



# Final Environmental Assessment

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## SH 146 (BS 146E to Ferry Road)

Houston District  
CSJ Number 0389-13-039

Harris County, Texas

June 2018

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## List of Acronyms

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation
ACS	American Community Survey
ADT	average daily traffic
APE	area of potential effect
BMP	Best Management Practices
BGPA	Bald and Golden Eagle Protection Act
CAA	Clean Air Act
CBRA	Coastal Barrier Resources Act
CEQ	Council on Environmental Quality
CMAQ	Congestion Mitigation and Air Quality
CMP	Coastal Management Program
CO	carbon monoxide
CWA	Clean Water Act
DHHS	U.S. Department of Health and Human Services
EA	Environmental Assessment
EFH	Essential Fish Habitat
EMST	Ecological Mapping System of Texas
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FWCA	Fish and Wildlife Coordination Act
FM	Farm-to-Market Road
FONSI	Finding of No Significant Impact
FTA	Federal Transit Administration
FY	Fiscal Year
FPPA	Farmland Protection Policy Act
HEI	Health Effects Institute
HGAC	Houston-Galveston Area Council
IBWC	U.S. Section of the International Boundary and Water Commission
IPaC	Information for Planning and Consultation (USFWS)
IRIS	Integrated Risk Information System
LEP	Limited English Proficiency
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act

MOU	Memorandum of Understanding
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NDD	Natural Diversity Database
NEPA	National Environmental Policy Act of 1969
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OSHM	Official State Historical Marker
PALM	Potential Archeological Liability Map
PA-TU	Programmatic Agreement Regarding the Implementation of Transportation Undertakings
PM	particulate matter
PWC	Texas Parks and Wildlife Code
RTEST	Rare, Threatened, and Endangered Species of Texas (TPWD)
RTP	Region Transportation Plan
ROW	right-of-way
RRC	Railroad Commission of Texas
RTHL	Recorded Texas Historical Landmarks
SAL	State Archaeological Landmark
SH	State Highway
SHPO	State Historic Preservation Office
SOV	single-occupancy vehicle
STIP	Statewide Transportation Improvement Program
SW3P	Storm Water Pollution Prevention Plan
TCEQ	Texas Commission on Environmental Quality
TERP	Texas Emissions Reduction Plan
THC	Texas Historical Commission
TIP	Transportation Improvement Plan
TMDL	Total Maximum Daily Load
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks & Wildlife Department
TSS	total suspended sediments
TWDB	Texas Water Development Board

TxDOT	Texas Department of Transportation
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VMT	vehicle miles traveled
VPD	vehicles per day
WOUS	Waters of the U.S.

## 1.0 INTRODUCTION

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 is included in **Appendix A** and photographs of the project location are included in **Appendix B**.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, Council on Environmental Quality (CEQ) Regulations (40 CFR §1502.13), FHWA Technical Advisory T6640.8A, and TxDOT guidance documents. Upon project initiation, federal funding was anticipated for this project; therefore, most of the technical studies were written to federal standards. However, funding has changed over the years and the project is being cleared as a State funded EA project. This EA was made available for public review and TxDOT has considered comments received at the public meeting and hearing for the project. If TxDOT determines that there are no significant adverse effects, the Department will prepare and sign a Finding of No Significant Impact, which will be made available to the public. A description of the public involvement is provided in Section 7.0.

## 2.0 PROJECT DESCRIPTION

### 2.1 *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 **Appendix C**. Typical sections of the existing and proposed roadways are depicted in **Appendix D**. 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

## **2.2 Proposed Facility**

Federal regulations require that federally funded transportation projects have logical termini. 23 CFR 771.111(f)(1). Simply stated, this means that a project must have rational beginning and end points. Those end points may not be created simply to avoid proper analysis of environmental impacts. The proposed project's logical termini are BS 146 to Ferry Road. These points were chosen as the logical termini because the proposed project would tie into the existing SH 146 mainlanes that terminate at BS 146 to the west of the proposed project and that terminate at Ferry Road to the east of the proposed project. 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 (Dr.). The proposed project limits are approximately 1.45 miles from North Alexander Drive in the west to 0.1 miles northeast of Baytown Loop in the east. No new ROW would be acquired. Proposed project plans include 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

Federal regulations require that a project have independent utility and be a reasonable expenditure even if no other transportation improvements are made in the area. 23 CFR 771.111(f)(2). This means a project must be able to provide benefit by itself, and that the project not compel further expenditures to make the project useful. Stated another way, a project must be able to satisfy its purpose and need with no other projects being built. The proposed project would address capacity and design deficiencies by developing SH 146 into a continuous freeway with mainlanes, which satisfies the project's need. The proposed project stands alone and does not require the construction of any other project to satisfy the stated purpose and need of the project; therefore, it cannot and does not irretrievably commit federal funds. Federal law prohibits a project from restricting consideration of alternatives for other reasonably foreseeable transportation improvements. 23 CFR 771.111(f)(3). This means that a project must not dictate or restrict any future roadway alternatives. The proposed project is the continuation of an existing freeway and would not restrict the consideration of alternatives for other foreseeable transportation improvements.

***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 projected ADT for SH 146 2021 and in the design year 2040 are reported in **Table 1**.

**Table 1: Average Daily Traffic (ADT)**

Location	2021	2040	2045
SH 146 from West of Elvinta Street to Ferry Road	39,600	53,300	56,900

The construction limits for the proposed project extend from BS 146 to Ferry Road. However, 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.

The Houston-Galveston Area Council (H-GAC) adopted the 2040 Region Transportation Plan (RTP) on January 23, 2015 and Fiscal Year (FY) 2017-2020 Transportation Improvement Program (TIP) on May 27, 2016. The U.S. Department of Transportation (USDOT), which includes FHWA/Federal Transit Administration (FTA) found the 2040 RTP Update and 2017-2020 TIP to conform to the State Implementation Plan (SIP). The proposed

project (CSJ: 0389-13-039) is listed in the 2040 RTP updated on July 8, 2016 and the 2017-2020 TIP adopted on May 27, 2016, and the 2017-2020 Statewide Transportation Improvement Program approved on December 19, 2016. The project RTP, TIP, and STIP pages have been included in **Appendix E**. The proposed project would cost an estimated \$47,090,744.

### **3.0 PURPOSE AND NEED**

#### **3.1 Need**

The proposed project is needed because of increasing traffic volumes within the project area and because SH 146 is currently a discontinuous freeway. Traffic is currently routed to frontage roads that do not meet the design criteria for a high-speed freeway. In addition, traffic flow along SH 146 is currently interrupted by the existing signalized intersection at North Alexander Drive. SH 146 is also designated hurricane evacuation route.

#### **3.2 Supporting Facts and/or Data**

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. 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.

#### **3.3 Purpose**

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 2040 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.

## **4.0 ALTERNATIVES**

### **4.1 *Build Alternative***

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.

### **4.2 *No Build Alternative***

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. The No-Build Alternative would not meet or satisfy the purpose and need of the proposed project since future transportation volume demands would not be met; however, the No-Build Alternative is being carried forward for comparison purposes.

### **4.3 *Preliminary Alternatives Considered but Eliminated from Further Consideration***

There were no preliminary alternatives considered for the proposed project other than the Build and No Build alternative. The proposed project would be constructed within existing ROW between existing frontage roads; therefore, alternatives to changes to alignment are limited.

## **5.0 AFFECTED ENVIRONMENT and ENVIRONMENTAL CONSEQUENCES**

The following technical reports and forms were prepared in support of this EA. These topics are addressed in the EA but are covered in greater detail within their respective reports. Copies of these documents are found at the Houston District Office and will be available at future public involvement activities.

- Wetland Delineation Report
- Traffic Noise Technical Report
- Hazardous Materials Initial Site Assessment Report
- Biological Evaluation Form

### **5.1 *Right-of-way/Displacements***

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.

### **5.2 *Land Use***

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.

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.

### **5.3 Farmlands**

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.

### **5.4 Utilities/Emergency Services**

The No Build Alternative would have no effect on utilities or emergency services.

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.

### **5.5 Bicycle and Pedestrian Facilities**

The No Build Alternative would have no effect on bicycle or pedestrian facilities, which are not currently provided along existing SH 146 in the project area.

For the Build Alternative, the inclusion of bicycle and pedestrian facilities were evaluated in compliance with TxDOT and USDOT policy. 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.

## **5.6 Community Impacts**

### Community Cohesion

Community cohesion is a term that refers to an aggregate quality of social, economic, and physical attributes that give definition to a geographic area often designated as a neighborhood or community. The FHWA defines cohesion as “those behaviors or perceptual relationships that are shared among residents of a community that cause the community to be identifiable as a discrete, distinctive geographic entity.” As such, a cohesive community enables residents to have a sense of belonging to their neighborhood or community and/or a strong attachment to neighbors, groups and institutions as a continual association over time.

As defined in the FHWA Technical Advisory T 6640.8A, changes in community cohesion because of highway construction and improvements may be beneficial or adverse. The No Build Alternative would not affect the existing structure of local communities; however, deterioration of mobility may occur with increased traffic volumes since the road will continue to be used heavily. As a result, future negative effects to community structure may occur from the No Build Alternative.

SH 146 is an existing community boundary, the proposed project does not require additional ROW, and would not result in permanent changes to access or travel patterns. The proposed main lanes will be built in the grass median between two existing high-speed travel lanes; therefore, the existing community boundary would not be made wider. Overall, the project is not anticipated to have a significant adverse effect on community cohesion, as SH 146 is an existing facility that already serves as a boundary between neighborhoods and communities.

### Access and Travel Patterns

Under the No Build Alternative, there will continue to be no restriction of access along SH 146 and cars will remain the primary mode of transportation.

In the short term, an increase in traffic congestion and potential changes in travel patterns would be expected during roadway construction of the Build Alternative. 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 mobility to the area would have a positive impact for residents in the vicinity of 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 would not permanently impact travel patterns. 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.

### 5.6.1 Environmental Justice

#### Minority Populations

For this analysis, the census blocks located adjacent the project area were analysed for race/ethnicity and compared to the city of Baytown and Harris County. The blocks located within the adjacent census block groups were chosen as the limits of this study because based on the locations of the roadways surrounding the proposed project these blocks would be the most likely to be impacted by the proposed projects. The proposed project does not require additional ROW and overall will improve mobility within the project area; therefore, the proposed project would most likely impact adjacent blocks.

There are a total of 28 blocks within 3 block groups adjacent to the project area; of these, 17 have no recorded population. Of the remaining 11 blocks, there are 4 blocks where 50% or more of residents belong to ethnic or racial minority groups (**Table 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 Population by Census Block**

Geographic Area	Total Pop.	Not Hispanic or Latino						% Hispanic or Latino of Any Race	%Total Minority Pop.
		%Black/African American	%AIAN*	%Asian	%NHPI*	%Other Race	%Two or More Races		
<b>Blocks within Block Group 3 (Census Tract 2538)</b>									
3001	2	0	0	0	0	0	0	0	0
3002	No Recorded Population								
3003	812	12.6	0.49%	0	0	0.49	1.97	50.62	66
3007	No Recorded Population								
3013	No Recorded Population								
3022	No Recorded Population								

**Table 2: Minority Population by Census Block (cont.)**

Geographic Area	Total Pop.	Not Hispanic or Latino						% Hispanic or Latino of Any Race	%Total Minority Pop.
		%Black/African American	%AIAN*	%Asian	%NHPI*	%Other Race	%Two or More Races		
<b>Blocks within Block Group 1 (Census Tract 2539)</b>									
1001	19	0	0	0	0	0	0	5.26	5
1002	No Recorded Population								
1003	No Recorded Population								
1004	No Recorded Population								
<b>Blocks within Block Group 1 (Census Tract 2539) cont.</b>									
1005	No Recorded Population								
1007	No Recorded Population								
1008	No Recorded Population								
1009	No Recorded Population								
1010	278	2.16	0.36				1.08	52.16	56
1014	No Recorded Population								
1015	No Recorded Population								
1016	18						5.56	16.67	22
<b>Blocks within Block Group 2 (Census Tract 2539)</b>									
2002	24		4.17					54.17	58
2009	27							48.15	48
2013	5	100							100
2015	59						5.08	15.25	20
2016	No Recorded Population								
2017	No Recorded Population								
2018	35	5.17					14.29	65.71	86
2028	No Recorded Population								
2031	3	0	0	0	0	0	0	0	0
2032	No Recorded Population								
<b>28 Block Area Total</b>	1282	9.05	0.47	0.00	0.00	0.31	2.18	48.2%	60
<b>City of Baytown</b>	67686	15	0	1	0	0	1	45	63
<b>Harris County</b>	4,092,459	18	0.2	6	0.1	0.2	1	41	67

### Low-income Populations

Census block groups located within and adjacent to the project area were analyzed using ACS 5-year (2012-2016) estimates for low-income populations and compared to the city of Baytown and Harris County. Within the census block group area analyzed, the median income is above the current (2018) poverty guideline for a family of four (\$25,100/year), as defined by the DHHS (**Table 3**).

**Table 3: Median Household Income**

Geographic Area	Median Household Income
Harris County	\$55,584
City of Baytown	\$49,930
Census Tract 2538, Block Group 3	\$48,565
Census Tract 2539, Block Group 1	\$41,417
Census Tract 2569, Block Group 2	\$44,688

Source: ACS 5-year estimates (2012-2016) B19013

### EJ Determination

In order to determine if the proposed project would result in “disproportionately high and adverse effects” on a minority or low-income population or deny them benefits of the Build Alternative, several additional factors are also considered:

- Displacements: The proposed project would be constructed entirely within existing ROW and would not require displacements.
- Transportation Needs: Impacts to access and travel patterns will occur throughout the project corridor and will not be limited to one community, including those with higher minority or low-income populations. Any inconveniences of the roadway being used for access to residences or businesses would be minimized during project construction.
- Exposure to pollution and hazardous materials: There may be short term, localized effects to air quality (i.e. dust) as well as noise levels generated by construction equipment during construction; however, these effects would be temporary and not selectively limited to minority or low-income communities.

Access and construction impacts would also be spread throughout the project area and not targeted in a specific community. Because no adverse impacts are anticipated for EJ communities in the project area, the

proposed project would not have a disproportionately high or adverse impact on minority and/or low-income populations.

### 5.6.2 Limited English Proficiency

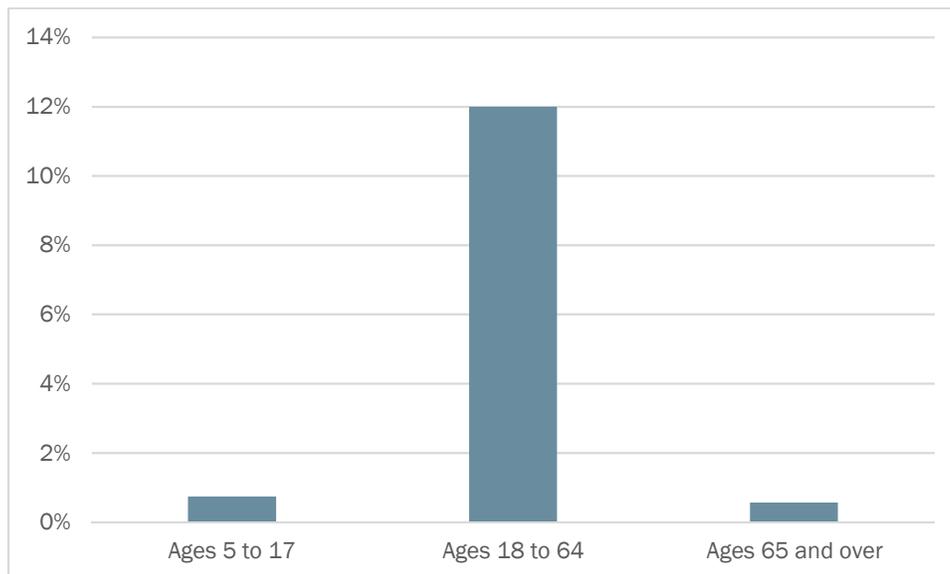
Executive Order 13166, entitled "Improving Access to Services for Persons with Limited English Proficiency (LEP)", mandates that Federal agencies examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so LEP persons can have meaningful access to them. It is expected that agency plans will provide for such meaningful access consistent with, and without unduly burdening, the fundamental mission of the agency. Each agency shall also work to ensure that recipients of Federal financial assistance (recipients) provide meaningful access to their LEP applicants and beneficiaries (65 Federal Register 50123, August 16, 2000).

The census block group within or adjacent to the project area, were analyzed to determine the percent of persons who speak English less than 'very well', which is considered LEP.

According to the 2012-2016 American Community Survey 5-year estimates, within the 3 census block group area analyzed, there are a total of 4,067 persons age 5 to age 65 and over. Of the 1,653 people (41 percent) that spoke a language other than English, 541 people (33 percent) speak English less than "very well" (have difficulty with English and thus is considered a person of LEP). The highest proportion of the total population, of individuals who speak English less than "very well" is portion of the population age 18 to 64 (12 percent), followed by the population age 15 to 17 (1 percent), and the population age 65 and over (1 percent). The majority of LEP individuals within the study area speak Spanish.

Comparatively, in both Harris County LEP individuals make up 20% of the total population and in the city of Baytown LEP individuals make up 16 percent of the total population. The age breakdown for LEP persons in the one group area is shown in **Figure 1**.

**Figure 1: Percent Population by Age Group Who Speak English Less Than "Very Well"**



Source: American Community Survey 2012-2016 5-year Estimate

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. A Public Hearing was held on June 29, 2017 to present the proposed improvements and to receive public comment on the proposed project. Newspaper announcements in both English (*Houston Chronicle* and *The Baytown Sun*) and Spanish (*La Sabasta*) newspapers were published to provide opportunities for citizens to request language interpreters. Persons who own property directly adjacent to the proposed project received the meeting notices and any additional notices in both English and Spanish. The project information brochure and comment forms provided at Public Hearing were printed in English and Spanish. In addition, a Spanish speaking translator was present at the Public Hearing. Given that the predominate language of LEP persons adjacent to the project area is Spanish and outreach has occurred in both English and Spanish, which will continue for future public outreach, it can be concluded that LEP persons have been given the opportunity to be meaningfully involved in the NEPA process.

### **5.7 Visual/Aesthetic Impacts**

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.

The No Build Alternative would have no direct effects on visual or aesthetic qualities; however, increased traffic congestion could lead to impacts on the existing facility or surrounding area. The Build Alternative would not result in a loss of visual or aesthetic quality and would remain similar to the quality of the existing facility.

### **5.8 Cultural Resources**

Cultural resources are 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, 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 (ACT) apply to these projects. Compliance with these laws requires consultation with the Texas Historical Commission (THC), the Texas State Historic Preservation Office (SHPO), and/or federally-recognized tribes to determine the project's effects on cultural resources. Under Federal and Texas law, cultural resources can be considered eligible for listing on the National Register of Historic Places (NRHP) or as a State Antiquities Landmark (SAL) if they meet criteria outlined in 36 CFR 60.4 or under the Texas Natural Resources Code Title 9, Chapter 191, Subchapter D. Review and coordination of this project followed approved procedures for compliance with federal and state laws.

#### **5.8.1 Archaeology**

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.

### **5.8.2 Historic Properties**

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 resources on 11 parcels (built prior to 1969) located within the proposed project APE.

TxDOT historians have evaluated the historic 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. 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 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.

### **5.9 DOT Act Section 4(f), LWCF Act Section 6(f), and PWC Chapter 26**

Section 4(f) of the U.S. Department of Transportation Act applies to the following two categories of resources: 1) publicly owned, significant and accessible parks, recreation areas, and wildlife and waterfowl refuges; and

2) significant historic and archeological sites, regardless of whether they are publicly or privately owned. The proposed project would not impact any Section 4(f) resources.

The proposed project would not impact any areas requiring Texas Parks and Wildlife Chapter 26 coordination. There are no Land and Water Conservation Act Section 6(f) resources in the project area.

## **5.10 Water Resources**

### **5.10.1 Clean Water Act Section 404**

The No Build Alternative would not affect jurisdictional wetlands or WOUS identified within the subject property.

A wetland delineation was conducted, in April 2018, in accordance with the 1987 Corps of Engineers Wetland Delineation Manual and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region. Based on observations and data collected in the field, one waters of the U.S. (Stream 1) was delineated within the project area. Stream 1 is 304.11 linear feet within the project area and flows through two concrete box culverts under the existing frontage roads and maintained median. Pond Gully flows into Cedar Creek, which flows into Galveston Bay south of the project area. Pond Gully is considered jurisdictional.

The Build alternative would not impact Stream 1 and no additional waters of the U.S. or wetlands were delineated within the project area.

The Build Alternative would not require USACE authorization under Section 404 of the CWA prior to the discharge of fill materials into WOUS, including wetlands.

### **5.10.2 Clean Water Act Section 401**

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

### **5.10.3 Executive Order 11990 Wetlands**

Executive Order 11990 requires that federally funded projects minimize the ‘destruction, loss or degradation’ of wetlands, which is similar to the CWA Section 404(b)(1) guidelines. This is not a federally funded project and therefore EO 11990 (“Protection of Wetlands”) does not apply.

### **5.10.4 Rivers and Harbors Act**

No waters regulated under the Rivers and Harbors Act are found within the project area. Therefore, neither a Section 9 or 10 permit of the Rivers and Harbors Act is required for this project.

### **5.10.5 Clean Water Act Section 303(d)**

Two waterbodies (Cedar Bayou Tidal and Goose Creek Tidal) are located within a 5-mile radius of the project area are listed as impaired on the TCEQ 2014 Section 303(d) List. Cedar Bayou Tidal (Segment 0901) is listed as impaired for bacteria, dioxin and polychlorinated biphenyls (PCBs) in edible tissue. Goose Creek Tidal (Segment 2426C) is listed as impaired for dioxin and PCBs in edible tissue. Runoff from the proposed project would discharge into Cedar Bayou Tidal.

To date, TCEQ has not identified (through either a total maximum daily load (TMDL) or the review of projects under the TCEQ MOU) a need to implement control measures beyond those required by the construction general permit (CGP) on road construction projects. Therefore, compliance with a

project's CGP, along with coordination under the TCEQ MOU for certain transportation projects, collectively meets the need to address impaired waters during the environmental review process.

303(d) coordination with the TCEQ is required and was completed by TxDOT on April 20, 2016. Runoff from the proposed project would discharge into waters within 5 miles upstream of Segment 0901. The assessment unit does not have an EPA-approved TMDL, however 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.

#### **5.10.6 Clean Water Act Section 402**

CWA Section 402 is the basis for the NPDES program, the permitting of which is administered at the state level. The Build Alternative would disturb more than five acres; therefore, TxDOT would be required to comply with the TCEQ - TPDES General Permit for Construction Activity. Since TPDES Construction General Permit (CGP) authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the project. The Project Development Process Manual and the Plans, Specifications, and Estimates (PS&E) Preparation Manual require a storm water pollution prevention plan (SWP3) be included in the plans of all projects that disturb one or more acres. The Construction Contract Administration Manual requires that the appropriate CGP authorization documents (notice of intent or site notice) be completed, posted, and submitted, when required by the CGP, to TCEQ and the municipal separate storm sewer system (MS4) operator. It also requires that projects be inspected to ensure compliance with the CGP.

The PS&E Preparation Manual requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the "Required Specification Checklists" require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SWP3, and to complete the appropriate authorization documents.

The proposed project is located within Phase II Baytown Urbanized Area Municipal Separate Storm Sewer System (MS4). A Notice of Intent (NOI) would also need to be filed with the city of Baytown stating that TxDOT would have a Storm Water Pollution Prevention Plan (SW3P) in place during construction of the proposed project. This SW3P will utilize the temporary control measures as outlined in the Department's manual "Standard Specifications for the Construction of Highways, Streets, and Bridges". Effects would be minimized by avoiding work by construction equipment directly in the stream channels and/or adjacent areas. No long-term water quality impacts are expected.

The contractor would take appropriate measures to prevent, minimize, and control the spill of fuels, lubricants, and hazardous materials in the construction staging area. All materials being removed and/or disposed of by the contractor would be done in accordance to state and federal laws and by the approval of the Project Engineer.

#### **5.10.7 Floodplains**

The proposed project is not located within a FEMA designated 100-year floodplain. A floodplain map has been included as **Figure 5**.

#### **5.10.8 Wild and Scenic Rivers**

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition. There are no waters designated as Wild and Scenic Rivers within the project area.

#### **5.10.9 Coastal Barrier Resources**

The Coastal Barrier Resources Act (CBRA) was enacted by Congress in 1982 to discourage development in certain coastal areas that are vulnerable to hurricane damage and that are host to valuable natural resources. The act designated certain undeveloped coastal areas as part of the Coastal Barrier Resources System and made those areas ineligible for most new federal expenditures and financial assistance. 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

#### **5.10.10 Coastal Zone Management**

The proposed project is not located within the Texas Coastal Management Program (CMP) boundary; therefore, the Texas CMP does not apply to the proposed project.

#### **5.10.11 Edwards Aquifer**

Harris County is not over the recharge or contributing zones of the Edwards Aquifer; therefore, the project is not subject to regulation under TCEQ's Edwards Aquifer rules.

#### **5.10.12 International Boundary and Water Commission**

The project does not encroach upon floodplains of flood control projects or rights-of-way under the jurisdiction of the US Section of the International Boundary and Water Commission (IBWC). Therefore, no license or permit will be required from the IBWC to proceed with this project.

#### **5.10.13 Drinking Water Systems**

Per the TWBD Groundwater Data Viewer, there are no private water wells within the project area. Nor are there any public wells located in the area based on the TCEQ's Source Water Assessment Viewer. Based on these findings, the project will have no impacts on groundwater via private or public wells.

## 5.11 Biological Resources

### 5.11.1 Texas Parks and Wildlife Coordination

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. However, no Coordination Conditions or MOU triggers were met and coordination with TPWD is not required for the proposed project.

### 5.11.2 Impacts to Vegetation

The project area is located within the EPA’s Western Gulf Coastal Plains Level III Ecoregion and the Northern Humid Gulf Coastal Prairie Level IV Ecoregion. The proposed project is entirely 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*).

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 using TPWD Ecological Mapping System of Texas (EMST) data and field reconnaissance. An existing condition assessment was performed by a qualified biologist to compare mapped TPWD EMST boundaries with the actual habitat found in the project area. 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 4** 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 4: Vegetation Impacts**

Ecological System Type	TPWD Mapped Ecological Systems within Project Area (acres)	Existing Condition Ecological Systems (acres)	Existing Condition Ecological Systems Direct Impacts (acres)	Coordination Threshold (acres)	Coordination Required (yes/no)
Coastal Grassland	25.26	NA	NA	2.0	No
Disturbed Prairie	0.01	NA	NA	3.0	No
Urban	29.58	55.06	55.06	NA	NA

### 5.11.3 Executive Order 13112 on Invasive Species

This project is not subject to Executive Order 13112 because it is not a federally funded undertaking. Landscaping will be conducted in accordance with the department’s Roadside Vegetation Management Manual and Landscape and Aesthetics Design Manual.

#### 5.11.4 Executive Memorandum on Environmentally and Economically Beneficial Landscaping

This project is not subject to this Executive Memorandum because it is not a federally funded undertaking. Landscaping will be conducted in accordance with the department's Roadside Vegetation Management Manual and Landscape and Aesthetics Design Manual.

#### 5.11.5 Impacts to Wildlife

The vegetation types located within the project area could support various wildlife species, such as small birds and mammals. Some mammalian species may continue to exist for years in these areas because of their ability to adapt to urban development. Typical mammals that could occur within the study area include Virginia opossum (*Didelphis virginiana*), house mouse (*Mus musculus*), common raccoon (*Procyon lotor*), and hispid cotton rat (*Sigmodon hispidus*).

Birds that could occur within these areas include Cooper's hawk (*Accipiter cooperii*), cattle egret (*Bubulcus ibis*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), rock pigeon (*Columba livia*), black vulture (*Coragyps atratus*), American crow (*Corvus brachyrhynchos*), northern mockingbird (*Mimus polyglottos*), American robin (*Turdus migratorius*) and mourning dove (*Zenaida macroura*). These birds could occur in the project area on a transient basis.

Reptiles and amphibians common to disturbed areas in southeast Texas include Texas brown snake (*Storeria dekayi*), Texas ratsnake (*Pantherophis obsoletus*), western cottonmouth (*Agkistrodon piscivorus*), little brown skink (*Scincella lateralis*), Gulf Coast toad (*Incilius nebulifer*), Rio Grande chirping frog (*Eleutherodactylus cystignathoides*), and southern leopard frog (*Lithobates sphenoccephala*).

Given that the proposed project is along an existing transportation corridor, no new barriers to wildlife movement would be introduced. Temporary effects to wildlife include the decreased attractiveness of habitat adjacent to the project corridor as well as possible disturbances to normal behavior patterns as a result of increased noise levels due to construction activities. Given that the project area is largely urbanized and that any existing wildlife habitat is regularly maintained, it is unlikely to permanently impact or cause displacement to wildlife species in the area. Since the project location does not permanently impact wildlife or the habitat described above, compensatory mitigation would not be offered.

#### 5.11.6 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) forbids the 'take' of migratory birds and their nests, which also includes during construction. While there is potential for migratory birds to nest within the project area, no nests were found during initial surveys. To document compliance with the MBTA, the following commitments will be incorporated.

- No active migratory bird nests (nests containing eggs and/or young) will be removed or destroyed at any time of the year.
- No colonial nests (swallows, for example) on or in structures will be removed until all nests in the colony become inactive.
- Measures, to the extent practicable, will be used to prevent or discourage migratory birds from building nests within portions of the project area planned for construction.
- Inactive nests will be removed from the project area to minimize the potential for reuse by migratory birds.

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

The Fish and Wildlife Coordination Act (FWCA) requires consultation with the U.S. Fish and Wildlife Service (USFWS) when “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified”. Any impacts to WOUS will necessitate a permit from the USACE before project construction, which will satisfy this requirement.

#### **5.11.8 Bald and Golden Eagle Protection Act of 2007**

The Bald and Golden Eagle Protection Act (BGPA) forbids ‘take’ of bald and golden eagle parts, nests, or eggs. The range of the golden eagle does not extend to southeast Texas. There is no nesting or foraging habitat for the bald eagle within the project area or within its immediate vicinity. Therefore, no additional coordination is required for this species.

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

The Magnuson-Stevens Fishery Conservation and Management Act of 1996, which established procedures for identifying Essential Fish Habitat (or, EFH), and the Marine Mammal Protection Act (MMPA). 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. Due to the project’s lack of habitat for the species addressed in these laws, no further coordination with resource agencies is required.

#### **5.11.10 Marine Mammal Protection Act**

The Magnuson-Stevens Fishery Conservation and Management Act of 1996, which established the Marine Mammal Protection Act (MMPA). The proposed project does not contain a tidally influenced water body; therefore, the requirements of MMPA do not apply. Due to the project’s lack of habitat for the species addressed in these laws, no further coordination with resource agencies is required.

#### **5.11.11 Threatened, Endangered, and Candidate Species**

Federal and state listed threatened and endangered species for Harris County were determined using the USFWS’ Information for Planning and Consultation (IPaC) database and the TPWD’s Rare, Threatened, and Endangered Species of Texas (RTEST) database. The TPWD Natural Diversity Database (NDD) was used to determine past and present occurrence information of state and federally listed threatened and endangered species, as well as natural communities deemed unique or vulnerable. These ‘element occurrence’ records were requested (November 10, 2017) and reviewed to determine those listed species and natural communities documented within a 10-mile radius of the project area. 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.

No effects due to fragmentation, loss of connectivity, barrier effects, or edge effects are anticipated. The proposed project would have no effect on any known population or individuals of state and/or federally listed threatened or endangered species. Furthermore, the project would not directly or indirectly effect or diminish the value of any other critical habitat for the survival or recovery of any listed species.

## 5.12 Air Quality

### Project Conformity

This project is located within Harris County, which is part of the Houston-Galveston-Brazoria area that has been designated by EPA as a moderate nonattainment area for the 2008 Ozone national ambient air quality standards (NAAQS); therefore, transportation conformity rules apply.

The proposed action is consistent with the Houston-Galveston Area Council (H-GAC)'s financially constrained 2040 Regional Transportation Plan (RTP) and the 2017-2020 Transportation Improvement Program (TIP), as amended. The RTP was initially found to conform to the TCEQ State Implementation Plan (SIP) by FHWA and FTA on September 11, 2015, and the TIP received a federal conformity determination on December 19, 2016. Copies of the MTP and TIP pages are included in Appendix C. All projects in the HGAC 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.

### Traffic Air Quality Analysis

Traffic data for the estimated time of completion (ETC) year 2022 and design year 2040 is 39,600 vehicles per day and 53,300 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 annual average 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.

### Hot Spot Analysis

The project is not located within a CO/PM10 nonattainment or maintenance area; therefore, a project level hot spot analysis is not required.

### Mobile Source Air Toxics (MSAT)

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 nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-cancer hazard contributors from the 2011 National Air Toxics Assessment (NATA) (<https://www.epa.gov/national-air-toxics-assessment>). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, 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.

### *Motor Vehicle Emissions Simulator (MOVES)*

According to EPA, MOVES2014 is a major revision to MOVES2010 and improves upon it in many respects. MOVES2014 includes new data, new emissions standards, and new functional improvements and features. It incorporates substantial new data for emissions, fleet, and activity developed since the release of MOVES2010.

These new emissions data are for light- and heavy-duty vehicles, exhaust and evaporative emissions, and fuel effects. MOVES2014 also adds updated vehicle sales, population, age distribution, and vehicle miles travelled (VMT) data. MOVES2014 incorporates the effects of three new Federal emissions standard rules not included in MOVES2010.

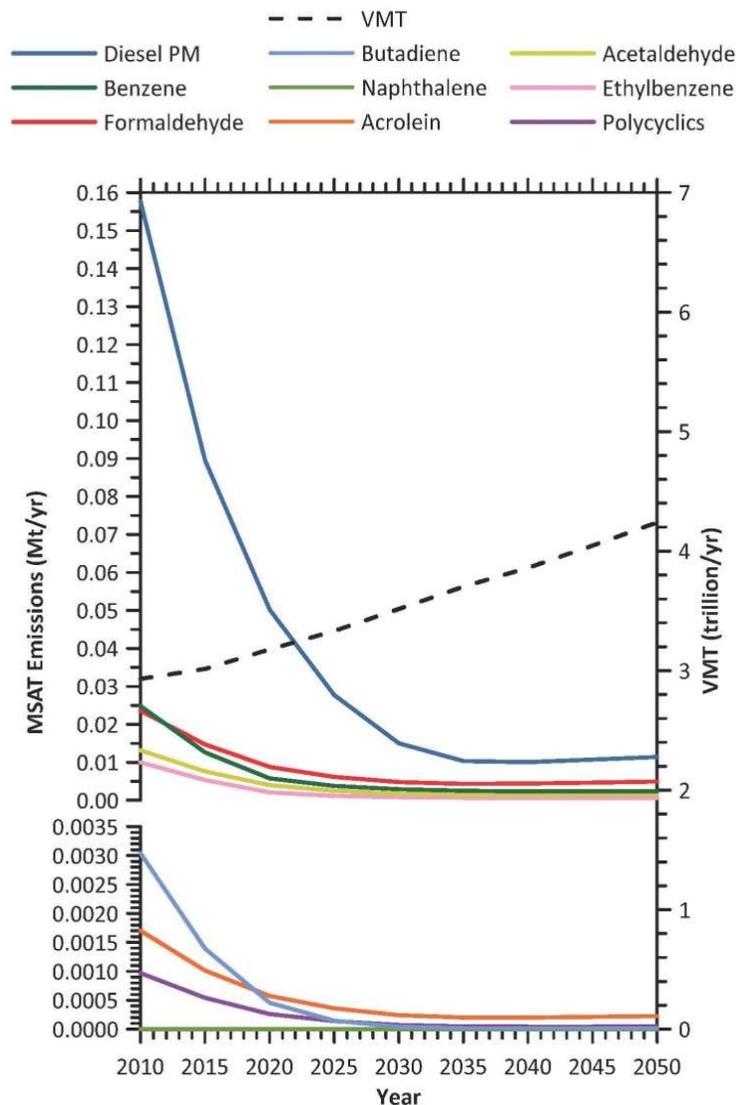
These new standards are all expected to impact MSAT emissions and include Tier 3 emissions and fuel standards starting in 2017 (79 FR 60344), heavy-duty greenhouse gas regulations that phase in during model years 2014-2018 (79 FR 60344), and the second phase of light duty greenhouse gas regulations that phase in during model years 2017-2025 (79 FR 60344).

Since the release of MOVES2014, EPA has released MOVES2014a. In the November 2015 MOVES2014a Questions and Answers Guide

<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100NNR0.txt> EPA states that for on-road emissions, MOVES2014a adds new options requested by users for the input of local VMT, includes minor updates to the default fuel tables, and corrects an error in MOVES2014 brake wear emissions. The change in brake wear emissions results in small decreases in PM emissions, while emissions for other criteria pollutants remain essentially the same as MOVES2014.

Using EPA's MOVES2014a model, as shown in **Figure 1**, FHWA estimates that even if VMT increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emissions for the priority MSAT is projected for the same time period.

**Figure 2: FHWA PROJECTED NATIONAL MSAT EMISSION TRENDS 2010-2050 FOR VEHICLES OPERATING ON ROADWAYS USING EPA'S MOVES2014a MODEL**



Source: EPA MOVES2014a model runs conducted by FHWA, September 2016.

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, meteorological, and other factors.

Diesel PM is the dominant component of MSAT emissions, making up 50 to 70 percent of all priority MSAT pollutants by mass, depending on calendar year. Users of MOVES2014a will notice some differences in emissions compared with MOVES2010b. MOVES2014a is based on updated data on some emissions and pollutant processes compared to MOVES2010b, and also reflects the latest Federal emissions standards in place at the time of its release. In addition, MOVES2014a emissions forecasts are based on lower VMT

projections than MOVES2010b, consistent with recent trends suggesting reduced nationwide VMT growth compared to historical trends.

### *MSAT Research*

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 potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA. The FHWA, EPA, the 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 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 FHWA entitled A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives, found at:

[https://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/research\\_and\\_analysis/mobile\\_source\\_air\\_toxics/msatemissions.cfm](https://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.cfm).

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 MOVES2014 model, emissions of all of the priority MSAT decrease as speed increases. 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 90 percent between 2010 and 2050 (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016 -

[http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/msat/index.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm). 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 portion of SH 146 where the mainlanes would be constructed for BS 146E to Ferry Road. 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 region-wide MSAT levels to be significantly lower than today.

### **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). A number of HEI studies are summarized in Appendix D of FHWA's Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents

[http://www.fhwa.dot.gov/environment/air\\_quality/air\\_toxics/policy\\_and\\_guidance/msat/index.cfm](http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm). 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 Special Report 16, <https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects> or in the future as vehicle emissions substantially decrease.

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 unsupported 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 (Special Report 16, <https://www.healtheffects.org/publication/mobile-source-air-toxics-critical-review-literature-exposure-and-health-effects> . As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA states that with respect to diesel engine exhaust, “[t]he absence of adequate data to develop a sufficiently confident dose-response relationship from the epidemiologic studies has prevented the estimation of inhalation carcinogenic risk (EPA IRIS database, Diesel Engine Exhaust, Section II.C. [https://cfpub.epa.gov/ncea/iris/iris\\_documents/documents/subst/O642.htm#quainhal](https://cfpub.epa.gov/ncea/iris/iris_documents/documents/subst/O642.htm#quainhal)

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 ([https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/\\$file/07-1053-1120274.pdf](https://www.cadc.uscourts.gov/internet/opinions.nsf/284E23FFE079CD59852578000050C9DA/$file/07-1053-1120274.pdf)).

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.

### **Congestion Management Process (CMP) Analysis**

This project is not an FHWA project; therefore, a project level CMP analysis is not required.

### **Construction Emissions**

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: <https://www.tceq.texas.gov/airquality/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.

### **5.13 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.

In December 2017, a fourth Regulatory Database Search and an ISA Form were completed to capture any additional records added between March 2013 and the present. The December 2017 Regulatory Database search identified 25 sites within the ASTM and TxDOT standard search radii. The 25 sites were reviewed and determined to not be of environmental concern to the proposed project. The locations of all the sites identified and a complete listing of the federal and state regulated sites searched can be found in the Hazardous Materials Initial Site Assessment Form located at the TxDOT Houston District Office.

An analysis of the ISA data and results from the May 2010, August 2011, March 2013, and December 2017 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).

#### Oil/Gas Wells

A review of the Railroad Commission of Texas (RRC) Well Bore database was performed in May 2018 and indicated there are no oil/gas wells located within the project area or adjacent to the project area; therefore, no impact to oil/gas wells is anticipated from the proposed project.

The potential impacts typically associated with the production of oil and gas include surface soil contamination

and Naturally Occurring Radioactive Material (NORM) issues. Elevated NORM issues may be an environmental concern in oil fields, especially where water injection has been used as a secondary recovery technique, or water disposal has occurred. However, no oil/gas wells are located within the project area; therefore, NORM hazards would likely not impact the project. Based on the absence of producing wells within the project area, the proposed project would have a minimal risk of NORM issues.

#### 5.14 Traffic Noise

This noise analysis was accomplished in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011). Existing and predicted traffic noise levels were modeled at receiver locations (**Appendix F, Figures 6A and 6B**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

As indicated in **Table 5**, the proposed project would result in traffic noise impacts.

**Table 5: Traffic Noise Levels dB(A) Leq**

Representative Receiver	NAC Category	NAC Level	Existing	Predicted 2044	Change (+/-)	Noise Impact
R1 – Church (interior)	D	52	47	47	0	No
R2 – Residential	B	67	69	71	2	Yes
R3 – Residential	B	67	70	70	0	Yes
R4 – Residential	B	67	71	70	-1	Yes
R5 – Residential	B	67	72	70	-2	Yes
R6 – Residential	B	67	63	65	2	No
R7 – Residential	B	67	59	62	3	No
R8 – Residential	B	67	60	62	2	No
R9 – Residential	B	67	58	61	3	No
R10 – Residential	B	67	61	64	3	No
R11 – Residential	B	67	64	66	2	Yes
R12 – Residential	B	67	69	69	0	Yes
R13 – Residential	B	67	62	65	3	No
R14 – Residential	B	67	60	63	3	No
R15 – Residential	B	67	59	62	3	No
R16 – Residential	B	67	64	65	1	No
R17 – Residential	B	67	63	65	2	No
R18 – Residential	B	67	62	63	1	No
R19 – Residential	B	67	64	66	2	Yes
R20 – Residential	B	67	64	66	2	Yes
R21 – Residential	B	67	64	66	2	Yes

Noise barriers were evaluated at five residential areas. A noise barrier would be reasonable and feasible at one location: Chase Village Mobile Home Park. Noise levels and barrier descriptions are included in **Table 6**.

**Table 6: Traffic Noise Levels dB(A) Leq**

Barrier	Representative Receivers	Total # Benefitted	Length	Height	Total Cost	\$/ Benefitted Receiver
1	R2-R5	37	1,432	12	\$309,312	\$8,360

Noise barriers are proposed, but the final decision to construct barriers will not be made until the competition of project design, utility evaluation and polling of adjacent property owners.

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2044) noise impact contours (**Table 7**).

**Table 7: Noise Impact Contours**

Land Use	Impact Contour	Distance from Edge of Pavement
NAC Category B&C	66 dB(A)	125 feet
NAC Category E	71 dB(A)	25 feet

Noise associated with the construction of the 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. No extended disruption of normal activities is expected. Provisions will 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.

A copy of this traffic noise analysis will be available to local officials. 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 project.

### 5.15 Induced Growth

The purpose of this section is to assess the potential for the proposed project to induce growth in a defined Area of Influence (AOI). Project-induced growth is considered an indirect effect, which is defined by CEQ regulations as those:

*“...effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects 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” (40 CFR 1508.8).*

Utilization of TxDOT’s *Induced Growth Indirect Impacts Decision Tree* (April 2014), and *Risk Assessment for Indirect Impacts* (April 2014) demonstrated that the proposed project required an induced growth analysis because it: 1) is located in an area with available, developable land; 2) would add capacity; 3) is inside a MPO planning boundary (HGAC); and 4) would significantly increase mobility in an area experiencing substantial population growth.

This section was developed using the Indirect Impacts Analysis Guidance (TxDOT 2016), which incorporates guidance from the 2002 National Cooperative Highway Research Program (NCHRP) Report 466 Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (NCHRP 2002), and the American Association of State Highway and Transportation Officials’ (AASHTO) Practitioner’s Handbook 12: Assessing Indirect Effects and Cumulative Impacts Under NEPA (AASHTO 2011).

In accordance with TxDOT guidance, the current analysis is focused on project-induced development effects, which are also called induced growth effects (NCHRP 2002). Induced growth effects are most often related to changes in mobility or accessibility to an area, which in turn affects the area’s attractiveness for development. Current TxDOT guidance established the following 6-step process to determine the potential for induced growth and its potential impacts:

**Table 8: Six-Step Approach to Conduct an Indirect Impact Analysis**

Step	Guidelines
1	Define the methodology.
2	Define the area of influence (AOI) and study timeframe
3	Identify areas subject to induced growth in the AOI
4	Determine if growth is likely to occur in the induced growth areas.
5	Identify resources subject to induced growth impacts.
6	Identify mitigation if applicable.

Source: TxDOT 2016.

Methodology

A planning judgment approach was the primary form of analysis used to identify development trends and the potential impact of the proposed project on regional land use patterns. Geographic information system (GIS)-based cartographic techniques were also utilized to quantify the amounts of developed land, developable land, and undevelopable land. This Cartographic Technique exercise utilized GIS software to analyze data (i.e., parcel information, aerial mapping) combined with constraints layers (i.e. FEMA floodplain mapping) and the proposed alignment outline, to determine the amount of currently developed land versus land available for development within the AOI.

Land that is not yet developed but is already planned for development was not included in the total amount of developable land as it is assumed that this land will be developed, regardless of whether the project is constructed. Land was assumed to be planned for development if the parcel was owned by a land development company or builder. However, the development of vacant, available land is considered possible

but not necessarily probable. The purpose of this indirect effects analysis is to determine if future development could be causally linked to the proposed roadway improvement project.

#### Define AOI and Study Timeframe

Indirect effects associated with a project can occur at a distance in time or space from the project itself (NCHRP Report 466 2002). The area studied for indirect effects will be referred to as the Area of Influence (AOI) to distinguish it from the study area used to assess the direct effects of the proposed project. The AOI encompasses approximately 4.9 square miles (3,140 acres) in Harris County (**Figure 7**). The AOI includes the area in which the proposed improvements to SH 146 could influence land development, based primarily on potential travel patterns.

The project proposes to construct a typical four-lane freeway section on SH 146 between two crossings of N. Alexander Drive for a distance of less than a mile. These lanes will largely convey through traffic; local traffic will generally use the existing frontage roads. Therefore, the east and west limits of the AOI extend only a short distance from each end of the project boundary, corresponding to the county line/Cedar Bayou to the east, and the Southern Pacific Railroad to the west. The north and south boundaries of the AOI generally correspond to Cedar Bayou Lynchburg Road and Ward Road, respectively. Based on the location of collector roads and access points to SH 146, it was assumed that most of the traffic within this north-south boundary would use and access SH 146 in the project area; therefore, greater capacity along this section of SH 146 would have the most influence on potential development in this area.

The temporal boundary for induced growth effects analysis ends in 2040. The year 2040 corresponds with the design year and the horizon dates for long-range planning documents and demographic forecasts that were made available for this study. Performance of the proposed project beyond 2040 cannot yet be reasonably evaluated.

#### Identify areas subject to induced growth in the AOI

Land within the AOI was classified as developed or undeveloped based on existing land use using current aerial photos, and publicly available County tax records. Undeveloped lands identified as parks and open space, cemeteries, and utilities rights-of-way were classified as undevelopable. In addition, there is a FEMA regulated floodway along Cedar and Cary Bayous that was also classified as undevelopable, though there is existing development in some of these areas. In general, higher density residential or commercial development is greatly restricted in the FEMA floodway. Any land not already developed, planned for development, or classified as undevelopable was considered developable land (**Table 9**).

**Table 9. Acres of Land Available for Project-Influenced Development within the AOI**

Existing Land Uses		Acres	% of Total AOI (3,140 acres)
Total Developed Land		2,586	82%
Total Undeveloped Land		554	18%
Undeveloped Land Analysis	Planned Development	31	1%
	Undevelopable Land	306	10%
Total Developable Land		217	7%

Determine if growth is likely to occur in the induced growth areas

This section includes information about trends that characterize the AOI over time. In general, the growth in Baytown and the immediate vicinity reflects the large amounts of growth occurring in Harris County over the past two decades as shown in terms of population change (**Table 10**) and number of structures being built (**Table 11**).

Harris County is the third-most populous county in the U.S. and will continue to grow at about the same pace in the future (**Table 12**). Baytown itself, both the city proper and its Census-County Division (CCD), has experienced much less growth compared to Harris County as a whole but is expected to sustain current growth levels into 2040 as well.

**Table 10: Current and Historic Population Growth in the Project Vicinity, 1990-2010**

Geography	Total Population by Year			
	1990	2000	2010	% Change from 1990 to 2010
City of Baytown*	63,850	66,430	71,802	12.5%
Baytown CCD+	N/A	68,507	72,734	6.2%
Harris County	2,818,199	3,400,578	4,092,459	45%

\* Includes small areas within Chambers County

+The Baytown CCD captures unincorporated areas in close proximity to the Baytown City limits and is contained entirely within Harris County.

Source: U.S. Census

**Table 11: Year Structure Built/Percent Built by Decade within Jurisdictions in the AOI, 1990-2014**

Geography	Total Homes	Year Structure Built/% Built Within Decade					
		1990-1999		2000-2009		2010 or later	
City of Baytown	29,419	2,672	9%	4,868	17%	1,263	4%
Baytown CCD	29,688	2,618	9%	4,357	15%	1,295	4%
Harris County	1,720,570	226,177	13%	346,144	20%	99,786	6%

Source: American Community Survey (Table B25034), "Year Structure Built".

**Table 12: Projected Population Growth in the Project Vicinity, 2010-2040**

City or County*	Total Population by Year (Projected 2020-2040)*				
	2010	2020	2030	2040	% Change from 2010-2040
City of Baytown	71,802	75,689	77,666	79,814	11%
Harris County	4,092,459	4,707,870	5,058,144	5,376,099	31%

Source: Texas Water Development Board (TWDB) 2016 Regional Water Plan Population 2020-2070

\*The TWDB does not provide future population estimates for the Baytown CCD.

The proposed project would improve mobility within the AOI and reduce the time-cost of travel, enhancing the attractiveness of the surrounding area to commuters and consumers. However, the AOI is largely already developed with industrial, residential, and commercial uses, and there is a limited amount of land in the AOI that is considered developable (Table 12). Any land development in the AOI is expected to continue regardless of whether the proposed project proceeds, as Baytown is projected to grow at the same rate in the future. Other factors, such as real estate market conditions, city financing opportunities for various public facility improvements, anticipated growth, and other local roadway improvements also play a role in nearby land development investment decisions. Additionally, the proposed main lanes will be built in the grass median between two existing high-speed travel lanes; therefore, access to adjacent parcels will not change. Therefore, no induced growth is anticipated from the proposed project and no mitigation for indirect impacts is proposed.

## **5.16 Cumulative Impacts**

As addressed by the CEQ, cumulative impacts are defined 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).

TxDOT’s Cumulative Impacts Analysis Guidelines (July 2016), Cumulative Impacts Decision Tree (April 2014), and Cumulative Impacts Risk Assessment (April 2014) were utilized to determine if the proposed project required a cumulative impacts analysis. It was determined that the proposed project would not require a Cumulative Impacts Assessment because the project would not have substantial direct or indirect impacts to any resource and no resources within the project area are in poor or declining health.

## **5.17 Construction Phase 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.

## **6.0 AGENCY COORDINATION**

The proposed project required 303(d) coordination with the TCEQ, the coordination was completed by TxDOT on April 20, 2016

The proposed project did not require Early Coordination with Texas Parks and Wildlife. The proposed project does not have impacts to wetlands or WOUS; therefore, coordination with the USACE is not required. The proposed project did not require coordination with the U.S. Fish and Wildlife Service because the proposed project would not affect any federally listed species. Coordination with the NRCS was not required because the proposed project is 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.

## **7.0 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.

A Public Hearing was held on June 29, 2017 to present the proposed improvements and to receive public comment on the proposed project. The hearing was advertised in the Houston Chronicle (June 14, 2017), the Baytown Sun (June 14, 2017), and La Sabasta (June 9, 2017). The public was given the opportunity to provide verbal and written comments regarding the proposed project. The project information brochure and comment forms provided at Public Hearing were printed in English and Spanish. In addition, a Spanish speaking translator was present at the Public Hearing. Representatives from TxDOT and TxDOT's consultant team were available throughout the public hearing to answer questions and further explain project details. A formal presentation was made to present information on the proposed project. A total of 20 people attended the hearing and two attendees provided comments. The comments made were about project funding and timeline, and ramp location.

## 8.0 ENVIRONMENTAL PERMITS, ISSUES, and COMMITMENTS

Table 13 outlines the environmental permits, issues, and commitments associated with the proposed project.

Table 13: Environmental Permits, Issues, and Commitments

Environmental Issues*	Commitments and Permits
Endangered Species/Wildlife	<p>The following Bird BMPs will be incorporated into the proposed project:</p> <ul style="list-style-type: none"> <li>• construction shall not disturb, destroy, or remove active nests, including those of ground nesting birds, during the nesting season,</li> <li>• avoid the removal of unoccupied, inactive nest, as practicable,</li> <li>• prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures for replacement or repair,</li> <li>• no collecting, capturing, relocating, or transporting adult birds, eggs, young, or active nests without a permit.</li> </ul>
Cultural Resources (Historical/Archeological)	<p>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.</p>
THC/SHPO	NA
Noise	<p>Provisions will 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.</p> <p>A noise barrier would be reasonable and feasible at one location: Chase Village Mobile Home Park. A Noise Workshop must be conducted with property owner of Chase Village Mobile Home Park.</p>
Water Quality	<p>The proposed project is located within Phase II Baytown Urbanized Area Municipal Separate Storm Sewer System (MS4). A Notice of Intent (NOI) would also need to be filed with the city of Baytown stating that TxDOT would have a Storm Water Pollution Prevention Plan (SW3P) in place during construction of the proposed project.</p>
Vegetation	<p>Thresholds were not exceeded, and coordination with TPWD is not required for the proposed project.</p>

Environmental Issues*	Commitments and Permits
Beneficial Landscape Practices/Vegetation Management	NA**
Hazardous Materials	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. Section 6.10 of the “General Provisions of the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges,” which applies to all highway projects, includes guidelines addressing the contractor’s responsibilities regarding the discovery of hazardous materials.
Traffic Control	A traffic control plan is to be implemented prior to construction activities.
<p>*See details regarding Environmental Issues in Section 5.0 Affected Environment &amp; Environmental Consequences. The commitments listed in Table 13 are not intended to be an all-encompassing list of commitments involved in construction.</p> <p>**Not Applicable</p> <p>These commitments are specific to TxDOT EPIC sheets to accompany general environmental commitments utilized in every TxDOT construction project.</p>	

## 9.0 CONCLUSION

Based on the information in this EA, TxDOT recommends implementation of 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.

TxDOT recommends that TxDOT’s Environmental Affairs’ Division find that implementing the Build Alternative would not be a major action significantly affecting the quality of the human or natural environment and thus issue a FONSI for this project.

## 10.0 REFERENCES

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2014c Cumulative Impacts Risk Assessment

2014d Cumulative Impacts Decision Tree

2017-2020 Transportation Improvement Program.

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2017c 2017-2020 Transportation Improvement Program

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## **11.0 APPENDICES**

**APPENDIX A: PROJECT LOCATION MAPS**

**APPENDIX B: PROJECT PHOTOS**

**APPENDIX C: SCHEMATICS**

**APPENDIX D: TYPICAL SECTIONS**

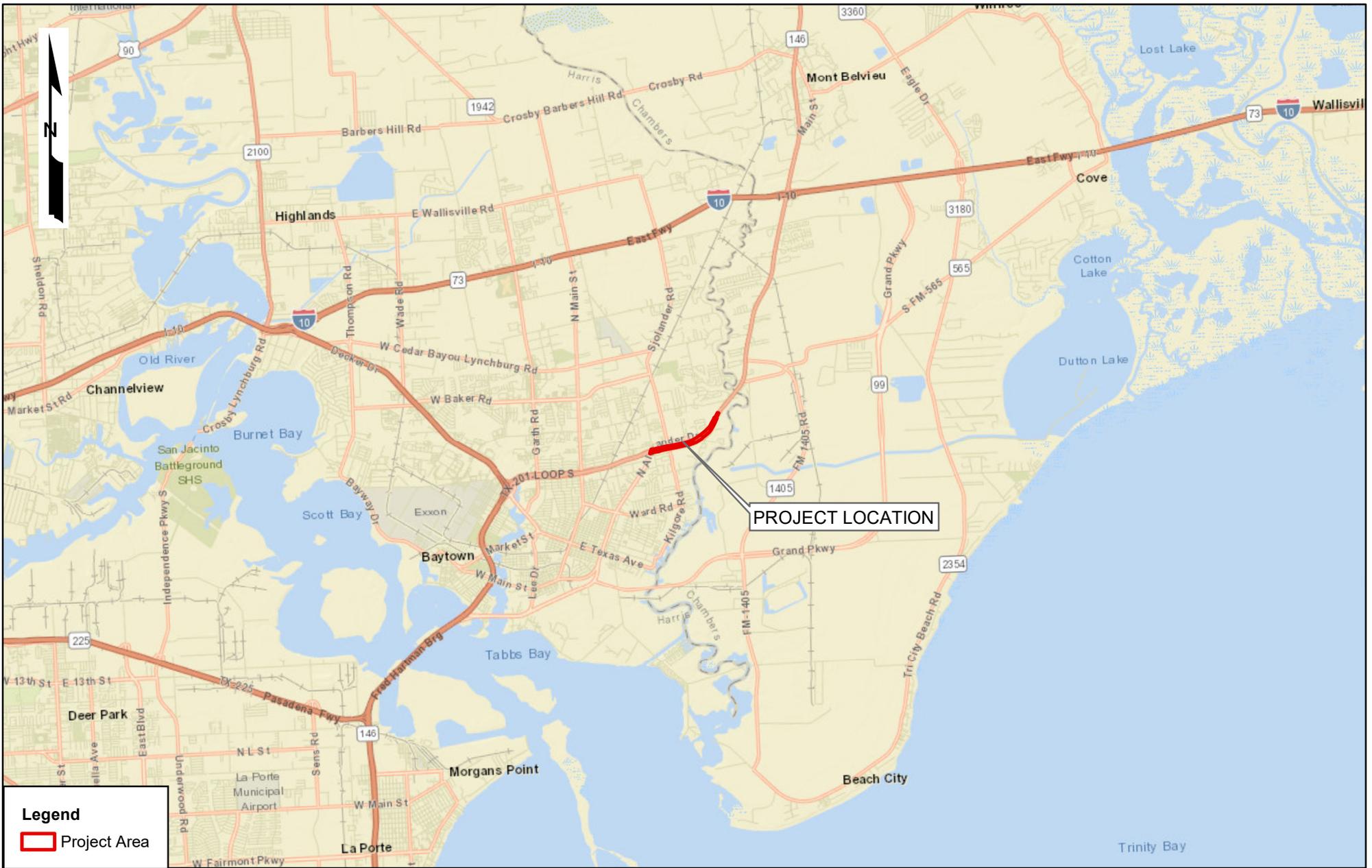
**APPENDIX E: PLAN AND PROGRAM EXCERPTS**

**APPENDIX F: RESOURCE SPECIFIC MAPS**

## **APPENDIX A: PROJECT LOCATION MAPS**

Figure 1: Project Vicinity Map

Figure 2: Project Location Map



**Legend**

 Project Area

0 1 2  
 Miles

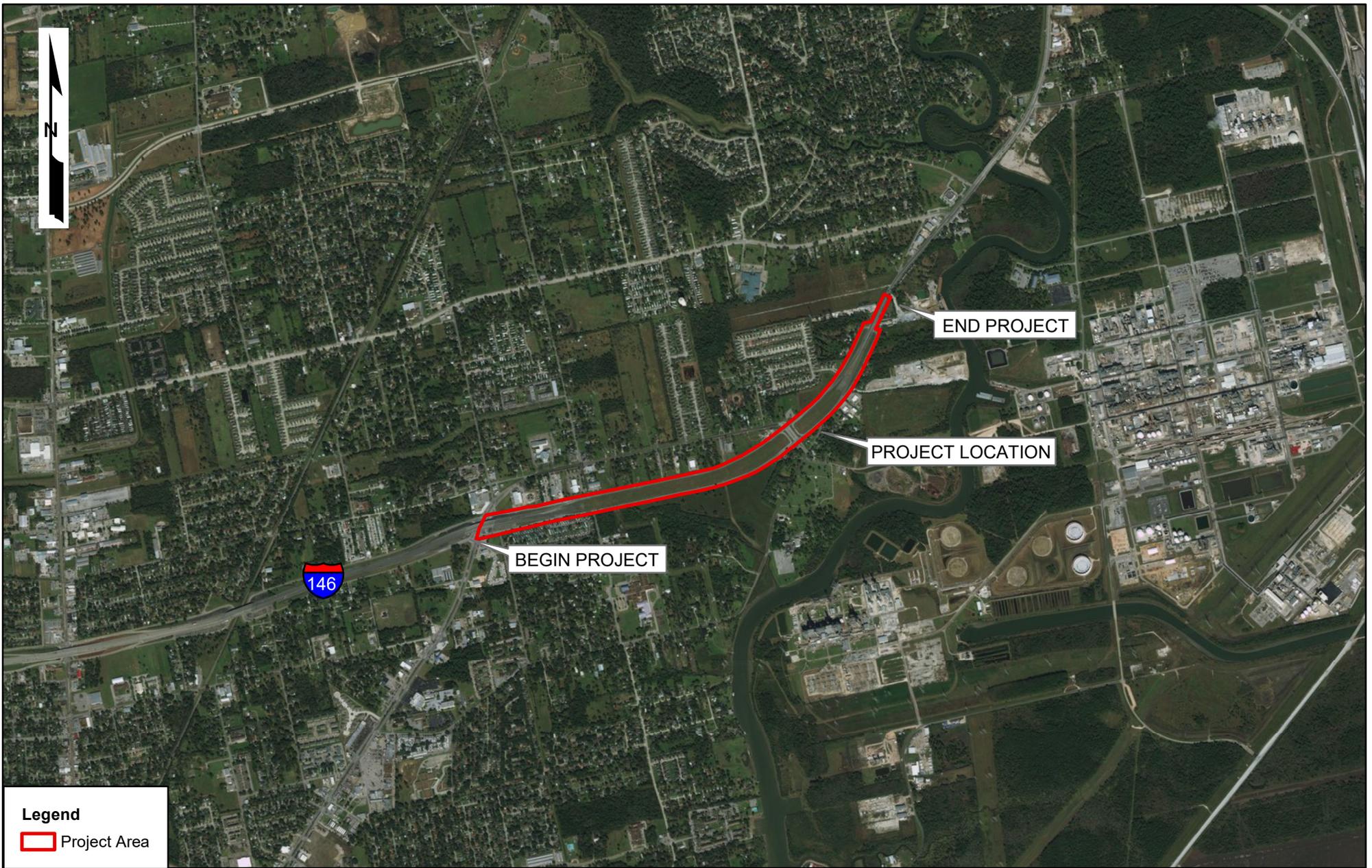
SH 146  
 (BUSINESS HIGHWAY 146 TO FERRY ROAD)  
 CSJ: 0389-13-039  
 VICINITY MAP



FIGURE 1

HARRIS COUNTY, TEXAS

DATE:  
 MAY  
 2018



**Legend**  
 Project Area

0 0.25 0.5  
 Miles

SH 146  
 (BUSINESS HIGHWAY 146 TO FERRY ROAD)  
 CSJ: 0389-13-039  
 PROJECT LOCATION MAP



FIGURE 2

HARRIS COUNTY, TEXAS

DATE:  
 MAY  
 2018

## APPENDIX B: PROJECT PHOTOS



Photo 1. Typical view of the maintained ROW between the existing SH 146 frontage roads.



Photo 2. Another typical view of the maintained ROW between the existing SH 146 frontage roads.



Photo 3. Typical view of the maintained ROW between the existing SH 146 frontage roads.



Photo 4. Typical view of maintained ROW between the existing SH 146 frontage roads.



Photo 5. View of Stream 1 showing culverts that continue under the project area



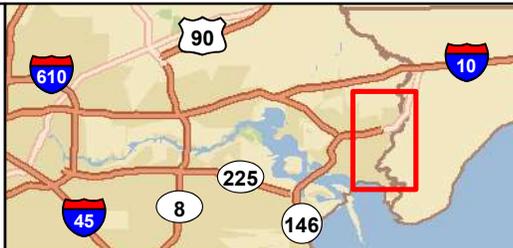
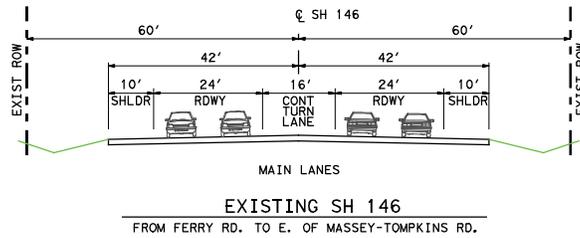
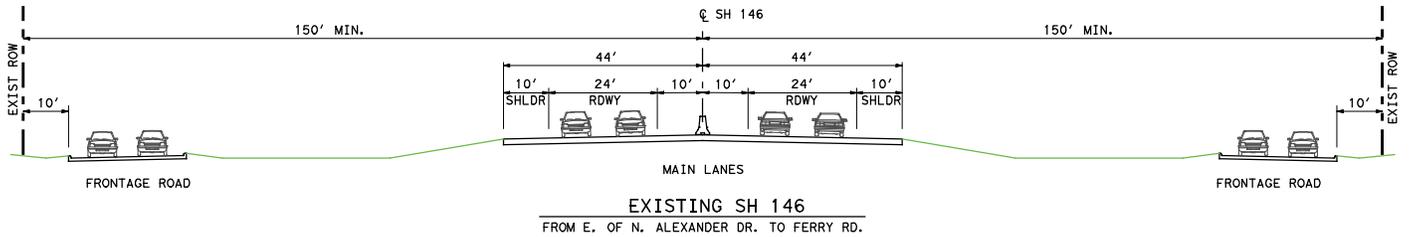
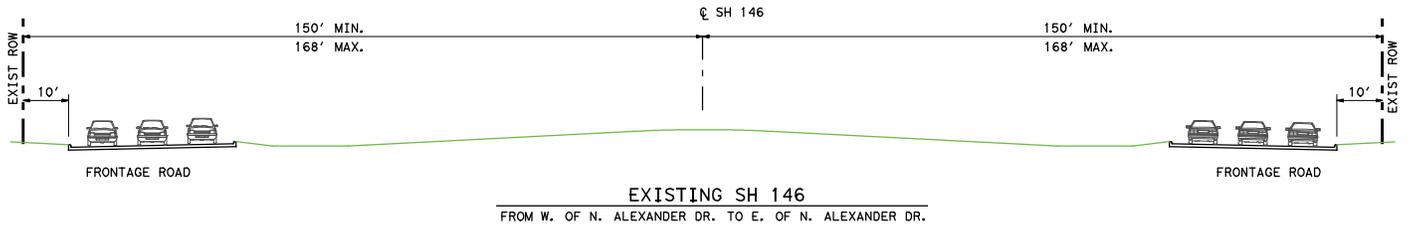
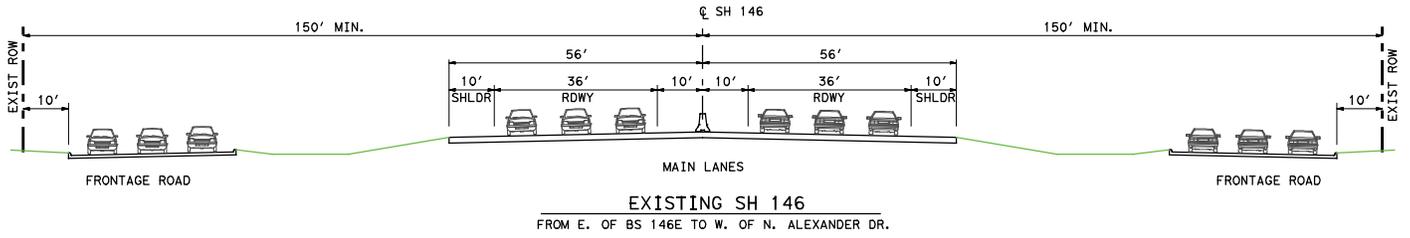
Photo 6. Typical view of the existing SH 146 frontage roads.

## APPENDIX C: SCHEMATICS

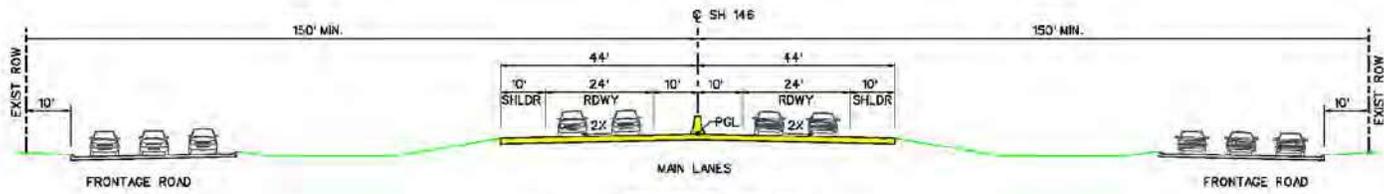


## APPENDIX D: TYPICAL SECTIONS

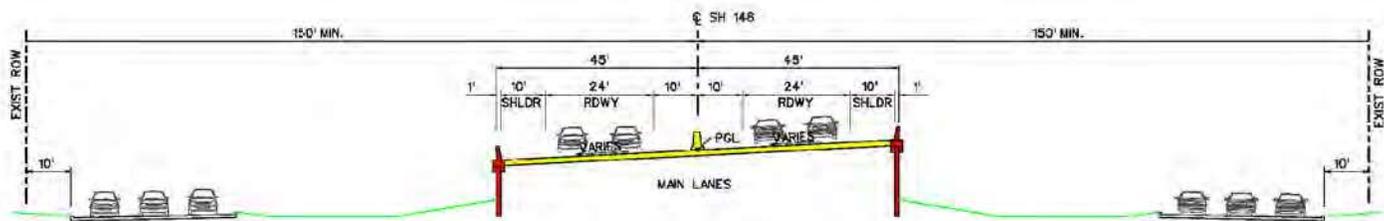
# TYPICAL SECTIONS - EXISTING



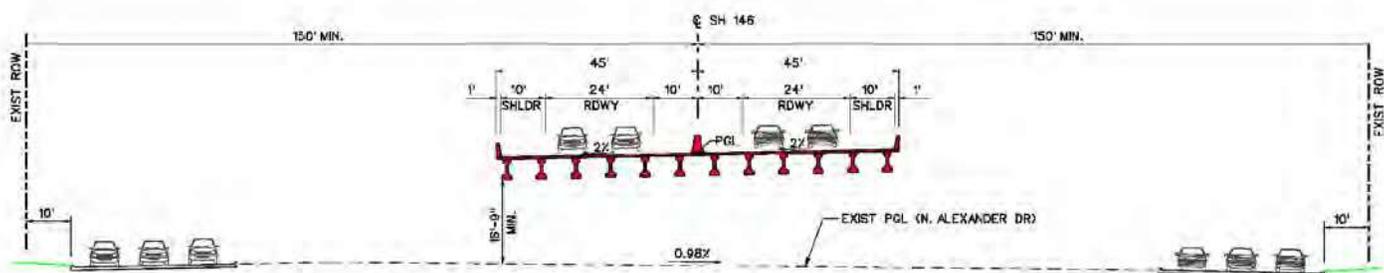
# TYPICAL SECTIONS - PROPOSED



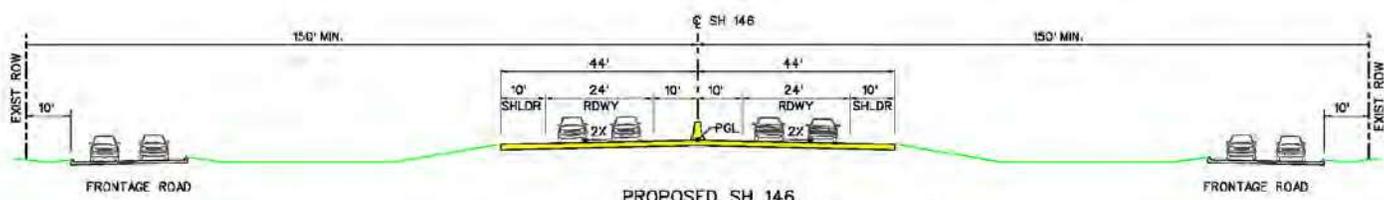
**PROPOSED SH 146**  
FROM E. OF BS 146E TO W. OF N. ALEXANDER DR.



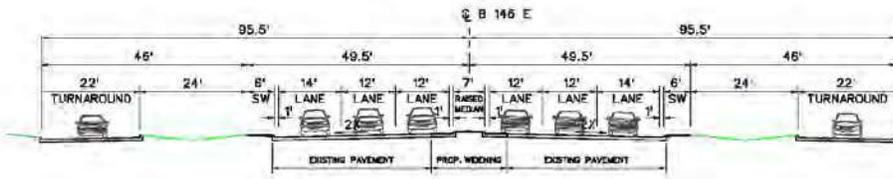
**PROPOSED SH 146**  
E. AND W. OF N. ALEXANDER DR.



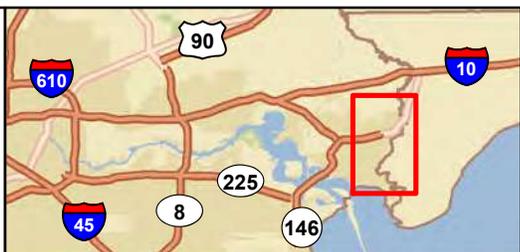
**PROPOSED SH 146**  
BRIDGE AT N. ALEXANDER



**PROPOSED SH 146**  
FROM E. OF N. ALEXANDER TO TIE AT EXIST SH 146 MAINLANES



**PROPOSED N. ALEXANDER/B 146 E**  
AT SH 146 FRONTAGE ROAD INTERSECTION



State Highway 146  
(Business Highway 146 to Ferry Road)  
CSJ 0389-13-039

PROPOSED TYPICAL SECTIONS  
Harris County, Texas

## APPENDIX E: PLAN AND PROGRAM EXCERPTS

# 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>IH 610</b>													
17036	0027-13-211	Harris	IH 69	IH 69 SW FWY NB	IH 610 NB	RECONSTRUCT DIRECT CONNECTOR	0.2	(6,6)	n/a	2017	EXEMPT	\$ 31.70	
<b>SH 146</b>													
137	0389-05-087	Harris	SH 146	FAIRMONT PARKWAY	RED BLUFF RD	WIDEN TO 6-LANES WITH TWO 2-LANE FRONTAGE ROADS	4.6	(4,6)	(0,4)	2018	2025	\$ 51.50	
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	1.8	(4,8)	(0,4)	2018	2025	\$ 76.70	
<b>I4632</b>													
0389-05-116		Harris	SH 146	NASA RD I	GALVESTON/HAR RIS CL	WIDEN TO 6-LANE ARTERIAL WITH 4-LANE EXPRESS LANES	1.0	(4,10)	n/a	2018	2025	\$ 98.80	
<b>468</b>													
0389-06-088		Galveston	SH 146	FM 518	FM 1764	WIDEN TO 6-LANES WITH TWO NONCONTINUOUS 2-LANE FRONTAGE ROADS IN SECTIONS	10.4	(4,6)	(0,4)	2021	2025	\$ 210.00	
<b>I3842</b>													
0389-06-095		Galveston	SH 146	HARRIS/GALVEST ON C/L	FM 518	WIDEN TO 6-LANES ARTERIAL WITH 4-LANE EXPRESS LANES	1.7	(4,10)	n/a	2019	2025	\$ 139.00	
<b>467</b>													
0389-07-025		Galveston	SH 146	FM 519	LP 197	CONSTRUCT RR OVERPASS	0.7	(2,4)	n/a	2030	2035	\$ 55.23	
<b>536</b>													
0389-13-039		Harris	SH 146	AT BS 146E	FERRY RD	CONSTRUCT 4 MAINLANES AND GRADE SEPARATION	0.9	(0,4)	(6,6)	2020	2025	\$ 47.09	
<b>752I</b>													
		Harris	SH 146	SH 146 SB	SOUTHERN ACCESS RD	CONSTRUCT DIRECT CONNECTOR FROM SB LANES OF SH 146	0.5	n/a	n/a	2020	2025	\$ 13.92	ERA (2025)
<b>I7055</b>													
0508-02-121		Chambers	SH 146	SH 146 SB AT IH 10 AND	IH 10 WVB FR TG RD AT SH 146 NB	CONSTRUCT MEDIAN IMPROVEMENTS AND EXTEND AND WIDEN TURN LANES	0.3	(4,4)	n/a	2018	2025	\$ .37	ERA (2025)
<b>SH 249</b>													
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	3.6	(0,6)	(4,4)	2018	2025	\$ 129.93	
<b>339</b>													
0720-03-074		Harris	SH 249	MONTGOMERY C/L	BROWN RD	CONSTRUCT TWO 3-LANE FRONTAGE ROADS	2.3	(6,6)	(0,6)	2017	2025	\$ 35.17	
<b>913</b>													
0720-03-123		Harris	SH 249	MONTGOMERY C/L	BROWN RD	CONSTRUCT 6-LANE TOLLWAY WITH GRADE SEPARATIONS AT BROWN, BAKER AND ZION ROADS	2.2	(6,6)	(0,6)	2017	2025	\$ 165.00	
<b>I1570</b>													
3635-01-001		Montgomery	SH 249	GRIMES COUNTY LINE	FM 1774/FM 149 IN PINEHURST	CONSTRUCT 4-LANE TOLLWAY IN SECTIONS	12.2	(0,4)	n/a	2017	2025	\$ 271.31	
<b>I4524</b>													
3635-02-001		Grimes	SH 249	FM 1774 IN TODD MISSION	MONTGOMERY COUNTY LINE	***INFORMATION ONLY** PROJECT CONSISTENT WITH MONTGOMERY CO. PROJECT IN PLAN (MPOID I1570). CONSTRUCT 4-LANE TOLLWAY (GRIMES CO.)	2.4	(0,4)	n/a	2017	2025	\$ 473.40	
<b>SH 288</b>													

Projects shaded in GRAY are exempt from conformity or are not considered regionally significant under H-GAC regional emissions analysis.

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
HOUSTON	HARRIS		SH 146	C,E,R	NONE	PORT OF HOUSTON AUTHORITY	<b>\$13,915,000</b>
STREET:	SH 146					REV DATE: 07/2016	
LIMITS FROM:	SH 146 SB					MPO PROJECT ID: 7521	
LIMITS TO:	SOUTHERN ACCESS RD					FUNDING CATEGORY: 3	
TIP	CONSTRUCT DIRECT CONNECTOR FROM SB LANES OF SH 146					MTP REFERENCE:	
DESCRIPTION:							
REMARKS:							

**Project History:**

Total Project Cost Information:		Cost of Approved Phases:	Authorized Funding by Category/Share:					Local Contribution	Funding By Category
			3-LOCAL:	Federal	State	Regional	Local		
Preliminary Engineering:	\$454,617	<b>\$13,915,000</b>		---	---	---	\$13,915,000	---	\$13,915,000
Right Of Way:	\$2,319,476								
Construction:	\$9,277,904								
Construction Engineering:	\$463,895								
Contingencies:	\$927,790								
Indirects:	\$471,318								
Bond Financing:	---								
<b>Total Project Cost:</b>	<b>\$13,915,000</b>	<b>FY2020</b>	<b>Funding by Share:</b>	---	---	---	\$13,915,000	---	\$13,915,000

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
HOUSTON	HARRIS	0389-13-039	SH 146	C,E,R	BAYTOWN	CITY OF BAYTOWN	<b>\$47,090,744</b>
STREET:	SH 146					REV DATE: 07/2016	
LIMITS FROM:	AT BS 146E					MPO PROJECT ID: 536	
LIMITS TO:	FERRY RD					FUNDING CATEGORY: 3	
TIP	CONSTRUCT 4 MAINLANES AND GRADE SEPARATION					MTP REFERENCE:	
DESCRIPTION:							
REMARKS:							

**Project History:**

Total Project Cost Information:		Cost of Approved Phases:	Authorized Funding by Category/Share:					Local Contribution	Funding By Category
			3-LOCAL:	Federal	State	Regional	Local		
Preliminary Engineering:	\$1,548,830	<b>\$47,090,744</b>		---	---	---	\$47,090,744	---	\$47,090,744
Right Of Way:	\$7,902,192								
Construction:	\$31,608,769								
Construction Engineering:	\$1,264,351								
Contingencies:	\$3,160,877								
Indirects:	\$1,605,725								
Bond Financing:	---								
<b>Total Project Cost:</b>	<b>\$47,090,744</b>	<b>FY2020</b>	<b>Funding by Share:</b>	---	---	---	\$47,090,744	---	\$47,090,744

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
HOUSTON	HARRIS		SH 99	C	NONE	TXDOT HOUSTON DISTRICT	<b>\$4,487,000</b>
STREET:	SH 99					REV DATE: 07/2016	
LIMITS FROM:	IH 10					MPO PROJECT ID: 17075	
LIMITS TO:	FORT BEND C/L					FUNDING CATEGORY: 2	
TIP	INSTALL ITS EQUIPMENT AND INFRASTRUCTURE (144-STRAND FIBER TRUNK LINE, CLOSED-CIRCUIT CAMERAS, DYNAMIC MESSAGE SIGNS RADAR-BASED VEHICLES SENSING DEVICES AND TRAVEL TIME READERS)					MTP REFERENCE:	
DESCRIPTION:							
REMARKS:							

**Project History:**

Total Project Cost Information:		Cost of Approved Phases:	Authorized Funding by Category/Share:					Local Contribution	Funding By Category
			2-PROP-7:	Federal	State	Regional	Local		
Preliminary Engineering:	\$219,863	<b>\$4,487,000</b>		---	\$4,487,000	---	---	---	\$4,487,000
Right Of Way:	---								
Construction:	\$4,487,000								
Construction Engineering:	\$269,220								
Contingencies:	\$448,700								
Indirects:	\$227,940								
Bond Financing:	---								
<b>Total Project Cost:</b>	<b>\$5,652,723</b>		<b>Funding by Share:</b>	---	\$4,487,000	---	---	---	\$4,487,000

## **APPENDIX F: RESOURCE SPECIFIC MAPS**

Figure 3: Wetland Delineation Map

Figure 4: 303(d) Streams Map

Figure 5: FEMA Floodplain Map

Figure 6: Noise Receptor Map

Figure 7: Indirect Effects Analysis Map



**Legend**

- Data Points
- Streams
- Project Area

0 350 700  
 Feet

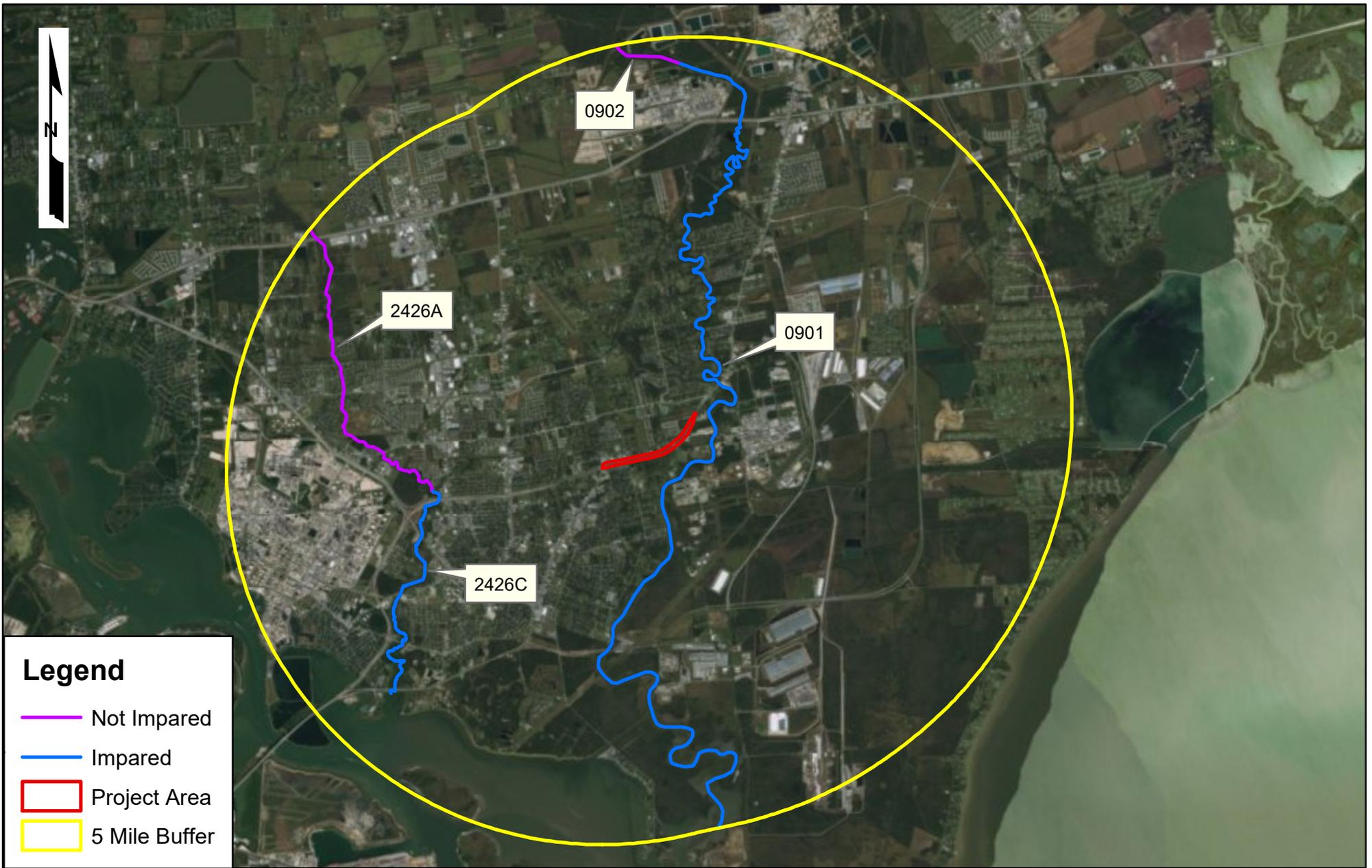
SH 146  
 (BUSINESS HIGHWAY 146 TO FERRY ROAD)  
 CSJ: 0389-13-039  
 WETLAND DELINEATION MAP



FIGURE 3

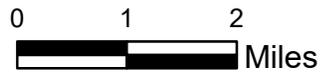
HARRIS COUNTY, TEXAS

DATE:  
 APRIL  
 2018



**Legend**

- Not Impaired
- Impaired
- Project Area
- 5 Mile Buffer



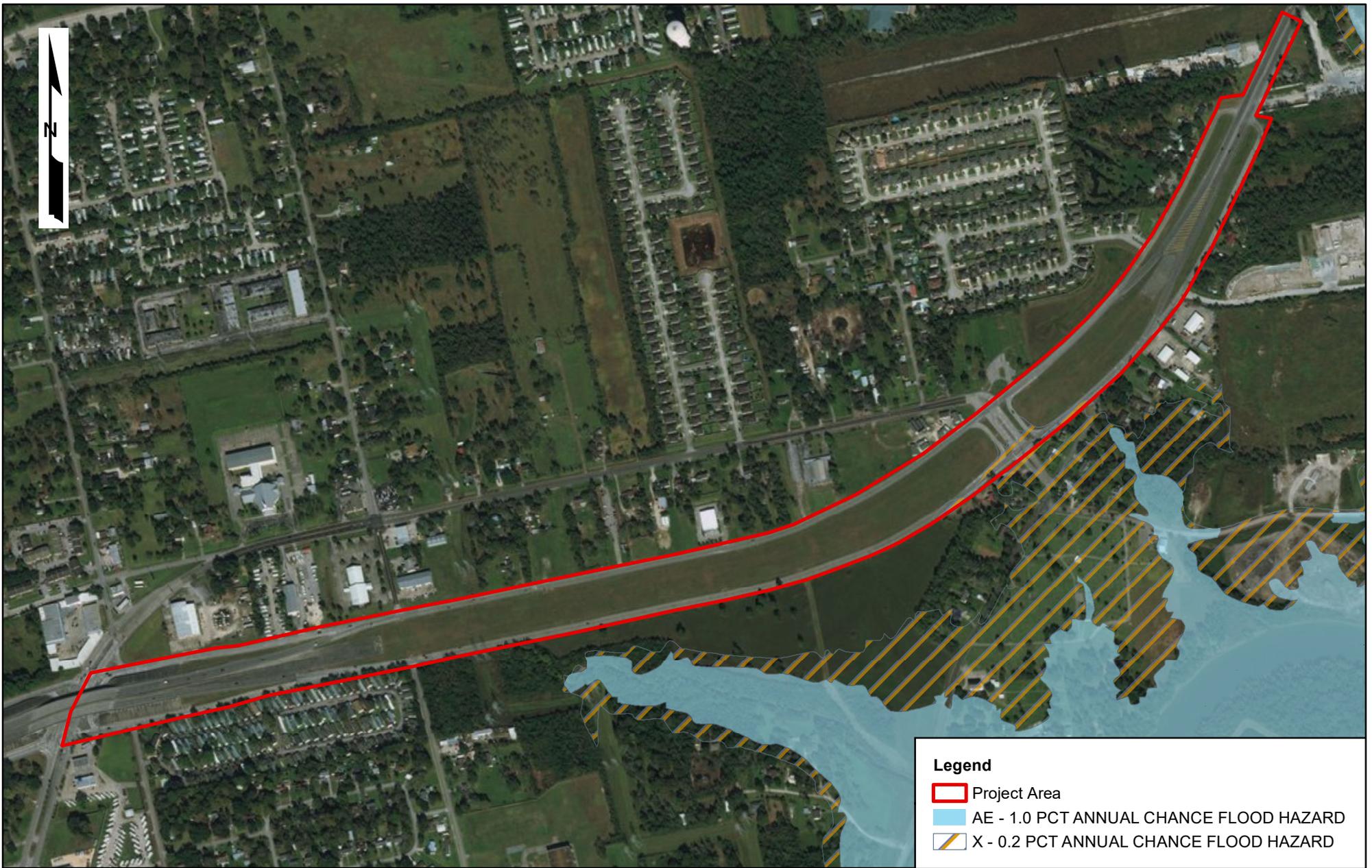
SH 146  
 (BUSINESS HIGHWAY 146 TO FERRY ROAD)  
 CSJ: 0389-13-039  
 303D STREAMS MAP



FIGURE 4

HARRIS COUNTY, TEXAS

DATE:  
 MAY  
 2018



**Legend**

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



**SH146**  
 FEMA FLOODPLAIN MAP  
 (BS 146E TO FERRY RD)



FIGURE 5

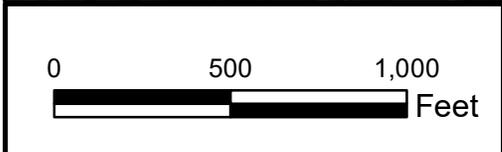
HARRIS COUNTY, TEXAS

DATE:  
 MAY 2018



**Legend**

- Non-Impacted Receptors
- Impacted Receptors
- Benefited Receptors
- Proposed Barriers



**SH 146**  
NOISE RECEPTOR MAP  
(BS 146E TO FERRY RD)



FIGURE 6 A

HARRIS COUNTY, TEXAS

DATE:  
MARCH  
2018



0 500 1,000  
 Feet

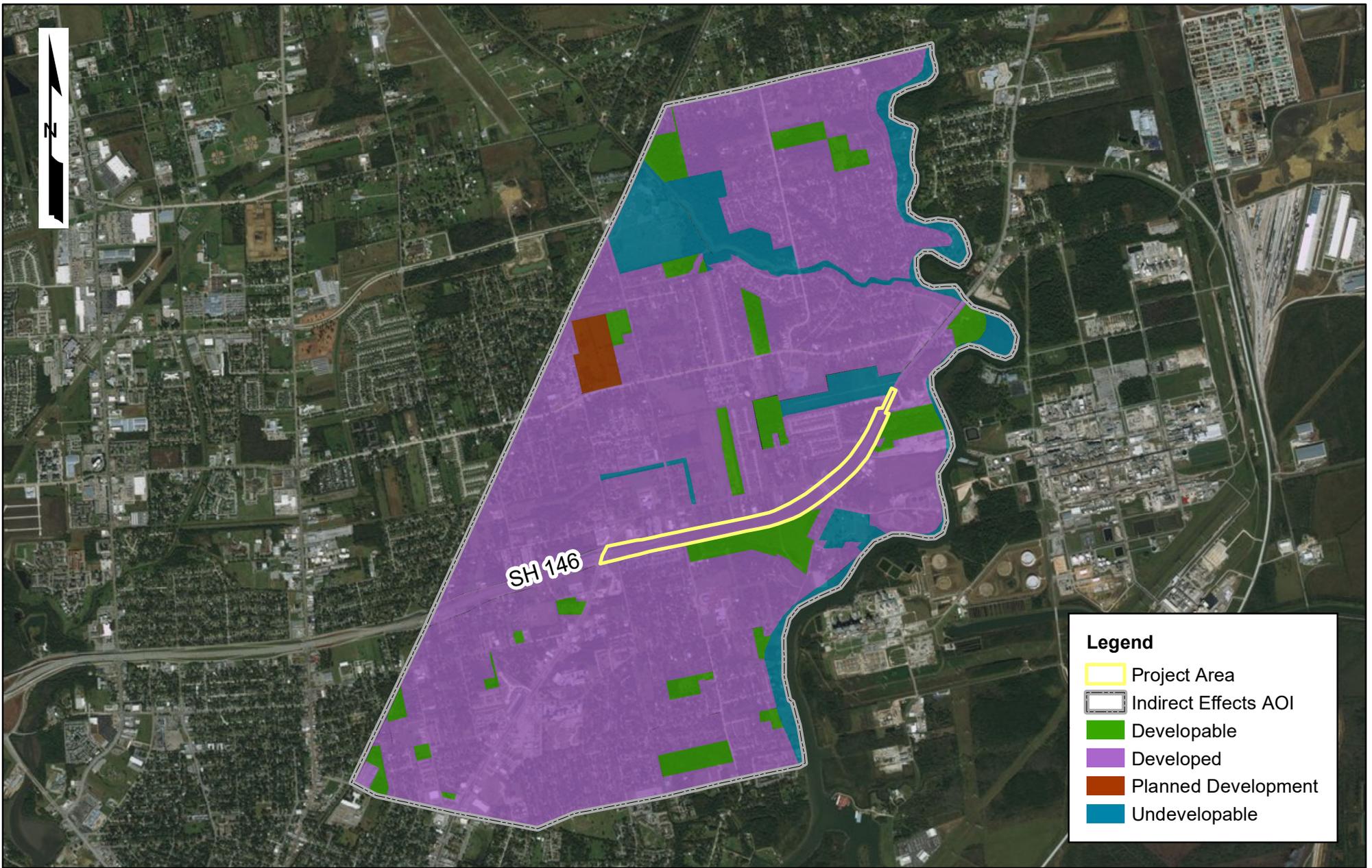
SH 146  
 NOISE RECEPTOR MAP  
 (BS 146E TO FERRY RD)



FIGURE 6 B

HARRIS COUNTY, TEXAS

DATE:  
 MARCH  
 2018



**Legend**

-  Project Area
-  Indirect Effects AOI
-  Developable
-  Developed
-  Planned Development
-  Undevelopable

0 1,250 2,500 5,000  
 Feet

SH 146  
 INDIRECT EFFECTS ANALYSIS  
 (BS 146E TO FERRY RD)



FIGURE 7

HARRIS COUNTY, TEXAS

DATE:  
 MARCH  
 2018