project. Emergency response and accessibility to medical services would be improved with increased roadway capacity. The proposed project would facilitate the development already occurring in the project area, which may include new roadways,

drainage, water supply and treatment facilities, schools, libraries, and medical services, in response to residential and commercial development.

## **F. Cultural Resources**

Cultural resources are generally classified as structures, buildings, archeological sites, districts (a collection of related structures, buildings and/or archeological sites), cemeteries and objects. Both federal and state laws require consideration of cultural resources during project planning. At the federal level, the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) of 1966, among others, apply to transportation projects such as this one. In addition, state laws, such as the Antiquities Code of Texas, also apply. Compliance with these laws may require consultation with the Texas Historical Commission (THC), Texas State Historic Preservation Officer (SHPO), and/or federally-recognized tribes to determine the proposed projects' effects on cultural resources. Review and coordination of the proposed project followed approved procedures for compliance with federal and state laws.

### ***Archeological Resources***

A review of data from the Potential Archeological Liability Map (PALM) indicates that no survey is recommended within the area of potential effects (APE) for archeological resources. For archeological reconnaissance, the APE encompasses the entire existing and proposed project ROW to the depth of proposed impacts. This area has been previously altered by development in the area, and was deemed to have a low potential for preservation of intact archeological resources. A **Potential Archeological Liability Map** of the project vicinity is included in **Appendix D**.

Based on the archeological study and consultation results, no further work is warranted. The preliminary reconnaissance study found that the project area had been extensively disturbed, precluding the possibility of it containing any intact archeological deposits. Consultation with federally-recognized Native American tribes with a demonstrated historic interest in the area was not required for the proposed project. Work conducted up to this point has identified no archeological resources that would be afforded further consideration under current cultural resource laws or that would be adversely affected by the proposed project. No public controversy exists regarding the proposed project's potential impacts on archeological sites or cemeteries.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease and TxDOT archeological staff would be contacted to initiate post-review discovery procedures.

### ***Historic Structures***

A review of the National Register of Historic Places (NRHP), the list of State Archeological Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant resources have been previously documented within the historical APE. It has been determined through consultation with the SHPO that the historical APE for the proposed project is the existing ROW, except where there is a grade separation. At this location, the APE extends to 150 feet from the centerline of the proposed project in either direction. A windshield survey conducted in August 2010 revealed that there are 15 historic-age resources on 11 parcels (built prior to 1969) located within the proposed project APE.

TxDOT historians have evaluated the historic-age resources through application of the Criteria of Eligibility for listing in the NRHP, and have determined that all 15 resources are not eligible for inclusion, either individually or as a whole. Correspondence from TxDOT can be found in

**Appendix B.** These resources do not have associations with significant historical figures or events to qualify for eligibility under Criteria A or B of the NRHP. They also represent common vernacular types that do not clearly reflect the distinctive characteristic of a type, period, method of construction, work of a master, or high artistic value to qualify as eligible under Criterion C of the NRHP. Additionally, unsympathetic alterations such as replacement doors, windows, and siding have compromised the resources' integrity of materials, design, and workmanship. No objections or expressions of concern were received from the Harris County Historical Commission.

Pursuant to Stipulation VI ("Undertakings with the Potential to Affect Historic Resources") Appendix 4 (2) of the First Amended Programmatic Agreement for Transportation Undertakings (PATU) between the FHWA, the SHPO, the Advisory Council on Historic Preservation (ACHP), and TxDOT, and the Memorandum of Understanding (MOU), TxDOT historians determined that no historic-age properties are present within the proposed project's APE and individual project coordination with SHPO is not required. This clearance remains valid for HIST; however, HIST is now operating under a new Programmatic Agreement (PA) dated December 2015. If the proposed project needs to be re-coordinated, it must occur under provisions of that new PA; however, the project does not require re-coordination at this time.

## **G. Water Resources**

### **Section 404 of the Clean Water Act: Waters of the United States**

The proposed project would not result in the placement of temporary or permanent dredge or fill material into jurisdictional waters of the United States (U.S.), including wetlands or other special aquatic sites; therefore, a Section 404 permit would not be required. An analysis of U.S. Geological Survey (USGS) topographic maps and Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), combined with field reconnaissance and a jurisdictional wetland delineation, revealed that one potentially jurisdictional water of the U.S., Pond Gully (Area B), and one upland stormwater retention pond (Area A) are present within the project limits. Pond Gully is channelized, flowing through a box culvert beneath SH 146 along the entire width of the ROW. All proposed work would occur at the existing grade above the box culvert containing Pond Gully. Therefore, no impacts to Pond Gully are anticipated to occur.

A jurisdictional delineation was performed on May 21, 2010, within the project limits. The results of this investigation can be found in the Preliminary Jurisdictional Delineation Report dated June 2010 (*Crouch Environmental Services, Inc. 2010. Preliminary Jurisdictional Delineation Report, BS 146 to Ferry Road, Harris County, Texas. 102 pp*). The proposed project contains 0.06 acre of potentially jurisdictional waters of the U.S. and no jurisdictional wetlands. The boundaries of the jurisdictional waters present within the project limits are depicted in **Figures 4A, 4B, and 4C**. No wetlands are present within the project limits.

### **Section 401 of the Clean Water Act: Water Quality Certification**

The proposed project would not require a Section 404 Permit; therefore, Section 401 Certification would not be required.

### **Executive Order 11990**

Based on the jurisdictional delineation performed on May 21, 2010, there are no wetlands present within the project limits. EO 11990 ("Protection of Wetlands") does not apply, because no wetlands would be impacted.

### **Rivers and Harbors Act of 1899, Sections 9 and 10**

The proposed project does not involve work in or over a navigable or tidal water of the U.S.; therefore, Sections 9 and 10 of the Rivers and Harbors Act do not apply.

### **Section 303(d) of the Clean Water Act**

The proposed project is located within approximately 5 stream miles of Cedar Bayou Tidal (Segment 0901), which is listed as threatened/impaired for bacteria, dioxin, and polychlorinated biphenyls (PCBs) in edible tissue on the Texas Commission on Environmental Quality (TCEQ) 2014 303(d) list. 303(d) coordination with the TCEQ is required, and will be completed by TxDOT. Runoff from the proposed project would discharge into waters within 5 miles upstream of Segment 0901. Best Management Practices (BMPs), such as sodding and temporary seeding, filter strips, and silt fencing would be employed to control the constituents of concern. These BMPs would also be installed around any storm sewer catch basins to prevent illicit discharges from entering water bodies in the vicinity of the proposed project.

The proposed project is not anticipated to create and/or exacerbate existing dioxin, PCB or bacteria levels into the surrounding watershed. It is anticipated that project construction would contribute temporary elevations of total suspended solids (TSS) in water bodies in the vicinity of the proposed project. This could potentially prevent light penetration into the water body, causing algal communities to die and decay, temporarily reducing dissolved oxygen. No long-term water quality impacts are expected as a result of the proposed project.

### **Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Construction General Permit**

This proposed project would include five or more acres of earth disturbance. TxDOT would comply with TCEQ's Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (CGP). A Storm Water Pollution Prevention Plan (SW3P) would be prepared and implemented, and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) would be required.

Stormwater from the proposed project would flow into a swale system adjacent to the project and eventually discharge into Pond Gully. BMPs, such as sodding and temporary seeding, filter strips, and silt fencing would be employed landward prevent illicit discharges from entering into water bodies within the vicinity of the proposed project.

### **Section 402 of the Clean Water Act: Texas Pollution Discharge Elimination System, Municipal Separate Storm Sewer System (MS4)**

The proposed project is located within the boundaries of the Phase II Baytown Urbanized Area Municipal Separate Storm Sewer System (MS4), and would comply with the applicable MS4 requirements.

### **Floodplains**

The proposed project is not located within a FEMA designated 100-year floodplain. A floodplain map has been included as **Figure 7**.

### **Texas Coastal Management Program**

The proposed project is located in a portion of Harris County, Texas, that falls within the Texas Coastal Management Program (TCMP) boundary. TxDOT has reviewed this proposed action for

consistency with the TCMP goals and policies in accordance with the regulations of the Coastal Coordination Advisory Council, and has determined that the proposed action is consistent with the applicable TCMP goals and policies, and would not have a direct and significant adverse effect on the Coastal Natural Resource Area (CNRA), identified in 31 TAC Chapter 501.31.

### **Wild and Scenic Rivers**

The proposed project does not involve work within any waters that are listed in the U.S. Department of Interior's National Wild and Scenic River System. No impacts to Wild and Scenic Rivers would occur.

### **H. Biological Resources**

Databases of sensitive species maintained by the U.S. Fish and Wildlife Service (USFWS) and TPWD were reviewed to determine the state and/or federally listed threatened or endangered species that occur or historically have occurred in Harris County (August 2015). TPWD provided the Natural Diversity Database (NDD) data on August 28, 2015. NDD Element of Occurrence Records were reviewed to determine the potential effects of the proposed project on threatened and endangered species within a 10-mile radius of the project area. The Element of Occurrences within 1.5 miles of the project area are detailed in the paragraph below. In addition, habitat assessments were conducted by a qualified biologist. A species list for Harris County outlining the species and habitat potentially present in the proposed study area has been included in the Biological Evaluation Form completed for this project and has been included in **Appendix E**.

According to the TPWD-NDD Element of Occurrence Records, Indianola beakrush (*Rynchospora indianolensis*) has been documented within 1.5 miles of the proposed project. Indianola beakrush is a state listed Species of Greatest Conservation Need. Because the project area consists of maintained right of way, median, and roadway, suitable habitat for Indianola beakrush is not present within the project study area. There are no other documented occurrences of threatened and endangered species within 1.5 miles of the proposed project.

It should be noted that data from the NDD does not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within a given project area. Absence of information in an area does not mean absence of occurrence.

### **Migratory Bird Treaty Act**

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, or egg in part or in whole, without federal permit issuance in accordance with the Act's policies and regulations. The project area was investigated for any structures containing migratory birds or indications of nesting migratory birds. A cursory nest survey was conducted during initial environmental investigations and no migratory birds or migratory birds' nests were found during the survey. Migratory birds may arrive in the vicinity of the project area to breed before or during construction of the proposed project. Migration patterns would not be affected by the proposed project. In accordance with the BMPs in the Biological Evaluation Form measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young during the nesting and breeding season (March 1 through September 15). If construction activities are anticipated to occur during the nesting and breeding season, a site-specific survey would be conducted at least 10 days prior to clearing and grubbing activities. If migratory birds or their nests are discovered during this survey, TxDOT would coordinate with the U.S. Fish and Wildlife Service (USFWS) to address MBTA concerns.

### **Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (BGEPA) prohibits any form of possession or taking of both Bald and Golden Eagles. The project area was investigated for any habitat suitable for use by Bald or Golden Eagles. No eagles or eagle nests were found and no suitable eagle habitat was observed. No adverse impacts to bald or golden eagles are anticipated as a result of the proposed project.

### **Magnuson-Stevens Fishery Conservation and Management Act**

The Magnuson-Stevens Fishery Conservation and Management Act prohibits activities that contribute to the continued loss of fish habitats. Toward this end, Congress mandated the identification of habitats essential to managed species and measures to conserve and enhance this habitat. The Magnuson-Stevens Act requires cooperation among the National Marine Fisheries Service (NMFS), the Regional Fishery Management Councils, fishing participants, federal and state agencies, and others in the protection, conservation, and enhancement of essential fish habitat (EFH). The proposed project is located within Harris County, Texas which has been identified as containing tidally influenced waters. The proposed project does not contain a tidally influenced water body; therefore, the requirements of EFH do not apply.

### **Fish and Wildlife Coordination Act**

The Fish and Wildlife Coordination Act (FWCA), as amended, was enacted to protect fish and wildlife when federal actions result in the control or modification of a natural stream or body of water. The statute requires federal agencies to take into consideration the effect that water-related projects would have on fish and wildlife resources, take action to prevent loss or damage to these resources, and provide for the development and improvement of these resources. To comply with the requirements of the FWCA, federal agencies must first determine whether a proposed activity would result in the control or modification of a body of water. The proposed project would not result in modifications to any body of water; therefore, coordination under the FWCA is not required.

### **Invasive Species and Beneficial Landscaping Practices**

On February 3, 1999, EO 13112 ("Invasive Species") was issued to prevent the introduction of invasive species, provide for their control, and minimize their economic, ecological and human health impacts. Disturbed areas would be revegetated in accordance with the *Executive Memorandum on Beneficial Landscaping* (April 26, 1994) and EO 13112. Regionally native and non-invasive plants would be utilized for revegetation efforts, including seed mixes, to the greatest extent practicable.

In accordance with the Executive Memorandum of August 10, 1995, all agencies shall comply with the NEPA as it relates to vegetation management and landscape practices for all federally assisted projects. The Executive Memorandum directs agencies, when cost-effective and to the extent practicable, to:

- Use regionally native plants for landscaping
- Design, use, or promote construction practices that minimize adverse effects on the natural habitat
- Seed to prevent pollution by, among other things, reducing fertilizer and pesticide use,
- Implement water-efficient and runoff reduction practices
- Create demonstration projects employing these practices

Landscaping included with the proposed project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices.

## I. Vegetation

### ***Existing Environment***

In accordance with §2.205 (a)(2) of the MOU between the TxDOT and the Texas Parks and Wildlife Department (TPWD), effective September 1, 2013, a Tier I site assessment was performed to identify and map vegetation within the project area. In addition, a Biological Evaluation Form was completed for the proposed project and has been included in **Appendix E**.

According to the EPA's Level III and IV Ecoregions of Texas the project area is located within the Western Gulf Coastal Plains Level III Ecoregion and the Northern Humid Gulf Coastal Prairie Level IV Ecoregion. The proposed project is located within existing ROW. The existing ROW consists of existing roadway and maintained roadside grasses, dominated by common introduced herbaceous vegetation and opportunistic weeds. Predominant vegetation found within the maintained ROW include Bermuda grass (*Cynodon dactylon*), Johnsongrass (*Sorghum halepense*), toothed medic (*Medicago polymorpha*), and perennial rye grass (*Lolium perenne*).

The results of the Tier I assessment were compared with triggers in §2.206 of the MOU between TxDOT and TPWD, and with the Threshold Table Programmatic Agreement between TxDOT and TPWD to determine if coordination with TPWD would be necessary for the proposed project. The TPWD Ecological Mapping Systems of Texas (EMST) data for the project area was reviewed to determine the type and size of Ecological Systems located within the project area. The project area was assessed by a qualified biologist to identify the existing vegetation assemblage in the project area. The biologist determined if the EMST ecological regions and region boundaries for the project area were accurate.

TPWD Ecological System boundaries were compared with the actual habitat of the project area and the ecological region boundaries were adjusted to accurately depict current site conditions. The direct impacts to each Ecological System were calculated using the results of the existing condition assessment performed by the qualified biologist. The direct impacts were then compared to the threshold for each Ecological System to determine if further coordination with TPWD would be required. Thresholds were not exceeded, and coordination with TPWD is not required for the proposed project. **Table 5** summarizes the type and size of Ecological Systems located within the project area according to TPWD's EMST compared to the existing conditions of the site.

Table 5: Vegetation Impacts					
MOU Habitat Type	TPWD Mapped Ecological Systems (Acres)	Existing Conditions Ecological Systems (Acres)	Direct Impacts to Existing Condition Ecological Systems (Acres)	Coordination Threshold (Acres)	Coordination Required (yes/no)
Coastal Grassland	25.26	NA	NA	2.0	No
Disturbed Prairie	0.22	NA	NA	3.0	No
Urban	29.58	55.06	55.06	NA	No

**Farmland Protection Policy Act**

Three soil mapping units are identified within the project study area according to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) *Soil Survey of Harris County, Texas*. These soils include Lake Charles-Urban land complex, Lake Charles clay (0-1% slopes), and Bernard-Urban land complex. None of these soils are considered hydric soils. The proposed project is not anticipated to adversely affect soil mapping units within the project vicinity. Alterations of soil present on site would occur as the proposed ROW would be regraded and the existing roadway materials are proposed to be replaced.

Projects considered exempt under the Farmland Protection Policy Act (FPPA) include those that require no additional ROW or require ROW that is developed, urbanized, or zoned for urban use. The proposed project would be constructed within the existing ROW and no additional ROW would be required; therefore, the proposed project is exempt from the requirements of the FPPA and requires no coordination with the NRCS.

**J. Air Analysis**

This project is located within the Houston-Galveston-Brazoria area that has been designated by EPA as a marginal nonattainment area for the 2008 ozone NAAQS; therefore, transportation conformity rules apply.

The proposed action is consistent with H-GAC’s financially constrained 2040 RTP and the 2015-2018 TIP, as amended, which were initially found to conform to the TCEQ State Implementation Plan (SIP) by FHWA and FTA on September 11, 2015 and December 2, 2014, respectively. Copies of the RTP and TIP pages are included in Appendix C. All projects in the 2015-2018 TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in Section 450, of Title 23 CFR and Section 613.200, Subpart B, of Title 49 CFR.

The project is not located within a CO or PM nonattainment or maintenance area; therefore, a project level hot-spot analysis is not required.

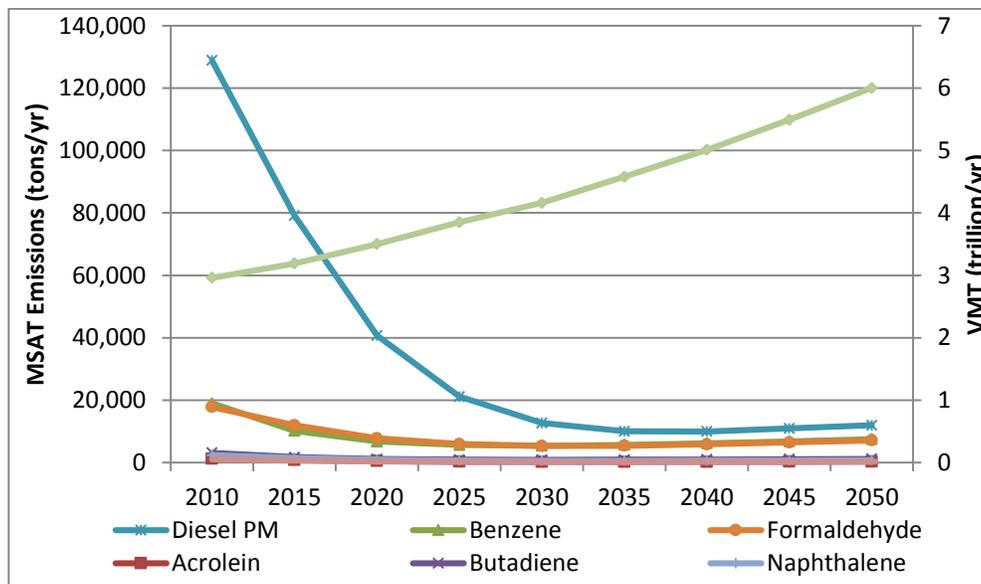
This project has a Letter of Waiver of Congestion Mitigation Analysis issued by H-GAC (Appendix B); therefore a project level CMP analysis is not required.

Traffic data for the estimated time of completion (ETC) year 2016 and design year 2040 is 63,800 vehicles per day and 41,600 vehicles per day, respectively. A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that the carbon monoxide standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000. The AADT projections for the project do not exceed 140,000 vehicles per day; therefore a Traffic Air Quality Analysis was not required.

### Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (<http://www.epa.gov/iris/>). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (<http://www.epa.gov/ttn/atw/nata1999/>). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA Mobile Source Air Toxics (MSAT) rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA’s MOVES2010b model, as shown in **Graph 1** and **Table 6**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

**Graph 1:  
PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050  
FOR VEHICLES OPERATING ON ROADWAYS  
USING EPA’S MOVES2010b MODEL**



Source: Table 1 below.

Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

**Table 6: PROJECTED NATIONAL MSAT EMISSION TRENDS 2010 – 2050  
FOR VEHICLES OPERATING ON ROADWAYS  
USING EPA’s MOVES2010b MODEL**

Pollutant / VMT	Pollutant Emissions (tons) and Vehicle-Miles Traveled (VMT) by Calendar Year									Change 2010 to 2050
	2010	2015	2020	2025	2030	2035	2040	2045	2050	
Acrolein	1,244	805	476	318	258	247	264	292	322	-74%
Benzene	18,995	10,195	6,765	5,669	5,386	5,696	6,216	6,840	7,525	-60%
Butadiene	3,157	1,783	1,163	951	890	934	1,017	1,119	1,231	-61%
Diesel PM	128,847	79,158	40,694	21,155	12,667	10,027	9,978	10,942	11,992	-91%
Formaldehyde	17,848	11,943	7,778	5,938	5,329	5,407	5,847	6,463	7,141	-60%
Naphthalene	2,366	1,502	939	693	607	611	659	727	802	-66%
Polycyclics	1,102	705	414	274	218	207	219	240	262	-76%
Trillions VMT	2.96	3.19	3.5	3.85	4.16	4.58	5.01	5.49	6	102%

Source: EPA MOVES2010b model runs conducted during May – June 2012 by FHWA.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA). The FHWA, EPA, Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

**Project-Specific MSAT Information**

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at: [http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/mobile\\_source\\_air\\_toxics/msatemissions.pdf](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf).

For each alternative in this document, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway

and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated VMT under each of the Alternatives are nearly the same, varying by less than percent, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases. The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built at SH 146. However, the magnitude and the duration of these potential increases compared to the No Build alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause regionwide MSAT levels to be significantly lower than today.

<b>Table 7: VMT Summary</b>		
<b>Alternative</b>	<b>Time Period</b>	<b>Vehicle Miles Traveled (VMT)</b>
No Build	AM Peak Hour	13063.33
	PM Peak Hour	10753.95
Build Alternative	AM Peak Hour	13372.15
	PM Peak Hour	13421.67

The additional travel lanes contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher under certain Build Alternatives than the No Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the new roadway sections that would be built between BS 146 and Ferry Road under the Build Alternative. However, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. On a regional basis, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be lower in the future.

## **Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis**

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action. The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, <http://www.epa.gov/iris/>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude. Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>). The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable. There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.healtheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of

risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

### **Conclusion**

In this document, a qualitative MSAT assessment has been provided relative to the various alternatives of MSAT emissions and has acknowledged that the Build Alternative project alternatives may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain and, because of this uncertainty, the health effects from these emissions cannot be estimated.

### **Construction-Related Impacts to Air Quality**

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles.

The potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: <http://www.tceq.state.tx.us/implementation/air/terp/>.

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

### **K. Noise Analysis**

This analysis was accomplished in accordance with TxDOT's (FHWA approved) Guidelines for Analysis and Abatement of Highway Traffic Noise.

Sound from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB." Sound occurs over a wide range of

frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB (A)." Also, because traffic sound levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "L<sub>eq</sub>". The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise
- Determination of existing noise levels
- Prediction of future noise levels
- Identification of possible noise impacts
- Consideration and evaluation of measures to reduce noise impacts

### Noise Abatement Criteria

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact will occur. This classification scheme is outlined in **Table 8**.

Table 8: Noise Abatement Criteria (NAC)		
Activity Category	FHWA (dV(A) L <sub>eq</sub> )	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential
C	67 (exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditorium, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, railyards, retail facilities, shipyards, utilities, (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

A noise impact occurs when either the absolute or relative criterion is met:

- Absolute criterion: the predicted noise level at a receiver approaches, equals, or exceeds the NAC. "Approach" is defined as 1 dB (A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB (A) or above.
- Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially exceeds" is defined as more than 10 dB (A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB (A) and the predicted level is 65 dB(A) (11 dB(A) increase).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

### **Noise Analysis Summary**

FHWA Traffic Noise Modeling (TNM) software was used to calculate existing and predicted traffic noise levels at receiver locations (**Table 9** and **Figure 5**) that represent the land use activity areas adjacent to the proposed project that may be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. TNM primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features and the locations of activity areas likely to be impacted by the associated traffic noise.

Table 9: Traffic Noise Levels (dB(A) L <sub>eq</sub> )							
Representative Receiver		NAC Category	NAC Level	Existing	Predicted Year (2032)	Change (+or[-])	Noise Impact
R1	Residence	B	67	63	64	1	No
R2	Residence	B	67	70	72	2	Yes
R3	Residence	B	67	72	72	0	Yes
R4	Residence	B	67	73	72	[1]	Yes
R5	Residence	B	67	74	72	[2]	Yes
R6	Residence	B	67	65	67	2	Yes
R7	Residence	B	67	61	63	2	No
R8	Residence	B	67	61	64	3	No
R9	Residence	B	67	59	63	4	No
R10	Residence	B	67	63	66	3	Yes
R11	Residence	B	67	67	66	[1]	Yes
R12	Residence	B	67	72	68	[4]	Yes
R13	Residence	B	67	62	65	3	No
R14	Residence	B	67	62	64	2	No
R15	Residence	B	67	60	63	3	No
R16	Residence	B	67	65	65	0	No
R17	Residence	B	67	65	65	0	No
R18	Residence	B	67	63	64	1	No
R19	Residence	B	67	66	67	1	Yes
R20	Residence	B	67	65	67	2	Yes
R21	Residence	B	67	66	67	1	Yes
R22	Residence	B	67	64	63	[1]	No
R23	Residence	B	67	66	67	1	Yes
R24	Residence	B	67	68	69	1	Yes

Source: Study Team 2010 and 2012.

### Environmental Consequences

The No Build Alternative would not directly result in impacts to noise receivers throughout the project study area; however, as projected traffic on the project site increases, noise levels would also increase.

As indicated in **Table 9**, the proposed project would result in traffic noise impacts. The following noise abatement measures were considered:

- Traffic management – Control devices could be used to reduce the speed of the traffic; however, the minor benefit of 1 dB (A) per 5 mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.
- Alteration of horizontal and/or vertical alignments – Any alteration of the existing alignment would displace existing businesses and residences, require additional ROW, and not be cost effective/reasonable.

- Buffer zone – The acquisition of sufficient undeveloped land adjacent to the project site to preclude future development potentially impacted by highway traffic noise would not be cost effective/reasonable.
- Noise barriers – This is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations. Results of the evaluation for the Build Alternative are discussed below.
  - Receivers 6, 19, 20, 21, and 23: These receivers represent single-family residences in the vicinity of the project area for a total of 11 residences with driveways facing the roadway. Continuous noise barriers at these receivers would restrict access to these residences. Gaps in a noise barrier would satisfy access requirements but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) or the noise reduction design goal of -7 dB(A) for at least one impacted front-row receiver.
  - Receiver 10, 11 and 24: These receivers represent three residences located behind commercial properties. Noise barriers would have a detrimental effect on these commercial properties by restricted views and access by potential customers.- Receiver 12: This receiver represents a total of two residences. A noise barrier would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) or the noise reduction design goal of -7 dB(A) for at least one impacted front-row receiver.

Before any abatement measure can be incorporated into the proposed project, it must be both feasible and reasonable. In order to be “feasible,” the measure must reduce noise levels by at least 7 dB(A) for at least one first-row impacted receiver. In order to be reasonable, it must not exceed \$25,000 for each benefited receiver.

None of the noise abatement measures would be both feasible and reasonable for any of the impacted receivers discussed above. However, a noise barrier was determined to be both feasible and reasonable for Receivers 2 through 5, and is proposed for incorporation into the proposed project.

- Receivers 2 through 5: These receivers represent a total of 37 residences. Based on preliminary calculations, a noise barrier 1,432 feet in length and 10 feet in height would be sufficient to achieve the minimum feasible reduction of 5 dB(A) and the noise reduction goal of -7dB(A) for at least one impacted front-row receiver at an estimated total cost of \$257,760 or \$6,966 for each benefited receiver. A Noise workshop would be accomplished to determine if those scheduled to receive proposed noise walls want them.

<b>Table 10: Proposed Barrier Description</b>						
<b>Barrier</b>	<b>Location</b>	<b>Height</b>	<b>Length</b>	<b>Benefitted Receivers</b>	<b>Cost</b>	<b>Cost per Benefitted</b>
1	Chase Village Mobile Home Park between McKinney Road and Elvinta Street	10 feet	1,432	37	\$257,760	\$6,966

**Noise  
Contours**

Land use activity areas between West Elvinta Road and Ferry Road within the project study area are currently Category D, indoor facilities (such as hospitals, libraries, and schools) requiring interior noise levels below 52 dbA. To avoid noise impacts that may result from future development of properties adjacent to the proposed project, local officials responsible for land use control programs should ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following predicted (2032) noise impact contours in **Table 11**.

<b>Table 11: Noise Impact Contours</b>			
<b>Undeveloped Area</b>	<b>Land Use</b>	<b>I Impact Contour</b>	<b>Distance from ROW</b>
West Elvinta Road to Ferry Road	NAC B and C	66 dB (A)	175 feet
	NAC E	71 dB(A)	50 feet

Source: Study Team 2010.

**Construction Noise**

Noise associated with the construction of the proposed project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

**Local Coordination**

A copy of this traffic noise analysis will be made available to local officials to ensure, to the maximum extent possible, future developments are planned, designed and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the proposed project.

**L. Hazardous Materials**

Based on the anticipated vertical alignment changes, excavation, and demolition of existing structures for the proposed project, an Initial Site Assessment (ISA) was conducted to identify potential hazardous materials in the project area. Originally conducted in May 2010, the ISA consisted of the following actions:

- Existing and historical land-use review
- Review of project geotechnical boring logs
- American Society for Testing and Materials (ASTM) E1527 Level or Equivalent Regulatory Database Search
- Site survey

In August 2011, a second ASTM E1527 Level or Equivalent Regulatory Database Search was performed to capture any additional records of recognized environmental conditions (RECs) added to the searched databases since the original search was conducted. The August 2011 Regulatory

Database Search found one site with a potential Recognized Environmental Condition (REC) located adjacent to the project site at the northeast corner of the intersection of West Elvinta Road and SH 146. The site is associated with both an Underground Storage Tank (UST) record and a Leaking Petroleum Storage Tank (LPST) record. The UST record (Facility ID 0032801) is owned by Angels Gas and Grocery and is located at 3209 SH 146, Baytown, Texas 77520. The UST record indicates that four steel USTs were removed from the ground as of June 5, 1999. The LPST record, associated with the same Facility ID, is listed by the TCEQ as LPST ID 91924. The record indicates that a former vapor impact or non-aqueous phase liquid (NAPL) is present in close proximity to subsurface utilities or other natural or man-made conduit, and that there was potential for the accumulation of explosive vapors or vapors that could cause acute effects in buildings or other structures. The LPST record further indicates that the TCEQ investigated and issued final concurrence, closing the case on June 7, 1988. No groundwater or soil contamination was reported for either of these records. No other records were reported for this UST/LPST site.

In March 2013, a third Regulatory Database Search was performed to capture any additional records added between August 2011 and the present. Along with the LPST/UST site located by the August 2011 search, the March 2013 search located four additional records. On March 29, 2013, additional visual surveying of the project vicinity was conducted, and an attempt was made to locate and inspect the sites of the records uncovered by the new database search.

One Closed Landfill Inventory (CLI) record adjacent to the project site, the Old Baytown Dump, is located on Ferry Road near the intersection with SH 146 on the south side of the project ROW. This site is listed as H-GAC CLI Site ID U1659, and the CLI record states that it was being used for storage of concrete drainage pipes and for brush disposal as of 2001. No information is available from the record as to what type of waste was previously disposed of at this site during its operational period. Exact boundaries and dates of operation are also unavailable. During the March 2013 visual survey, the site was found behind the Remarkable Minds childcare center at 4006 Baytown Loop. A number of large diameter concrete pipes were found in the southwest corner of the site amidst unmaintained herbaceous vegetation and brush. No RECs were observed on the site. No groundwater or soil contamination was reported for either of these records. No other records were reported for this site.

The Regulatory Database Search located one site in the EPA's Resource Conservation and Recovery Act (RCRA) database. The Baytown-East District Publicly-Owned Treatment Works (POTW) site is listed as EPA ID TXT490013802 and is located on Ferry Road approximately 0.25 miles south of the project boundary. This site is recorded as a non-generator of hazardous waste. The March 2013 visual survey revealed that this site is now an empty lot, containing only small trees, shrubs, and periodically mowed and maintained herbaceous upland. No groundwater or soil contamination was reported in this record. No other records were reported for this site.

The search also located two records in Environmental Data Resources' internal Historical Auto Stations (HAS) database, which documents the former locations of automotive-related businesses. The two sites listed, Borrego's Tires and Mechanic Shop (HAS 1015443800) and Bailey Valve Repair (HAS 1015432011), are respectively located 0.09 and 0.20 miles from the project boundary. However, a review of aerial photos and the March 2013 visual survey of the project vicinity confirmed that these two sites have been converted into residential neighborhood spaces. No groundwater or soil contamination was reported in these records. No other records were reported for these sites.

An analysis of the ISA data and results from the May 2010, August 2011, and March 2013 Regulatory Database Searches indicate that the proposed project will not involve the acquisition of

known unresolved contamination where TxDOT could reasonably expect to assume liability for corrective action upon acquisition. In addition, the proposed project does not involve known hazardous materials impacts that could be anticipated to adversely affect construction (e.g., cannot be resolved before letting or during construction). A copy of the ISA and the March 2013 Regulatory Database Search can be obtained from the TxDOT Houston District.

#### **M. Visual Impacts and Aesthetics**

The proposed project is located in a primarily commercial, light industrial, institutional, and residential environment with several undeveloped properties. The construction of the proposed project would result in the visual resources of the project vicinity remaining unchanged, except for the grade separation at in the intersection of SH 146 and North Alexander Drive, where construction would involve a grade separation. The proposed project is not anticipated to result in adverse effects to visual resources.

#### **N. Construction Impacts**

Construction of the proposed project would be carried out in such a way as to minimize the impacts to the traffic passing through the construction zone. Traffic control would be consistent with TxDOT policies and standards. All traffic control would conform to Part IV (Traffic Control for Street and Highway Construction and Maintenance Operations) of the *Texas Manual of Uniform Traffic Control Devices*.

Due to operations normally associated with road construction, there is a possibility that noise levels would be above normal in the areas adjacent to the ROW. Construction would be limited to daylight hours when occasional loud noises are more tolerable. Extended disruption of normal activities for any one receptor is not considered likely. Every reasonable effort would be made to minimize construction noise.

Construction may temporarily degrade air quality through dust and exhaust gases associated with construction equipment. The control of particulate matter emanating from various construction activities would be in accordance with TCEQ regulations and would be incorporated into the final design and construction specifications. To minimize exhaust emissions, contractors would be required to use emission control devices and limit unnecessary idling of construction vehicles.

Considering the generally level nature of the terrain of the project site, construction would not appear to result in adverse effects to the surrounding environment from erosion. Erosion and sedimentation would be controlled by job-site erosion control specifications, on-site inspections during construction, silt fences, and by seeding during and at the completion of the proposed project. TxDOT contract specifications require contractors to minimize negative effects to the environment at all times during construction operations.

During construction, the contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials in the construction staging area. The use of construction equipment within sensitive areas would be minimized or eliminated entirely. All construction materials used for the proposed project would be removed as soon as work schedules permit. Any unanticipated hazardous materials and/or petroleum contamination encountered during construction would be handled according to applicable federal and state regulations per TxDOT standard specifications.

## **O. Indirect and Cumulative Impacts**

Using the screening tools in Appendix C of TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (September 2010), it was determined that both indirect and cumulative impact analyses were required due to the added capacity of the proposed project. This section describes the analysis of potential indirect and cumulative effects of the proposed addition of four main lanes to SH 146 and a grade separation at the intersection of SH 146 and North Alexander Drive.

In general, indirect and cumulative effects include those consequences of a proposed action that are not direct and may not be readily observable. Indirect effects are those effects that would be expected to be caused by the proposed project but would be later in time or removed in distance. Cumulative effects are those impacts that would result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions. Indirect and cumulative effects are less defined than direct effects, and by definition, cumulative effects are incremental in nature and usually are less defined than indirect effects. This analysis follows the requirements and processes outlined in the following regulations and guidance:

- 23 CFR 771, a regulation prescribing the policies and procedures of the FHWA for implementing NEPA and the regulations of the Council on Environmental Quality (CEQ), 40 CFR 1500 through 1508
- *Guidance on Preparing Indirect and Cumulative Impact Analyses*, TxDOT, September 2010
- *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*, FHWA Technical Advisory T6640.8A, 1987
- Position Paper: *Secondary and Cumulative Impact Assessment in the Highway Project Development Process*, FHWA, 1992
- Report 466: *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects*, NCHRP, 2002
- Report 25-25/Task 22: *Forecasting Indirect Land Use Effects of Transportation Projects*, NCHRP, 2007
- *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process (Interim Guidance)*, FHWA, 2003
- *Considering Cumulative Effects Under the National Environmental Policy Act*, CEQ, 1997
- *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis*, CEQ, 2005
- *Guidance for Preparers of Cumulative Impact Analysis Approach and Guidance*, California Department of Transportation, 2005.

### **Indirect Impacts**

Indirect impacts are defined as those that are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts differ from those directly associated with the construction and operation of the transportation facility and are often caused by induced development and growth. This in turn can result in a variety of related effects, such as changes in land use, population density or growth rate, economic vitality, and effects on air and water and other natural resources, including ecosystems. The potential for indirect impacts to occur is determined in large part by municipal planning objectives and the location of the proposed project.

There are three broad categories of indirect effects:

- Encroachment-Alteration Effects alter the behavior and function of the physical environment. These effects are related to project design features, but are separated from the project by time and/or distance.
- Access-Alteration Effects, also known as Project-Influenced Effects or the Land Use Effect. Changes in traffic, access, and mobility can result in changes in land use. Highway projects might promote development, or influence and increase the rate of development. These effects are often referred to as induced growth.
- Effects Related to Project-Influenced Development, or Induced Growth-Related Effects, are attributable to the induced growth itself.

Examples of potential indirect effects of transportation projects include:

- Development and land use changes due to improved access
- Increase in stormwater runoff due to changes in land use and increased development on land surrounding a proposed roadway facility
- Increased sedimentation of wetlands and streams and decreased water quality due to future development of land adjacent to a new roadway facility
- Loss of vegetation and wildlife habitat and decreased habitat value in areas of increased land development caused indirectly by improved access
- Impact to historic or archeological resource sites from development projects on private property that do not require cultural resource investigation because public funds or permits are not required
- Increased use of parks and recreational areas due to more convenient access provided by a new facility
- Stimulation of the local economy from the circulation of construction spending; improved access to employment opportunities, markets, goods, or services such as health and education; an increased work force related to construction; and developments stemming from a new facility

TxDOT’s *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (September 2010) is adapted from the NCHRP Report 466 and describes a seven-step process for conducting an indirect impacts analysis. The steps listed in **Table 12** were followed for analysis of indirect effects of the proposed project.

<b>Table 12: Steps for Conducting an Indirect Impact Analysis</b>	
1	Scoping
2	Identify the study area’s goals and trends
3	Inventory of the study area’s notable features
4	Identify impact-causing activities of the proposed action and alternatives
5	Identify potentially substantial indirect effects for analysis
6	Analyze indirect effects and evaluate results
7	Assess consequences and consider/develop mitigation

Source: TxDOT 2010.

**Step 1: Scoping**

The project area consists of residential, industrial, commercial, institutional and undeveloped properties, with some adjacent undeveloped land under construction for industrial and commercial uses. The need for the proposed project is driven by the ongoing and anticipated development

in the area. The roadway project is not intended to induce development; it is in response to the capacity needs of existing and previously planned development in the area. Assuming appropriate implementation of applicable land use planning regulations and control strategies, related effects to water and other natural systems, including ecosystems, would be avoided and minimized.

Indirect impacts from the proposed project are considered through 2035, the year by which the current *2035 RTP Update* will be implemented. Projects currently in the *2035 RTP Update* have been fully evaluated based on projections for 2035, and performance of the proposed improvements beyond that time cannot yet be reasonably evaluated.

Data collection for indirect impact analysis included a literature review; collection of demographic and economic data; and collection of land use information from local planning resources and developers. A public meeting was held in November 2010 (see Public Involvement section of this document, page 65) to gather comments and concerns from local residents and stakeholders along the proposed project boundary. Given the speculative nature of indirect impact prediction, it must be stated that qualitative assumptions were predominantly relied upon during the analysis. The Area of Influence (AOI), which is the geographic area assessed for the indirect impacts study, includes the proposed project area and properties immediately adjacent to the proposed project. The limits of the AOI are the boundary of the Cedar Bayou watershed to the west, Cedar Bayou-Lynchburg Road to the north, FM 1405 to the east, and SH 99 to the south. The AOI is approximately 8,795 acres. The extent of the AOI was determined in part by the commute shed of the proposed project. Area residents beyond the major thoroughfares used as AOI boundaries are likely better served by those roads or others than by SH 146. The AOI also fully encompasses the area potentially susceptible to an increase in noise from the improved roadway. Finally, the Cedar Bayou watershed was selected as the western edge of the AOI boundary, as the proposed project is not expected to cause impacts to water resources beyond that boundary. The AOI for the proposed project is depicted in **Figure 6**.

The *2035 RTP Update* catalogues transportation systems and services in the area contained by the boundaries of the AOI. The document also addresses regional transportation needs that are identified through forecasting current and future travel demand, developing and evaluating system alternatives and selecting those options that best meet the mobility needs of the region. The proposed facility is included in this plan. Indirect impacts will be analyzed through 2035, utilizing the data and predictions contained in the *2035 RTP Update*.

#### Step 2: Identify the Study Area's Goals and Trends

The proposed project lies within the limits of Harris County. Existing land use plans created by the City of Baytown (Baytown 2025 Comprehensive Plan) reveal that the current and future land use of both the developed and undeveloped areas within the AOI would continue to be primarily industrial and commercial development. The growth patterns currently experienced in the AOI, necessitating the proposed improvement project, are not expected to change significantly.

The Houston-Galveston region is projecting a significant increase in population and employment over the next 25 years. The additional population will bring total regional population to 8.8 million people by 2035. Based on the projected job growth, a 60 percent increase in employment is expected by 2035 (*2035 RTP Update*). According to H-GAC's regional growth forecasting data for the nine census tracts represented in the AOI, significant increases are expected in the number of households (72 percent increase), employment (94 percent increase) and population (66 percent increase) by the year 2035.

The air quality in the AOI is currently considered in poor health, because it is within the nonattainment or maintenance area for 8-hour ozone. In addition, the proposed project would result in an increase in mobility and access to the area. All such actions would result in changes of traffic patterns and have the potential to indirectly impact air quality in the area.

### Step 3: Inventory of Study Area's Notable Features

The AOI for the proposed project currently has industrial and commercial development, or is platted for development. Historically, the land within the AOI has been developed primarily for commercial and industrial land uses.

#### *Vegetation and Wildlife*

The AOI lies within the Gulf Coast Prairies and Marshes ecoregion. Vegetation within the project study area is characteristic of an urbanized setting. Two distinct vegetative communities were observed within the proposed project limits: mowed and maintained ROW, and riparian forest. The mowed and maintained ROW was found throughout the project site between the frontage lanes, while the riparian forest was found abutting Pond Gully.

#### *Water Quality*

The Cedar Bayou watershed is located in east Harris County. Cedar Bayou forms a large portion of the boundary between Harris, Liberty, and Chambers Counties, with approximately half of the watershed in Harris and the remainder in the other two counties. Cedar Bayou flows in a southward direction from its headwaters in Liberty County to its mouth at Galveston Bay. The watershed covers approximately 202 square miles, with Cedar Bayou being the primary water body. There are approximately 128 miles of open streams within the watershed, including the primary stream and tributary channels. According to National Wetlands Inventory (NWI) maps, there are approximately 799 acres of wetlands within the AOI.

The proposed project is located within approximately 5 stream miles of Cedar Bayou Tidal (Segment 0901), which is listed as threatened/impaired for bacteria, dioxin, and PCBs in edible tissue on the TCEQ 2014 303(d) list. 303(d) coordination with the TCEQ is required, and will be completed by TxDOT. This may be a result of increased development, sewage system failures and improper use of fertilizers and pesticides by homeowners and lawn maintenance companies.

#### *Air Quality*

The AOI is within the H-GAC 8-hour ozone NAAQS nonattainment zone. The region is in attainment with all other current NAAQSs.

#### *Socioeconomic Resources*

The estimated population within the watershed (Harris County portion) is just over 32,000. Much of the Cedar Bayou watershed is undeveloped, with the exception of the City of Baytown (located in Harris and Chambers Counties) and Mont Belvieu (located in Chambers County). The watershed is primarily rural and agricultural, with the most development activity related to large commercial grass farming operations. Most of the primary stream and floodplain is environmentally sensitive due to the saltwater marshlands in the lower reaches and the undeveloped riparian areas surrounding the natural channels in the upper reaches. The TPWD considers the area around the mouth of Cedar Bayou to be critical wildlife habitat.

Public facilities of note in the project vicinity include Cedar Bayou Junior High School and Stephen F. Austin Elementary School, the Eastside Church of Christ, the Church of New Beginnings, the Cedar Bayou Church of Christ, and Cedarcrest Cemetery & Monument.

Several single-family homes are adjacent to the project ROW and are mainly located north of the intersection of Ferry Road and North Alexander Drive. One large subdivision, Hunter's Ridge, is located adjacent to the proposed project. Commercial operations in the project vicinity include Veolia Environmental Services, Bay Star Ambulance Services, Mass Flow Technologies, Bear Land Surveying, Cedar Bayou Animal Clinic, Baytown Chevron, Newman's Homes, Eddy RV & Tractor Sales, Kab Recycling Center, and H&H Tractor & Lawn Equipment.

#### Step 4: Identify Impact-Causing Activities of the Proposed Action and Alternatives

The proposed project would include the addition of four main lanes and one grade separation that would be constructed within the existing ROW. The four main lanes would be constructed between previously constructed frontage roads. The proposed project would not create access to parcels that had not already been provided by the existing frontage roads. Construction would require clearing of vegetation and excavation and fill in some locations. Depending on the phasing of construction and negotiations with the contractor, storage of some construction materials may be allowed within the project ROW. The proposed project is expected to help alleviate traffic congestion in the project area.

Most of the construction would be performed within previously disturbed areas that have mowed and maintained vegetation. A total of approximately 30.12 acres (54.9 percent of total project acreage) of mowed and maintained vegetation in the existing ROW would be temporarily and/or permanently disturbed.

#### Step 5: Identify Potentially Substantial Indirect Effects for Analysis

Indirect effects of the proposed project were examined for the potential to be substantial. Types of indirect effects include: encroachment-alteration effects to the natural and human environment, induced growth effects, and effects related to induced growth.

##### *Encroachment-Alteration Effects (Vegetation and Wildlife)*

The proposed project would affect approximately 30.12 acres of mowed and maintained roadway ROW. Wildlife habitat in the project vicinity is limited, as most of the area is developed or used for agricultural purposes. No new barriers to wildlife movement would be introduced by the proposed project. Fragmentation of wildlife habitat has occurred in the area due to past roadway, land development, and agricultural land uses. Noise generated by construction of the proposed project would be temporary. Operational noise, noise generated by use of the roadway, may increase within the immediate vicinity of the roadway. This increase in operational noise would have negligible effects to wildlife and other species immediately outside the vicinity of the proposed project.

##### *Encroachment-Alteration Effects (Water Quality)*

The proposed project would not impact waters of the U.S., including wetlands. Potential indirect effects on water quality from roadway projects include water quality degradation from roadway-induced development. Stormwater runoff may contain nutrients, oils, greases, pesticides, herbicides, bacterial inputs, as well as other non-point source (grass clippings and garbage from storm drains) and point source pollutants (wastewater treatment plants, industrial activities, etc.). Sediment loads into the watershed would be the result of ground disturbances that are not adequately controlled through BMPs performed during construction and general unauthorized dumping into the storm sewer system. Future land use changes would have the potential to result in additional stormwater related pollutant inputs into Cedar Bayou/Pond Gully if inadequately treated prior to discharge. Harris County has implemented the Storm Water Quality Management Guidance Manual (2001) for new residential and commercial developments, which identify various

BMPs to control pollutants from entering into the watershed. It is anticipated that control measures described in this guidance manual would be implemented for the Build Alternative.

#### *Encroachment-Alteration Effects (Socioeconomic Resources)*

The proposed project would help alleviate congestion and improve mobility in the corridor, but would not substantially change travel patterns and access in the corridor. The construction of the grade separation at North Alexander Drive would raise the level of the roadway, creating a minor alteration to the aesthetics of the existing corridor. No substantial encroachment-alteration effects would be expected to neighborhoods, travel patterns, the economy, aesthetics, or other socioeconomic resources.

#### *Induced Growth Effects*

The immediate project area is largely developed with industrial, residential, and commercial uses. There is a limited amount of land along and near the proposed project alignment that is undeveloped or not already platted for development. Land development in the AOI is expected to continue regardless of whether the proposed project proceeds. Other factors, such as real estate market conditions, city financing opportunities for various public facility improvements, anticipated growth, and other local roadway improvements play a role in nearby land development investment decisions. No substantial induced growth effects would be expected in the vicinity of the proposed project.

#### *Effects Related to Induced Growth (Air Quality)*

Induced growth is not expected to result in substantial ecological effects, because most of the AOI is developed and habitat throughout the AOI has previously been fragmented.

Based on the results of Steps 1 through 5 that evaluated the possible project-related actions that can indirectly impact air, it was determined that the proposed project would not be anticipated to cause indirect air quality impacts in the AOI. The AOI is within the EPA designated HGB nonattainment area for 8-hour ozone. The AOI is currently in attainment for all other NAAQS pollutants, including CO. No change in the attainment status is anticipated within the AOI as a result of emissions associated with the Build Alternative. In order for the region to achieve ozone attainment, a variety of point, non-point, and mobile source emission reduction strategies must be implemented for the entire Houston-Galveston area as outlined in the SIP.

Indirect air quality impacts from MSAT are unquantifiable due to existing limitations to determine pollutant emissions, dispersion, and impacts to human health. Emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., new light-duty and heavy duty on road fuel and vehicle rules, the use of low sulfur diesel fuel). Even with an increase in VMT and possible temporary emission increases related to construction activities, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of road emissions, MSAT, and the ozone precursors, volatile organic compound (VOC) and nitrogen oxide (NOx). As the proposed project is not anticipated to result in indirect air quality impacts, further discussion in Steps 6 and 7 below is not necessary.

#### Step 6: Analyze Indirect Effects and Evaluate Results

Based on other projects in the region and empirical studies by other transportation agencies (NCHRP Report 25-25 [Task 22]), added capacity projects on existing roadway facilities tend to have less of an effect on induced development than new facilities. As an improvement to an existing facility, the proposed project is not expected to induce growth and development.

The project area constitutes a diminutive fraction of the open stream segments present within the watershed. The majority of water quality inputs to the project area are from outside sources. It is expected that the overall effect of the proposed project to water quality of water bodies in the vicinity of the project would be negligible.

Future development projects would likely impact some waters of the U.S., including wetlands, in the AOI. The U.S. Army Corps of Engineers (USACE) maintains a “no net loss” policy for losses of waters of the U.S., including wetlands, and any impacts resulting from development would require compensatory mitigation to offset the functions and services these areas provide to the surrounding environment. Increased impervious surfaces and runoff from surrounding areas within the watershed could adversely affect the effectiveness of the functions and services they provide. Loss of the functions of waters of the U.S., including wetlands, could cause higher flow rates with less attenuation and settling of pollutants and suspended solids, adversely affecting water quality within the receiving waters and downstream watersheds.

#### Step 7: Assess Consequences and Consider/Develop Mitigation

Based on the indirect impacts analysis presented above and assuming appropriate implementation of applicable land use planning regulations and control strategies, related indirect effects to air, noise, water and other natural systems, including ecosystems, would be avoided and minimized. The proposed project would not contribute significant indirect impacts within the AOI.

#### **Cumulative Impacts**

The CEQ regulations define cumulative effects as:

“...the impact on the environment which results from the incremental impact of the action (proposed project) when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

Cumulative effects (impacts) include both direct and indirect, or induced, effects that would result from the proposed project, as well as the effects from other projects (past, present, and reasonably foreseeable future actions) not related to or caused by the proposed action. The cumulative effects analysis considers the magnitude of the cumulative effect on the health of the resource. Health refers to the general overall condition, stability, or vitality of the resource and the trend of that condition. Laws, regulations, policies, or other factors that may change or sustain the resource trend were considered to determine if more or less stress on the resource is likely in the foreseeable future.

Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time. Cumulative effects of the proposed project would be the incremental effects that the project’s direct or indirect effects have on that resource in the context of other past, present, and reasonably foreseeable future effects from unrelated activities.

The evaluation of cumulative effects discussed in this report follows the eight steps in TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses* (September 2010), which reflects the requirements of controlling case law. To conduct the cumulative impact analysis, it was essential to build on information derived on the direct and indirect impacts analyses. Unlike direct impacts, quantifying indirect and cumulative impacts may be difficult, since a large part of

the analysis requires foresight of activities that may occur in the future within the study area. This eight-step approach, outlined in **Table 13** was utilized to assess the potential cumulative impacts of the past, present, and reasonably foreseeable future actions on the resources in the proposed study area. The methodology used to complete this evaluation is also in accordance with guidance from the CEQ, *Considering Cumulative Effects under the National Environmental Policy Act* (1997).

<b>Table 13: Steps for Identifying and Assessing Cumulative Impacts</b>	
1	Identify the resources to consider in the analysis
2	Identify the resource study area
3	Describe the current status/viability and historical context for each resource
4	Identify direct and indirect impacts of the proposed project that might contribute to a cumulative impact
5	Identify other reasonably foreseeable future effects
6	Identify and assess potential cumulative impacts
7	Report the results
8	Assess the need for mitigation

Source: TxDOT Standards of Uniformity (SOU) 2009.

#### Step 1: Identify the Resources to Consider in the Analysis

The first step in performing the cumulative impact analysis was to identify which resources to consider in the analysis. The cumulative impact analysis should focus only on:

- resources substantially impacted (directly or indirectly) by the proposed project
- resources currently in poor or declining health or at risk, even if proposed project impacts are relatively small (less than significant)

Construction of the proposed project would not be expected to have substantial direct or indirect impacts to any resources evaluated. **Table 14** summarizes direct and indirect impacts of the proposed project, presents a determination of which resources would be carried forward and evaluated in the cumulative effects analysis, and identifies the resources and effects categories that were eliminated from the cumulative effects evaluation. The resources selected for cumulative effect analysis are water quality, vegetation, ozone, CO, MSATs, and noise.

#### Step 2: Identify the Resource Study Area

The cumulative effects analysis considered both geographic and temporal study limits, where applicable. A Resource Study Area (RSA) was defined for each resource and is discussed in the subsection for each resource following **Table 14**. The RSAs are used for characterization of the resource status/viability and historical context for each resource and to determine the potential cumulative effects on a resource when quantitative information was not available. Cumulative effects were determined considering the potential cumulative effect on the health and trend of the resource within the RSA.

#### Step 3: Describe the Current Status/Viability and Historical Context for Each Resource

The current status/viability and historical context of each resource is described and presented in each resource subsection of **Table 14**. This information is important to establish the baseline condition and trend the resource is experiencing, and to be able to estimate the magnitude of effects to the resource. The historical context is described to provide an explanation of the factors that have caused the current health, condition, or status of the resource. As previously

mentioned, health refers to the general overall condition, stability, or vitality of the resource and the trend of that condition. Where possible, a quantitative assessment of the current health condition and the trend the resource is experiencing was provided; however, for many resources, quantitative data were not available. For these resources, a qualitative discussion of the resource health and trend is presented, as well as the actions that have caused or influenced them.

#### Step 4: Identify Direct and Indirect Impacts of the Project that Might Contribute to a Cumulative Impact

In this step, the direct and indirect effects are identified that could result from the proposed project and may contribute to a cumulative effect when added to non-project-related effects. Direct and indirect impacts are defined by CEQ regulations (40 CFR 1508.8) as follows: "Direct impacts are caused by the action and occur at the same time and place. Indirect (secondary) impacts are caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate and related effects on air and water and other natural systems, including ecosystems." A summary of the direct and indirect effects is presented for each resource in **Table 14**.

#### Step 5: Identify Other Reasonably Foreseeable Future Effects

A cumulative and indirect effects analysis requires consideration of past and present actions, and reasonably foreseeable future actions. The approach used for this cumulative effects analysis included an assessment of past, present, and future actions with the purpose of characterizing the types of actions that are representative of past, present, and future development and activities in the RSA. This provides a context for the types of development projects that have caused the current status/viability of the land and other resources, and the trends the resources are experiencing. It also provides insight as to the effect of development on future resource stress and future trends.

#### Step 6: Identify and Assess Potential Cumulative Impacts

Quantitative assessment of the cumulative effects on resource health and trends in the RSA was the goal of the cumulative effects analysis. However, where incomplete or unavailable information precluded a quantitative assessment of a resource, a qualitative assessment of the cumulative effect was performed. The cumulative effects analysis considered the direct and indirect effects of the proposed project, together with the effects of past, present, and reasonably foreseeable future projects. The magnitude of the cumulative effect was determined by comparing the effect to the health and trend of the affected resource.

#### Step 7: Report the Results

The results of the cumulative effects analysis are reported herein. Direct effects are summarized under each resource in the following sections and indirect effects were reported in the *Indirect Effects Analysis* section above. The assumptions and analysis methods used are described in each resource section.

#### Step 8: Assess the Need for Mitigation

Opportunities for mitigation of adverse effects are discussed for each resource in the following sections. These are not meant to be mitigation measures that TxDOT would, or has the authority to implement. Rather, they are intended to disclose steps or actions that could be undertaken by local, state, and federal agencies and organizations to minimize the potential cumulative effect on the health and trend of each resource.

**Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis**

Current Health of Resource	Direct Effects	Indirect Effects	Included in Cumulative Effects Analysis
<b>Land Use</b>			
<p>Within the 8,795- acre RSA (identical to the AOI in Figure 6), land use is a mix of residential, commercial, industrial, institutional, and undeveloped uses. In general, higher density development occurs in the northern portion of the RSA, in association with established communities and along major roadway facilities</p>	<p>No new ROW would be acquired for the proposed project and the existing land use in the area would not be directly affected by the proposed project.</p>	<p>No changes in overall land use patterns in the area would be anticipated as an indirect result of implementation of the proposed project. The proposed project is consistent with local community plans. Development will continue in response to predicted population and employment increases.</p>	<p>No</p>
<b>Farmland</b>			
<p>Farmland in Texas are being increasingly developed, with 2.2 million acres of rural land in Texas converted to developed use in a five-year period between 1992 and 1997. Large amounts of farmland are being converted and proposed to be converted to residential and other developed use as the population grows.</p>	<p>No new ROW would be acquired for the proposed project so there would be no direct effect on farmland.</p>	<p>With construction of the proposed project, the increased access and mobility would accommodate existing plans for development in the area. The anticipated development in the vicinity of the proposed project could convert existing far and pasture land to residential and commercial uses.</p>	<p>No</p>
<b>Communities/ Quality of Life</b> (The communities/quality-of-life resource encompasses human environment effects. The issues listed below were evaluated.)			
<p><b>Displacements and Relocations</b></p>	<p>No new ROW would be acquired and no displacements or relocations would occur with the proposed project.</p>	<p>With construction of the proposed project, the increased access and mobility would accommodate existing plans development in the area. The anticipated development in the vicinity of the proposed project could induce displacement or relocation.</p>	<p>No</p>

**Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis (continued)**

Current Health of Resource	Direct Effects	Indirect Effects	Included in Cumulative Effects Analysis
<b>Communities/Quality of Life (continued)</b>			
<b>Community and Public Resources</b>	<p>In the short term, an increase in traffic congestion and potential changes in travel patterns would be expected during roadway construction. In the long term, the proposed project would improve mobility in the RSA, having a positive impact for citizens living in nearby neighborhoods and providing easier access to community and public facilities. Traffic to Bayport and Barbours Cut terminals is anticipated to increase as a result of their terminal expansions. The proposed grade separation will increase mobility of this traffic through the RSA, decreasing congestion and enhancing the quality of life for nearby communities.</p> <p>As the regional population grows and congestion on SH 146 increase, improved access to the area would have a positive impact for residents in the RSA. Emergency response and accessibility to medical services would be improved with increased roadway capacity.</p>	<p>The proposed project would facilitate the development already occurring in the RSA, which may include new roadways, drainage, water supply and treatment facilities, schools, libraries, and medical services, in response to residential and commercial development.</p>	No
<b>Communities/Quality of Life (continued)</b>			
<b>Environmental Justice Population and Demographics</b>	<p>No impacts to low-income and minority communities would be expected as result of the proposed project.</p>	<p>No indirect impact to environmental justice populations or demographics of the study area would be expected as a result of the proposed project.</p> <p>Increased overall mobility would facilitate anticipated development in the RSA, bringing expanded public facilities and services.</p>	No
<b>Economic Resources</b>	<p>No new ROW would be purchased for the proposed project so no economic resources would be directly affected.</p>	<p>Indirect economic benefits would be associated with induced development within the RSA. The proposed project would improve mobility and facilitate growth, which in turn would result in an economic benefit to the surrounding community.</p>	No

**Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis (continued)**

<p><b>Visual and Aesthetic Qualities</b></p> <p>The RSA includes residential subdivisions, undeveloped agricultural land, and several commercial and light industrial properties.</p>	<p>The proposed grade separation at North Alexander Drive could cause some direct visual and aesthetic impacts in that area.</p>	<p>Future land development along the proposed project corridor could affect the visual quality of the RSA.</p>	<p>No</p>
<p><b>Communities/Quality of Life (continued)</b></p>			
<p><b>Noise</b></p> <p>Roadway traffic is the dominant source of noise in the project area.</p>	<p>Noise generated by construction of the proposed project would be temporary. Traffic noise impacts would occur at various locations along the proposed project. Specific information on impacts and proposed noise abatement is addressed in the Noise Analysis section of this document (page 30).</p> <p>Traffic to Bayport and Barbours Cut terminals is anticipated to increase as a result of their terminal expansions. The proposed grade separation will increase mobility of this traffic through the RSA, which will improve noise quality.</p>	<p>Operational noise, noise generated by use of the roadway, may increase within the immediate vicinity of the roadway if populations expand and traffic counts increase. If undeveloped areas in the RSA become developed, typical urban noise sources would be anticipated. It is anticipated that future development would take place without the proposed project; therefore the proposed project would not cause cumulative impacts to noise.</p>	<p>NO</p>
<p><b>Vegetation</b></p>			
<p>Existing development has caused fragmentation and habitat loss, which has removed and changed the vegetation species composition in the developed areas. Vegetation species occurring throughout the RSA have not diminished to a level at which they have become threatened or endangered.</p>	<p>The proposed project would impact up to 30.12 acres of mowed and maintained vegetation located within the ROW, based on the preliminary assessment.</p>	<p>Future development may remove forested and riparian habitats in the RSA and introduce new plant varieties, including landscaping species and/or invasive species. The proposed project area does not include any unique or protected vegetation. It is anticipated that future development would take place without the proposed project; therefore the proposed project would not cause cumulative impacts to vegetation.</p>	<p>No</p>
<p><b>Wetlands/Waters of the U.S.</b></p>			
<p>Existing development in the RSA has previously impacted wetlands and waters of the U.S. According to NWI maps, there are approximately 799 acres of wetlands within the RSA</p>	<p>The project area contains approximately 0.06 acres of potential jurisdictional waters of the U.S. (Pond Gully) and no wetlands. Pond Gully is channelized, flows through a box culvert beneath the roadway, and would not be impacted by the proposed project.</p>	<p>Future development may impact jurisdictional waters of the U.S., including wetlands, and would need to comply with Section 404 of the Clean Water Act (CWA) for these impacts.</p>	<p>No</p>
<p><b>Floodplains</b></p>			
<p>The proposed project is located outside of a FEMA designated 100-year floodplain. Within the RSA, both Pond Gully and Cedar Bayou are located in the 100-year floodplain.</p>	<p>No direct impacts are anticipated to occur to floodplains in the RSA</p>	<p>Development within floodplains could occur as an indirect impact and would be subject to federal and local regulations. Stormwater detention and hydraulic features would offset any fill in the floodplain or increase in impermeable cover.</p>	<p>No</p>

**Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis (continued)**

<b>Air Quality</b>			
<p><b>Ozone &amp; Carbon Monoxide</b></p> <p>The proposed project is located within Harris County, currently classified as a “marginal” nonattainment area for the 2008 8-hour ozone standard as of July 20, 2012. The attainment date is December 31, 2015.</p> <p>According to studies conducted by H-GUC, the regional MPO, air quality has been improving in the Houston-Galveston area over the past 30 years and is expected to continue to improve.</p> <p>The HGB area is currently in attainment for all other NAAQS.</p>	<p>The proposed project is consistent with the area’s financially constrained <i>2035 RTP Update</i> and 2013-2016 TIP, found to conform to the TCEQ SIP by FHWA and FTA on January 25, 2011 and November 1, 2012, respectively. Through transportation conformity, transportation projects proposed for implementation within the HGB nonattainment area are required to demonstrate consistency with the area’s SIP for attaining the ozone standard.</p> <p>Traffic data for the design year 2035 for the existing layout is 59,200 vpd for the main lanes of SH 146. A prior TxDOT modeling study and previous analysis of similar projects demonstrated that it is unlikely that a CO standard would ever be exceeded as a result of any project with an average ADT below 140,000.</p> <p>Traffic to Bayport and Barbours Cut terminals is anticipated to increase as a result of their terminal expansions. The proposed grade separation will increase mobility of this traffic through the RSA, which will improve air quality.</p>	<p>Proposed transportation projects in the HGB area must be included in the <i>2035 RTP Update</i> and must conform to the SIP. Development planned for the area may lead to activities that contribute to increased hazardous air pollutants/VOCs, which are precursors to ozone; however, these facilities must meet federal regulations and conform to SIP standards. Therefore, indirect air quality impacts would be minor.</p> <p>The regional trend has been an improvement in air quality as a result of more efficient vehicles and cleaner burning fuel. The trend is expected to continue.</p> <p>It is expected that future levels of ozone, CO, and MSAT will meet NAAQS set by the EPA, following the implementation in future years of more stringent fuel quality and efficiency standards.</p>	<p>No</p>
<p><b>Mobile Source Air Toxics</b></p>	<p>There may be short term, localized effects to air quality (e.g., increase in dust, diesel exhaust) during construction in the immediate area adjacent to the proposed project.</p>	<p>According to EPA studies, MSAT are expected to be much lower in the future compared to current levels due to improvements in vehicle technology and fuels.</p>	<p>No</p>
<b>Water Quality</b>			
<p>Water quality has been impacted in Harris and Chambers Counties primarily due to agricultural practices, oil and gas production, and the conversion of undeveloped land to an urban environment.</p> <p>The proposed project is located within approximately 5 stream miles of Cedar Bayou Tidal (Segment 0901), which is listed as threatened/impaired for bacteria, dioxin, and PCBs in edible tissue on the TCEQ 2014 303(d) list.</p>	<p>During construction, exposed soil could erode into streams and increase turbidity and sediment loading downstream. Use of BMPs would minimize the impact to water quality. The presence of additional pavement would increase the impervious area, this increasing stormwater runoff. Landscaping efforts and roadway design would minimize potential water quality effects from increased runoff.</p>	<p>Indirect effects to water quality would be minor because land developers would have to comply with local, state, and federal water Stormwater control measures and BMPs would be implemented during construction; therefore, the proposed project would not cause cumulative impacts to water quality.</p>	<p>No</p>

**Table 14: Determinations of Resources/Issues Considered in Cumulative Effects Analysis (continued)**

<b>Wildlife</b>			
Continued development within the RSA has caused fragmentation and habitat loss, which affects species in the immediate vicinity.	Direct impacts to wildlife could be mortality as a result of habitat fragmentation and species attempting to cross the roadway to move throughout the RSA.	The proposed roadway improvements could have an indirect effect on wildlife through facilitating current development patterns, potentially disrupting or removing wildlife habitats.	No
<b>Wild and Scenic Rivers</b>			
Not Applicable	Not Applicable	Not Applicable	No
<b>Coastal Barrier</b>			
Not Applicable	Not Applicable	Not Applicable	No
<b>Essential Fish Habitat</b>			
Not Applicable	Not Applicable	Not Applicable	No
<b>Threatened and Endangered Species</b>			
No state and federal threatened/endangered species for Harris County, or their suitable habitat, have been documented within a 1.5-mile radius of the project site.	No direct impacts are anticipated to occur as a result of the proposed project.	Impacts to threatened and endangered species could occur as future development in the RSA encroaches into plant and wildlife habitats. State-listed threatened and endangered species may be affected by temporary construction noise and noise resulting from operation of the roadway after construction within the immediate vicinity of the proposal project, but not within the majority of the RSA.	No
<b>Cultural Resources: Historic and Archeological</b>			
No known historic properties or cultural resources occur within the proposed project ROW.	No direct impacts.	No known indirect impacts.	No

## **Summary of Analysis of Cumulative Effects**

Twenty resources to which indirect and direct effects could contribute to cumulative effects were considered. These include water resources, vegetation, three air quality components (ozone, CO, and MSAT) and noise quality. It was determined that the proposed project would not cause cumulative impacts to these twenty resources; therefore, the cumulative impacts analysis was not carried forward beyond Step 1.

### **PERMITS AND COMMITMENTS**

#### **A. Section 303(d) of the Clean Water Act**

Runoff from the proposed project would discharge into waters within 5 miles upstream of Segment 0901. Sodding and temporary seeding, filter strips, silt fencing, and/or other BMPs would be employed to control the constituents of concern. These BMPs would also be implemented around any storm sewer catch basins to prevent illicit discharges from entering water bodies in the vicinity of the proposed project.

#### **B. Section 402 of the Clean Water Act**

The proposed project would disturb more than 5 acres of ground surface; therefore, TxDOT is required to comply with the TCEQ TPDES Construction General Permit for Stormwater Runoff, and an NOI would be required. As the proposed project is within the vicinity of an impaired/threatened stream segment (Cedar Bayou), coordination with the TCEQ would be required prior to construction. Temporary erosion, sediment and water pollution prevention control measures would be implemented to minimize pollution of stormwater runoff from the construction site. Where appropriate, the temporary erosion and sedimentation control features shall be in place prior to construction. The project will also comply with the applicable MS4 requirements. The construction and maintenance of the proposed project is not anticipated to result in exceedances of state or federal water quality standards.

#### **C. Section 404/401 of the Clean Water Act**

The proposed project would not result in the placement of temporary or permanent dredge or fill material into jurisdictional waters of the U.S., including wetlands or other special aquatic sites; therefore, a Section 404 permit and Section 401 Certification would not be required.

#### **D. Section 9 and 10 of the Rivers and Harbors Act**

The proposed project does not involve work in or over a navigable or tidal water of the U.S.; therefore, Sections 9 and 10 of the Rivers and Harbors Act do not apply. The proposed project does not require a USCG Section 9 Bridge Permit.

#### **E. Improving Access for Limited English Proficiency**

Reasonable steps, such as provision of special communication interpreters or accommodation of other language needs, would continue to be taken to ensure such persons have meaningful access to the programs, services, and information that TxDOT provides.

#### **F. Unanticipated Archeological Deposits**

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease, and TxDOT archeological staff would be contacted to initiate post-review discovery procedures.

### **G. Migratory Bird Treaty Act**

If construction activities are anticipated to occur during the nesting and breeding season, a site-specific survey would be conducted no more than 10 days prior to planned clearing and grubbing activities. If migratory birds or their nests are discovered during this survey, TxDOT would coordinate with the UFWWS to address MBTA concerns.

### **H. Invasive Species and Beneficial Landscaping Practices**

Landscaping included with the proposed project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices.

### **I. Minimization of Construction Impacts**

To minimize exhaust emissions, contractors would be required to use emission control devices and limit unnecessary idling of construction vehicles. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

## **PUBLIC INVOLVEMENT**

A public meeting was held on November 17, 2010, for the proposed project. This meeting was advertised in the *Houston Chronicle* (November 3, 2010), the *Baytown Sun* (November 4, 2010), and *La Voz* (November 7, 2010, in Spanish). The public was given the opportunity to provide comments regarding the proposed project. Representatives from TxDOT and TxDOT's consultant team were available throughout the public meeting to answer questions and further explain project details. Attendees were primarily concerned with current safety issues, roadway flooding, and overall mobility in the local community.

Attendees were provided with bilingual project information handouts and comment forms to submit written comments. These forms could be returned at the meeting or accepted by mail if postmarked by December 1, 2010. A total of 34 people attended the public meeting, and 7 attendees provided written comments. A majority of comments requested additional safety improvements and improved access throughout the study area. As a result of comments provided by the public, two ramps were relocated in the project design.

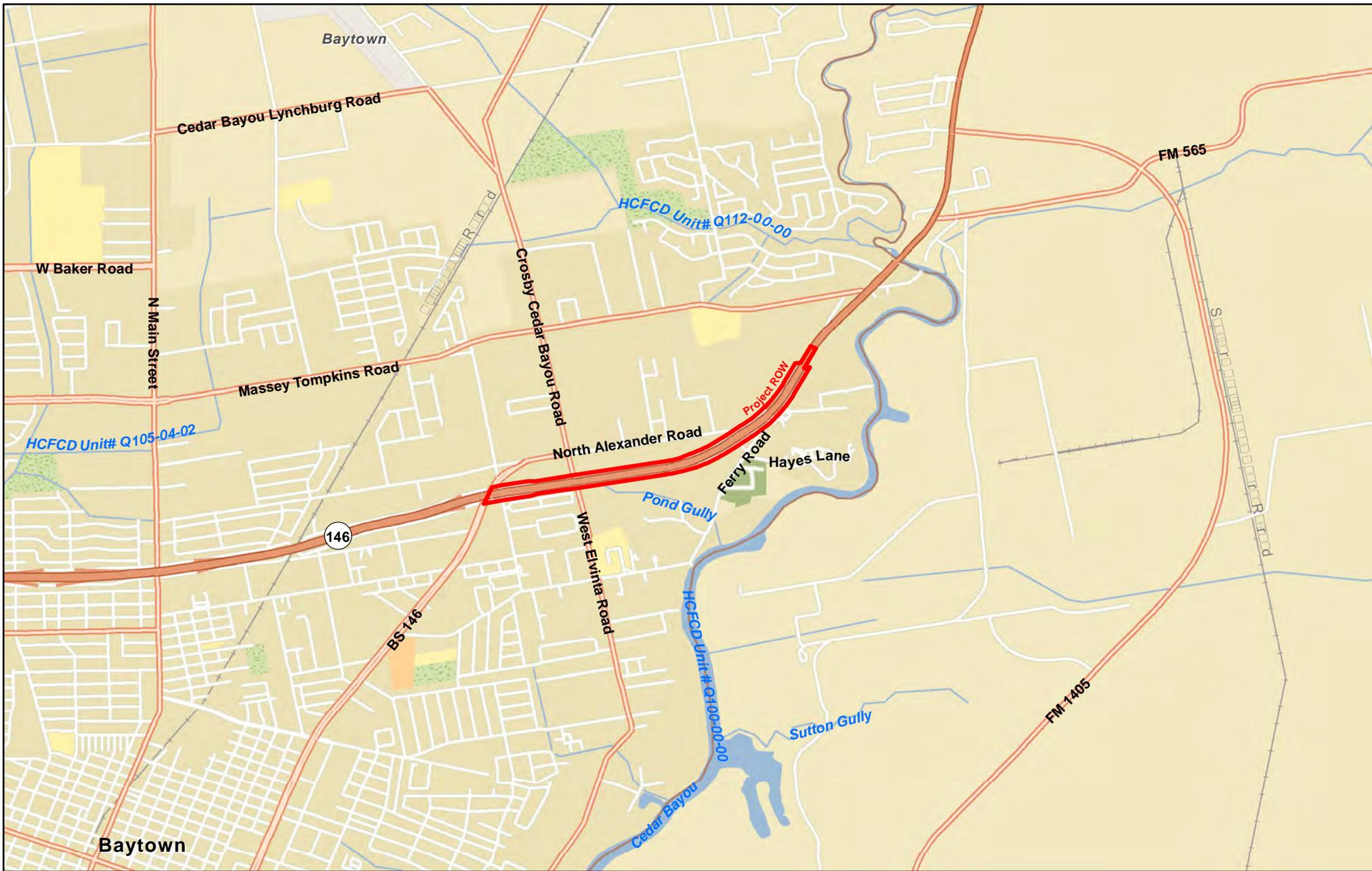
It is anticipated that North Alexander Drive would be closed on either side of SH 146 while the grade separation is constructed for the main lanes of SH 146. In addition, one of the three frontage road lanes in either direction would be closed during main lane construction. Notices would be sent to affected property owners prior to construction of these road closures and traffic would be directed to alternative routes.

Following certification by TxDOT that the environmental documentation for this project is substantially complete, an NAOPH will be sent to the public following current TxDOT guidelines. The notice will be published in the *Houston Chronicle* and *La Subasta* and mailed to adjacent property owners.

### **Recommendations for Implementation of the Build Alternative and for a FONSI**

Based on the information in this EA and in this project's Administrative Record, TxDOT recommends implementation of the Build Alternative. As of the completion of the public review period, no comments from the public were received regarding the Build Alternative. The engineering, social, economic, and environmental studies conducted thus far indicate that the proposed project would result in no significant effects to the quality of the human or natural environment. The project sponsors recommend that TxDOT find that implementing the Build Alternative would not be a major federal action significantly affecting the quality of the human or natural environment, and thus issue a Finding of No Significant Impact (FONSI) for this project.

## FIGURES



N

0 1 6



S 146

B 146 R d

S 1

R 1

M

B r

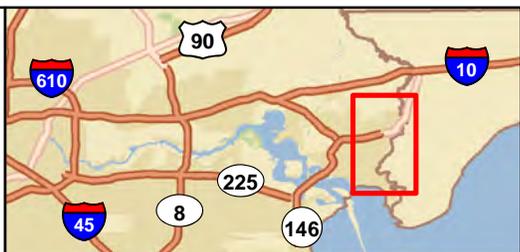
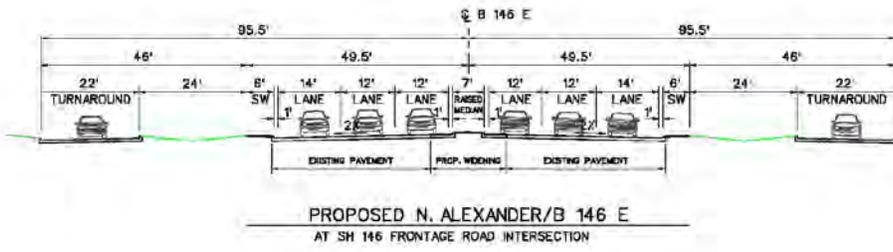
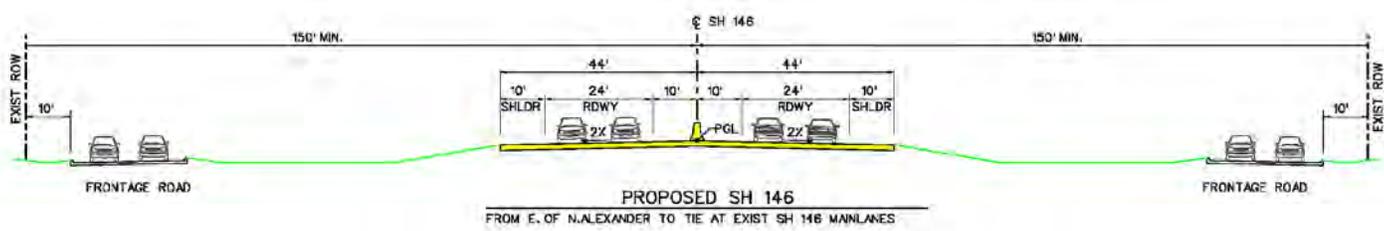
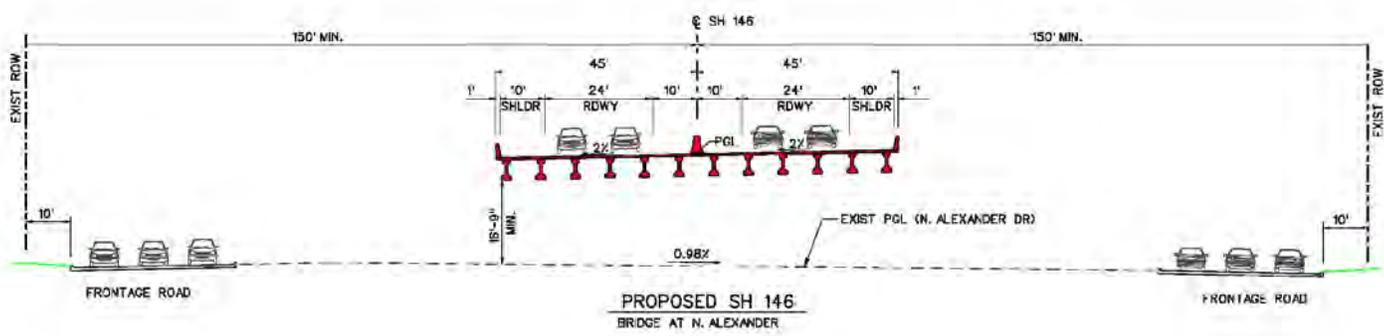
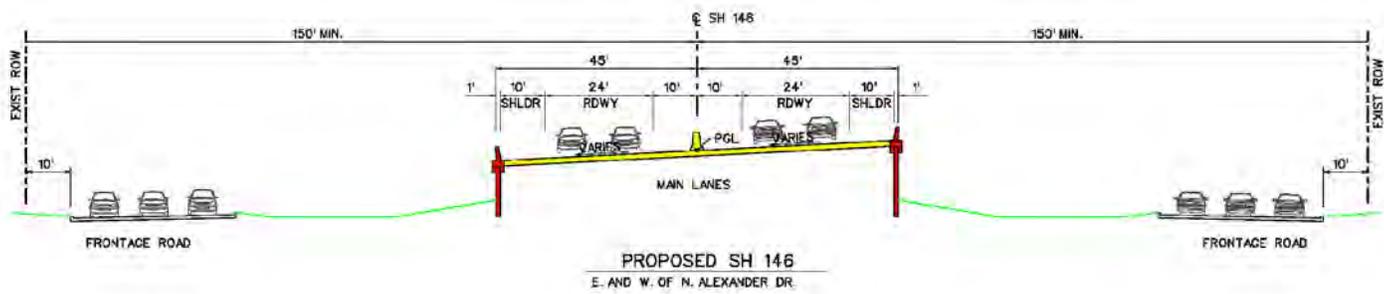
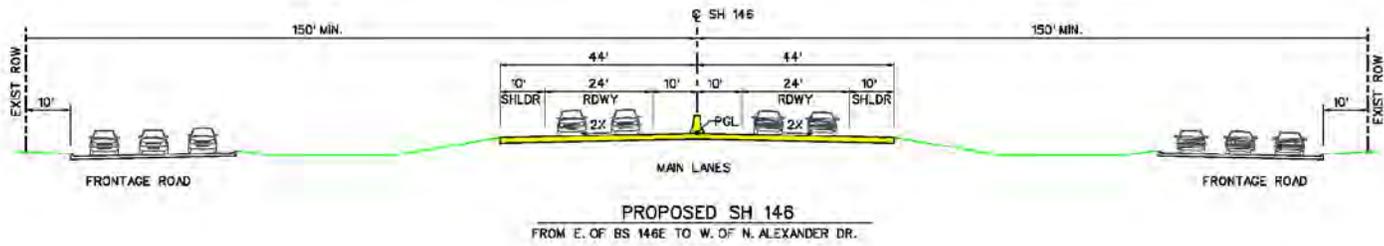








# TYPICAL SECTIONS - PROPOSED

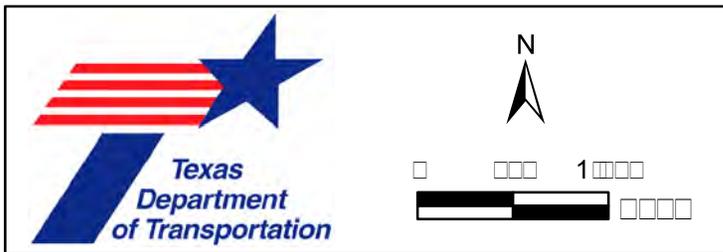
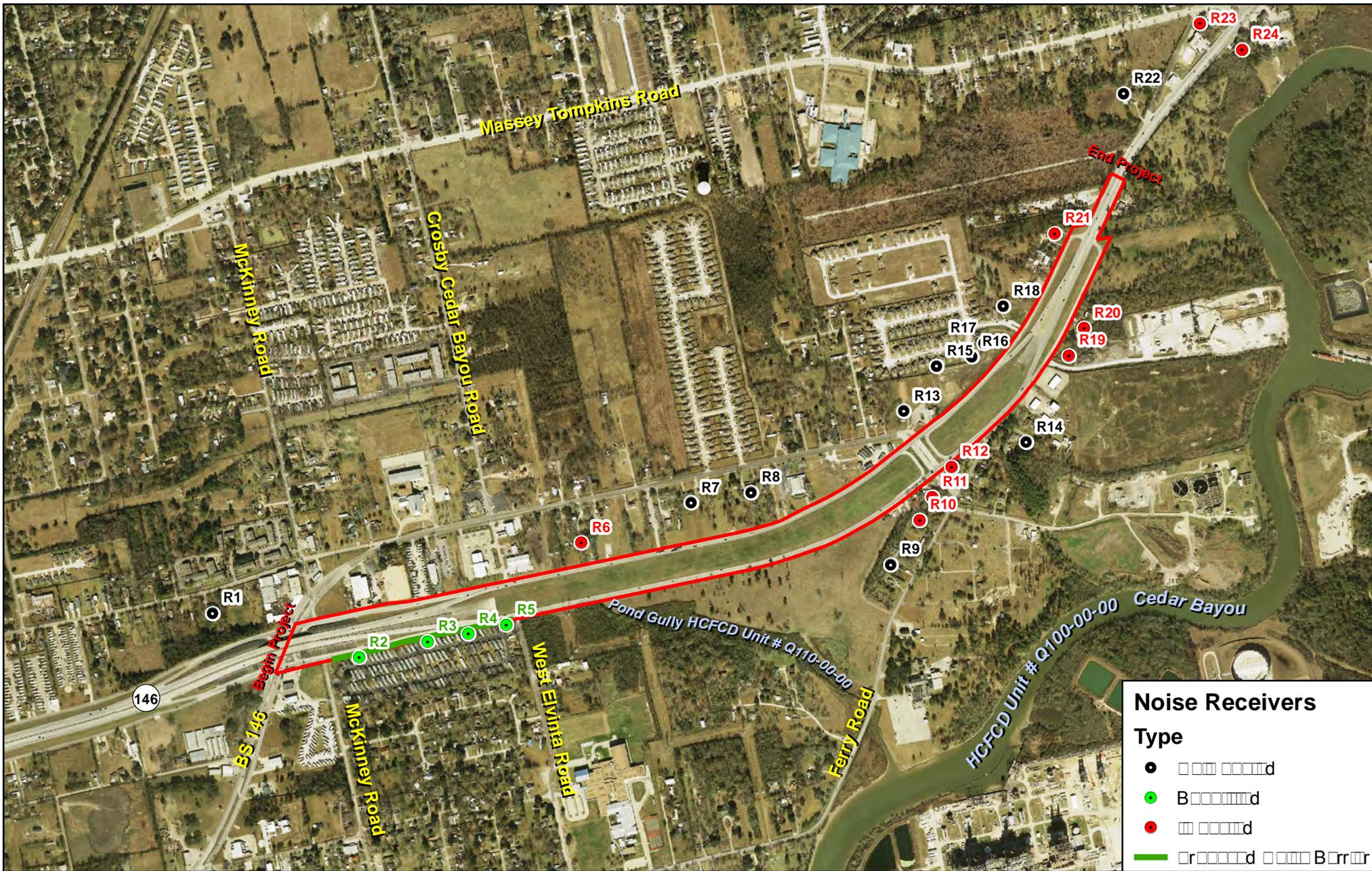


S 146  
 B 146  
 S  
 R B  
 R S D S S S  
 R

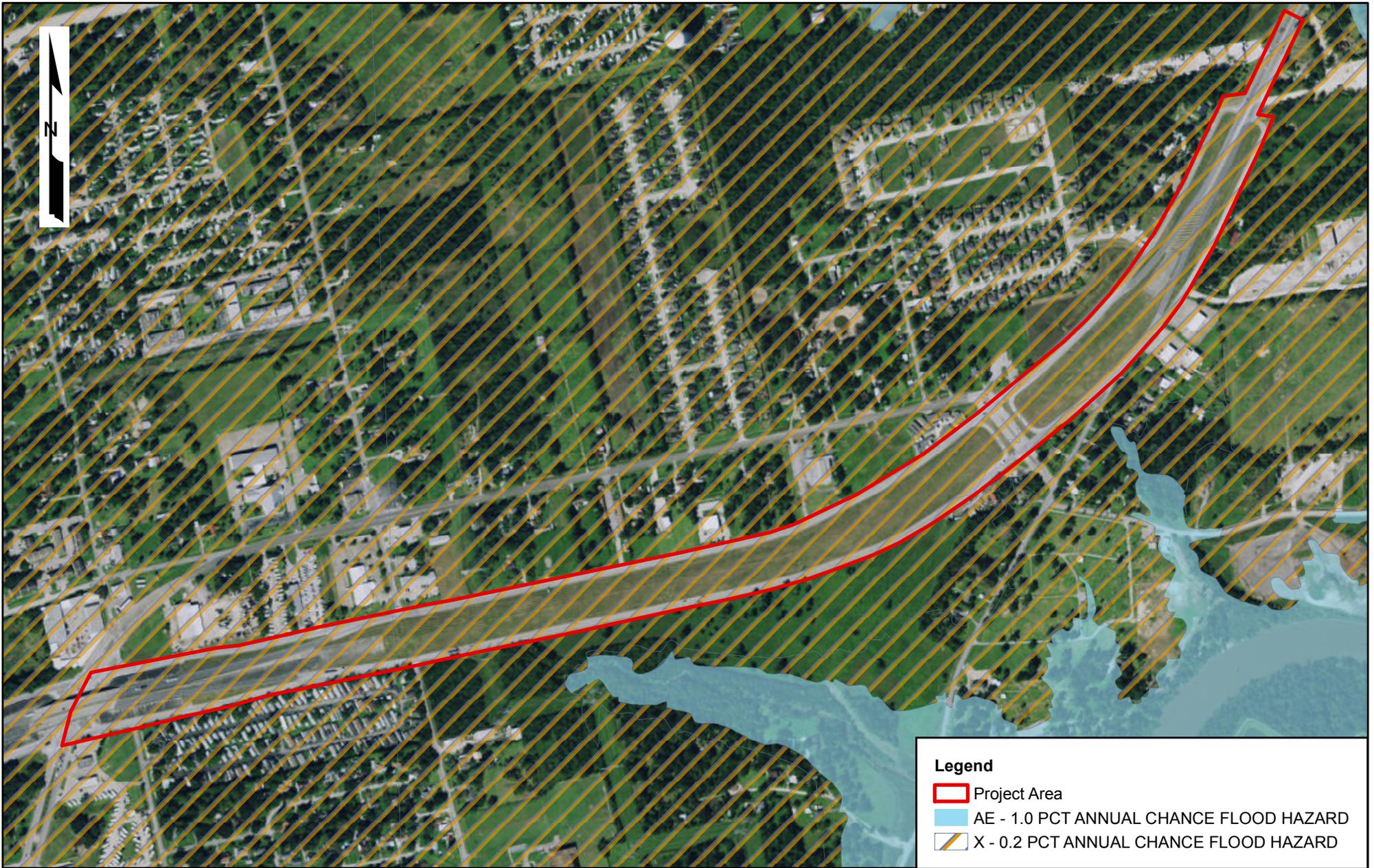






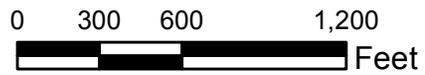


S	□□□□□□□□	146
B	□□□□□□□□□□□□□□	146
S	□□□□□□□□	1
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B	□□□□□□□□□□□□□□	□□□□□□□□□□



**Legend**

-  Project Area
-  AE - 1.0 PCT ANNUAL CHANCE FLOOD HAZARD
-  X - 0.2 PCT ANNUAL CHANCE FLOOD HAZARD



**SH 146**  
FEMA FLOODPLAIN MAP  
(BS 146E TO FERRY RD)



FIGURE 7

HARRIS COUNTY, TEXAS

PREPARED BY:



DATE:

APRIL  
2016

**APPENDIX A**  
**PROJECT PHOTOGRAPHS**

## Project Photographs



*This photograph is facing east and depicts the SH 146 overpass at the intersection of SH 146 and BS 146. This is the beginning of the proposed project. The proposed main lanes would begin at the concrete cut-outs shown in the center of the photograph.*



*This photograph is facing west along SH 146 and depicts the intersection of SH 146 and Crosby-Cedar Bayou Road, just east of the intersection of SH 146 and BS 146.*











**APPENDIX B**  
**AGENCY CORRESPONDENCE**



# MEMORANDUM

**TO:** Rakesh Tripathi, P.E.

**DATE:** March 29, 2010

**FROM:** William E. Knowles, P.E.

**FILE:** TPP (T)  
(512) 486-5100

**SUBJECT:** Traffic Data  
CSJ: 0389-13-039  
SH 146:  
From W. Elvinta to Ferry Rd  
Harris County

---

Attached are schematics depicting anticipated average daily traffic volumes and turning movements for the years 2011 and 2035 for the specified limits of the route. Also included are tabulations showing traffic analysis for highway design for the 2011 to 2035 twenty four year design period along with the project notes sheet.

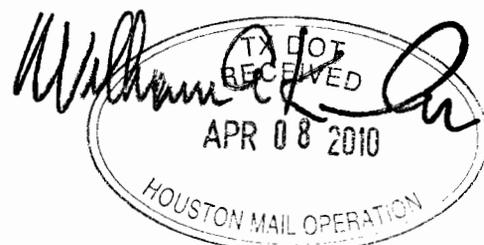
This analysis was completed for both the Existing and the Proposed layouts.

Please refer to your original memorandum dated January 25, 2010.

If you have any questions or need additional information, please contact George Petrek at (512) 486-5140.

## Attachments

cc: ✓ James Koch, P.E., HOU  
Emmanuel C. Samson, HOU  
Design Division



**TRAFFIC ANALYSIS FOR HIGHWAY DESIGN**

Houston District

March 24, 2010

<b>EXISTING LAYOUT</b>										Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 24 Year Period (2011 to 2035)		
Description of Location	Average Daily Traffic		Dir Dist %	K Factor	Base Year		ATHWLD	Percent Tandem Axles in ATHWLD	Flexible Pavement	S N	Rigid Pavement	SLAB
	2011	2035			ADT	Percent Trucks DHW						
<p align="center"><u>SH 146</u> From W. Elvinta to Ferry Rd <u>Mainlanes</u></p>												
At Match Line A	31,100	49,800	59 - 41	13.9	10.4	6.9	14,500	70	18,251,000	3	26,003,000	8"
At Match Line B	40,400	64,700	59 - 41	13.9	8.4	5.5	14,500	70	19,178,000	3	27,304,000	8"
At Match Line C	N/A	---	---	---	---	---	---	---	---	---	---	---
At Match Line D	N/A	---	---	---	---	---	---	---	---	---	---	---
<p align="center"><u>FRIG</u></p>												
At Match Line A	8,500	13,600	59 - 41	13.9	7.1	5.3	12,200	70.0	2,688,000	3	3,564,000	8"
At Match Line B	1,600	2,500	59 - 41	13.9	37.5	28.1	12,200	70	2,610,000	3	3,476,000	8"
At Match Line C	39,600	63,400	59 - 41	13.9	9.7	7.3	14,600	50	17,066,000	3	22,659,000	8"
At Match Line D	42,000	67,200	59 - 41	13.9	9.5	7.1	14,700	50	17,724,000	3	23,530,000	8"
Harris County												

**NOT INTENDED FOR CONSTRUCTION  
BIDDING OR PERMIT PURPOSES**  
William Erick Knowles, P.E.  
Serial Number 84704

# TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Houston District

March 24, 2010

Description of Location	PROPOSED LAYOUT										Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 24 Year Period (2011 to 2035)					
	Average Daily Traffic		Dir Dist %	Base Year			ATHWLD	Percent Tandem Axles in ATHWLD	Flexible Pavement	S				Rigid Pavement	N	SLAB
	2011	2035		K Factor	ADT	DHV										
														Percent Trucks		
<u>SH 146</u>																
From W. Elvinta to Ferry Rd																
<u>Mainlanes</u>																
At Match Line A	31,800	50,900	59 - 41	13.9	10.3	6.8	14,500	70	18,480,000	3	26,329,000	3	8"			
At Match Line B	40,200	64,300	59 - 41	13.9	8.4	5.5	14,500	70	19,069,000	3	27,149,000	3	8"			
At Match Line C	37,000	59,200	59 - 41	13.9	8.8	5.8	14,500	70	18,384,000	3	26,178,000	3	8"			
At Match Line D	37,000	59,200	59 - 41	13.9	9.1	6.0	14,500	70	19,007,000	3	27,068,000	3	8"			
At Match Line E	29,900	47,900	59 - 41	13.9	10.9	7.2	14,500	70	19,390,000	3	26,206,000	3	8"			
At Match Line F	36,100	57,700	59 - 41	13.9	9.3	6.1	14,500	70	18,937,000	3	26,970,000	3	8"			
<u>FRTG</u>																
At Match Line A	8,000	12,800	59 - 41	13.9	7.5	5.6	12,200	70	2,671,000	3	3,542,000	3	8"			
At Match Line B	2,000	3,200	59 - 41	13.9	30.0	22.5	12,200	70	2,650,000	3	3,528,000	3	8"			
At Match Line C	2,800	4,500	59 - 41	13.9	21.4	16.1	12,200	70	2,657,000	3	3,535,000	3	8"			
At Match Line D	5,200	8,300	59 - 41	13.9	11.5	8.6	12,200	70	2,649,000	3	3,519,000	3	8"			
At Match Line E	9,900	15,800	59 - 41	13.9	6.1	4.6	12,300	80	3,038,000	3	4,316,000	3	8"			
At Match Line F	6,100	9,800	59 - 41	13.9	9.8	7.4	12,200	70	2,661,000	3	3,534,000	3	8"			
Harris County																

**NOT INTENDED FOR CONSTRUCTION  
BIDDING OR PERMIT PURPOSES**  
William Erick Knowles, P.E.  
Series Number 84704

## **Notes on the Completion of SH 146: From W. Elvinta to Ferry Rd Project**

March 18, 2010

### **For the Detailed Schematics:**

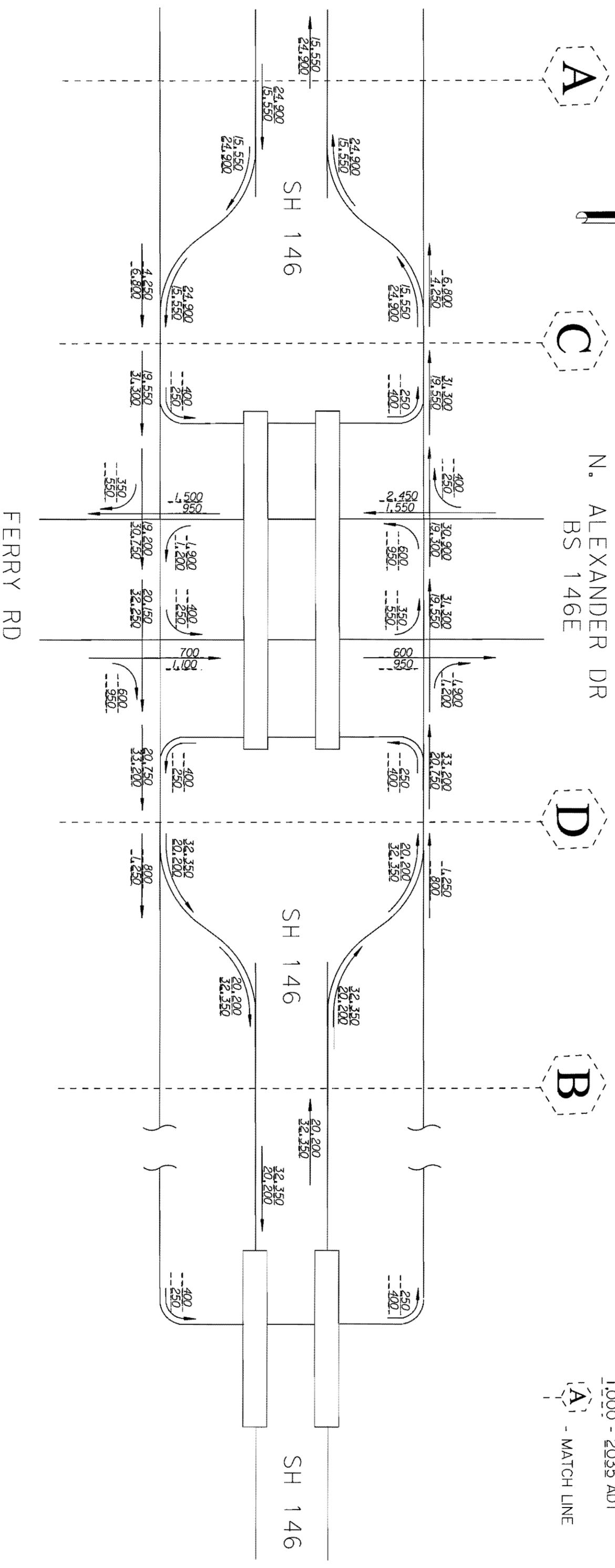
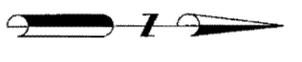
1. Match Lines A, B, C, & D are at the same locations for both the existing and the proposed layouts. For example, Match Line A is located west of the diamond configured ramps for both the existing and the proposed layouts.
2. Match Lines E & F are only for the proposed layout and are located between the inner X-configured ramps and the outer diamond configured ramps.

George Petrek

**NOT INTENDED FOR CONSTRUCTION  
BIDDING OR PERMIT PURPOSES  
William Erick Knowles, P.E.  
Serial Number 84704**

NOT INTENDED FOR CONSTRUCTION  
 BIDDING OR PERMIT PURPOSES  
 William Erick Knowles, P.E.  
 Serial Number 84704

LEGEND  
 1,000 - 2011 ADT  
 1,000 - 2035 ADT  
 [A] - MATCH LINE

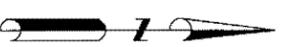


EXISTING LAYOUT

DETAILED TURNING MOVEMENTS  
 2011 & 2035 ANTICIPATED AVERAGE DAILY TRAFFIC VOLUMES  
 AND TURNING MOVEMENTS AT THE SPECIFIED INTERSECTION OF  
 SH 146 AT FERRY ROAD / BS 146E.

HARRIS COUNTY

TRANSPORTATION PLANNING AND PROGRAMMING DIVISION  
 MARCH 15, 2010  
 SHEET 1 of 1



A

E

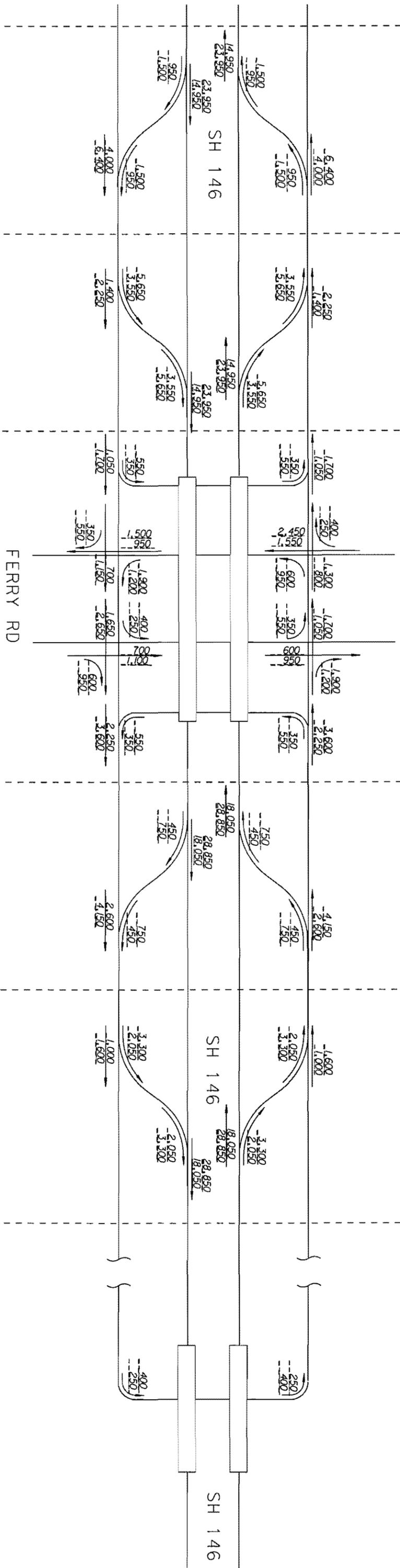
C

D

F

B

N. ALEXANDER DR  
BS 146E



LEGEND  
 1,000 - 2011 ADT  
 1,000 - 2035 ADT

- MATCH LINE

NOT INTENDED FOR CONSTRUCTION  
 BIDDING OR PERMIT PURPOSES  
 William Erick Knowles, P.E.  
 Serial Number 84704

PROPOSED LAYOUT

DETAILED TURNING MOVEMENTS  
 2011 & 2035 ANTICIPATED AVERAGE DAILY TRAFFIC VOLUMES  
 AND TURNING MOVEMENTS AT THE SPECIFIED INTERSECTION OF  
 SH 146 AT FERRY ROAD / BS 146E

HARRIS COUNTY

TRANSPORTATION PLANNING AND PROGRAMMING DIVISION  
 MARCH 15, 2010  
 SHEET 1 of 1

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SH 146

Traffic Study Memorandum

From BS 146 E to Ferry Road

Texas Department of Transportation  
Houston District

Prepared by  
Rodriguez Transportation Group, Inc.

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**TABLE OF CONTENTS**

TABLE OF CONTENTS..... ii  
 LIST OF FIGURES ..... ii  
 LIST OF TABLES ..... ii  
 AUTHORIZATION..... 1  
 SCOPE OF SERVICES ..... 1  
 PURPOSE AND NEED..... 1  
 PROJECT LIMITS ..... 1  
 EXISTING CONDITIONS..... 1  
 TRAFFIC ANALYSIS ..... 2  
     Proposed Schematic Options ..... 2  
     Traffic Projections ..... 4  
     Modeling Approach ..... 7  
     Operational Analysis..... 8  
 CONCLUSION..... 12

**LIST OF FIGURES**

Figure 1: Project Location Map ..... 2  
 Figure 2: Lane Configuration and Design Year 2035 Traffic Line Diagram (No-Build) ..... 4  
 Figure 3: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option A)..... 5  
 Figure 4: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option B)..... 6  
 Figure 5: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option C)..... 7

**LIST OF TABLES**

Table 1: Overall Corridor Summary ..... 8  
 Table 2: LOS Criteria for Signalized Intersections..... 8  
 Table 3: Signalized Intersection LOS ..... 9  
 Table 4: LOS Criteria for Signalized Intersections..... 9  
 Table 5: Basic Freeway LOS for Build Option A..... 10  
 Table 6: Basic Freeway LOS for Build Option B..... 10  
 Table 7: Basic Freeway LOS for Build Option C..... 11  
 Table 8: Corridor Directional Average Speeds..... 11

## **AUTHORIZATION**

Rodriguez Transportation Group, Inc. (RTG) has prepared this memorandum, under the terms of an Engineering Service Contract with the Texas Department of Transportation – Houston District (TxDOT). A written Notice to Proceed with schematic development was issued by TxDOT, authorizing work to begin on July 25, 2011.

## **SCOPE OF SERVICES**

The TxDOT Engineering Services contract provides for the development of a traffic study memorandum that summarizes the traffic analysis, as it relates to the conceptual schematic development and Categorical Exclusion (CE) document for the SH 146 improvement project.

## **PURPOSE AND NEED**

The purpose of the proposed project is to improve capacity and provide a continuous roadway between BS 146 E and Ferry Road in order to accommodate existing traffic, future growth of the region, improve safety, and to improve connectivity.

## **PROJECT LIMITS**

The project limits for the conceptual geometric schematic development and traffic analysis under this contract extend from BS 146 E to northeast of Ferry Road. The project length is approximately 0.87 miles. The project is located in Harris County. The project limits are shown in **Figure 1**.

## **EXISTING CONDITIONS**

SH 146 is primarily a four-lane divided frontage road within the project limits. There is an existing four-lane freeway main lane section that ends just north of BS 146 E at the entrance and exit ramps to and from North Alexander Drive. The intersection of SH 146 and North Alexander Drive is currently a signalized diamond interchange. The intersection of SH 146 and Ferry Road is currently a one-way stop controlled intersection.

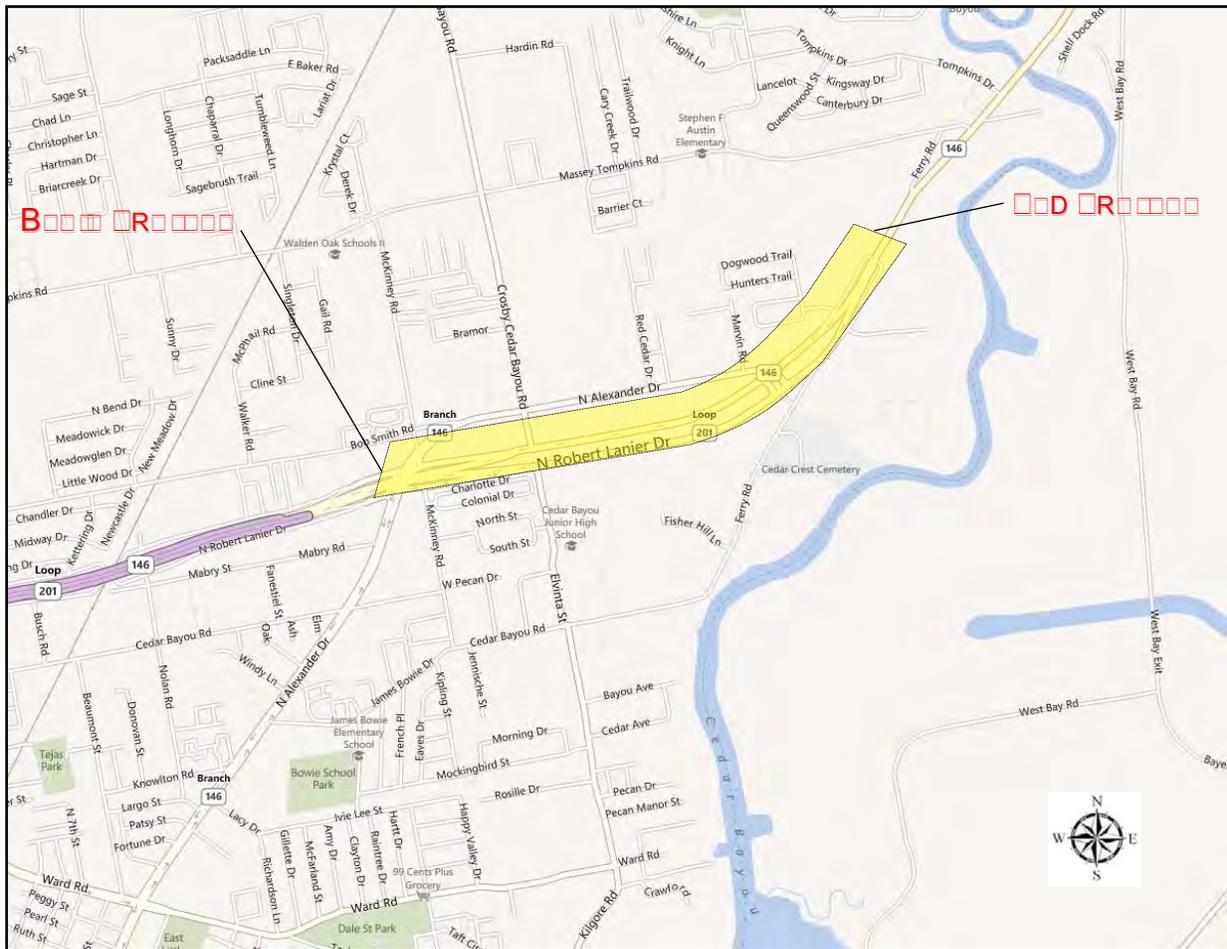


Figure 1: Project Location Map

## TRAFFIC ANALYSIS

### Proposed Schematic Options

Three (3) proposed schematic options were developed to address the project purpose and need. All three options extend the freeway main lanes from the end of the existing main lanes south of North Alexander Road northward to the beginning of the existing main lanes north of North Alexander Road. All three options provide for a grade separation at North Alexander Road and would improve safety and mobility. The schematic options are described in more detail below.

#### Option A

- Extends a four-lane main lane section from the existing main lane terminus south of North Alexander Road to the beginning of the existing main lane section north of North Alexander Road
- Provides for a grade separation at North Alexander Road
- Keeps the northbound exit ramp to North Alexander, the southbound exit ramp to North Alexander Road, and the southbound entrance ramp from North Alexander Road in place
- Eliminates the northbound entrance ramp from North Alexander Road
- Provides for a new northbound BS 146 E entrance ramp and a new southbound BS 146 E exit ramp

- The northbound frontage road north of the entrance ramp to be removed (also called Ferry Road) will be widened to three (3) lanes leading to the SH 146 intersection
- The SH 146 at Ferry Road intersection is presumed to warrant a signal in the design year
- The traffic that previously used the northbound North Alexander Road entrance ramp would use the SH 146 at Ferry Road signalized intersection
- Local access would be handled through the SH 146 at BS 146 E, the SH 146 at North Alexander Road, and the SH 146 at Ferry Road intersections

The lane configuration for Option A is shown in **Figure 3**.

#### Option B

- Extends a four-lane main lane section from the existing main lane terminus south of North Alexander Road to the beginning of the existing main lane section north of North Alexander Road
- Provides for a grade separation at North Alexander Road
- Provides for a new northbound BS 146 E entrance ramp and a new southbound BS 146 E exit ramp
- All existing ramps remain in place
- The existing northbound North Alexander entrance ramp enters as a lane addition onto the SH 146 main lanes
- No frontage road widening is required in Option B
- The SH 146 at Ferry Road intersection is presumed to warrant a signal in the design year
- Local access would be handled through the SH 146 at BS 146 E, the SH 146 at North Alexander Road, and the SH 146 at Ferry Road intersections.

The lane configuration for Option B is shown in **Figure 4**.

#### Option C

- Extends a four-lane main lane section from the existing main lane terminus south of North Alexander Road to the beginning of the existing main lane section north of North Alexander Road
- Provides for a grade separation at North Alexander Road
- Provides for a new northbound BS 146 E entrance ramp and a new southbound BS 146 E exit ramp
- Converts the existing one way frontage road system to a two way frontage road system from North Alexander to Ferry Road to provide local access to adjacent properties
- All existing ramps remain in place. However, the northbound entrance ramp from North Alexander and the southbound exit ramp to North Alexander would be re-stripped to work with two way frontage roads.
- No signal would be required at the SH 146 and Ferry Road intersection
- Local access would be handled through the two way frontage road system

The lane configuration for Option C is shown in **Figure 5**.

### Traffic Projections

The SH 146 traffic analysis was performed for the design year of 2035. Design year traffic projections and existing year (2011) traffic volumes, including K values, directional distributions, and truck percentages were obtained from TxDOT's Transportation Planning and Programming Division (TP&P). TP&P projections and design year peak hour traffic projections for the no-build alternative and each build option are shown in **Figures 2, 3, 4, and 5.**

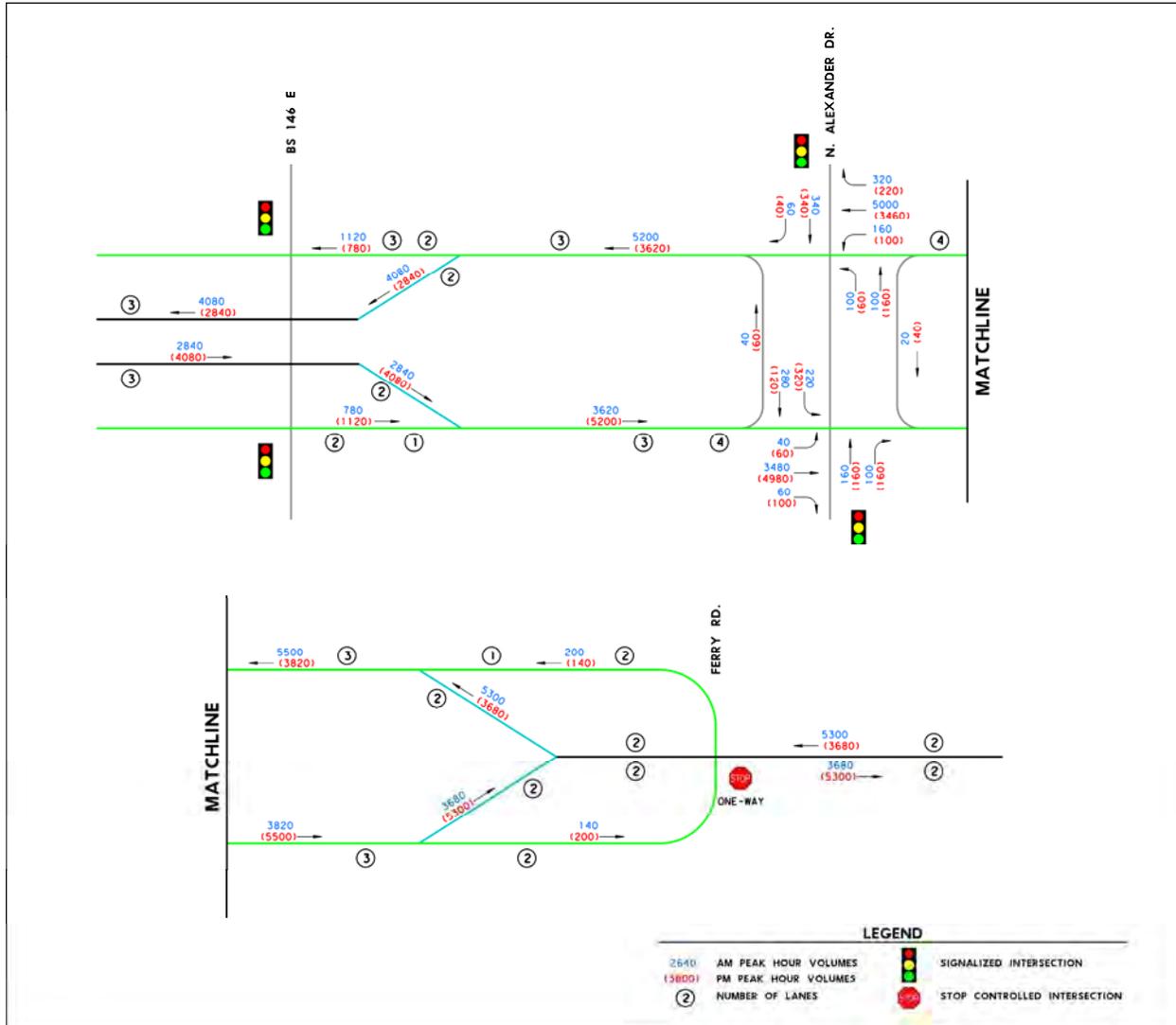


Figure 2: Lane Configuration and Design Year 2035 Traffic Line Diagram (No-Build)

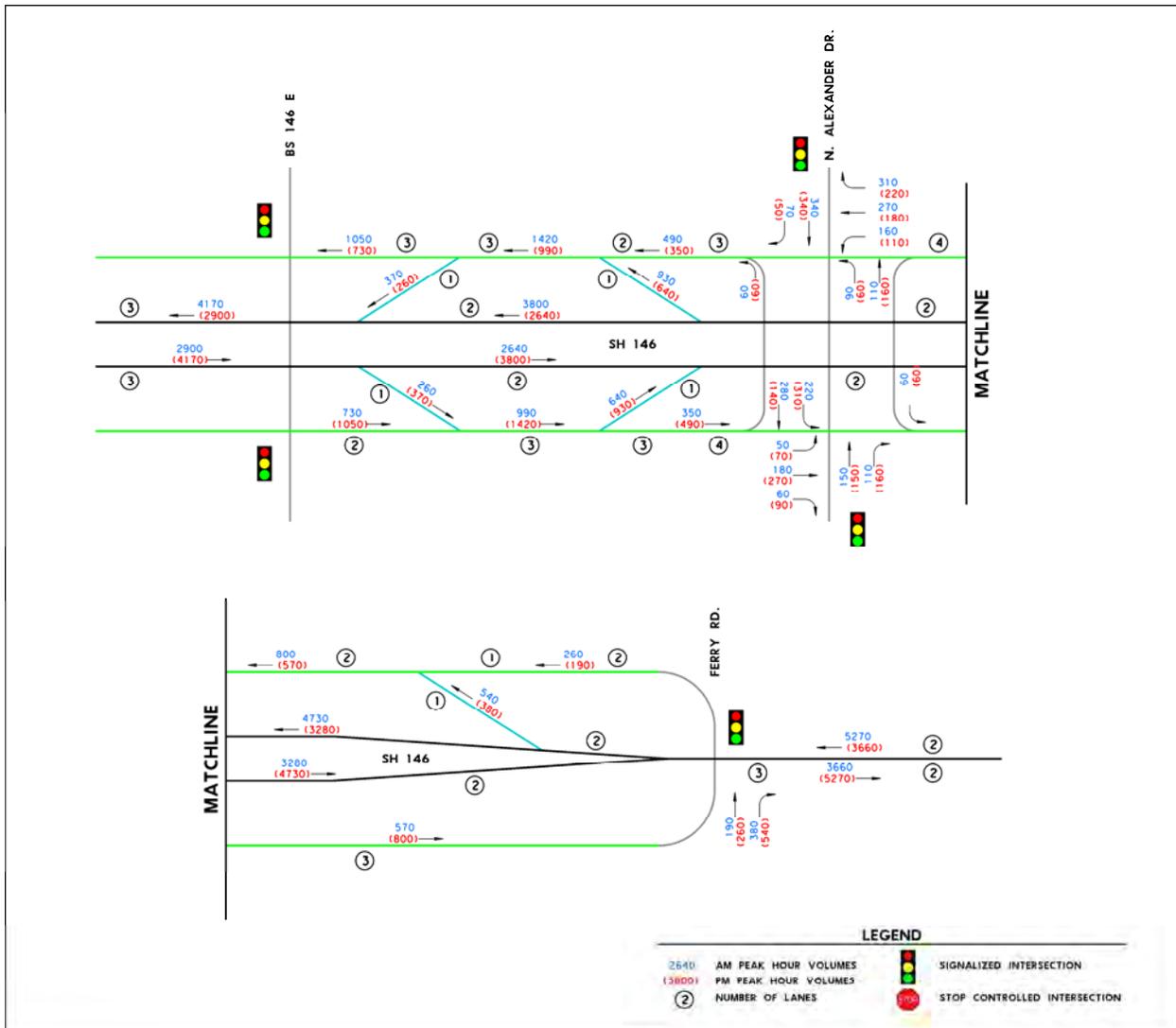


Figure 3: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option A)

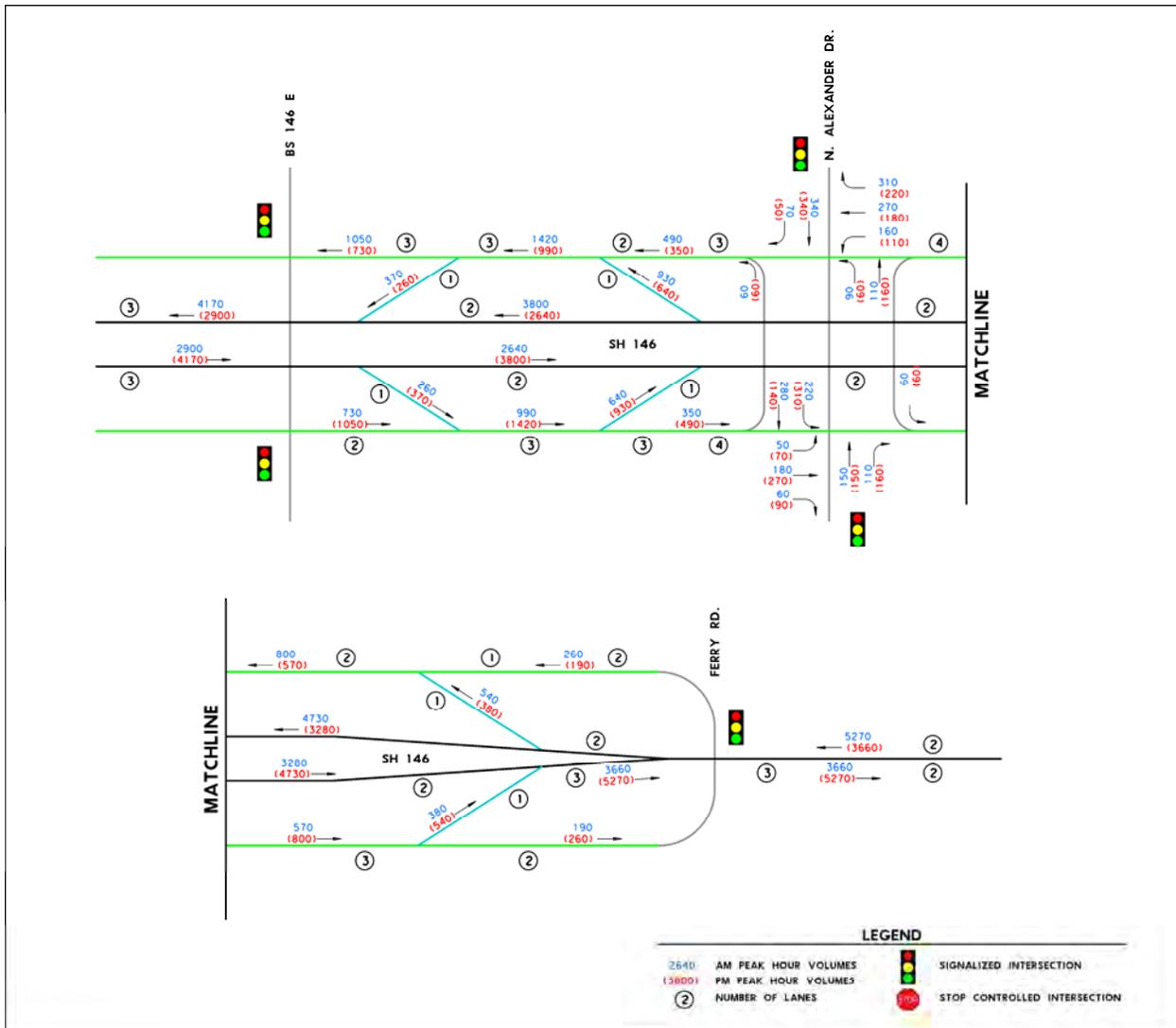


Figure 4: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option B)

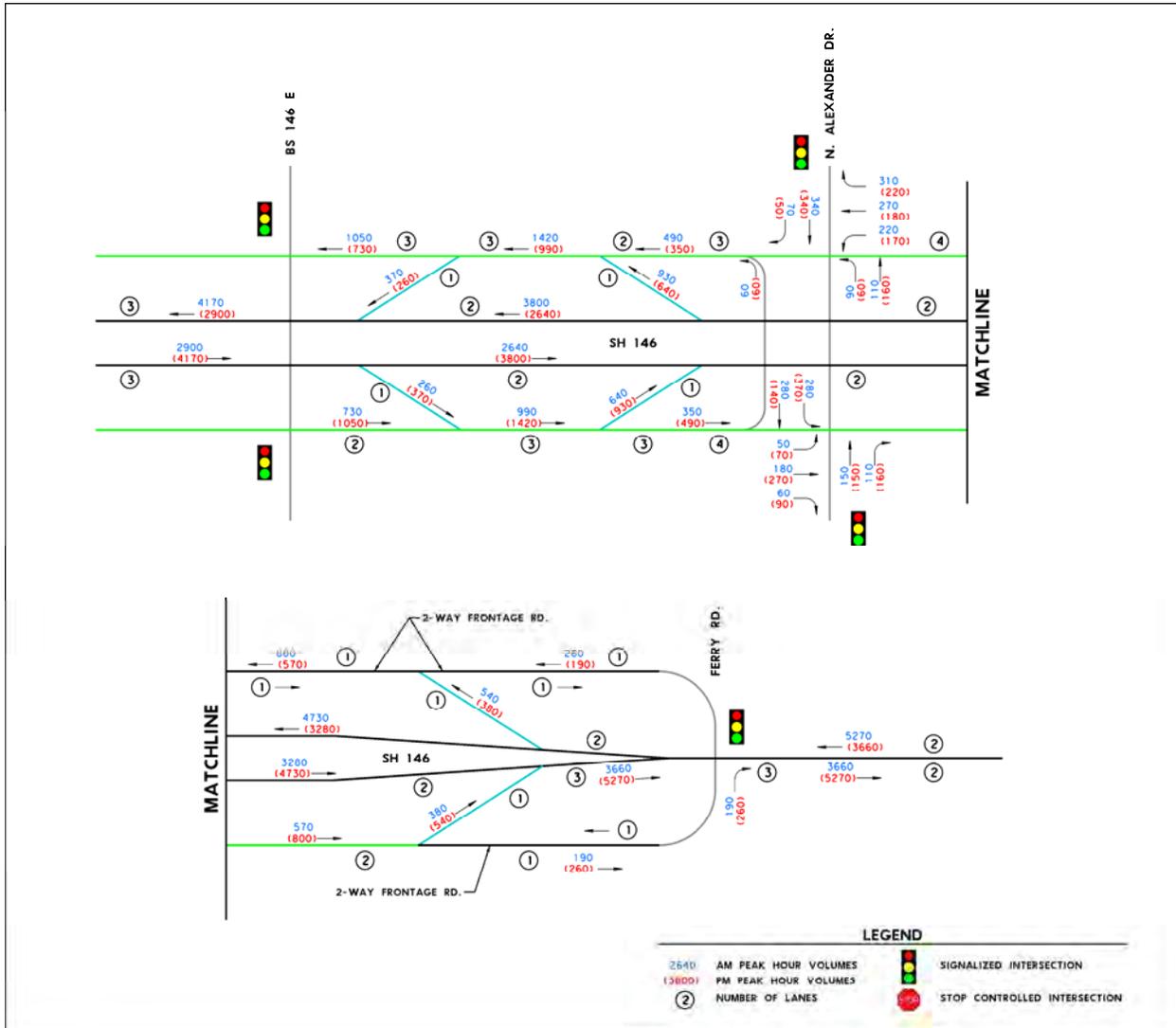


Figure 5: Lane Configuration and Design Year 2035 Traffic Line Diagram (Option C)

### Modeling Approach

CORSIM was chosen as the tool to perform the traffic analysis on this project. CORSIM is a microscopic traffic model developed by the Federal Highway Administration (FHWA) that is able to analyze an entire network versus analyzing one piece of the network at a time.

PASSER-V was used to generate optimal signal timings for the intersections. PASSER-V is a microcomputer program that selects the optimum cycle length and phase sequence that minimizes the total intersection delay for both diamond interchanges and traditional four-legged intersections. Once the signal timing data was derived from the PASSER-V program, it was input into the CORSIM models. The CORSIM models were then executed and measures of effectiveness (MOE's) were generated.

**Operational Analysis**

The CORSIM models were run for a one-hour period in both the A.M. and P.M. peak hours for the following scenarios:

- No-build Option (2035 projections on the existing geometry)
- Schematic Options A, B, and C (2035 traffic projections on each proposed option)

The operational analysis results are broken into three categories: overall corridor summary, main lane speeds and levels-of-service (LOS), and intersection LOS.

The overall corridor summary is a summary of the performance of the corridor as a whole. The measures of effectiveness (MOE’s) include the total vehicle miles travelled (VMT), the total delay in vehicle-hours and the average speed of the corridor for both peak hours. The overall corridor summary is shown in **Table 1**.

Measure of Effectiveness (MOE)	No Build		Option A		Option B		Option C	
	AM Peak	PM Peak						
Vehicle Miles Travelled (VMT)	13063.3	10754.0	13372.2	13421.7	12836.9	13335.6	14435.5	12947.0
Total Delay (veh-hrs)	485.5	911.4	386.5	743.2	378.3	780.2	339.8	738.2
Average Speed (mph)	26.9	11.8	34.6	18.1	34.0	17.0	42.5	17.5

**Table 1: Overall Corridor Summary**

**Table 1** indicates that within the corridor study limits all three build options perform relatively equal during both peak hours in the design year. All three build options perform better than the No Build scenario. In all scenarios operations are worst during the PM Peak hour.

Signalized intersection LOS is based on control delay per vehicle. The LOS thresholds for signalized intersection are shown in **Table 2**. Intersection levels-of-service for the SH 146 study corridor are summarized in **Table 3**. The LOS calculated is for the entire intersection. As such, the peak direction LOS may be worse than the intersection LOS indicated in **Table 3**. It is common practice to report LOS for the entire intersection, not just the peak direction.

LOS	Control Delay (s/veh)
A	= < 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

**Table 2: LOS Criteria for Signalized Intersections**

Intersection	No Build				Option A				Option B				Option C			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Avg. Delay (sec/veh)	LOS														
SH 146 at North Alexander Drive	16.0	B	114.6	F	8.2	A	9.3	A	8.6	A	9.3	A	9.3	A	11.0	B
SH 146 at Ferry Road	-	-	-	-	15.2	B	38.9	D	12.7	B	24.8	C	-	-	-	-

**Table 3: Signalized Intersection LOS**

**Table 3** shows that the intersections in all three build options operate at LOS A during the A.M. peak hour and no lower than LOS D during the P.M. peak hour. By comparison, in the No Build alternative, the SH 146 at North Alexander Drive intersection operates at LOS B during the A.M. peak hour but LOS F during the P.M. peak hour, indicating that the proposed main lane extension including bridging over the SH 146 and North Alexander Road intersection is needed by the design year and would significantly improve intersection operations versus the No Build scenario.

As outlined in the 2000 Highway Capacity Manual (HCM), freeway LOS is based on density in passenger cars per mile per lane. Analysis of long sections of freeway requires breaking the section into individual segments. The individual segments may consist of basic freeway segments, weaving segments, and merge/diverge segments. There are no weaving segments as defined by HCM within in study area and because the analysis was performed using CORSIM, a traffic simulation model, operational problems with the main lanes and ramps can easily be identified by viewing the simulation. The LOS thresholds for basic freeway segments are shown in **Table 4**.

LOS	Density (pc/mi/ln)
A	0-11
B	> 11-18
C	> 18-26
D	> 26-35
E	> 35-45
F	> 45

**Table 4: LOS Criteria for Basic Freeway Segments**

To quantitatively compare the build options, the basic freeway segment speeds, density, and LOS are shown for each of the build options in **Tables 5, 6, and 7, respectively.**

NB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
BS 146 E to North Alexander Drive Exit Ramp	62.9	15.7	B	9.3	111.2	F
North Alexander Drive Exit Ramp to BS 146 E Entrance Ramp	62.7	21.0	C	8.7	151.2	F
BS 146 E Entrance Ramp to Ferry Road	59.6	25.4	C	12.5	127.7	F
SB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
Ferry Road to North Alexander Drive Exit Ramp	33.7	63.0	F	35.1	56.8	F
North Alexander Exit Ramp to BS 146 E Exit Ramp	57.1	31.1	D	57.3	29.1	D
BS 146 E Exit Ramp to North Alexander Drive Entrance Ramp	61.5	23.2	C	61.6	21.7	C
North Alexander Drive Entrance Ramp to BS 146 E	61.4	17.1	B	61.4	15.9	B

**Table 5: Basic Freeway LOS for Build Option A**

NB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
BS 146 E to North Alexander Drive Exit Ramp	62.7	15.8	B	8.7	115.6	F
North Alexander Drive Exit Ramp to BS 146 E Entrance Ramp	62.4	21.1	C	7.6	166.7	F
BS 146 E Entrance Ramp to North Alexander Road Entrance Ramp	59.5	25.6	C	11.1	138.6	F
North Alexander Road Entrance Ramp to Ferry Road	43.2	28.6	D	11.1	116.8	F
SB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
Ferry Road to North Alexander Drive Exit Ramp	34.2	57.0	F	35.1	56.3	F
North Alexander Exit Ramp to BS 146 E Exit Ramp	57.0	28.8	D	57.6	28.6	D
BS 146 E Exit Ramp to North Alexander Drive Entrance Ramp	61.8	21.1	C	61.9	21.2	C
North Alexander Drive Entrance Ramp to BS 146 E	61.8	15.6	B	61.8	15.6	B

**Table 6: Basic Freeway LOS for Build Option B**

NB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
BS 146 E to North Alexander Drive Exit Ramp	63.2	15.7	B	8.6	112.2	F
North Alexander Drive Exit Ramp to BS 146 E Entrance Ramp	63.0	21.0	C	7.5	161.4	F
BS 146 E Entrance Ramp to North Alexander Road Entrance Ramp	60.3	25.3	C	10.0	145.8	F
North Alexander Road Entrance Ramp to Ferry Road	59.1	19.9	C	9.2	132.3	F
SB Segment Limits	AM Peak Hour			PM Peak Hour		
	Avg. Speed (mph)	Density (pc/mi/ln)	LOS	Avg. Speed (mph)	Density (pc/mi/ln)	LOS
Ferry Road to North Alexander Drive Exit Ramp	34.3	72.7	F	36.6	53.8	F
North Alexander Exit Ramp to BS 146 E Exit Ramp	56.2	37.6	E	58.3	28.2	D
BS 146 E Exit Ramp to North Alexander Drive Entrance Ramp	61.0	27.9	D	61.9	21.1	C
North Alexander Drive Entrance Ramp to BS 146 E	61.0	20.4	C	61.9	15.4	B

**Table 7: Basic Freeway LOS for Build Option C**

**Tables 5, 6, and 7** indicate that all three build options perform similar in the design year. Generally, the proposed freeway segments perform at LOS D or during both peak hours for all three alternatives. The exception is the northbound operation during the P.M. peak hour. In all three build alternatives, the northbound movement performs at LOS F with very low operating speeds. This is to be expected as the northbound movement is the P.M. peak movement and the freeway ends at the north end of the study segment reducing speeds and increasing density in the transition as well as upstream of the transition.

Because the no-build scenario does not have any freeway segments within the study area, directional average speeds within the study corridor were used to compare the no build scenario to the build options. The corridor directional average speeds are shown in **Table 8**.

Alternative	Direction	AM Peak Hour	PM Peak Hour
		Average Speed (mph)	Average Speed (mph)
No Build	Northbound	30.6	10.2
	Southbound	28.5	18.7
Option A	Northbound	61.4	10.4
	Southbound	57.9	58.1
Option B	Northbound	60.0	9.4
	Southbound	58.1	58.4
Option C	Northbound	61.7	8.8
	Southbound	57.4	58.8

**Table 8: Corridor Directional Average Speeds**

**Table 8** indicates that all three build options perform significantly better than the no-build option during the design year.

## **CONCLUSION**

The operational analysis shows that all three conceptual schematic options that were developed to address the project purpose and need can improve traffic operations for the design year. All three options have similar results with no option being significantly better than any of the others.

All three build options will improve traffic operations for the design year compared to the no-build option. Option C would change local travel patterns and driver familiarity the most by converting the one way frontage roads north of North Alexander Drive. Option A could potentially improve safety over the other options by eliminating the North Alexander Drive northbound entrance ramp.



# MEMORANDUM

**TO:** Project Management 850 File  
**District:** Houston  
**County:** Harris  
**CSJ#:** 0389-13-039  
**Highways:** SH 146  
**Limits:** From BS 146E to Ferry Road  
**Project Description:** HIST: Stipulation VI, Appendix 4. Construct 4 main lanes and grade separation. No new ROW required. No historic properties present.

**FROM:** Shonda Mace **DATE:** August 23, 2010  
**SUBJECT:** Internal review under the Programmatic Agreement for Transportation Undertakings among the Federal Highway Administration, Texas State Historic Preservation Officer, Advisory Council on Historic Preservation, and the Texas Department of Transportation; and the Memorandum of Understanding (MOU) between the Texas Historical Commission and the Texas Department of Transportation.

---

## PROJECT DESCRIPTION

The Texas Department of Transportation (TxDOT) Houston District proposes to construct four main lanes on SH 146 from BS 146E (although roadway modification would only take place east of Elvinta Street) to Ferry Road in Baytown, Harris County, Texas, a distance of approximately 0.87 miles. Existing SH 146 is a six-lane divided urban frontage road. No new right-of-way (ROW) would be required.

## STATEMENT OF METHODS

A review of the National Register of Historic Places (NRHP), the list of State Archeological Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant resources have been previously documented within the area of potential effects (APE). It has been determined through consultation with the State Historic Preservation Officer (SHPO) that the APE for the proposed project is the existing ROW, except where there is a grade separation. At this location, the APE extends to 150 ft. A windshield survey undertaken in August 2010 revealed that there are fifteen (15) historic-age resources on 11 parcels (built prior to 1969) located within the project APE.

## DETERMINATIONS OF NATIONAL REGISTER ELIGIBILITY

TxDOT Historians have evaluated the historic-age resources through application of the Criteria of Eligibility for listing in the National Register of Historic Places, and have determined that all fifteen resources are **not eligible** for inclusion in the NRHP, either individually or as a whole. They do not have associations with significant historical figures or events to qualify for eligibility under Criteria A or B. They also represent common vernacular types that do not clearly reflect the distinctive characteristic of a type, period, method of construction, work of a master, or high artistic value to qualify as eligible under Criterion C. Additionally, unsympathetic alterations such as replacement doors, windows, and siding have compromised the resources' integrity of materials, design, workmanship (such as Resource #s 2 & 10).

## HISTORIC CONTEXT

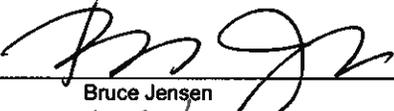
Baytown, Texas (located in Harris County) was initially settled in the 1822 when a ferry crossing was established at the junction of the San Jacinto River with Buffalo Bayou. Growth to the area was slow, despite the establishment of a shipyard at the mouth of Goose Creek in the early 1850s and the Bayland Orphans' Home for Children of Confederate Soldiers in 1867. In 1908, after two unsuccessful drilling attempts, an oil strike was made beside

Tabbs Bay.<sup>1</sup> Then, in 1916 the Goose Creek oilfield became famous as the first offshore drilling field, after the Humble and Sour Lake oilfields. In response to this, the towns of Pelly and Goose Creek developed near the oilfield in 1917-18. In 1917 a refinery was built near the Goose Creek oilfield and the Humble Oil and Refining Company (later Exxon Company) was founded, along with the city of Baytown. Although initially a temporary settlement of army tents, barracks, and small shacks, Baytown became permanent in 1923 when streets were laid out, utilities provided, and lots sold. In 1947, the communities of Baytown, Pelly, and Goose Creek consolidated under the name of Baytown. Over the next 50 years, the population increased from 20,000 to almost 70,000.<sup>2</sup>

The period of significance for Baytown and the identified resources begins in 1916 with the Goose Creek oilfield and ends in 1947 with the consolidation of Pelly, Goose Creek, and Baytown. All fifteen (15) historic-age resources are evaluated within this time frame.

### CONCLUSIONS

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects," Appendix 4 (2) of the Programmatic Agreement for Transportation Undertakings, (PATU) between the Federal Highway Administration (FHWA), the Texas State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and the Texas Department of Transportation (TxDOT) and the Memorandum of Understanding (MOU), TxDOT Historians determined that no historic properties are present within the proposed project's APE and individual project coordination with SHPO is not required.

Approved by  for TxDOT 9.13.10  
Bruce Jensen Date

Lead Reviewer  for TxDOT 8.25.10  
Lead Reviewer's Initials Date

SRM

Attachment

Cc w/out attachment: Bobby Jones, Atlanta District; ENV Reading File;

Cc w/ attachment: THC; ENV-HIST

<sup>1</sup> Handbook of Texas Online, s.v. "," <http://www.tshaonline.org/handbook/online/articles/BB/hdb1.html> (accessed August 24, 2010).

<sup>2</sup> "History of Baytown." City of Baytown, Texas, April 15, 2005, 24 August 2010 <http://www.baytown.org/about/history/default.htm>

from **Haley Norman** haley@crouchenvironmental.com  
to txnnd@tpwd.state.tx.us

date Wed, Aug 17, 2011 at 5:36 PM  
subject SH 146 Road Improvement Project NDD Data Request  
mailed-by crouchenvironmental.com

Hello-

I would like to request an EOR List, EOR report, and an ArcGIS shapefile for a proposed roadway improvement project near the City of Baytown, Harris County, Texas. The project is SH 146 between BS 146 and Ferry Road. The attached vicinity map displays the location of the project. It is located in the **Mont Belvieu, Texas** USGS topographic quadrangle.

Please let me know if you have any further questions to move forward with my request.

Thanks!

**Haley Norman**  
**Environmental Consultant**

**Crouch Environmental Services, Inc.**  
**402 Teetshorn**  
**Houston, TX 77009**  
**713.775.1343**

 **vicinity.pdf**  
402K [View](#) [Download](#)

---

from **Bob Gottfried** Bob.Gottfried@tpwd.state.tx.us  
to Haley Norman <haley@crouchenvironmental.com>

date Wed, Aug 24, 2011 at 10:22 AM  
subject RE: SH 146 Road Improvement Project NDD Data Request  
mailed-by tpwd.state.tx.us

Ms. Norman,

The Texas Natural Diversity Database (TXNDD) includes federal, and state listed and tracked Threatened, Endangered, and Rare species. The attached .zip file contains documents that will guide you inappropriate use, restrictions, and shapefile interpretation of Texas NDD data as well as a request for adding data to the TXNDD. Also included is a shapefile of the T&E and Rare species element occurrences, information the TXNDD has available presently, within and touching the requested quads along with a companion EO **report**; areas where EO data are absent **do not mean** absence of occurrence for Threatened, Endangered, and Rare species. An EO **list** is included, buffered to approximately 10 miles from the requested quad boundaries to notify you of other potential federal, and state listed and tracked Threatened, Endangered, and Rare species within the area. To round out your review, please use the pertinent TPWD Annotated County lists of Rare Species; webpage address found below. For questions on these county lists please contact Celeste Brancel at [celeste.brancel@tpwd.state.tx.us](mailto:celeste.brancel@tpwd.state.tx.us) or (512)389-8021.

- If your project area is in Travis, Williamson, or Bexar county it is highly recommended that you download the GIS shapefiles for the Karst Zones from the USFWS website <http://www.fws.gov/southwest/es/austintexas/> and/or contact Jenny Wilson – USFWS at (512)490-0057 x 231 for a review of the project location. All three counties are known to have multiple important karst features.
- If your information request includes one or more records for **Bald Eagle** or **colonial waterbirds**, contact Brent Ortego at [brent.ortego@tpwd.state.tx.us](mailto:brent.ortego@tpwd.state.tx.us) or (361) 576-0022 for more up-to-date information on the *Bald Eagle* or **colonial waterbirds**.
- **For communication towers**, in addition to the USFWS guidelines in the attachment and the links at [towerkill.com](http://towerkill.com), there is research identifying a simple way to reduce bird strike and high bird mortality at towers. Gehring J., P. Kerlinger, A.M. Manville II. (2009) Communication towers, lights, and birds: successful methods of reducing the frequency of avian collisions. Ecological Applications: Vol. 19, No. 2, pp. 505-514.doi: 10.1890/07-1708.1
- For **wind energy or transmission related projects**, to obtain the Department’s guidelines it is also recommended to contact Kathy Boydston, the Department lead, at [kathy.boydston@tpwd.state.tx.us](mailto:kathy.boydston@tpwd.state.tx.us) or 512/389-4638. In addition, the U.S. Fish and Wildlife Service's Interim Guidance on Avoiding and Minimizing Wildlife Impacts from Wind Turbines, along with other helpful links and information, can be accessed at: <http://www.fws.gov/habitatconservation/wind.html>.
- If your information request contains records for **Texas trailing phlox** you should contact Jason Singhurst at [jason.singhurst@tpwd.state.tx.us](mailto:jason.singhurst@tpwd.state.tx.us) or (512) 389-8726.

*Absence of information in an area does not mean absence of occurrence. Given the small proportion of public versus private land in Texas, the TXNDD does not include a representative inventory of rare resources in the state. Data from the TXNDD do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within your project area. These data cannot substitute for an on-site evaluation by qualified biologists.*

**Additional sources of data:**

TPWD Annotated County Lists: [http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered\\_species/](http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/)  
 USFWS species lists: [http://ecos.fws.gov/tess\\_public/servlet/gov.doi.tess\\_public.servlets.EntryPage](http://ecos.fws.gov/tess_public/servlet/gov.doi.tess_public.servlets.EntryPage)  
 USFWS CRITICAL HABITAT: <http://criticalhabitat.fws.gov/>  
 Ecologically Significant Stream  
 Segments: [http://www.tpwd.state.tx.us/landwater/land/maps/gis/data\\_downloads/](http://www.tpwd.state.tx.us/landwater/land/maps/gis/data_downloads/)  
 Ecologically Significant Stream Segment  
 Information: [http://www.tpwd.state.tx.us/landwater/water/environconcerns/water\\_quality/sigsegs/](http://www.tpwd.state.tx.us/landwater/water/environconcerns/water_quality/sigsegs/)

Bob Gottfried  
 Texas Natural Diversity Database Admin.

--Original Message----

**From:** Haley Norman [mailto:[haley@crouchenvironmental.com](mailto:haley@crouchenvironmental.com)]

**Sent:** Wed 2011-08-17 5:37 PM

**To:** Texas Natural Diversity Database

- Show quoted text -  
 - Show quoted text -

 **norman\_20110817.zip**  
 597K [View](#) [Download](#)

## Occurrence List for Surrounding Quads

<u>Scientific Name:</u>	<u>Common Name:</u>	<u>Occurrence Number:</u>	<u>State Status:</u>	<u>Federal Status:</u>	<u>Eo Id:</u>
<i>Anaxyrus houstonensis</i>	Houston Toad	8	E	LE	3224
<i>Chloris texensis</i>	Texas windmill-grass	4			7849
<i>Chloris texensis</i>	Texas windmill-grass	6			2166
<i>Chloris texensis</i>	Texas windmill-grass	9			7812
<i>Chloris texensis</i>	Texas windmill-grass	14			3942
<i>Chloris texensis</i>	Texas windmill-grass	27			2089
<i>Haliaeetus leucocephalus</i>	Bald Eagle	47	T		1808
<i>Haliaeetus leucocephalus</i>	Bald Eagle	59	T		7972
<i>Quercus nigra-quercus phellos series</i>	Water Oak-willow Oak Series	19			1095
<i>Quercus nigra-quercus phellos series</i>	Water Oak-willow Oak Series	20			1092
<i>Rayjacksonia aurea</i>	Houston daisy	11			7313
<i>Rayjacksonia aurea</i>	Houston daisy	19			5117
<i>Rayjacksonia aurea</i>	Houston daisy	21			597
<i>Rookery</i>		167			6411
<i>Rookery</i>		168			5069
<i>Rookery</i>		169			1076
<i>Rookery</i>		172			3340
<i>Rookery</i>		173			6735
<i>Rookery</i>		176			5599
<i>Rookery</i>		378			7621
<i>Rookery</i>		379			4757
<i>Rookery</i>		380			4756

<u>Scientific Name:</u>	<u>Common Name:</u>	<u>Occurrence Number:</u>	<u>State Status:</u>	<u>Federal Status:</u>	<u>Eo Id:</u>
<i>Rookery</i>		408			4689
<i>Schizachyrium scoparium-paspalum plicatulum series</i>	Little Bluestem-brownseed Paspalum Series	16			3175
<i>Schizachyrium scoparium-paspalum plicatulum series</i>	Little Bluestem-brownseed Paspalum Series	32			2689
<i>Thurovia triflora</i>	threeflower broomweed	11			7357



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**HOUSTON-GALVESTON AREA COUNCIL**

---

**P. O. Box 22777 • 3555 Timmons Lane • Houston, Texas 77227-2777 • 713/627-3200**

March 19, 2013

Manny Francisco  
Transportation Planning  
Texas Department of Transportation  
P.O. Box 1386  
Houston, Texas 77251-1386

**REF: Letter of Waiver of Congestion Mitigation Analysis (CMA)  
Project: SH 146 4-Mainlanes and Grade Separation  
CSJ ID #: 0389-13-039 / MPO ID #: 536**

Dear Mr. Francisco:

The Congestion Management Process (CMP) Roadway Network is defined as roadways classified as principal or major arterials and higher roadway facilities in the urban areas (meaning after principal arterial, State Highways, FM roads, Freeways, etc.); while minor arterial and higher roadway facilities in the rural area, as defined in the TxDOT Roadway Inventory Log (RI-2) and other roadways designated by the TPC. Added capacity roadway projects, NOT on the adopted CMP network, are not subject to Congestion Mitigation Analysis (CMA) requirements. In addition, added capacity projects on the adopted CMP network, which have current environmental findings (FONSI/ROD) are also exempt from CMA. Currents FONSI/ROD should be within the last three years. Moreover, added-capacity projects one-mile or less in length are considered insignificant and therefore are also exempt from CMA.

**H-GAC is issuing this Letter of Waiver (LOW) of CMA for the above referenced project because it is less than one mile in length, and as such exempt from CMA. Please include this LOW in the Environmental Assessment (EA) document of this project for Transportation Improvement Plan (TIP) &/or other submittals.**

If you have any questions about this CMA waiver and/or the CMP, please contact me at (713) 499-6692 or [stephan.gage@h-gac.com](mailto:stephan.gage@h-gac.com).

Sincerely,

A handwritten signature in blue ink, appearing to read 'Stephan Gage', is written over a light blue circular stamp.

Stephan Gage  
Sr. Transportation Planner



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

**Texas Division Office**

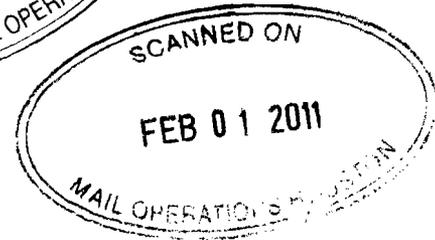
January 27, 2011

300 E 8<sup>th</sup> Street, Rm 826  
Austin, Texas 78701  
Phone: 512-536-5900  
Fax: 512-536-5990  
texas.fhwa@dot.gov

In Reply Refer To:  
HB-TX

Request for Environmental Classification  
Harris County  
SH 146: BS 146 to Ferry Road  
CSJ: ~~0912-71-894~~ 0389-13-039

Melissa Neeley  
Director of Project Delivery Management  
Environmental Affairs Division  
Texas Department of Transportation  
Austin, TX 78701



Dear Ms. Neeley:

The Federal Highway Administration (FHWA) has reviewed the Texas Department of Transportation Environmental Affairs Division (TxDOT ENV) Request for Environmental Classification, dated August 26, 2010, for the proposed SH 146 project. The proposed project will construct four mainlanes and grade-separated intersection at North Alexander Drive within the existing right-of-way. The project would begin just west of Ferry Road and extend the freeway just east of the North Alexander Drive intersection with a length of approximately one mile.

The project is located in a suburban area that is developed with residential and commercial properties. After preliminary research, there appears to be a low potential for impacts to section 4(f) properties, Threatened and Endangered Species, hazardous materials, or archeological or historical resources. No right-of-way is required for this project and no displacements are expected. A noise analysis and an Indirect and Cumulative Impacts analysis will be conducted as part of the document preparation. Also no disproportionate impacts to low-income or minority populations are expected.

FHWA has determined it is appropriate to classify the SH 146 environmental document as a Categorical Exclusion (CE). This decision is based on the information provided in the TxDOT ENV Request for Environmental Classification and discussions with the TxDOT Houston District concerning the proposed project.



Therefore, the preparation of an Environmental Assessment (EA) is not required at this time since, based on past experience, this action is not expected to involve significant environmental impacts. This decision, however, is based on what is known to date and should significant environmental impacts be identified during the environmental process, FHWA will require that an EIS be prepared in accordance with 23 CFR 771.119.

Should you have any questions regarding this determination, please contact me at 512-536-5964 or Mr. Randy Paulk at 512-536-5961.

Sincerely,

A handwritten signature in black ink, appearing to read 'Daniel Mott', with a long horizontal flourish extending to the right.

Daniel Mott  
Houston Major Projects Engineer

cc: Mr. Pat Henry, P.E., TxDOT Houston District

**APPENIDIX C**  
**CONSISTENCY & TRANSPORTATION PLAN**

**CORRIDOR-BASED MAJOR INVESTMENTS**

MPOID	CSJ	County	Facility	From	To	Description	Length (mi)	Main Lanes	Frontage Lanes	Fiscal Year	Analysis Year	Total Project
												Cost (M, YOE)
<b>SH 146 (CONT'D)</b>												
139	0389-05-088	Harris	SH 146	RED BLUFF RD	NASA I	WIDEN TO 8-LANES, GS AT MAJOR INTERSECTIONS AND 2 2-LANE FRONTAGE ROADS	1.75	(4,8)	(0,4)	2017	2025	\$ 69.26
14632	0389-05-116	Harris	SH 146	NASA RD I	GALVESTON/HARRIS CL	WIDEN TO 6-LANE ARTERIAL WITH 4-LANE EXPRESS LANES	1.00	(4,10)	n/a	2018	2025	\$ 79.70
536	0389-13-039	Harris	SH 146	AT BS 146E	FERRY RD	CONSTRUCT 4 MAINLANES AND GRADE SEPARATION	0.87	(0,4)	(6,6)	2020	2025	\$ 47.09
7521		Harris	SH 146	SH 146 SB	SOUTHERN ACCESS RD	CONSTRUCT DIRECT CONNECTOR FROM SB LANES OF SH 146	0.53	n/a	n/a	2020	EREA (2025)	\$ 13.92
<b>SH 249</b>												
14524	0720-02-072	Grimes	SH 249	FM 1774 IN TODD MISSION	MONTGOMERY COUNTY LINE	**INFORMATION ONLY** PROJECT CONSISTENT WITH MONTGOMERY CO. PROJECT IN PLAN (MPOID 11570). CONSTRUCT 4-LANE TOLLWAY (GRIMES CO.)	2.41	(0,4)	n/a	2016	2018	n/a
339	0720-03-074	Harris	SH 249	MONTGOMERY C/L	BROWN RD	CONSTRUCT TWO 3-LANE FRONTAGE ROADS	1.14	(6,6)	(0,6)	2016	2018	\$ 35.17
913	0720-03-123	Harris	SH 249	MONTGOMERY C/L	BROWN RD	CONSTRUCT 6-LANE TOLLWAY WITH GRADE SEPARATIONS AT BROWN, BAKER AND ZION ROADS	1.18	(6,6)	(0,6)	2016	2018	\$ 165.00
11570	0720-02-073	Montgomery	SH 249	GRIMES COUNTY LINE	FM 1774/FM 149 IN PINEHURST	CONSTRUCT 4-LANE TOLLWAY IN SECTIONS	12.18	(0,4)	n/a	2016	2018	\$ 271.31
914	0720-02-074	Montgomery	SH 249	FM 1774/FM 149 IN PINEHURST	SPRING CREEK/HARRIS C/L	CONSTRUCT 6-LANE TOLLWAY WITH GRADE SEPARATIONS AT STAGECOACH RD AND WOODLANDS PARKWAY	3.60	(0,6)	(4,4)	2016	2018	\$ 129.93
<b>SH 288</b>												
495	0111-03-031	Fort Bend	FM 521	HARRIS C/L	S OF FM 2234	WIDEN TO 4-LANE DIVIDED	0.30	(2,4)	n/a	2015	2018	\$ 3.05
534	0111-01-067	Harris	FM 521	BW 8	FORT BEND C/L	WIDEN TO 4-LANE DIVIDED SECTION AND CONSTRUCT GRADE SEPARATION AT UPRR (DOT# 447 969Y)	0.60	(2,4)	n/a	2015	2018	\$ 38.52
13765	0598-02-092	Brazoria	SH 288	HARRIS C/L	CR 58	CONSTRUCT 4 TOLL LANES WITH GRADE SEPARATIONS	5.04	(0,4)	n/a	2015	2018	\$ 196.44
13767	0598-02-093	Brazoria	SH 288	CR 58	SH 99	CONSTRUCT 4 TOLL LANES WITH GRADE SEPARATIONS	8.23	(0,4)	n/a	2032	2035	\$ 261.00

**HOUSTON-GALVESTON MPO  
APPENDIX D**

**2035 RTP UPDATE - PROJECTS UNDERGOING ENVIRONMENTAL ASSESSMENT**

MPOID [CSJ] SPONSOR	FACILITY FROM TO	DESCRIPTION	FISCAL YEAR LENGTH TOTAL PROJECT COST
<b>Harris County Projects</b>			
<b>11061</b> CITY OF PASADENA	<b>RED BLUFF RD</b> SOUTH ST BW 8	DESIGN AND RECONSTRUCT 4-LANE DIVIDED ROADWAY INCL DRAINAGE AND SIGNALS AT SAN AUGUSTINE/ORREL AND BW 8	2020 1.02 \$3,864,856
<b>8067</b> HARRIS COUNTY	<b>RICHEY RD W</b> CUTTEN RD CHAMPION FOREST	WIDEN TO 4-LANE CONCRETE BLVD W/ CURBS, STORM SEWERS & TURN LANES ON NEW LOCATION (NORTH OF EXISTING WEST RICHEY ROAD AND PARALLEL TO BOURGEOIS)	2023 1.25 \$13,496,199
<b>10973</b> HARRIS COUNTY	<b>RICHEY RD W</b> ELLA BLVD IH 45 N	WIDEN FROM 2-LANE TO 4-LANE	2033 0.7 \$6,701,822
<b>134</b> CITY OF HOUSTON	<b>RICHMOND AVE</b> W OF ROGERDALE WILCREST	WIDEN TO 6-LANES	2020 0.7 \$1,526,573
<b>10999</b> UPTOWN HOUSTON DISTRICT	<b>RICHMOND AVE</b> IH 610 SAGE	RECONSTRUCT 8-LANE DIVIDED ROADWAY WITH UTILITY IMPROVEMENTS	2020 0.45 \$9,175,241
<b>11000</b> UPTOWN HOUSTON DISTRICT	<b>RICHMOND AVE</b> SAGE CHIMNEY ROCK	WIDEN FROM 6 TO 8 LANES	2020 0.59 \$8,548,810
<b>11003</b> UPTOWN HOUSTON DISTRICT	<b>SAGE RD</b> SAN FELIPE WOODWAY	RECONSTRUCT ROADWAY ELIMINATING OPEN DITCH, ADDING CURB & GUTTER, SIDEWALKS AND TURNING LANES	2021 0.86 \$7,500,000
<b>7521</b> PORT OF HOUSTON AUTHORITY	<b>SH 146</b> SH 146 SB SOUTHERN ACCESS RD	CONSTRUCT DIRECT CONNECTOR FROM SB LANES OF SH 146	2020 0.53 \$13,915,000
<b>137</b> [0389-05-087] TXDOT HOUSTON DISTRICT	<b>SH 146</b> FAIRMONT PARKWAY RED BLUFF RD	WIDEN TO 6-LANES WITH TWO 2-LANE FRONTAGE ROADS	2025 4.6 \$100,426,000
<b>536</b> [0389-13-039] CITY OF BAYTOWN	<b>SH 146</b> AT BS 146E FERRY RD	CONSTRUCT 4 MAINLANES AND GRADE SEPARATION	2020 0.87 \$47,090,744
<b>11764</b> METRO	<b>SH 288</b> ALMEDA LINE GRT (RR ROW) INTERMODAL TERMINAL	SH 288 ALMEDA LINE GUIDED RAPID TRANSIT	2033  \$250,000,000

Sorted by: Street, CSJ Number, then MPOID

**APPENDIX D**  
**POTENTIAL ARCHEOLOGICAL LIABILITY MAP**



**APPENDIX E**  
**BIOLOGICAL EVALUATION FORM**



# Biological Evaluation Form

**Main CSJ:** 0389-13-038

**Date of Evaluation:** October 12, 2015

Project has no Federal nexus.

**Proposed Letting Date:** August 2024

Project not assigned to TxDOT under the NEPA Assignment MOU

**District(s):** Houston

**County(ies):** Harris

**Roadway Name:** SH 146

**Limits From:** BS 146E

**Limits To:** Ferry Road

**Project Description:** Construction of four main lanes and a grade separation

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

## Endangered Species Act (ESA)

  No   Is the action area of the proposed project within the range and in suitable habitat of federally protected species?

Date that the [IPaC system](#) was accessed: October 12, 2015

Resources consulted or activities conducted to make effect determination (if applicable):

- TPWD County List       USFWS Critical Habitat Maps       Species Expert Consulted
- Aerial Photography       Coastal Areas Maps       Site Visit
- Topographic Map       Species Study Conducted       Karst Zone Maps
- Ecological Mapping System of Texas (EMST)       Natural Diversity Database (NDD)

Other:

## Essential Fish Habitat (EFH)

  No   Are tidally influenced waters in the action area of the proposed project?

Date that the [NOAA EFH Mapper](#) was accessed: August 26, 2015

Comments:

There are no tidally influenced waters within the proposed project area.



### Coastal Barrier Resources Act (CBRA)

No Is the action area of the proposed project located within a designated CBRA map unit?

Date that the [USFWS CBRA Mapper](#) was accessed: August 26, 2015

Comments:

The proposed project is not located within a designated CBRA map unit.

### Marine Mammal Protection Act (MMPA)

No Is the action area of the proposed project within range of marine mammals and their habitat?

Comments:

The proposed project is located within uplands and does not contain tidally influenced waters; therefore, no marine mammals or habitat were located within the project area.

### Migratory Bird Treaty Act (MBTA)

Yes Is there potential for nesting birds to be present in the project action area during construction?

No Were active nests identified during the site survey?

Yes Will BMPs will be incorporated to protect migratory bird nests?

### Bald and Golden Eagle Protection Act (BGEPA)

No Does the proposed project have the potential to impact Bald or Golden Eagles?

Comments:

No eagles or eagle nests were observed and no suitable eagle habitat was observed.

### Fish and Wildlife Coordination Act (FWCA)

No Does the project have impacts on one or more Waters of the U.S. or wetlands?

Comments:

There are no wetlands or waters of the U.S. located within the project area.



### Executive Order 13112 on Invasive Species

Yes Would the project be in compliance with EO 13112?

Comments:

Regionally native and non-invasive plants would be utilized for revegetation efforts, including seed mixes to the greatest extent practicable.

### Executive Memorandum on Beneficial Landscaping

Yes Would landscaping be included in the proposed projects?

Describe landscaping activities:

Landscaping including with the proposed project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscaping practices.

Yes Would the proposed project be in compliance with the Executive Memorandum on Beneficial Landscaping?

### Farmland Protection Policy Act (FPPA)

No Would the project require new ROW or permanent easements (do not include temporary easements)?

### General Comments

The proposed project would be constructed entirely within existing, previously disturbed ROW.



### TPWD Analysis Section

#### Texas Parks and Wildlife Coordination Conditions

- 1.   No   Is the project limited to a maintenance activity exempt from coordination?  
<http://txdot.gov/inside-tdot/division/environmental/maintenance-program.html>
- 2.   No   Has the project previously completed coordination with TPWD?

#### Tier I Site Assessment

#### MOU Triggers

- 1.   No   Is the project within range of a state threatened or endangered species or SGCN and suitable habitat is present?

Comments:

The proposed project is within the range of state threatened species, endangered species, or SGCN; however suitable habitat is not present.

Date [TPWD County](#) List Accessed: October 12, 2015

Date that the NDD was accessed: October 8, 2015

What agency performed the NDD search? TPWD



NDD Search Results for EOIDs and Tracked Managed Areas

EOID Number	Common Name	Scientific Name	Listing Status	Buffer Zone
11162	Texas Tauschia	<i>Tauschia texana</i>	State Species of Greatest Conservation Need (SGCN)	10 Mile
11159	Texas Tauschia	<i>Tauschia texana</i>	SGCN	10 Mile
5117	Houston Daisy	<i>Rayjacksonia aurea</i>	SGCN	10 Mile
7357	Threeflower Broomweed	<i>Thurovia triflora</i>	SGCN	10 Mile
6739	Corkwood	<i>Leitneria floridana</i>	SGCN	10 Mile
11071	Indianola Beakrush	<i>Rhynchospora indianolensis</i>	SGCN	10 Mile
11038	Indianola Beakrush	<i>Rhynchospora indianolensis</i>	SGCN	10 Mile
10431	Awnless Bluestem	<i>Bothriochloa exaristata</i>	SGCN	10 Mile
7849	Texas Windmill Grass	<i>Chloris texensis</i>	SGCN	10 Mile
7812	Texas Windmill Grass	<i>Chloris texensis</i>	SGCN	10 Mile
2089	Texas Windmill Grass	<i>Chloris texensis</i>	SGCN	10 Mile
3175	Little Bluestem-Brownseed Paspalum Series	<i>Schizachyrium scoparium-Paspalum plicatulum Series</i>	NA	10 Mile
1092	Water Oak-Willow Oak Series	<i>Quercus nigra-Quercus phellos Series</i>	NA	10 Mile
7621	Colonial Wading Bird Colony	NA	NA	10 Mile
6411	Colonial Wading Bird Colony	NA	NA	10 Mile
5069	Colonial Wading Bird Colony	NA	NA	10 Mile
4757	Colonial Wading Bird Colony	NA	NA	10 Mile
4756	Colonial Wading Bird Colony	NA	NA	10 Mile
3340	Colonial Wading Bird Colony	NA	NA	10 Mile
1076	Colonial Wading Bird Colony	NA	NA	10 Mile

2.   No   NDD and TCAP review indicates adverse impacts to remnant vegetation?

Comments:

No species or remnant vegetation were documented within a 1.5-mile radius of the project site.

3.   No   Does the project require a NWP with PCN or IP by USACE?

Comments:

There are no wetlands or waters of the U.S. located within the project area.

4.   No   Does the project include more than 200 linear feet of stream channel for each single and complete crossing of one or more of the following that is not already channelized or otherwise maintained:



**Biological Evaluation Form**

Comments:

There are no waters of the U.S. located within the project area.

- 5.   No   Does the project contain known isolated wetlands outside the TxDOT ROW that will be directly impacted by the project?

Comments:

There are no isolated wetlands outside the TxDOT ROW that will be directly impacted by the project.

- 6.   No   Would the project impact at least 0.10 acre of riparian vegetation?

Comments:

The project will not impact riparian vegetation.

- 7.   No   Does project disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement?

Comments:

The project does not disturb a habitat type in an area equal to or greater than the area of disturbance indicated in the Threshold Table Programmatic Agreement.

\*Attach associated file of EMST output (Mapper Report or other Excel File which includes MOU Type, Ecosystem Name, Common/Vegetation Type Name) in ECOS

Excel File Name:

BEF\_Vegetation.xlsx

- 7.1   Yes   Is there a discrepancy between actual habitat(s) and EMST mapped habitat(s)?

\*Explanation:

Table 1 and Figures 2 and 3 included in the attachments show the discrepancy between actual habitat and EMST mapped habitat.

Attach file showing discrepancy between actual and EMST mapped habitat(s).

File Name:

Table 1, showing vegetation discrepancies, is included as an attachment. Also attached are Figures 2 and 3 showing mapped and existing habitats.

### Is TPWD Coordination Required?

**No** - No coordination is required because no Coordination Conditions or MOU triggers were met.



## Findings

### *Endangered Species Act (ESA)*

No suitable habitat was observed for any federally listed species. Therefore, there would be no effect on federally listed species. However, measures to avoid harm to any threatened and endangered species would be taken should they be observed during construction of the proposed project. Coordination with the USFWS would not be required. The USFWS IPaC website was accessed on October 12, 2015.

### *Essential Fish Habitat (EFH)*

Essential fish habitat is defined by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. Tidally influenced waters do not occur within the project action area. Coordination with National Marine Fisheries Service (NMFS) is not required.

### *Coastal Barrier Resources Act (CBRA)*

The Coastal Barrier Resources Act (CBRA) established the Coastal Barrier Resources System to protect a defined set of geographic units along the coast of the U.S.

This project is not located within a designated CBRA map unit. Coordination with the U.S. Fish and Wildlife Service (USFWS) is not required.

### *Marine Mammal Protection Act (MMPA)*

Marine mammals are protected under the Marine Mammal Protection Act (MMPA). The Texas coast provides suitable habitat and is within range of several marine mammals including the West Indian Manatee (*Trichechus manatus*), and bottlenose dolphin (*Tursiops truncatus*).

The project area does not contain suitable habitat for marine mammals. Coordination with NMFS is not required.

### *Migratory Bird Treaty Act (MBTA)*

The Migratory Bird Treaty Act (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations.

A site survey did not identify active nests within the project action area. TxDOT will take all appropriate actions to prevent the take of migratory birds, their active nests, eggs, or young by the use of proper phasing of the project or other appropriate actions.

A MBTA appropriate EPIC will be included in the project file.

### *Bald and Golden Eagle Protection Act (BGEPA)*

The proposed project does not have the potential to impact Bald or Golden Eagles.



*Fish and Wildlife Coordination Act (FWCA)*

The Fish and Wildlife Coordination Act (FWCA) of 1958 requires that federal agencies obtain comments from USFWS and TPWD. This coordination is required whenever a project involves impounding, diverting, or deepening a stream channel or other body of water.

The proposed project would have no impact to Waters of the U.S. or wetlands and no Section 404 permit is required; therefore, no review by the U.S. Fish and Wildlife Service (USFWS).

*Executive Order 13112 on Invasive Species (EO 13112)*

Re-vegetation of disturbed areas would be in compliance with the Executive Order on Invasive Species (EO 13112). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

*Executive Memorandum on Beneficial Landscaping*

Landscaping would be a part of the proposed project activities. Re-vegetation of disturbed areas would be in compliance with the Executive Memorandum on Beneficial Landscaping (26Apr94). Regionally native and non-invasive plants will be used to the extent practicable in landscaping and re-vegetation.

Landscaping including with the proposed project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscaping practices.

*Farmland Protection Policy Act (FPPA)*

Coordination with the National Resources Conservation Service for FPPA would not be required because the project requires no additional ROW or permanent easements.

**Signatures:**

    No     Was this form completed by TxDOT environmental staff?

Prepared By: John Williams Title: Env. Scientist

[Signature] Date: 12/3/2015  
Signature

TxDOT Reviewer: Sabrina Stachowski Title: Environmental Specialist

**Sabrina Stachowski** Digitally signed by Sabrina Stachowski  
DN: cn=Sabrina Stachowski, o, ou, email=sabrina.stachowski@txdot.gov, c=US  
Date: 2015.12.03 07:56:42 -0600  
[Signature] Date: December 3, 2015  
Signature



## *Suggested Attachments*

**Aerial Map (with delineated project boundaries)**

**USFWS T&E List**

**TPWD T&E List**

**Species Impact Table**

**NDD EOID List and Tracked Managed Areas (Required for TPWD Coordination)**

**NOAA EFH Mapper Printout**

**USFWS CBRA Mapper Printout**

**EMST Project MOU Summary Table (Required for TPWD Coordination)**

**TPWD SGCN List**

**FPPA Documentation**

**NRCS Web Soil Survey Map**

**Census Bureau Urbanized Area Map**

**Landscaping Plans**

**Photos (Required for TPWD Coordination)**

**Previous TPWD Coordination Documentation (if applicable)**



The following table shows the revision history for this guidance document.

Revision History	
Effective Date Month, Year	Reason for and Description of Change
May 2014	Version 1 released.
August 2015	Version 2 released.  Revised the overall appearance to be more consistent with a form.  Upgraded the District and County selection fields for increased simplicity.  Included the NEPA Assignment MOU language for projects that are assigned to TxDOT under the NEPA Assignment MOU.  Revised the Endangered Species Act to distinguish between take/no take and affect based on the project having or not having a federal nexus.  Updated the Farmland Protection Policy Act questions to be more consistent with the applicable regulations.

**Attachments:**  
**Threatened and Endangered Species List**  
**NDD Map**  
**EMST Map and Table**  
**IPaC Trust Resource Report**

## **Threatened and Endangered Species List**

## HARRIS COUNTY

**Table 1: State and Federal Threatened and Endangered Species of Harris County**

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effect/Impact
<b>AMPHIBIANS</b>						
Houston toad	<i>Anaxyrus houstonensis</i>	E	E†	Sandy soil, breeds in ephemeral pools	No	No
Southern Crawfish Frog	<i>Lithobates areolatus areolatus</i>	SGCN		Abandoned crawfish holes and small mammal burrows. Found in moist meadows, pasturelands, pine scrub and river flood plains	No	No
<b>BIRDS</b>						
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	T	DM†	Potential migrant, nest in west Texas	No	No
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	SGCN	DM†	Potential migrant	No	No
Bald Eagle	<i>Haliaeetus leucocephalus</i>	T	DM	Near water areas, in tall trees	No	No
Black Rail	<i>Laterallus jamaicensis</i>	SGCN		Marshes, pond borders, wet meadows, and grassy swamps	No	No
Brown Pelican	<i>Pelecanus occidentalis</i>	SGCN	DM†	Island near coastal areas	No	No
Henslow Sparrow (wintering)	<i>Ammodramus henslowii</i>	SGCN		weedy fields, fields with bunch grass, vines, and brambles, need bare ground	No	No
Mountain Plover	<i>Charadrius montanus</i>	SGCN		Short grass plains and bare dirt (plowed fields)	No	No
Red-cockaded Woodpecker	<i>Picoides borealis</i>	E	E†	Nest in 60+ year pine, forages in 30+ pine	No	No
Red Knot	<i>Calidris camitus rufa</i>	SGCN	T†		No	No
Southeastern Snowy Plover	<i>Charadrius alexandrinus tenuirostris</i>	SGCN		Winter migrant on Texas coast beaches, bayside mud or salt flats	No	No
Sprague's Pipit	<i>Anthus spragueii</i>	SGCN	C†	Migrant, upland prairie, coastal grasslands	No	No
White-faced Ibis	<i>Plegadis chihi</i>	T	*	Freshwater marshes, but some brackish or salt marshes	No	No
White-tailed Hawk	<i>Buteo albicaudatus</i>	T	*	Coastal Prairies	No	No
Whooping Crane	<i>Grus americana</i>	E	E†	Winters in Aransas National Wildlife Refuge	No	No
Wood Stork	<i>Mycteria americana</i>	T	*	Prairie ponds and flooded pastures	No	No
<b>FISHES</b>						
American eel	<i>Anguilla rostrata</i>	SGCN		Coastal waterways below reservoirs to gulf	No	No
Creek chubsucker	<i>Erimyzon oblongus</i>	T	*	Variety of small rivers and creeks, prefers headwaters	No	No
Smalltooth sawfish	<i>Pristis pectinata</i>	E	E†	Sheltered bays, shallow banks, estuaries and river mouths	No	No
<b>MAMMALS</b>						
Louisiana black bear	<i>Ursus americanus luteolus</i>	T	T†	Bottomland hardwoods; large, undisturbed forested areas	No	No
Plains spotted skunk	<i>Spilogale putoria interrupta</i>	SGCN	*	Open fields, prairies, croplands, fence rows, farm yards, brushy areas, and tall grass prairies	No	No
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	T	*	Cavity trees in hardwood forest, concrete culverts, abandoned buildings	No	No
Red wolf	<i>Canis rufus</i>	E	E†	Extirpated, brushy, forested areas, coastal prairies	No	No
Southeastern myotis bat	<i>Myotis austroriparius</i>	SGCN		Cavity trees in hardwood forest, concrete culverts, abandon buildings	No	No
West Indian manatee	<i>Trichechus manatus</i>	--	E	Gulf and bay system	No	No
<b>MOLLUSKS</b>						
Louisiana pigtoe	<i>Pleurobema riddellii</i>	T	*	Streams & moderate-sized rivers, mud, sand, and gravel	No	No
Sandbank pocketbook	<i>Lampsilis satura</i>	T	*	Rivers with moderate to swift flows, gravel-sand, and sand	No	No

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effect/Impact
<b>MOLLUSKS</b>						
Texas pigtoe	<i>Fusconaia askewi</i>	T	*	Rivers with mixed mud, sand, and fine gravel in protected areas.	No	No
<b>REPTILES</b>						
Alligator snapping turtle	<i>Macrolemys temminckii</i>	T	*	Deep water of rivers and canals	No	No
Green sea turtle	<i>Chelonia mydas</i>	T	E, T†	Gulf and bay system	No	No
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	E†	Gulf and bay system	No	No
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E†	Gulf and bay system	No	No
Loggerhead Sea Turtle	<i>Caretta caretta</i>	T	T†	Gulf and bay system	No	No
Texas horned lizard	<i>Phrynosoma cornutum</i>	T	*	Open, semi-arid regions, with bunch grass	No	No
Timber/Canebrake rattlesnake	<i>Crotalus horridus</i>	T	*	Swamps/floodplains of hardwood/upland pine	No	No
<b>VASCULAR PLANTS</b>						
Coastal gay-feather	<i>Liatris bracteata</i>	SGCN		Coastal prairie grasslands	No	No
Florida ladies-tresses	<i>Spiranthes brevilabris var. floridana</i>	SGCN		Moist to wet, open sites, pine dominated uplands, open scrub pinelands w/ saw palmetto.	No	No
Giant sharpstem umbrella-sedge	<i>Cyperus cephalanthus</i>	SGCN		on saturated, fine sandy loam soils or on heavy black clay	No	No
Houston daisy	<i>Rayjacksonia aurea</i>	SGCN		barren, sparsely vegetated saline slicks, pimple mounds, on sandy to sandy loam.	No	No
Neglected coneflower	<i>Echinacea paradoxa var. neglecta</i>	SGCN		Rocky prairies, glades and crosstمبر open woodlands & savannas, full sun.	No	No
Panicled indogobush	<i>Amorpha paniculata</i>	SGCN		Acid seep forests, peat bogs, wet floodplain forests, & seasonal wetlands on the edge of Saline Prairies.	No	No
Texas ladies tresses	<i>Spiranthes brevilabris var. brevilabris</i>	SGCN		Sandy soils in moist prairies,	No	No
Texas meadow-rue	<i>Thalictrum texanum</i>	SGCN		woodlands and woodland margins on sandy loam, on pimple mounds, clay pan savannahs	No	No
Texas prairie dawn	<i>Hymenoxys texana</i>	E	E	Poorly drained areas in open grasslands; pimple mounds	No	No
Texas windmill Grass	<i>Chloris texensis</i>	SGCN		Sandy to sandy loam soils in bare areas	No	No
Threeflower broomweed	<i>Thurovia triflora</i>	SGCN		low vegetation, on light colored silt or fine sand over saline clay.	No	No

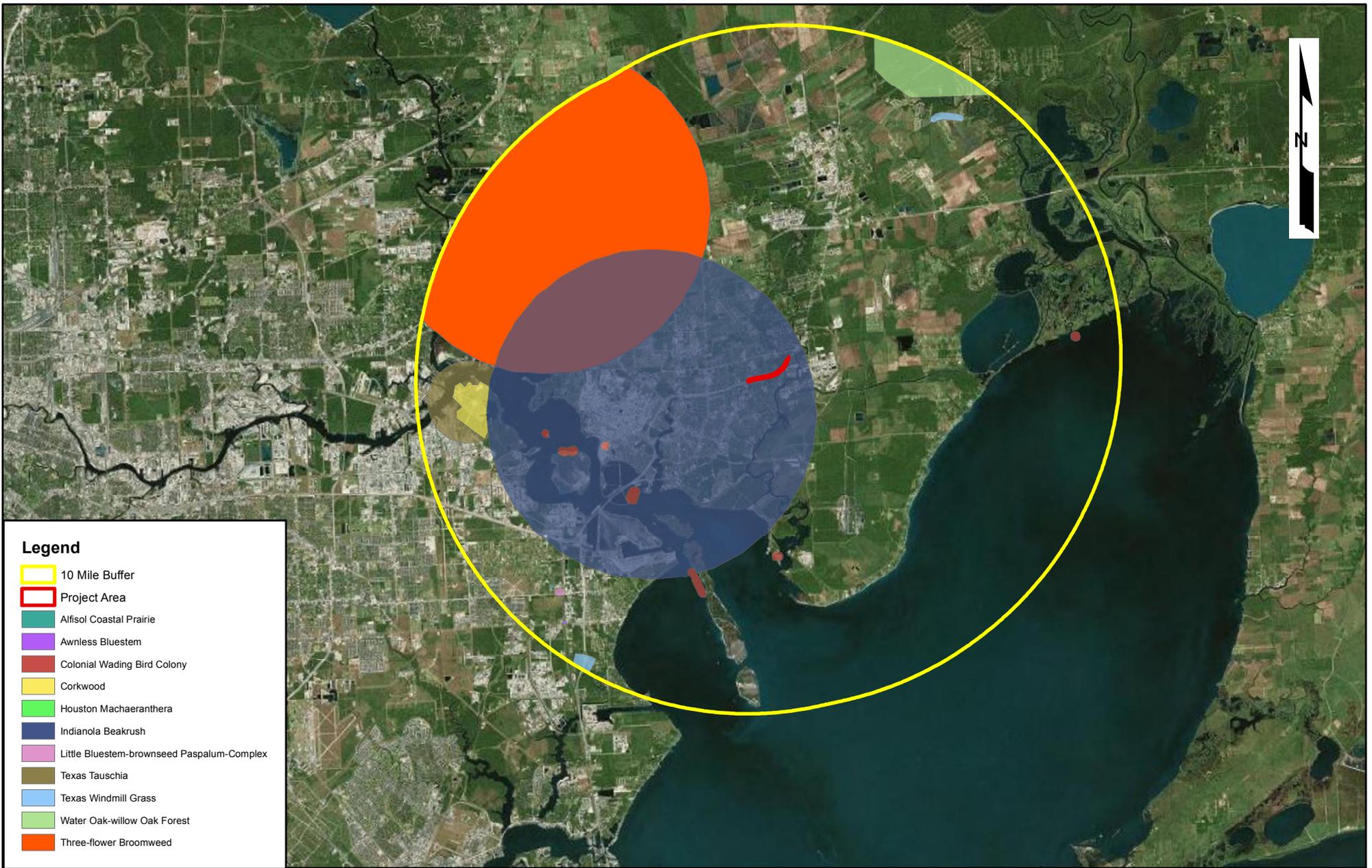
\* These species occur on the State listing of threatened or endangered species; however, they are not federally listed at this time by the U.S. Fish and Wildlife Service (2011).

† These species are listed by the U.S. Wildlife Service; however, they are not listed to occur within this county by the Clear Lake office of the U.S. Fish and Wildlife Service (2011).

-- Not listed for Texas Parks and Wildlife for this county 9/28/11)

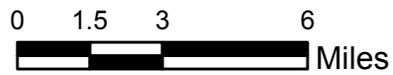
E = endangered T = threatened H = historical occurrence I = introduced population C = candidate species SGCN = species of greatest conservation need DM = delisted taxon, recovered, being monitored first five years SAT = similarity of appearance to a threatened taxon, D = delisted taxon, PDL= proposed delisting

## **NDD Map**



**Legend**

- 10 Mile Buffer
- Project Area
- Alfisol Coastal Prairie
- Awnless Bluestem
- Colonial Wading Bird Colony
- Corkwood
- Houston Machaeranthera
- Indianola Beakrush
- Little Bluestem-brownseed Paspalum-Complex
- Texas Tauschia
- Texas Windmill Grass
- Water Oak-willow Oak Forest
- Three-flower Broomweed



**SH146**  
 NDD DATABASE SEARCH  
 (10 MILE RADIUS)  
 (BS 146E TO FERRY RD)

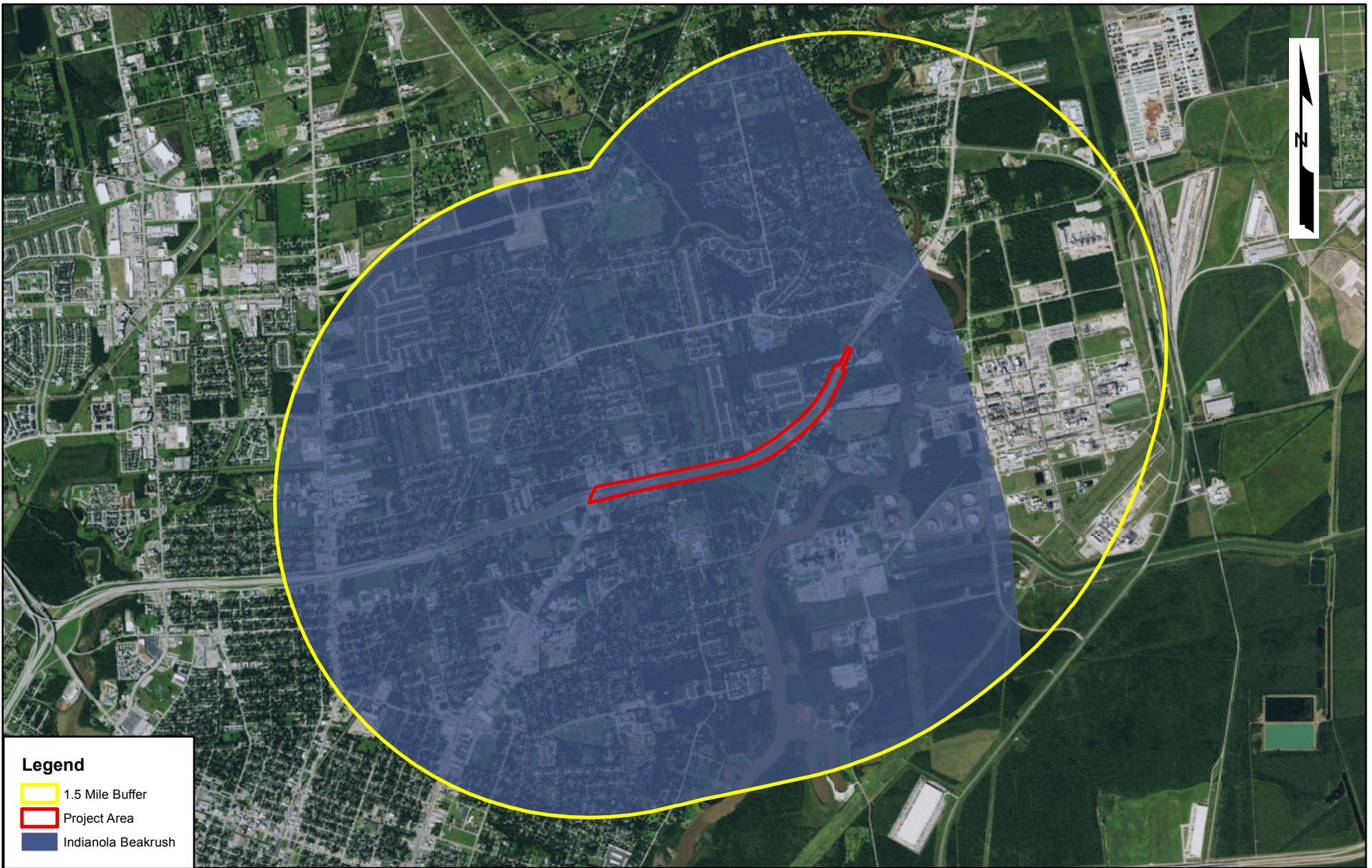


FIGURE 1A

HARRIS COUNTY, TEXAS

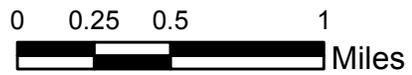
PREPARED BY:  
 ECOSYSTEM  
 PLANNING &  
 RESTORATION

DATE:  
 OCT.  
 2015



**Legend**

-  1.5 Mile Buffer
-  Project Area
-  Indianola Beakrush



**SH146**  
 NDD DATABASE SEARCH  
 (10 MILE RADIUS)  
 (BS 146E TO FERRY RD)



FIGURE 1B

HARRIS COUNTY, TEXAS

PREPARED BY:  
 ECOSYSTEM  
 PLANNING &  
 RESTORATION

DATE:  
 OCT.  
 2015

## **EMST Table and Exhibits**



0 300 600 1,200  
 Feet

SH 146  
 TPWD MAPPED ECOLOGICAL SYSTEMS MAP  
 (BS 146E TO FERRY RD)

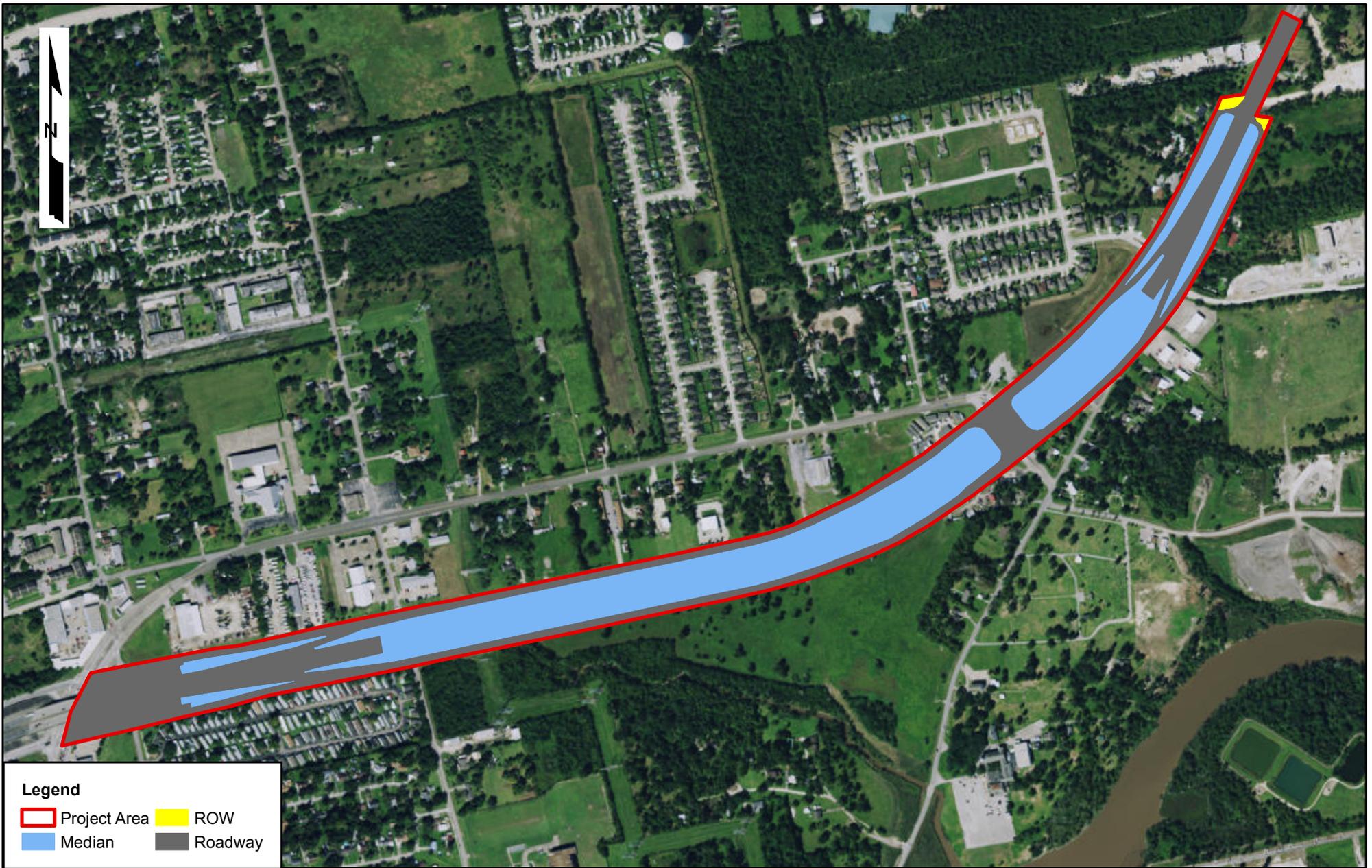


FIGURE 2

HARRIS COUNTY, TEXAS

PREPARED BY:  
 ECOSYSTEM  
 PLANNING &  
 RESTORATION

DATE:  
 OCT.  
 2015



**Legend**  
 [Red Outline] Project Area [Yellow Fill] ROW  
 [Blue Fill] Median [Grey Fill] Roadway

0 300 600 1,200  
 [Scale Bar] Feet

**SH146**  
 TPWD EXISTING CONDITION ECOLOGICAL SYSTEMS MAP  
 (BS 146E TO FERRY RD)



FIGURE 3

HARRIS COUNTY, TEXAS

PREPARED BY:  
 ECOSYSTEM  
 PLANNING &  
 RESTORATION

DATE:  
 OCT.  
 2015

**Table 2: Vegetation Impacts**

MOU Habitat Type	TPWD Mapped Ecological Systems within Project Area (acres) <i>See Figure 2</i>	Existing Condition Ecological Systems (acres) <i>See Figure 3</i>	Direct Impacts to Existing Condition Ecological Systems (acres)	Coordination Threshold (acres)	Coordination Required (yes/no)
Coastal Grassland	25.26	NA	NA	2.0	No
Disturbed Prairie	0.22	NA	NA	3.0	No
Urban	29.58	55.06	55.06	NA	No

## **IPaC Trust Resource Report**

# SH 146

## *IPaC Trust Resource Report*

Generated October 12, 2015 02:56 PM MDT

This report is for informational purposes only and should not be used for planning or analyzing project-level impacts. For projects that require FWS review, please return to this project on the IPaC website and request an official species list from the Regulatory Documents page.



US Fish &amp; Wildlife Service

# IPaC Trust Resource Report



## Project Description

**NAME**

SH 146

**PROJECT CODE**

S3T2P-VDKAF-HXVOD-YXORK-NJZR6I

**LOCATION**

Harris County, Texas

**DESCRIPTION**

The City of Baytown, in conjunction with the Texas Department of Transportation (TxDOT), proposes to improve State Highway (SH) 146 with the construction on four main lanes over 0.87 miles in the existing right-of-way (ROW) between Business Highway (BS) 146 and Ferry Road in Baytown, Harris County, Texas. The proposed project limits, including areas of restriping, extend approximately 1.45 miles and include the construction of a grade separation for the main lanes of SH 146 over North Alexander



## U.S. Fish & Wildlife Contact Information

Species in this report are managed by:

**Texas Coastal Ecological Services Field Office**

17629 El Camino Real, Suite 211

Houston, TX 77058-3051

(281) 286-8282

# Endangered Species

Proposed, candidate, threatened, and endangered species that are managed by the [Endangered Species Program](#) and should be considered as part of an effect analysis for this project.

This unofficial species list is for informational purposes only and does not fulfill the requirements under [Section 7](#) of the Endangered Species Act, which states that Federal agencies are required to "request of the Secretary of Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action." This requirement applies to projects which are conducted, permitted or licensed by any Federal agency.

A letter from the local office and a species list which fulfills this requirement can be obtained by returning to this project on the IPaC website and requesting an official species list on the Regulatory Documents page.

## Birds

### **Least Tern** *Sterna antillarum* **Endangered**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind related projects within migratory route.

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B07N>

### **Piping Plover** *Charadrius melodus* **Threatened**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind related projects within migratory route.

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B079>

### **Red Knot** *Calidris canutus rufa* **Threatened**

THIS SPECIES ONLY NEEDS TO BE CONSIDERED IF THE FOLLOWING CONDITION APPLIES

Wind related projects within migratory route.

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B0DM>

### **Sprague's Pipit** *Anthus spragueii* **Candidate**

CRITICAL HABITAT

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B0GD>

## Flowering Plants

### **Texas Prairie Dawn-flower** *Hymenoxys texana*

**Endangered****CRITICAL HABITAT**

**No critical habitat** has been designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=Q2RK>

## Mammals

### **West Indian Manatee** *Trichechus manatus*

**Endangered****CRITICAL HABITAT**

There is **final** critical habitat designated for this species.

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=A007>

## Critical Habitats

Potential effects to critical habitat(s) within the project area must be analyzed along with the endangered species themselves.

There is no critical habitat within this project area

# Migratory Birds

Birds are protected by the [Migratory Bird Treaty Act](#) and the Bald and Golden Eagle Protection Act.

Any activity which results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service (1). There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured.

You are responsible for complying with the appropriate regulations for the protection of birds as part of this project. This involves analyzing potential impacts and implementing appropriate conservation measures for all project activities.

<p><b>American Oystercatcher</b> <i>Haematopus palliatus</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G8">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0G8</a></p>	<b>Bird of conservation concern</b>
<p><b>Bald Eagle</b> <i>Haliaeetus leucocephalus</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B008</a></p>	<b>Bird of conservation concern</b>
<p><b>Black Rail</b> <i>Laterallus jamaicensis</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09A</a></p>	<b>Bird of conservation concern</b>
<p><b>Black Skimmer</b> <i>Rynchops niger</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EO">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0EO</a></p>	<b>Bird of conservation concern</b>
<p><b>Brown-headed Nuthatch</b> <i>Sitta pusilla</i> Year-round</p>	<b>Bird of conservation concern</b>
<p><b>Dickcissel</b> <i>Spiza americana</i> Season: Breeding</p>	<b>Bird of conservation concern</b>
<p><b>Fox Sparrow</b> <i>Passerella iliaca</i> Season: Wintering</p>	<b>Bird of conservation concern</b>
<p><b>Gull-billed Tern</b> <i>Gelochelidon nilotica</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JV">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JV</a></p>	<b>Bird of conservation concern</b>
<p><b>Henslow's Sparrow</b> <i>Ammodramus henslowii</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09D">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B09D</a></p>	<b>Bird of conservation concern</b>
<p><b>Hudsonian Godwit</b> <i>Limosa haemastica</i> Season: Migrating</p>	<b>Bird of conservation concern</b>
<p><b>Le Conte's Sparrow</b> <i>Ammodramus leconteii</i> Season: Wintering</p>	<b>Bird of conservation concern</b>
<p><b>Least Bittern</b> <i>Ixobrychus exilis</i> Season: Breeding</p>	<b>Bird of conservation concern</b>
<p><b>Least Tern</b> <i>Sterna antillarum</i> Season: Breeding</p>	<b>Bird of conservation concern</b>

<b>Lesser Yellowlegs</b> <i>Tringa flavipes</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Loggerhead Shrike</b> <i>Lanius ludovicianus</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FY</a>	<b>Bird of conservation concern</b>
<b>Long-billed Curlew</b> <i>Numenius americanus</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06S</a>	<b>Bird of conservation concern</b>
<b>Marbled Godwit</b> <i>Limosa fedoa</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0JL</a>	<b>Bird of conservation concern</b>
<b>Mississippi Kite</b> <i>Ictinia mississippiensis</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Nelson's Sparrow</b> <i>Ammodramus nelsoni</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Painted Bunting</b> <i>Passerina ciris</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Peregrine Falcon</b> <i>Falco peregrinus</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0FU</a>	<b>Bird of conservation concern</b>
<b>Prothonotary Warbler</b> <i>Protonotaria citrea</i> Season: Breeding	<b>Bird of conservation concern</b>
<b>Red Knot</b> <i>Calidris canutus rufa</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0DM</a>	<b>Bird of conservation concern</b>
<b>Red-headed Woodpecker</b> <i>Melanerpes erythrocephalus</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Reddish Egret</b> <i>Egretta rufescens</i> Year-round <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06U">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B06U</a>	<b>Bird of conservation concern</b>
<b>Rusty Blackbird</b> <i>Euphagus carolinus</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Sandwich Tern</b> <i>Thalasseus sandvicensis</i> Year-round	<b>Bird of conservation concern</b>
<b>Seaside Sparrow</b> <i>Ammodramus maritimus</i> Year-round	<b>Bird of conservation concern</b>
<b>Sedge Wren</b> <i>Cistothorus platensis</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Short-billed Dowitcher</b> <i>Limnodromus griseus</i> Season: Wintering	<b>Bird of conservation concern</b>
<b>Short-eared Owl</b> <i>Asio flammeus</i> Season: Wintering <a href="https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD">https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?spcode=B0HD</a>	<b>Bird of conservation concern</b>
<b>Snowy Plover</b> <i>Charadrius alexandrinus</i> Season: Breeding	<b>Bird of conservation concern</b>

**Swainson's Warbler** *Limnothlypis swainsonii*

Season: Breeding

**Bird of conservation concern****Whimbrel** *Numenius phaeopus*

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B0JN>**Bird of conservation concern****Wilson's Plover** *Charadrius wilsonia*

Season: Breeding

**Bird of conservation concern****Worm Eating Warbler** *Helmitheros vermivorum*

Season: Migrating

**Bird of conservation concern****Yellow Rail** *Coturnicops noveboracensis*

Season: Wintering

<https://ecos.fws.gov/speciesProfile/profile/speciesProfile.action?sPCODE=B0JG>**Bird of conservation concern**

## Refuges

Any activity proposed on [National Wildlife Refuge](#) lands must undergo a 'Compatibility Determination' conducted by the Refuge. If your project overlaps or otherwise impacts a Refuge, please contact that Refuge to discuss the authorization process.

There are no refuges within this project area

# Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes.

Project proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate [U.S. Army Corps of Engineers District](#).

## DATA LIMITATIONS

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

## DATA EXCLUSIONS

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

## DATA PRECAUTIONS

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

There are no wetlands identified in this project area