Texas Department of Transportation

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October 4, 2012

CONTACT: DPD

Re-Evaluation
Harris and Chamber Counties
SH 99 (Grand Parkway), Segment I-2:
From SH 225 to IH 10 East
Control 3187-01-005, 3187-02-006, 3187-01-009 and 3510-10-901

Mr. Daniel Mott, P.E.
Houston Major Projects Engineer
Federal Highway Administration
300 East 8th Street, Room 826
Austin, Texas 78701

Dear Mr. Mott:

Attached is one copy of the Re-Evaluation of the Final Environmental Impact Statement for the SH 99, Grand Parkway, Segment I-2 roadway project.

This Re-evaluation addresses the proposed construction of an 8.7-mile portion of the project from SH 146 to FM 1405, proposed tolling of the roadway from SH 146 to north of Fisher Road, and a proposed overpass at Fisher Road. At this time, your concurrence that this Segment Re-evaluation has been prepared in accordance with 23 CFR 771.129 and the Federal Highway Administration Technical Advisory T 6640.8A, Section XI with a determination that the Record of Decision analysis remains valid, is requested.

If you have any questions, please contact Mr. Lance Olenius, TxDOT Houston District Project Manager, at (713) 802-5271.

Sincerely,

Pat Henry, P.E.
Director of Project Development
Houston District

CPH:ljh
Attachment
cc: Mr. Lance Olenius

Concur: _____ Date: 10/09/2012
Federal Highway Administration

RE-EVALUATION OF THE FINAL ENVIRONMENTAL IMPACT STATEMENT

SH 99 - GRAND PARKWAY
SEGMENT I-2
FROM SH 225 TO IH 10 EAST

4-LANE TOLLWAY,
WITH ASSOCIATED FRONTAGE ROADS AND OVERPASSES
FROM SH 146 TO FISHER ROAD

HARRIS AND CHAMBERS COUNTIES

CSJ Nos:
3187-01-005
3187-02-006
3187-01-009
3510-10-901

Prepared By:

Federal Highway Administration
Texas Department of Transportation
Houston District

April 2011

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1.0 PURPOSE OF AND NEED FOR PROPOSED PROJECT

1.0 PURPOSE OF AND NEED FOR PROPOSED PROJECT

1.1 INTRODUCTION

A Final Environmental Impact Statement (FEIS) was prepared in 1997 for the section of Grand Parkway (State Highway [SH] 99) from SH 225 to Interstate Highway (IH) 10 East (E) in Harris and Chambers Counties, Texas. This section of SH 99 is referred to as "Segment I-2" and the total length of the segment is approximately 15 miles. The proposed project evaluated in the 1997 FEIS was the "interim" facility, a 4-lane at-grade arterial, with preservation of right-of-way (ROW) that would accommodate the future "ultimate" 6-lane freeway with frontage roads and overpasses in some locations.

This Re-evaluation addresses the proposed construction of an 8.7-mile portion of the project from SH 146 to Farm-to-Market Road (FM) 1405, proposed tolling of the roadway from SH 146 to north of Fisher Road, and a proposed overpass at Fisher Road. *Figure 1* shows the Segment I-2 project limits and the area of the project addressed in this Re-evaluation. Continuous project activity has taken place since the issuance of the Record of Decision (ROD) in 1998. *Table 1-1* lists the environmental documents related to the proposed project.

Table 1-1. Segment I-2 Environmental Documents

Date	Environmental Document	Project
1997/1998	FEIS/ROD	Four-lane at-grade arterial from SH 225 to IH 10(E). Included preserving a 300- to 400-foot wide corridor ROW to accommodate future 6-lane freeway, once justified.
2002	Re-evaluation Approved	Nine-mile section of Segment I-2, from IH 10(E) to Business State Highway (BS) 146 at SH 99 (formerly Spur 55), redesign of U-turn at Cedar Bayou, and alteration of drainage Channel B.
2006	Categorical Exclusion Approved	Design change (proposed bridge) at FM 565.
2007	Re-evaluation Approved	Proposed tolling of Segment I-2 from IH 10(E) to Fisher Road.
2008	Categorical Exclusion Approved	Bridge replacement, BS 146 westbound at Goose Lake.

Source: Segment I-2 Study Team 2010

Design and operation of the proposed project from SH 225 to IH 10(E) as described in the approved FEIS has been modified since the 1998 ROD. Design changes addressed in approved environmental documents listed in *Table 1-1* include: modification of the proposed U-turn at Cedar Bayou to minimize construction impacts to wetlands in the proposed project area, alteration of the drainage route of Channel B, and addition of a bridge at FM 565. The operational change was tolling of the section from IH 10(E) to Fisher Road.

In 1997, it was anticipated that there would be two phases of construction (described from east to west) – Phase One from IH 10(E) to BS 146, and Phase Two from BS 146 to Missouri Street (approximately 650 feet west of Goose Lake). As discussed in the FEIS, the portion of Segment I-2 between Missouri Street in Baytown and SH 225 was planned independently and constructed prior to 1997, and was incorporated into the Segment I-2 project. Due to regional project planning and funding constraints, the limits of the first phase of construction were shortened by approximately 2.5 miles, ending at FM 1405 instead of BS 146. Construction of the first phase began in 2003, and the roadway was opened to traffic on March 25, 2008. Toll collection along the portion of the roadway between IH 10(E) and Fisher Road is expected to begin in the fallof 2011. With the opening of this new roadway section, vehicles can travel on the planned Segment I-2 route from SH 146 to IH 10(E) using existing BS 146, former Spur 55, and the completed Phase I of Segment I-2, even though the proposed Phase I and II roadway improvements west of FM 1405 have not been implemented.

The specific design and ROW changes for the proposed project are described in *Section 1.2*. Operation of the facility as a toll road would require two toll gantries in the area from SH 146 to FM 1405. The main lanes of this section of Segment I-2 would be tolled; however, frontage roads paralleling the main lanes and the main lanes of the bridges crossing Goose Lake and Cedar Bayou would remain as free travel lanes. Three of the proposed construction projects are listed in the Houston-Galveston Area Council's (H-GAC) 2035 Regional Transportation Plan (RTP) Update and 2011-2014 Transportation Improvement Program (TIP), as described below, and copies of pages from the RTP Update and TIP are included in *Appendix B*. The total estimated cost for the proposed improvements as shown in the 2035 RTP Update is $207,169,528. The control-section-job (CSJ) Numbers (No.), brief project descriptions, and the estimated costs for the proposed improvements are provided below.

- CSJ No. 3187-01-009, BS 146 W to SH 146: Construct 4-lane tollway with two non-continuous 2-lane frontage roads and interchanges. Estimated cost - $128,917,140.

- CSJ No. 3187-01-005, BS 146-E to Chambers County Line: Widen to 4-lane tollway with two 2-lane frontage roads and interchanges. Estimated cost - $29,708,370.

- CSJ No. 3187-02-006, Harris County Line to FM 1405: Widen to 4-lane tollway with two 2-lane frontage roads and interchanges. Estimated cost - $48,543,748.

- CSJ No. 3510-10-901, 0.66 mile North of Fisher Road to 0.62 mile West of Fisher Road: Construct 4 main lanes toll overpass. Estimated cost - $17,411,000. (Note: This project is not listed in the 2035 RTP Update. The estimated cost is from a previous approved RTP. Construction of this overpass is expected to become part of a project to complete overpasses at major thoroughfares between FM 1405 and IH 10(E) that will be listed in an amendment to the 2035 RTP Update [anticipated CSJ No. 3510-10-901].)

The 1997 FEIS and the subsequent environmental documents listed in *Table 1-1* are referenced herein as previous baseline information.

1.2 PROPOSED ACTION

In general, the proposed action addressed in this Re-evaluation is the construction of new 2-lane frontage roads and a 4-lane tollway from SH 146 to Fisher Road, with overpasses at major intersections.

In the 1997 FEIS, Segment I-2 was evaluated as a 4-lane at-grade arterial in a 300 to 400-foot wide corridor. The proposed ROW would accommodate a future 6-lane freeway, with frontage roads in some locations, when warranted; however, the FEIS did not address construction or operation of the 6-lane roadway. The future 6-lane, or "ultimate" facility, included overpasses at many intersections.

The design changes between the proposed project evaluated in the FEIS and the project addressed in this Re-evaluation are described below and summarized in *Table 1-2*. The preliminary typical cross sections and roadway plan/profile are shown on preliminary roadway schematics in *Appendix C*.

1. The proposed project evaluated in the FEIS was a 4-lane at-grade roadway, with one new bridge at Cedar Bayou (for westbound traffic). The current proposed project is a 4-lane tollway, with two 2-lane frontage roads, overpasses at major intersections, and one new 2-lane bridge at Cedar Bayou (for westbound traffic). The proposed project design is similar to the schematics presented in the FEIS for the "ultimate" 6-lane freeway with frontage roads, except that four main lanes are currently proposed instead of six.

2. Overpasses are proposed at: Wyoming Street, Lee Drive/Causeway Road, Union Pacific (UP) Railroad and South Main Street (single bridge over both), BS 146, Tri-Cities Beach Road, FM 1405, and Fisher Road. Except for the proposed overpass at Tri-Cities Beach Road, all of these overpasses and associated frontage roads and ramps were included in the "ultimate" 6-lane freeway project presented in the FEIS. The overpass at Tri-Cities Beach Road is proposed in response to requests from the community to maintain north-south traffic movement on the road.

3. The proposed project includes replacement of the eastbound bridge over Goose Lake as a 2-lane bridge with an auxiliary lane. The westbound 2-lane bridge would be widened to accommodate an auxiliary lane. The "ultimate" project in the FEIS showed two 3-lane main lane bridges and two 2-lane frontage road bridges over Goose Lake; frontage road bridges are not proposed with the current project. In the area between Wyoming Street and Lee Drive/Causeway Road, approximately 2 acres less ROW is now proposed versus the ROW proposed in the FEIS.

4. The proposed project includes reconstruction of the eastbound BS 146 lanes and frontage road from SH 146 to Wyoming Street. The proposed roadways were shown on the 6-lane schematics in the FEIS, but the roadway alignment for the current schematic design is revised, but within the ROW evaluated in the FEIS.

5. The proposed project includes the redesign of the U-turn at Cedar Bayou that was addressed in the 2002 Re-evaluation.

6. At the UP Railroad crossing located east of South Main Street, the existing BS 146 roadway is below the railroad. On the 6-lane schematics in the FEIS, the main lanes were shown on two bridges over the railroad, and the frontage roads were shown at-grade. The schematic

design has been revised, and the frontage roads are now proposed to be below-grade (below the railroad), as they are currently, and the main lanes would be over the railroad. This design change reduces the ROW requirement in the area of the railroad by approximately 1.8 acres.

7. The proposed project evaluated in the FEIS required acquisition of approximately 586 acres of ROW, in an approximate 300 to 400-foot wide corridor, in the project area from FM 225 to IH 10(E). From FM 1405 to IH 10(E), project ROW has been acquired. In the Segment I-2 project area between SH 146 and FM 1405, acquisition of approximately 46 acres of ROW would be required for the current proposed section of the project that is the subject of this Re-evaluation. The proposed ROW was part of the proposed ROW evaluated in the 1997 FEIS.

8. The main lanes would be operated as a toll facility. Main lanes and some access ramps would be tolled. Tolling would require installation of electronic toll collection facilities consisting of underground wires, antennas, lights, and cameras installed in the overhead structures, and an 8-foot by 10-foot equipment building for the electronic toll collection system. While the main lanes and some ramps would be tolled, the frontage roads would remain free. The bridges over Cedar Bayou and Goose Lake would be shared by toll and free traffic, but traffic would be able to exit the main lanes/auxiliary lane after crossing the bridges without paying a toll. Frontage road traffic would be routed onto the main lanes/ auxiliary lane by entrance and exit ramps on each end of the bridges. Toll traffic and free traffic would also share the bridge over the UP railroad approximately one mile east of FM 1405.

Table 1-2. Summary of Project Changes

Location	1997 FEIS Proposed Interim Facility	1997 FEIS Future Ultimate Facility	Proposed Project in this Re-evaluation
SH 146 to FM 1405	4-lane main lanes with frontage roads between the BS 146/Spur 55 (now SH 99) inter-section and FM 1405	6-lane main lanes with frontage roads	4-lane main lanes with frontage roads
SH 146 interchange	No work west of the BS 146/Spur 55 (now SH 99) intersection	Direct connectors and ramps	Direct connector
Wyoming Street interchange	No work west of the BS 146/Spur 55 (now SH 99) intersection	6-lane overpass	4-lane overpass
Goose Lake	No work west of the BS 146/Spur 55 (now SH 99) intersection	Two 3-lane main lane bridges and two 2-lane frontage road bridges	Reconstruct eastbound bridge as 2-lane bridge with one auxiliary lane; widen 2-lane westbound bridge to accommodate one auxiliary lane
Lee Drive/Causeway Road interchange	No work west of the BS 146/Spur 55 (now SH 99) intersection	6-lane overpass	4-lane overpass
South Main Street interchange	No work west of the BS 146/Spur 55 (now SH 99) intersection	6-lane overpass	4-lane overpass
UP Railroad	No work west of the BS 146/Spur 55 (now SH 99) intersection	6-lane overpass, at-grade frontage roads at railroad	4-lane overpass, frontage roads will be under the railroad, like existing
BS 146/Spur 55 (now SH 99) interchange	SH 99 at-grade	6-lane overpass, reconfigured interchange	4-lane overpass, reconfigured interchange
Tri-Cities Beach Road interchange	SH 99 at-grade	SH 99 at-grade	4-lane overpass
Cedar Bayou	New westbound 2-lane bridge	Widening of westbound and eastbound bridges, from 2 lanes to 3 lanes	New 2-lane westbound bridge, modify U-turn west of Cedar Bayou
FM 1405 interchange	SH 99 at-grade	6-lane overpass	4-lane overpass
Fisher Road interchange	SH 99 at-grade	6-lane overpass	4-lane overpass

Source: Segment I-2 Study Team 2010

The proposed project from SH 146 to Fisher Road is approximately 8.7 miles in length. The proposed main lanes would typically have two 12-foot lanes with 6-foot inside shoulders and 10-foot outside shoulders in each direction. The frontage roads in these areas would typically have two 12-foot lanes, with 4-foot inside shoulders and 8-foot outside shoulders.

Between Lee Drive/Causeway Road and South Main Street, the main lanes would typically have two 12-foot lanes with 6-foot inside shoulders and 10-foot outside shoulders in each direction. In these areas, the frontage roads would typically have two 11-foot lanes, with curbs and a 1-foot curb offset.

The overpasses at Wyoming Street, Lee Drive/Causeway Road, UP Railroad and South Main Street, BS 146, Tri-Cities Beach Road, FM 1405, and Fisher Road would typically have two 2-lane bridges with 12-foot lanes, 6-foot inside shoulders, and 10-foot outside shoulders. The main lanes of the overpasses would be divided, similar to the at-grade main lanes approaching the overpasses. The project would require the acquisition of approximately 46 acres of ROW, as indicated on the preliminary schematics shown in *Appendix C*.

The main lanes would be tolled electronically. West of Fisher Road, the proposed toll gantries would be on the eastbound and westbound SH 99 main lanes in two locations: west of BS 146 and east of FM 1405. Toll gantries would also be located west of the BS 146/SH 99 intersection on the proposed westbound entrance ramp and eastbound exit ramp. The locations of proposed toll collection facilities are shown in *Appendix A, Figure 2*. Installation of toll gantries would not require additional ROW. Toll gantries are currently in place along Segment I-2 from IH 10(E) to Fisher Road.

1.3 PURPOSE OF AND NEED FOR PROPOSED PROJECT

The FEIS for SH 99, Segment I-2 documents that the need for the project is insufficient connections to the Baytown thoroughfare system and travel demands in excess of those that can be satisfied by the financially constrained metropolitan transportation plan. The stated purpose of SH 99, Segment I-2 is to provide access and increased mobility to the freeway (highway) network, help expedite the implementation of several major thoroughfare plans, and to provide added capacity around the City of Houston for evacuations from the Gulf Coast prior to or during a hurricane. Implementation of the proposed project as described in *Section 1.2* would support the original purpose of and need for SH 99, Segment I-2 by providing a more efficient transportation route within the project limits for local residents, commuters, school buses, and the traveling public. The proposed improvements to this segment of SH 99 would also accommodate the increasing number of vehicles and meet the transportation requirements of the Texas Department of Transportation (TxDOT). The “Purpose and Need for Proposed Action” section of the FEIS remains valid for this Re-evaluation.

The proposed action includes operating the main lane section of SH 99 from SH 146 to Fisher Road as a toll facility. The purpose of tolling SH 99, Segment I-2 is to allow a faster way to finance construction, supplement limited highway funds, and address transportation needs sooner. The proposed implementation of tolling would support the original need for and purpose of Segment I-2 by generating revenue for the construction, operation, and maintenance of the proposed project. Revenue from tolling this portion of SH 99, Segment I-2 would be used for the construction, operation, and maintenance of Segment I-2, and possibly other segments of SH 99.

Historically, TxDOT has financed highway projects on a “pay-as-you-go” basis, using motor fuel taxes and other revenue deposited in the state highway fund. However, population increases and

traffic demand have outpaced the capacity of this traditional finance mechanism. To help meet critical transportation funding shortfalls, in December 2003 the Texas Transportation Commission approved a policy under House Bill 3588 (HB 3588) instructing TxDOT to evaluate all controlled-access highway projects as possible candidates for tolling. These projects would include projects that are currently under construction and those in the planning stage involving new lane construction. Under this direction, TxDOT identified SH 99, Segment I-2 as a candidate toll project. The 2007 Re-evaluation addressed tolling of Segment I-2 from IH 10(E) to Fisher Road; electronic toll gantries were installed and tolls will be collected starting in 2010. Tolls for the portion of SH 99, Segment I-2 from SH 146 to Fisher Road would also be collected by the use of electronic toll collection (on toll gantries) on the main lanes. Frontage roads between SH 146 and Fisher Road, and bridge lanes at the Goose Lake and Cedar Bayou bridges constructed as part of the roadway project would remain as free travel lanes and would not be tolled.

H-GAC is the Metropolitan Planning Organization (MPO) for the Houston-Galveston area. Proposed SH 99, Segment I-2 extends from IH 10(E) to SH 225. Due to funding constraints, the project is separated into several construction sections. The northernmost section from FM 1405 to IH 10(E), including the overpass at FM 565, has been constructed and is approved to be operated as a toll road from Fisher Road to IH 10(E). Three of the four project CSJs evaluated in this Re-evaluation are consistent with the area's financially constrained 2035 RTP Update and the 2011-2014 TIP. The U.S. Department of Transportation (Federal Highway Administration [FHWA]/Federal Transit Authority [FTA]) found the 2035 RTP Update and 2011-2014 TIP to conform to the State Implementation Plan (SIP) on January 25, 2011. The CSJ No. for the proposed Fisher Road overpass is expected to be added to an amended 2035 RTP Update in summer of 2011.

1.4 SINGLE OCCUPANCY VEHICLE ANALYSIS

Congestion reduction strategies have remained unchanged; therefore the “Single Occupancy Vehicle (SOV) Analysis,” now known as Congestion Mitigation Analysis (CMA), section of the FEIS remains valid for this Re-evaluation.

1.5 ORGANIZATION OF THIS REPORT

The format of this report is similar to the 1997 FEIS, with added sections from the May 2002 and 2007 Re-evaluations. This Re-evaluation includes the following additional or renamed/renumbered sections since the FEIS: *Section 4.14 Construction*, *Section 4.15 Indirect Impacts*, and *Section 4.16 Cumulative Effects Analysis*.

This Re-evaluation includes supplementary information regarding the project history, environmental approvals, public involvement, construction history, status of ROW acquisition, and design changes. Updated information about the affected environment is in *Section 3*, and project impacts are addressed in *Section 4*.

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2.0 EVALUATION OF ALTERNATIVES

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2.1 INTRODUCTION

No additional alignment alternatives have been considered for the proposed project. Alternative 6 remains the preferred alignment. Alternative 6 follows SH 146 and BS 146 to the junction with SH 99 (formerly Spur 55) and continues along SH 99 to east of the intersection with FM 1405, where it turns north on new alignment to intersect with IH 10(E). The tolling of Segment I-2 would be primarily an operational change that would require the installation of electronic toll collection facilities. Toll collection would be used as a way to fund maintenance and operation of SH 99, Segment I-2 and other SH 99 roadway improvements. The "Evaluation of Alternatives" section of the FEIS remains valid.

2.2 RIGHT-OF-WAY IMPACTS

This Re-evaluation focuses on the portion of the project between SH 146 and Fisher Road. In the area between SH 146 and FM 1405, approximately 46 acres of ROW are required for construction of the proposed project. The proposed ROW is within the area of proposed ROW evaluated in the 1997 FEIS. The ROW from FM 1405 to IH 10(E), including the area of the proposed Fisher Road overpass, was already acquired by TxDOT. The current proposed project section will require ROW for "corner clips" at some intersecting streets, widening of the existing roadway on both the north and south sides of SH 99 between South Main Street and Cedar Bayou, and between Cedar Bayou and FM 1405. The intersection of BS 146 and SH 99 will be reconfigured, with SH 99 as the continuous roadway and BS 146 intersecting at approximately 90 degrees. Part of the required ROW acquisition would be for the reconfiguration of this interchange. No residential, business, or other displacements are expected; however, some oil and gas wells and natural gas pipeline equipment will require relocation. *Appendix A, Figure 3* shows the existing and proposed ROW from SH 146 to Fisher Road (also see *Appendix C*).

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3.0 AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

3.1 LAND USE

The SH 99, Segment I-2 land use study area shown in *Appendix A, Figure 4* is an approximate 1,000-foot-wide study area, 500 feet from each side of the centerline of the proposed roadway. Excluding existing roadways in the study area, land use is 7 percent Commercial/Industrial, 10 percent Oil and Gas production, 2 percent Parks, less than 1 percent Public, less than 1 percent Residential, and 80 percent undeveloped. Undeveloped land use includes land used for agricultural purposes (i.e., livestock grazing) (*Appendix A, Figure 4*).

Land use north of proposed SH 99, Segment I-2 from SH 146 to Cedar Bayou is primarily light industry (Commercial/Industrial), with residential extending northward into Baytown. South of the existing roadway and east of Goose Lake, land use consists of a mixture of mostly undeveloped wooded areas with scattered oil and gas production fields. Some single-family homes are south of SH 99 in the vicinity of FM 1405. East of BS 146 and north of the existing SH 99 are Horace Mann Junior School and De Zavala Elementary School (*Appendix A, Figure 4, Sheet 3*). New commercial/industrial development has occurred along SH 99 in the vicinity of FM 1405 and Fisher Road since the May 2002 Re-evaluation (*Appendix A, Figure 4, Sheets 5, 6, and 8*).

The project does not bisect any established neighborhoods or isolate any neighborhoods or communities, nor would it disrupt orderly planned development of the project area. The project is consistent with the plans and policies of local governmental entities.

3.1.1 Right-of-Way and Displacements

ROW acquisition in the area of the proposed project was primarily for roadways constructed prior to the development of SH 99. Acquisition occurred in four stages. In the 1950s and early 1960s, ROW was acquired in the portion of the project extending from SH 146 to BS 146. Starting in 1982, ROW was purchased for the former Spur 55 from BS 146 to Cedar Bayou. Starting in 1988, ROW was purchased for the former Spur 55 from Cedar Bayou to FM 1405. Between 1998 and 2006, ROW was purchased for SH 99, Segment I-2 from FM 1405 to IH 10(E), which included the area of the proposed Fisher Road overpass. The section of ROW initially acquired in the 1950s and 1960s predates the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The ROW acquisition that occurred in 1982 and 1988 followed requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. ROW acquisition for the proposed project is discussed in *Section 2.2*.

3.2 SOCIAL RESOURCES

3.2.1 Population and Demographics

SH 99, Segment I-2 is located in Harris and Chambers Counties, and portions of the project area are in the cities of Houston, La Porte, and Baytown. This Re-evaluation is prepared to address the portion of Segment I-2 from SH 146 to FM 1405, and the area of the proposed Fisher Road overpass, located in Harris and Chambers Counties, and partially within the City of Baytown. The Year 2000 population and the 2010, 2020, and 2030 population projections for Harris and Chambers Counties, including the cities of Houston, La Porte, and Baytown, are shown in *Table 3-1*.

Table 3-1. Population Statistics for Harris and Chambers Counties, and the Cities of Houston, La Porte, and Baytown

Geographic Area	Population			
	2000	2010	2020	2030
Harris County	3,400,578	3,951,682	4,502,786	5,053,890
Chambers County	26,031	31,375	37,328	42,867
City of Houston	1,953,631	2,199,988	2,472,783	2,741,099
City of La Porte	31,880	35,467	38,960	42,394
City of Baytown	66,430	68,772	71,106	73,380

Source: Texas Water Development Board (TWDB) 2010

Between 2000 and 2030, the populations of Harris and Chambers Counties, and the Cities of Houston and Baytown are forecast to increase by 48, 83, 42, and 11 percent, respectively. There is a civilian labor force of 1,959,298 in Harris County and 14,409 in Chambers County, with respective unemployment rates of 6.3 and 7.6 percent, as of April 2009, according to the Texas Workforce Commission. The 1999 median household income in Harris and Chambers Counties was $42,598 and $47,964, respectively. According to the 2000 U.S. Census, the 1999 average median household income for the 6 block groups that make up the study area was $47,316, as shown in *Table 3-2*.

3.2.2 Neighborhoods and Community Cohesion

Residential neighborhoods/communities are located in the vicinity of the proposed project. Neighborhoods/communities in the vicinity of the proposed project are shown on *Appendix A, Figures 3* and *4*. The closest residential areas are located approximately 180-200 feet from the project ROW. The residential communities nearest to the proposed project include the Marina Club at Baytown Apartments and Southwest Section 1 neighborhood, located north of Missouri Street (*Appendix A, Figure 3, Sheet 1*). To accommodate pedestrian and bicycle users crossing SH 99, sidewalks will be constructed at signalized/signed intersections. Land use adjacent to the proposed project consists of commercial/light industrial businesses, oil and gas production areas, recreational/park areas, undeveloped/agricultural (e.g., livestock grazing), and a small number of institutional/public facilities (e.g., schools, churches). Many of the residential communities near the proposed project are apartment communities or established single-family residential communities built between the 1940s and early 1980s.

3.2.3 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was enacted on February 11, 1994, and mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of programs on minority and low-income populations. A minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact that consists of persons classified by the United States (U.S.) Census Bureau as Black, Asian, American Indian or Alaska Native, Hispanic, or other non-white persons, including those persons of two or more races. A low-income population is defined as a group of people and/or a community that, as a whole, lives below the national poverty level. The poverty guideline for a

family of four people in 2000, as defined by the U.S. Department of Health and Human Services, was a total annual household income of $17,050, which increased to $22,350 in 2011. U.S. poverty thresholds from the 2000 Census were used for purposes of determining low-income populations. The poverty threshold for a family of four in 1999, as defined by the in the 2000 Census, was a total annual household income of $17,029. According to FHWA Order 6640.23 and U.S. Department of Transportation (DOT) Order 5610.2, disproportionately high and adverse human or environmental effects on minority or low-income populations generally mean adverse effects that:

- Are predominantly borne by a minority population and/or low-income population, or
- Would be suffered by the minority population and/or low-income population, and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority population and/or non-low-income population.

Year 2000 U.S. Census data was not available during the preparation of the 1997 FEIS. The proposed project traverses 37 Census blocks, 6 Census block groups, and 4 Census tracts. To identify minority and/or low-income populations in smaller geographic areas, socioeconomic data from Census blocks and block groups were analyzed. Individual Census block groups and blocks that cross the proposed ROW were examined to identify populations with greater than a 50 percent minority and/or low-income population, or Census block groups with median household incomes below the 2011 poverty threshold. *Table 3-2* shows the Year 2000 U.S. Census low-income and racial/ethnic distribution data for the portion of Segment I-2 between SH 146 and Fisher Road.

Table 3-2. Population and Demographics for Environmental Justice Analysis

Geographic Area			Total Population	Race/Ethnicity by Percent					% Minority	% Low-Income	Median Household Income
				White	Hispanic	African American	Asian	Other			
County and City											
Chambers County			26,031	77.6	10.8	9.7	0.7	1.2	22.4	15.5	$47,964
City of Baytown			66,430	50.2	34.2	13.1	1.0	1.5	49.8	11.0	$40,559
4 Census Tracts Average			17,832	53.0	36.8	8.8	0.6	1.2	47.0	13.9	$43,756
6 Census Block Groups Average			9,727	62.0	27.8	8.0	0.9	1.3	38.0	10.8	$47,316
37 Census Blocks Average			1,563	56.8	26.4	10.9	4.1	2.7	43.2	NA	NA
Census Block Groups and Blocks											
Tract	Block Group	Block									
7102	--	--	7,955	83.0	11.1	4.4	0.4	1.1	17.0	6.1	$67,083
	2	--	4,293	78.4	15.2	4.7	0.5	1.2	21.6	7.4	$62,350
		2000	0	0	0	0	0	0	0	NA	NA
		2001	18	100	0	0	0	0	0	NA	NA
		2009	8	37.5	62.5	0	0	0	**62.5**	NA	NA
		2022	154	66.2	13.0	14.3	3.9	2.6	33.8	NA	NA
		2076	13	92.3	7.7	0	0	0	7.7	NA	NA
	3	--	1,032	83.5	5.9	9.4	0.5	0.7	16.5	3.5	$78,931
		3022	116	84.5	13.8	0	0	1.7	15.5	NA	NA
		3023	0	0	0	0	0	0	0	NA	NA
		3024	0	0	0	0	0	0	0	NA	NA

Table 3-2. ***cont.***

Geographic Area			Total Population	Race/Ethnicity by Percent					% Minority	% Low-Income	Median Household Income
				White	Hispanic	African American	Asian	Other			
Census Block Groups and Blocks											
Tract	Block Group	Block									
		3025	2	0	100.0	0	0	0	0	NA	NA
		3061	0	0	0	0	0	0	0	NA	NA
		3063	0	0	0	0	0	0	0	NA	NA
		3064	0	0	0	0	0	0	0	NA	NA
		3065	0	0	0	0	0	0	0	NA	NA
		3066	0	0	0	0	0	0	0	NA	NA
		3067	4	0	25.0	0	25.0	50.0	**100.0**	NA	NA
		3068	0	0	0	0	0	0	0	NA	NA
		3072	4	0	0	0	100.0	0	**100.0**	NA	NA
		3078	0	0	0	0	0	0	0	NA	NA
		3079	3	0	100.0	0	0	0	**100.0**	NA	NA
2544	--	--	3,620	17.7	67.1	13.9	0.1	1.2	82.3	24.3	$30,586
	3	--	815	26.1	69.0	2.9	0	2.0	73.9	23.6	$30,000
		3000	0	0	0	0	0	0	0	NA	NA
		3001	95	46.3	48.4	1.1	0	4.2	**53.7**	NA	NA
2546	--	--	4,396	20.1	66.1	12.6	0.3	0.9	79.9	22.8	$31,209
	3	--	779	40.4	37.0	21.5	0.5	0.6	59.6	30.3	$30,385
		3000	98	60.2	37.8	2.0	0	0	39.8	NA	NA
		3001	17	64.7	29.4	0	0	5.9	35.3	NA	NA
		3004	0	0	0	0	0	0	0	NA	NA
		3010	29	31.0	58.6	10.3	0	0	**69.0**	NA	NA
		3013	52	51.9	40.4	7.7	0	0	48.1	NA	NA
		3015	18	22.2	77.8	0	0	0	**77.8**	NA	NA
		3016	0	0	0	0	0	0	0	NA	NA
		3017	0	0	0	0	0	0	0	NA	NA
		3996	0	0	0	0	0	0	0	NA	NA
		3999	0	0	0	0	0	0	0	NA	NA
	4	--	1,219	18.5	69.2	11.5	0	0.8	81.5	15.7	$33,750
		4013	66	24.2	50.0	25.8	0	0	**75.8**	NA	NA
2547	--	--	1.861	18.2	67.6	8.5	3.5	2.1	81.8	5.5	$46,146
	1	--	1,589	66.1	19.0	9.2	3.6	2.1	33.9	6.4	$48,478
		1014	165	9.7	83.0	0.6	4.2	2.4	**90.3**	NA	NA
		1017	0	0	0	0	0	0	0	NA	NA
		1018	0	0	0	0	0	0	0	NA	NA
		1019	701	46.5	25.8	17.3	6.6	3.8	**53.5**	NA	NA
		1022	0	0	0	0	0	0	0	NA	NA

Bold cells within the % minority or median household income column indicate a high percentage minority and/or low-income population where Census block groups and blocks along the proposed project were examined to identify populations with greater than a 50 percent minority and/or low-income populations, or Census block groups with median household incomes below the 2011 poverty threshold.

Not Available (NA) - Income data is not available at the Census block level.

Source: U.S. Census Bureau 2000

The data used in this analysis will help determine the potential for disproportionate adverse impacts to minority and/or low-income populations within the project area, based on race/ethnicity data and income data (i.e., poverty threshold status) from the 2000 Census Summary tape files 1 and 3, respectively. Cumulatively for the 37 Census blocks, 43.2 percent of the population is classified as minority. Cumulatively for the 6 block groups, 10.8 percent is low-income (i.e., below the poverty threshold in 2000), and the average median household income is $47,316.

Of the 37 Census blocks and 6 Census block groups that traverse project ROW, 10 Census blocks have high minority populations and no Census block groups have low median household incomes. Relocations potentially required for the proposed project are discussed in *Section 3.1.1, Right-of-Way and Displacements.* No residential displacements would occur in the project area. Noise impacts are anticipated at two noise receivers within one Census block (Tract 2544, Block Group 3, Block 3001), which has a greater than 50 percent minority population. The noise impacts and possible mitigation for residential communities affected by traffic noise was analyzed according to the FHWA's Noise Abatement Criteria, as discussed in *Section 3.4, Noise*.

3.2.4 Limited English Proficiency

EO 13166, *Improving Access to Services for Persons with Limited English Proficiency* (LEP), sets a framework to improve access to federally conducted and federally assisted programs and activities for persons who, as a result of national origin, are limited in their English proficiency. According to the 2000 Census, approximately 7.8 percent of the persons residing within the 6 Census block groups speak English less than "very well," which is considered LEP, and approximately 3.1 percent are Linguistically Isolated (LI) (*Table 3-3*). The LEP language distribution is 84.6 percent Spanish, 12.7 percent Indo-European languages, 0 percent Asian/Pacific Islander languages, and 2.6 percent Other. During the field investigation in the project area, no businesses, community facilities, billboards or signs were observed in any language other than English. *Table 3-3* provides the LEP and LI data for the county, city, and Census block groups included in the proposed project area.

Table 3-3. Limited English Proficiency and Linguistically Isolated Data

Geographic Area	Limited English Proficiency			% Composition LEP by Language				Linguistically Isolated		
	Total Population Sampled	LEP	% LEP	Spanish	Indo-European	Asian/ Pacific	Other	Total Population Sampled	LI	% LI
County or City										
Harris County	3,121,999	569,799	18.3	83.5	4.3	11.1	1.1	1,206,423	119,700	9.9
Chambers County	24,205	1,165	4.8	85.3	11.5	2.9	0.3	9,137	195	2.1
City of Baytown	61,101	8,519	13.9	94.5	3.7	1.0	0.8	23,608	1,495	6.3
City of Houston	1,794,753	394,996	22.0	84.7	4.0	10.1	1.2	718,897	88,058	12.2
Block Groups										
7102.00:3	1,003	5	0.5	100.0	0	0	0	1,427	7	0.5
7102.00:2	3,932	148	3.8	90.5	9.5	0	0	354	3	0.8
2544.00:3	686	119	17.3	100.0	0	0	0	228	8	3.5
2546.00:3	665	48	7.2	62.5	0	0	37.5	282	12	4.3
2546.00:4	1,047	295	28.2	92.9	7.1	0	0	370	71	19.2
2547.00:1	1,463	69	4.7	24.6	75.4	0	0	596	0	0
6-Block Group Total	8,796	684	7.8	84.6	12.7	0	2.6	3,257	101	3.1

Source: U.S. Census 2000

3.3 AIR QUALITY

SH 99, Segment I-2 is located within Harris and Chambers Counties, which are designated as a "severe" 8-hour ozone non-attainment area under the National Ambient Air Quality Standards (NAAQS); therefore, the transportation conformity rule does apply. Proposed SH 99, Segment I-2 extends from SH 225 to IH 10(E). The project is divided into several construction sections due to funding availability. The proposed project on which this Re-evaluation focuses includes the project section from SH 146 to FM 1405, and the Fisher Road overpass. The project area is partly in Harris County and partly in Chambers County. As discussed in *Section 1.1*, three of the four proposed construction projects are consistent with the area's financially constrained 2035 RTP Update. The CSJ for the proposed Fisher Road overpass is expected to be added to the 2035 RTP Update with an amendment in the summer of 2011. The three CSJs currently included in the 2035 RTP Update and 2011-2014 TIP are shown on the RTP and TIP pages included in *Appendix B*. The RTP Update has been found to conform to the SIP. The conformity determination by the U.S. DOT (FHWA/FTA) for the 2035 RTP Update was approved January 25, 2011.

Traffic data for the estimated time of completion (ETC) year is approximately 26,300 average annual daily traffic (AADT) or vehicles per day (VPD), and design year traffic is approximately 43,800 AADT. A prior TxDOT modeling study and previous analysis of similar projects demonstrated that is it unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an AADT below 140,000. The AADT projections for this project do not exceed 140,000 vpd; therefore, Traffic Air Quality Analysis (TAQA) was not required. All projects in the TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in 23 Code of Federal Regulations [CFR] 450 and Subpart B of 49 CFR 613.200. Energy, environment, air quality, cost, and mobility considerations are addressed in the programming of the TIP.

Air pollution is a cause of human illness and ecosystem degradation. Motor vehicles, industries, construction equipment, and some commercial operations are among the sources of air pollution in the Houston area. The main air pollutants emitted from motor vehicles are volatile organic compounds (VOCs) and other hydrocarbons, nitrogen oxides, carbon monoxide, carbon dioxide, and particulate matter. VOCs and nitrogen oxides can react in the air in sunlight to form ground-level ozone, a toxic pollutant. Because the reactions take place over several hours, maximum concentrations of ozone are often far downwind of the precursor sources. Thus, ozone is a regional problem and not a local condition.

The U.S. Environmental Protection Agency (EPA) sets NAAQS for seven air pollutants to protect public health. The Clean Air Act (CAA) Amendments of 1990 establish specific milestones toward attaining clean air standards, depending on the severity of the air pollution problem in the region. The EPA classifies the Houston-Galveston-Brazoria (HGB) area, which includes Harris and Chambers Counties, as a severe ozone nonattainment area.

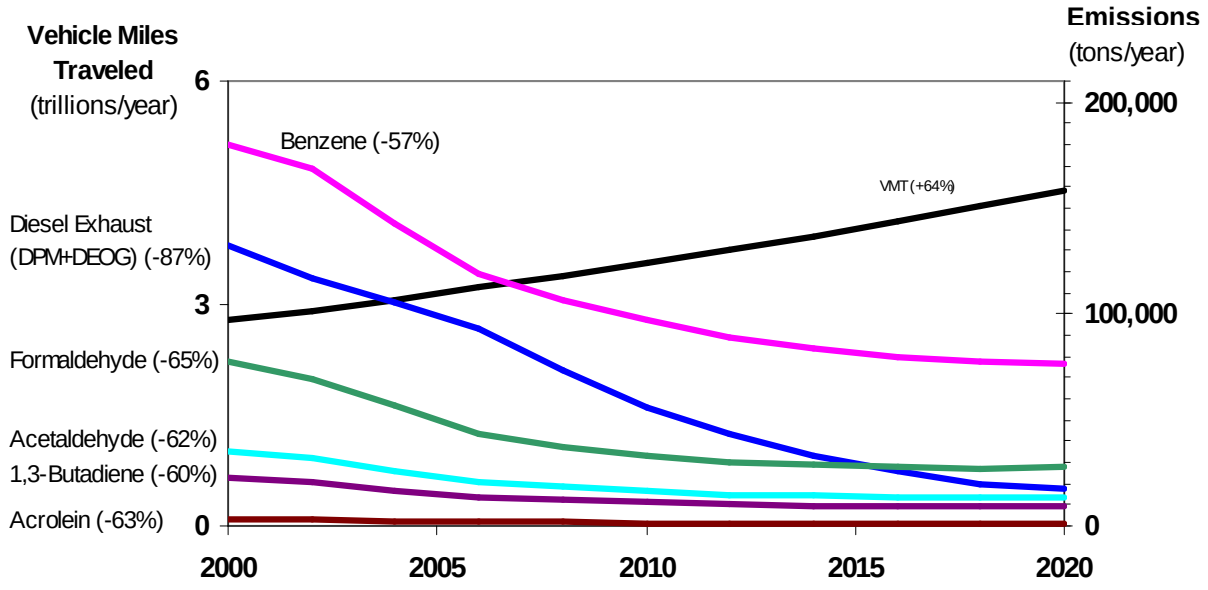
3.3.1 Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics (e.g., benzene, 1,3-butadiene). Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners), and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the CAA and has some responsibilities on the health effects of MSATs. EPA issued a final rule on the control of MSATs in 2001 (*Controlling Emissions of Hazardous Air Pollutants from Mobile Sources,* 66 Federal Register [FR] 17229, March 29, 2001). This rule was issued under the authority in Section 202 of the CAA. In its rule, the EPA examines the impacts of current and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low-emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy-duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, the FHWA projects that even with a 64 percent increase in vehicle miles traveled (VMT), these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel particulate matter emissions by 87 percent, as shown in *Exhibit 1*.

Exhibit 1. US Annual Vehicle Miles Traveled vs. Toxic Air Pollutant Emissions, 2000-2020



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: *Highway Statistics 2000*, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM +DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO_4 from diesel-powered vehicles, with the particle size cutoff set at 10 microns.

In an ongoing review of MSATs, the EPA finalized additional rules under authority of CAA Section 202(l) to further reduce MSAT emissions that are not reflected in the exhibit above. The EPA issued Final Rules on *Control of Hazardous Air Pollutants from Mobile Sources* (72 FR 8427, February 26, 2007) under Title 40 CFR Parts 59, 80, 85, and 86. The rule changes became effective on April 27, 2007. As a result of this review, EPA adopted the following new requirements to

significantly lower emissions of benzene and the other MSATs by: (1) lowering the benzene content in gasoline; (2) reducing evaporative emissions that permeate through portable fuel containers; and (3) reducing non-methane hydrocarbon (NMHC) exhaust emissions from passenger vehicles operated at cold temperatures (under 75 degrees Fahrenheit).

Beginning in 2011, petroleum refiners must meet an annual average gasoline benzene content standard of 0.62 percent by volume, for both reformulated and conventional gasolines, nationwide. This would be a 38 percent reduction from 2007. EPA standards to reduce NMHC exhaust emissions from new gasoline-fueled passenger vehicles will become effective in phases. Standards for light-duty vehicles and trucks (≤ 6000 pounds [lbs]) become effective during the period of 2010 to 2013, and standards for heavy light-duty trucks (6,000 to 8,000 lbs) and medium-duty passenger vehicles (up to 10,000 lbs) become effective during the period of 2012 to 2015. Evaporative requirements for portable gas containers become effective with containers manufactured in 2009. Evaporative emissions must be limited to 0.3 grams of hydrocarbons per gallon per day.

EPA has also adopted more stringent evaporative emission standards (equivalent to current California standards) for new passenger vehicles. The new standards become effective in 2009 for light vehicles and in 2010 for heavy vehicles. In addition to the reductions from the 2001 rule, the new rules will significantly reduce annual national MSAT emissions. The EPA estimates that emissions in the year 2030, when compared to emissions in the base year prior to the rule, will show a reduction of 330,000 tons of MSATs (including 61,000 tons of benzene), more than one million tons of VOCs, and more than 19,000 tons of particulate matter 2.5 microns or less in size ($PM_{2.5}$).

Current Levels of Air Toxics in the Segment I-2 Area, Available TCEQ Monitor Data

The Texas Commission on Environmental Quality (TCEQ) and other local organizations operate air quality monitors that measure ambient concentrations of the criteria pollutants and air toxics. This network of monitors measures the levels of various pollutants in the air. However, not all pollutants are measured at all monitors. The official data from these monitors are found on the EPA's Air Data web site: www.epa.gov/air/data. The distance of the monitors closest to the project ROW is shown in *Table 3-4*. Not all monitors sample for the same pollutants, including MSATs. It usually takes several months following a complete year of data collection for that data to be reviewed for quality assurance.

Table 3-4. Local Air Toxics Monitoring Data

Monitor ID	*Annual Average 1-Hour $PM_{2.5}$**	*2009 24-Hour Annual Average Concentrations***							*Distance From Build Alternative*
		Benzene	*1,3 Butadiene*	*Formaldehyde*	*Acetaldehyde*	*Acrolein*	*Naphthalene*	*Polycyclic Organic Matter (POM)*	
CAMS 145 (EPA Site ID 48-201-0061)	N/A	4.49	0.29	N/A	N/A	N/A	N/A	N/A	7 miles
CAMS 148 (EPA Site ID 48-201-0058)	N/A	3.41	0.95	N/A	N/A	N/A	N/A	N/A	1.7 miles

Notes: EPA Disclaimer regarding these data: "Readers are cautioned not to infer a qualitative ranking order of geographic areas based on Air Data reports. Air pollution levels measured in the vicinity of a particular monitoring site may not be representative of the prevailing air quality of a county or urban area. Pollutants emitted from a particular point source may have little impact on the immediate geographic area, and the amount of pollutants emitted does not indicate whether the point source is complying with applicable regulations." (Source: http://www.epa.gov/air/data/limits.html).

* Particulate Matter (PM) 2.5 is measured in micrograms per cubic meter. ** Air Toxics are measured in parts per billion (ppb).

N/A - data not available; The minimum detection limit for air toxics is 0.4 ppb.

Source: EPA Air Data 2010

Currently, no NAAQS have been established for any of the priority MSATs. The EPA is in the process of assessing the risks of exposure to these pollutants. The EPA's Integrated Risk Information System (http://cfpub.epa.gov/ncea/iris/index.cfm) can be reviewed for more information on the potential for human health effects that may result from exposure to MSATs.

Sensitive Receptor Assessment

There may be localized areas where ambient concentrations of MSATs are slightly higher in the build scenario than in the no-build scenario. Dispersion studies have shown that the MSAT emissions from vehicles on a "roadway" ("roadway emissions") start to drop off at 100 meters (328 feet) from the roadway, and by 500 meters (1,640 feet) most studies have shown it is difficult to distinguish the roadway from background air toxic levels in any given area. Sensitive receptors include facilities likely to contain larger concentrations of sensitive populations (hospitals, schools, licensed day care facilities, and elder care facilities). An assessment of sensitive receptors located within both 100 and 500 meters of the proposed project was conducted. *Table 3-5* provides a listing of sensitive receptors by distance from the proposed project. The sensitive receptors are also shown in *Appendix A, Figure 3*.

Table 3-5. Sensitive Receptors Located Near the Proposed Project

Type of Receptor	Address	Sensitive Receptors 0 - 100 Meters	Sensitive Receptors 100 - 500 Meters
Schools			
Horace Mann Junior School	310 S. Highway 146 Baytown, Texas	0	1
De Zavala Elementary School	305 Tri-Cities Beach Road Baytown, Texas	0	1
Licensed Day Care Facilities			
Berea Christian Learning	300 Highway 146 Baytown, Texas 77520	0	1
De Zavala Elementary Day Care	305 Tri-Cities Beach Road Baytown, Texas 77520	0	1
Total		**0**	**4**

Source: Chambers County and Harris County Appraisal Districts and Texas Department of Family and Protective Services 2009

3.4 NOISE

A noise analysis for the entire Segment I-2 was conducted for the FEIS. The most recent FHWA traffic noise model at the time, STAMINA 2.0, was used. The noise analysis conducted for the FEIS evaluated a four-lane at-grade facility. This document is evaluating a facility with four main lanes, which includes bridges/overpasses at cross streets, with at-grade frontage roads in some locations. Since the original noise analysis did not evaluate the four main lanes and associated overpasses, a new noise analysis was performed in 2009 for this Re-evaluation.

Sound from highway traffic is generated mostly from a vehicle's tires, engine, and exhaust. It is commonly measured in decibels and is expressed as "dB." Sound occurs over a wide range of frequencies, but the human ear does not perceive all frequencies equally. An adjustment is made to

the high and low frequencies to approximate the way an average person hears sounds. This adjustment is called A-weighting and is expressed as "dBA." Also, because traffic sound levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The dominant source of noise near the proposed project is highway traffic. However, existing noise levels, by themselves, do not determine whether noise impacts would occur. Rather, noise impacts are determined by comparing existing noise levels to future noise levels. The potential extent of noise impacts for the proposed project is presented in *Section 4.4*.

3.5 WETLANDS AND OTHER WATERS OF THE UNITED STATES

Pursuant to EO 11990 (Protection of Wetlands) and Section 404 of the Clean Water Act (CWA), a wetland delineation was conducted to determine the presence of waters of the United States, including wetlands, within the project area. According to the United States Army Corps of Engineers (USACE), the federal agency having authority over waters of the United States, wetlands are those areas that are inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Wetlands are transitional areas between terrestrial and aquatic systems resulting from the interaction of hydrophytic vegetation, wetlands hydrology, and hydric soils. Previous coordination with the USACE, which was subsequent to the January 9, 2001 U.S. Supreme Court case *Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers*, resulted in the USACE determining that Goose Lake, Cedar Bayou, a wetland adjacent to Cedar Bayou, and Sutton Gully were the only waters of the United States in the project area subject to the USACE's jurisdiction. The USACE's approved determination of the previous wetland delineation has expired; therefore a new jurisdictional determination would need to be obtained from the USACE. Additionally, new guidance has been issued by the USACE regarding the delineation of waters of the United States, including wetlands, and the determination of the jurisdictional status of identified waters. A wetland delineation of the entire project corridor, including the existing and proposed ROW, was recently performed using the methodology described by the *USACE Wetlands Delineation Manual* (USACE 1987), the October 2008 *Atlantic and Gulf Coastal Plain Interim Regional Supplement*, and subsequent guidance on the clarification, interpretation, and implementation of wetlands regulations. Potentially jurisdictional areas identified during the wetland delineation are shown on *Appendix A, Figure 5*.

3.5.1 Potentially Jurisdictional Areas

Fifty-one (51) aquatic resources were delineated and evaluated for jurisdictional status under the CWA. Of the 51 aquatic resources delineated, the following areas were considered potentially subject to jurisdiction under the CWA: three (3) Traditional Navigable Waters (TNWs), four (4) Relatively Permanent Waters (RPWs), and 27 wetland areas that are either adjacent to, or have a continuous surface connection to, potentially jurisdictional waters. The USACE has not verified the jurisdictional status of these resources. Coordination with the USACE is ongoing.

Waters of the United States – Three (3) named TNWs were identified within the project area, with a total area of approximately 23.6 acres. These waters are subject to CWA jurisdiction under 33 CFR 328.3(a)(1) and 40 CFR 230.3(s)(1). Four (4) RPWs were found within the existing and proposed ROW with a total area of approximately 1.0 acre. The USACE has not verified the jurisdictional status of these resources. These water bodies may be regulated under the CWA as relatively

permanent non-navigable tributaries of TNWs. "Relatively permanent" is defined as tributaries having year round flow or continuous seasonal flow for at least three months per year. Examples of these in the project area include unnamed tributaries to TNWs, diverted natural waterways, and channelized waterways that flow into TNWs. The TNW and RPW features and their areas within the existing and proposed ROW are shown in *Table 3-6*.

Table 3-6. TNW and RPW Features and Effects to Potentially Jurisdictional Waters of the United States

Description	Area Within ROW (acre)	Estimated Impact(1) (acre)	Section 10 or Section 404 Water
Traditional Navigable Waters (TNW)			
Black Duck Bay	8.957(2)	0.007	Sec. 10
Cedar Bayou	4.896(2)	0.005	Sec. 10
Goose Lake	9.764(2)	0.003	Sec. 10
Subtotal	**23.617**	**0.015**	
Relatively Permanent Waters			
Cedar Point Lateral (abandoned)	0.003	0.000	Sec. 404
Drainage Ditch to Pine Gully	0.407	0.122	Sec. 404
Un-Named Drainage to Sutton Gully	0.218	0.000	Sec. 404
Un-Named Tributary to Tabbs Bay	0.407	0.340	Sec. 404
Subtotal	**1.035**	**0.462**	
Potentially Jurisdictional Wetlands, Associated Water Body			
Black Duck Bay (5 wetland areas)	2.481	0.808	Sec. 404
Cedar Bayou (4 wetland areas)	6.004	0.137	Sec. 404
Cedar Point Lateral (abandoned)	0.886	0.384	Sec. 404
Drainage Ditch to Pine Gully (4 wetland areas)	0.025	0.000	Sec. 404
Floodplain (1 wetland area)	0.009	0.009	Sec. 404
Goose Lake (6 wetland areas)	0.475	0.007	Sec. 404
Wetland Adjacent to Unnamed Tributary to Tabbs Bay	0.006	0.006	Sec. 404
Subtotal	**9.886**	**1.351**	
Total	**34.538**	**1.828**	

Notes: (1) Impacts are estimated and subject to change. It is anticipated that permanent impacts would occur from installation of additional bridge columns and other fill activities; however, bridge and culvert designs are not complete and impacts are not quantifiable. Impacts include all permanent and temporary effects within the limits of potentially jurisdictional Section 10 and Section 404 waters. (2) Acreages are associated with the open waters of Black Duck Bay, Cedar Bayou, and Goose Lake, which are within the limits of the identified/labeled project ROW; however, these open waters are not areas that would be acquired by TxDOT as part of the project ROW.

Source: Segment I-2 Study Team 2010

Wetlands – Twenty (20) wetland areas potentially subject to jurisdiction under the CWA were identified within the existing and proposed ROW, with a total area of approximately 9.9 acres. The USACE has not verified the jurisdictional status of these resources. These areas are either adjacent to, abut, or neighbor TNWs, or have a continuous hydrological surface connection to RPWs. Areas classified as wetlands meet the three wetlands criteria of hydrophytic vegetation, hydric soils, and wetland hydrology. Vegetation observed within these areas is dominated by a variety of herbaceous species as described in the vegetation section of the FEIS, under "periodically inundated wetlands." These wetland areas are listed in *Table 3-6*.

3.5.2 Potentially Non-Jurisdictional Areas

Of the 51 aquatic resources delineated, the potentially non-jurisdictional areas in the project area include nine (9) areas that meet the three wetland criteria (approximately 5.3 acres). The potentially non-jurisdictional wetland areas have no significant nexus to TNWs or RPWs. These wetland features are isolated depressional wetlands that are not adjacent to or connected to waters of the United States. Non-jurisdictional depressional areas are not regulated by the USACE pursuant to Section 404 of the CWA; however, the USACE has not verified the jurisdictional status of areas identified for this project. The USACE is the official agency to determine the jurisdiction and extent of wetlands and other waters of the United States.

3.5.3 Floodplains

Floodplains within the ROW of the proposed project are shown on *Appendix A, Figure 5*. Approximately 73 acres of floodplains occur within the existing and proposed ROW, according to the effective 100-year floodplain maps.

3.6 THREATENED AND ENDANGERED SPECIES

According to the 1997 FEIS, no threatened or endangered species would be impacted by the proposed project. Review of recent aerial photographs indicates that habitat and land use within the existing and proposed ROW has not changed since the FEIS. Records of the most recent data for sensitive species maintained by the U.S. Fish and Wildlife Service (USFWS) and the Texas Parks and Wildlife Department (TPWD) were reviewed to determine state and/or federally listed threatened or endangered species that occur or historically have occurred in Harris and Chambers Counties. Potential effects of the proposed project on listed species were determined by reviewing the TPWD Natural Diversity Database (NDD) Element of Occurrence Records (March 3, 2010) and by conducting habitat assessments. The NDD data cannot provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features in any area, nor can these data substitute for on-site evaluation. A species list for the state and federally listed species in Harris and Chambers Counties is found in *Table 3-7*. No unique, critical, designated, or proposed designated habitat for the listed species exists in or near the proposed project area.

Table 3-7. Potential Project Effects to Listed Species within Harris and Chambers Counties

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effects Discussion
Amphibians						
Houston Toad	*Bufo houstonensis*	E	E†	Sandy soil, breeds in ephemeral pools	No	No effect
Birds						
American Peregrine Falcon	*Falco peregrinus anatum*	T	DM†	Potential migrant along coastlines	No	No impact; rare transitory migrant
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	SOC	*	Potential migrant along coastlines	No	No impact; rare transitory migrant
Bald Eagle	*Haliaeetus leucocephalus*	T	DM	Near water areas, in tall trees	No	No impact
Black Rail	*Laterallus jamaicensis*	SOC	*	Edges of freshwater marshes and ponds	No	No impact
Brown Pelican	*Pelecanus occidentalis*	E	DM	Inland near coastal areas	Yes	May impact
Henslow's Sparrow	*Ammodramus henslowii*	SOC	*	Weedy fields and grassy, bramble areas during winter	No	No impact
Mountain Plover	*Charadrius montanus*	SOC	*	Nests in short grass prairie	No	No impact
Peregrine Falcon	*Falco peregrinus*	T	*	Potential migrant along coastlines	No	No impact; rare transitory migrant
Piping Plover	*Charadrius melodus*	T	T	Winter migrant, beaches and bayside mud or salt flats	No	No effect
Red-cockaded Woodpecker	*Picoides borealis*	E	E†	Nest in 60+ year pine, forages in 30+ pine	No	No effect
Reddish Egret	*Egretta rufescens*	T	*	Brackish marshes and shallow salt ponds and tidal flats	No	No impact: project within existing or adjacent brushy ROW
Snowy Plover	*Charadrius alexandrinus*	SOC	*	Coastal areas during winter	No	No impact: project within existing or adjacent brushy ROW
Southeastern Snowy Plover	*Charadrius alexandrinus tenuirostris*	SOC	*	Coastal areas during winter	No	No impact: project within existing or adjacent ROW
Swallow-tailed Kite	*Elanoddes forficatus*	T	*	Lowland forests and marshes along rivers	No	No impact
Western Snowy Plover	*Charadrius alexandrinus nivosus*	SOC	*	Winter migrant along coast	No	No impact: project within existing or adjacent ROW

Table 3-7. *cont.*

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effects Discussion
Birds cont.						
White-faced Ibis	*Plegadis chihi*	T	*	Freshwater marshes, but some brackish or salt marshes	No	No impact
White-tailed Hawk	*Buteo albicaudatus*	T	*	Coastal prairies	No	No impact
Whooping Crane	*Grus americana*	E	E†	Winters in Aransas NWR	No	No effect
Wood Stork	*Mycteria americana*	T	*	Prairie ponds and flooded pastures	No	No impact: project within existing or adjacent ROW
Fishes						
American Eel	*Anguilla rostrata*	SOC	*	Coastal waterways and still waters, streams, and lakes	Yes	May impact
Creek Chubsucker	*Erimyzon oblongus*	T	*	Variety of small rivers and creeks, prefers headwaters	No	No impact
Smalltooth Sawfish	*Pristis pectinata*	E	E†	Coastal waterways and estuaries, still waters, streams, and lakes; prefers shallow bays	No	No effect
Mammals						
Louisiana Black Bear	*Ursus americanus luteolus*	T	T†	Bottomland hardwoods; large, undisturbed forested areas	No	No effect
Plains Spotted Skunk	*Spilogale putorius interrupta*	SOC	*	Open fields, prairies, woodlands	Yes	May impact
Rafinesque's Big-Eared Bat	*Corynorhinus rafinesquii*	T	*	Cavity trees in hardwood forest, concrete culverts, abandoned buildings	No	No impact
Red Wolf	*Canis rufus*	E	E†	Extirpated, formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	No	No effect
Southeastern Myotis Bat	*Myotis austroriparius*	SOC	*	Cavity trees in hardwood forest, concrete culverts, abandoned buildings	No	No impact
Mollusks						
Little Spectaclecase	*Villosa lienosa*	SOC	*	Creeks and rivers in east Texas	No	No impact
Louisiana Pigtoe	*Pleurobema riddellii*	T	*	Stream and river substrates	No	No impact
Pistolgrip	*Tritigonia verricosa*	SOC	*	Mud and silt substrates	No	No impact
Rock Pocketbook	*Arcidens confragosus*	SOC	*	Mud, sand, and gravel substrates	No	No impact

Table 3-7 *cont.*

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effects Discussion
Mullusks cont.						
Sandbank Pocketbook	*Lampsilis satura*	T	*	Gravel and sand bottoms of flowing rivers	No	No impact
Texas Pigtoe	*Fusconaia askewi*	T	*	Mud, sand, and gravel bottoms in sheltered streams	No	No impact
Wabash Pigtoe	*Fusconaia flava*	SOC	*	Mud, sand, and gravel bottoms in flowing streams	No	No impact
Reptiles						
Alligator Snapping Turtle	*Macroclemys temminckii*	T	*	Deep water of rivers and canals	Yes	May impact
Atlantic Hawksbill Sea Turtle	*Eretmochelys imbricata*	E	E	Gulf and bay system	No	No effect
Green Sea Turtle	*Chelonia mydas*	T	T	Gulf and bay system	No	No effect
Gulf Saltmarsh Snake	*Nerodia clarkii*	SOC	*	Saline flats, coastal bays, and brackish river mouths	No	No impact
Kemp's Ridley Sea Turtle	*Lepidochelys kempii*	E	E	Gulf and bay system	No	No effect
Leatherback Sea Turtle	*Dermochelys coriacea*	E	E	Gulf and bay system	No	No effect
Loggerhead Sea Turtle	*Caretta caretta*	T	T	Gulf and bay system	No	No effect
Northern Scarlet Snake	*Cemophora coccinea copei*	T	*	Mixed hardwood scrub on sandy soils	No	No impact
Smooth Green Snake	*Liochlorophis vernalis*	T	*	Gulf coastal prairies, prefers dense vegetation	No	No impact
Texas Diamondback Terrapin	*Malaclemys terrapin littoralis*	SOC	*	Coastal marshes, tidal flats	No	No impact: project within existing or adjacent ROW
Texas Horned Lizard	*Phrynosoma cornutum*	T	*	Open, semi-arid regions, with bunch grass	No	No impact
Timber/Canebrake Rattlesnake	*Crotalus horridus*	T	*	Swamps/floodplains of hardwood/upland pine	No	No impact
Vascular Plants						
Coastal Gay-feather	*Liatris bracteata*	SOC	*	Black clay soils of prairie remnants	No	No impact
Giant Sharpstem Umbrella-sedge	*Cyperus cephalanthus*	SOC	*	Moderately drained remnant coastal prairies	No	No impact
Houston Daisy	*Rayjacksonia aurea*	SOC	*	Sandy loam grasslands around pimple mounds	No	No impact
Texas Meadow-Rue	*Thalictrum texanum*	SOC	*	Shaded ditches next to woodlands	No	No impact

Table 3-7. *cont.*

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Effects Discussion
Vascular Plants *cont.*						
Texas Prairie Dawn	*Hymenoxys texana*	E	E	Poorly drained areas in open grasslands; pimple mounds	No	No effect
Texas Windmill Grass	*Chloris texensis*	SOC	*	Sandy loam soils in grassland and next to ditches	No	No impact
Threeflower Broomweed	*Thurovia triflora*	SOC	*	Ecotone between salty prairies and tidal flats	No	No impact

* These species occur on the state listing of threatened or endangered species and species of concern; however, they are not federally listed at this time by the USFWS (2010).

† These species are listed by the USFWS; however, they are not listed as occurring within Harris County or Chambers County by the Clear Lake office of the USFWS (2010).

E = endangered T = threatened SOC = species of concern D = delisted taxon DM = delisted taxon, recovered, being monitored first five years

Source: TPWD 2010, USFWS 2010

According to the TPWD NDD Element of Occurrence records search conducted March 3, 2010, in conjunction with analysis of geographic data, no documented occurrences of species or vegetation series listed in the NDD records are known within the limits of the proposed project or within 1.5 miles of the proposed project. Qualified biologists conducted a survey in the ROW on March 2, 2010 and listed species or rare vegetation series were not observed during the field investigation. The project area is north of Galveston Bay. The Galveston Bay system provides habitat for listed sea turtles, but sea turtle habitat is not present in the vicinity of the proposed project. Since the project crosses waterbodies that are tidally-influenced, the sea turtles are discussed below.

Federally Listed Species

Harris County

The Bald Eagle and Texas prairie dawn are federally listed in Harris County. The Bald Eagle was delisted in June 2007. The Bald Eagle will be monitored by USFWS for five years after delisting. The Bald Eagle is still protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. No suitable habitat for the Bald Eagle is located within or adjacent to the project ROW. The project will have no impact on the Bald Eagle. The ROW is either completely disturbed or wooded/scrub-shrub type habitat. This type of habitat is not suitable for Texas prairie dawn. The proposed project will have no effect on Texas prairie dawn. The sea/marine turtles are not federally listed in Harris County. The proposed Goose Lake crossing in Harris County occurs north of sea/marine turtle habitat in Galveston Bay.

Chambers County

Five sea/marine turtles are federally listed in Chambers County: Atlantic hawksbill sea turtle, green sea turtle, Kemp's Ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle. The Goose Lake crossing is located in Harris County, and the sea/marine turtles are not listed in Harris County. Goose Lake is north of sea/marine turtle habitat. The proposed project crosses Cedar Bayou, which is tidally influenced, in Chambers County. Cedar Bayou is a riverine deepwater type of habitat.

Cedar Bayou flows into the Galveston Bay system, but it is not part of the Galveston Bay system at SH 99 approximately 4 miles upstream of Galveston Bay. The crossing along Cedar Bayou occurs north of potential sea turtle habitat. The Atlantic hawksbill, green sea turtle, and leatherback turtles generally inhabit offshore waters and nest on sandy beaches. The Atlantic hawksbill turtle will occupy more inland waters (lagoon, bays, etc.) if coral reefs and natural rocky areas are present. The offshore habitat, coral reefs, and natural rocky areas are not present in the project area. Kemp's Ridley sea turtle and the loggerhead sea turtle occur more frequently along the Texas Gulf Coast than the other listed turtles. The Kemp's Ridley sea turtle typically lives in offshore open water habitat, and sandy beaches are used for nesting. The Kemp's Ridley sea turtle will feed in shallow bays where sea grasses are present. This type of habitat does not occur along Cedar Bayou. Loggerhead sea turtles are similar to Kemp's Ridley turtles and nest on sandy beaches and spend time in the open water environments. The loggerhead sea turtle will generally return to nearshore areas along the coast and in bays and estuaries. The loggerhead sea turtle prefers to feed along grassy areas in shallow water. This type of habitat is not found in Cedar Bayou in the area of the proposed project. The closest known sea grass is approximately 4 miles southeast of the project area along the eastern shore of Trinity Bay. Supporting data was obtained from the NMFS website (http://www.nmfs.noaa.gov/pr/species/turtles/, date accessed September 17, 2010), TPWD website (http://www.tpwd.state.tx.us/huntwild/wild /species/endang/animals/reptiles_amphibians/, date accessed September 17, 2010), and a paper on Galveston Bay System by Warren Pulich, Jr.

The Bald Eagle is federally listed in Chambers County. The Bald Eagle was delisted in June 2007. The Bald Eagle will be monitored by USFWS for five years after delisting. The Bald Eagle is still protected by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. No suitable habitat for the Bald Eagle is located within or adjacent to the project ROW. The project will have no impact on the Bald Eagle.

State Listed Species

The TPWD NDD revealed no documented occurrences of listed species within the proposed project ROW, and the following two TPWD species of concern were documented within 5 miles of the project: Texas windmill grass (Element of Occurrence identification no. [EOID] 7849) and threeflower broomweed (EOID 7357) (*Table 3-7*). No listed threatened or endangered species were documented within the project ROW or within 5 miles of the project. Species of concern are at-risk plant and animal species that TPWD has determined appear to be in need of conservation or monitoring. The TPWD NDD Element of Occurrence records search also documented that two rookeries (EOIDs 1076 and 4756) were found within 1.5 miles of the proposed project, and four rookeries (EOIDs 4757, 5069, 6411, and 7621) and one vegetation series, little bluestem-brownseed paspalum series (EOID 3175), were within 5 miles of the project. Habitat is present for the American eel, a state species of concern, within Goose Lake and Cedar Bayou. Habitat for the plains spotted skunk, a state species of concern, was observed adjacent to the ROW. Neither species has been documented in the area. Habitat for the state listed threatened alligator snapping turtle was observed in both Goose Lake and Cedar Bayou. No alligator snapping turtles have been documented in the project vicinity. Suitable habitat for the state listed endangered Brown Pelican is adjacent to the project area. No Brown Pelican were observed during site visits.

The proposed project area contains either disturbed soils or wooded areas that are not habitat for Texas windmill grass, threeflower broomweed, or the little bluestem-brownseed paspalum series. Texas windmill grass is endemic to Texas and prefers a habitat of sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants. It has also been observed on mowed

roadsides that may mimic natural prairie regimes. The Element of Occurrence records show the last documented sighting was in 1984, southwest of the Fred Hartman Memorial Bridge (SH 146 bridge over the San Jacinto River/Houston Ship Channel). Threeflower broomweed is also endemic to Texas coastal prairies, and its preferred habitat includes black clay soils of remnant grasslands and tidal flat areas. The Element of Occurrence records show that the last documented sighting was in 1897, northwest of the project area. Based on lack of suitable habitat, no observation of listed species, and no known occurrences of these species, historically, in the project study area or within 1.5 miles of the project study area, the plant species do not occur within the proposed project ROW.

3.7 CULTURAL RESOURCES

3.7.1 Historical Structures

The historical resources study conducted for the 1997 FEIS identified 26 structures in the SH 99, Segment I-2 project vicinity as potentially eligible for inclusion in the National Register of Historic Places (NRHP). Coordination with the State Historic Preservation Officer (SHPO) was concluded in February 1996 and it was determined that none of the identified structures were NRHP-eligible. Except for the proposed overpass at Fisher Road, the planned project has been constructed from FM 1405 to IH 10(E). The historic resources investigation for this Re-evaluation addressed the project from SH 146 to FM 1405.

A review of the 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 APE for the proposed project between SH 146 and FM 1405. It has been determined through consultation with the SHPO that the APE for the proposed project is 150 feet from the proposed ROW. A reconnaissance survey undertaken in May and August 2009 revealed that there are eleven historic-age resources (built prior to 1968) on five legally distinct parcels located within the project APE. The survey cut-off date is based on the anticipated let date of 2013. There are two Official Texas Historical Markers commemorating the Baytown Orphanage and Ashbel Smith, M.D. in the Project APE. The markers would not need to be relocated for the project as proposed and would not be affected during construction of the project.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects," Appendix 4 (2) of the Programmatic Agreement for Transportation Undertakings (PATU) between FHWA, the Texas SHPO, the Advisory Council on Historic Preservation, 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 the SHPO is not required (*Appendix D*).

3.7.2 Archeological Resources

During preparation of the 1997 FEIS, coordination with the SHPO was concluded in December 1996; it was determined that construction of Alternative 6 (the preferred alternative) would have no effect on archeological or historic properties. Alternative 6 is the existing/proposed route for Segment I-2. Previous consultation with the Texas Historical Commission (THC) resulted in a recommendation that no further archeological investigations were needed. In 2007, TxDOT recommended that the proposed project, as it is currently designed, would have no effect on any archeological historic properties or sites that are listed or eligible for listing on the National Register of Historic Places, or as State Archeological Landmarks, or as State Historic Landmark; therefore, consultation with the

SHPO is not necessary. In 2011, TxDOT conducted an internal review under the PA for the Fisher Road overpass and determined that no further archeological survey was needed (*Appendix D*). Consultation with federally-recognized Native American tribes was initiated on March 7, 2011. No objections or expressions of concern were received within the comment period.. Additional coordination with the Chambers County Historical Commission and the Harris County Historical Commission was conducted in 2009 for the proposed project (*Appendix D*). Representatives of the commissions did not provide information regarding potential archeological resources. In the unlikely event that evidence of archaeological deposits is encountered during construction, work in the immediate area will cease and TxDOT's archaeological staff will be contacted to initiate accidental discovery procedures under the provisions of the Programmatic Agreement among TxDOT, THC, FHWA, and the Advisory Council on Historic Preservation, and the MOU between TxDOT and THC.

3.8 HAZARDOUS MATERIALS

The SH 99, Segment I-2 area that would be impacted by the proposed project is primarily rural or undeveloped, with some residential and a few commercial/industrial areas. The industrial areas primarily consist of warehouses located near FM 1405. The western portion of the project area has had extensive oil and gas exploration activities (*Appendix A, Figure 4*). A Phase II Environmental Site Assessment (ESA) investigation was performed in 1996 in the project area on a parcel of land adjacent to and west of South Main Street, and south of BS 146. An active oil well was reported within the proposed project ROW. The proposed project ROW was revised to avoid the area with the oil well. One active oil and gas well would be displaced by the current proposed ROW (*Appendix A, Figure 3, Sheet* 2).

An updated review of selected regulatory databases published by federal and state agencies was conducted to determine the potential for hazardous materials in the project area. A commercial database vendor, Banks Information Solutions, Inc. (Banks), prepared the regulatory database report on February 9, 2009. Banks researched databases in accordance with *American Society for Testing and Materials* (ASTM) *Standard: E 1527-05 Standard Practice for Environmental Site Assessment* and TxDOT environmental guidance search radii. The regulatory listings are limited and include only those sites that are known to the regulatory agencies to be permitted, contaminated, or in the process of evaluation for potential contamination at the time of publication.

ASTM Standards and TxDOT-Recommended Regulatory Databases

The regulatory database report included a review of the ASTM and TxDOT-recommended databases. The following is an abbreviated list of the ASTM and TxDOT-recommended federal and state databases and records that were searched for relevant information:

- National Priority List (NPL), within 1.25 miles; EPA list of confirmed or proposed Superfund sites
- Comprehensive Environmental Response, Compensation, and Liability Information Service (CERCLIS), within 0.50 mile; proposed or possible NPL sites from the EPA database of current and potential Superfund sites currently or previously under investigation
- Resource Conservation and Recovery Act (RCRA) treatment, storage, or disposal (TSD) sites, within 0.50 mile; EPA database of sites that treat, store, dispose, or incinerate hazardous waste

- RCRA Corrective Action Report (CORRACTS), within 1.25 miles; EPA database of RCRA Information System (RCRIS) sites (hazardous waste handlers) under reported corrective action
- RCRA Generator (GEN), within 0.50 mile; EPA database of RCRIS sites that create more than 100 kg of hazardous waste per month or meet other RCRA requirements, including the RCRA Administrative Action Tracking System and Compliance Monitoring and Enforcement List
- Emergency Response Notification System (ERNS), within 0.25 mile; EPA database of emergency response actions for reported spills of regulated materials
- Underground Petroleum Storage Tanks (UST), within 0.50 mile; TCEQ database of underground petroleum storage tanks that are registered with the state
- Leaking Underground Petroleum Storage Tanks (LUST), within 0.75 mile; TCEQ database of underground petroleum storage tanks that have reported leaks of petroleum substances
- State/Tribal Voluntary Cleanup Program (VCP) and Innocent Owner/Operator Program (IOP), within 0.75 mile; some VCP and IOP sites are noted as having institutional controls placed on them
- State Wells, within 0.50 mile; TWDB database of public drinking water well and surface intake sites
- Federal Wells, within 0.50 mile; U.S. Geological Survey (USGS) United States Ground-Water Sites Inventory – Database of more than 850,000 records of wells, springs, test holes, tunnels, drains, and excavations in the United States
- State Other, within 1.25 miles; TCEQ Texas Industrial Hazardous Waste Notice of Registration (IHW NOR) data. TCEQ enters all information submitted by industrial and hazardous waste transporters, receivers (including recyclers), generators, and one-time shipments into a database that tracks industrial and hazardous waste generation and management activities in the state of Texas. All facilities of these types receive a solid waste registration number.
- Oil and Gas Wells, within 0.50 mile; Texas Railroad Commission (RRC) listing of completions, plugging, and permits. Data is obtained only from digital data provided by the Texas RRC.

Regulatory Database Report Summary

Because more than three years have elapsed since the last hazardous materials investigation was conducted for the 2007 Re-evaluation, the February 9, 2009 Banks database report was examined for new hazardous materials concerns. Regulated properties were verified and/or identified with ground truthing, review of aerial photography, and review of Harris County Appraisal District (HCAD) records. Based on the investigations conducted, *Table 3-8* summarizes the number and type of regulated sites in the project area. Locations of sites listed in this table are presented in *Appendix A, Figure 3*.

Table 3-8. Environmental Database Summary

Database	Banks Radius (miles)	Banks Database Report Sites	Regulated Properties Within ½ Mile of SH 99 Proposed ROW
Federal National Priority List (NPL)	1.25	0	0
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	0.50	0	0
Federal CERCLIS No Further Remedial Action Planned (NFRAP)	0.25	7	0
Federal Resource Conservation and Recovery Act (RCRA) Treatment, Storage, and Disposal (TSD) Facilities	.50	1	0
Federal RCRA Corrective Action Sites (CORRACTS)	1.25	4	1
Federal RCRA Generators (large and small quantity generators [LQG and SQG])	0.50	32	2
Emergency Response Notification System (ERNS)	0.25	1,210	N/A
State Sites including TCEQ State Superfund Registry, Voluntary Cleanup Program (VCP), and Innocent Owner/Operator Program (IOP)	0.75	2	0
Solid Waste Landfill (SWL)	0.50	11	0
State Other and Texas Industrial Hazardous Waste (TxIHW) Notice of Registration	0.25	73	7
Underground Petroleum Storage Tanks (UST)	0.50	39	7
Leaking UST (LUST)	0.75	30	6

Source: Banks Information Solutions, Inc. February 9, 2009

For the Re-evaluation, the area of Segment I-2 being evaluated extends from SH 146 to Fisher Road. The western portion of the project area includes residential, commercial, public, and large areas with oil and gas production fields, and has higher potential for environmental hazards than the area east of the BS 146/SH 99 intersection. The area east of Tri-Cities Beach Road is primarily rural or undeveloped, with three sites where oil and gas equipment is located in close proximity, but not within, the proposed ROW. Cedar Crossing Industrial Park was developed over the past 10 years, and is located on both sides of SH 99 between Cedar Bayou and Fisher Road.

Regulatory database sites that are mapped within a 0.5-mile radius of the proposed project are listed in *Table 3-9*. These include former LUSTs, UST sites, automotive repair shops, and similar types of facilities that use or manage hazardous substances during routine operations. None of the facilities listed in *Table 3-9* would be expected to impact the proposed project.

Table 3-9. Hazardous Materials Sites

ID Number	Name	Address	Issue	Condition
1	Baytown Market 2	1617 Missouri Street, Baytown, TX 77520	UST	Two 10,000-gallon gasoline tanks; both in use
2	Bayland Park Marina	2601 S. Highway 146, Baytown, TX 77520	UST	Two 4,000-gallon tanks, one gasoline and one diesel; both out of use
3	Veolia EJ Technical Solutions LLC	1800 S. Highway 146, Baytown, TX 77520	RCRA CORRACTS and Other	Active; Conditionally Exempt Small Quantity Generator (CESQG)
4	US Filter Westates Baytown Facility	2201 Lee Drive, Baytown, TX 77520	Other	Inactive
5	Baytown Valero	1600 S. Highway 146, Baytown, TX 77520	UST	Three 8,000-gallon tanks; two with gasoline and one with diesel and all removed from the ground; two 20,000-gallon tanks both in use, one with gasoline and one with diesel; one 12,000-gallon tank with diesel and in use
6	Exxon	717 W. Main Street, Baytown, TX 77520	LUST	One 6,000-gallon tank with gasoline - removed from ground; two 8,000 gallon tanks with gasoline - removed from ground; one 1,000-gallon tank with gasoline – removed from ground. Groundwater other than drinking water aquifer or water well impacted/threatened; final concurrence issued, case closed
7	Former City of Baytown Public Works Garage	806 W. Nazro Street, Baytown, TX 77520	RCRAGEN	Inactive; SQG
8	Allen's Garage	303 W. Cleveland, Baytown, TX 77520	Other	Inactive; CESQG

Table 3-9. ***cont.***

ID Number	Name	Address	Issue	Condition
9	Abandoned Service Station	425 W. Main Street, Baytown, TX 77520	LUST	Groundwater impacted, no apparent threats or impacts to receptors; final concurrence pending documentation of well plugging
10	Former Diamond Shamrock	220 W. Main Street, Baytown, TX 77520	LUST	Two 10,000-gallon gasoline tanks; groundwater impacted, no apparent threats or impacts to receptors; final concurrence issued, case closed
11	Former Industrial Solutions LLP	1018 S. Highway 146, Baytown, TX 77520	RCRAGEN and Other	Inactive; no waste generated
12	UPS	223 E. Republic Street, Baytown, TX 77520	Other	Inactive
13	Former Baytown Warehouse	200 E Republic Street, Baytown, TX 77520	LUST	One 6,000-gallon used oil tank - groundwater impacted; final concurrence issued, case closed; one 4,000-gallon tank with used oil - removed from ground
14	AA Dump Truck Service	418 E. Texas Ave. Baytown, TX 77520	Other	Industrial and hazardous waste transporter; no waste generated
15	Jons Mart Diamond Shamrock	605 E. Texas Avenue, Baytown, TX 77520	LUST	Groundwater impacted, public/domestic water supply well within 0.25 mile; final concurrence issued, case closed
16	Exxon Station	101 S. Alexander Drive, Baytown, TX 77520	LUST	Groundwater impacted, no apparent threats or impacts to receptors; final concurrence issued, case closed

Table 3-9. ***cont.***

ID Number	Name	Address	Issue	Condition
17	Walgreens	100 N. Alexander Drive, Baytown, TX 77520	Other	Inactive
18	Former Firestone	144 S. Alexander, Baytown, TX 77520	UST	Inactive; CESQG
19	Former Firestone service station (Now La Quinta Motel)	144 S. Alexander Baytown, TX 77520	Other	Former service station listed with petroleum storage tanks and industrial and hazardous waste generation registration number. For current La Quinta motel, assuming all facilities are removed, this is an inactive hazardous material site.

Source: Banks Information Solutions, Inc. February 2009

In addition to federal and state standard databases, oil and gas well locations were obtained from the Texas RRC**.** According to data obtained from the Texas RRC, exploration companies have drilled a large number of oil and gas wells within the Segment I-2 study area. The oil and gas wells are primarily in the western portion of the study area. Most of the wells have been plugged or abandoned. One active well is located in an area where roadway ROW would be acquired; the well would be displaced. This well is located east of the UP Railroad and south of BS 146, and is Hazardous Material Site No. 21 on *Appendix A, Figure 3, Sheet 2*. One active well appears to be located partially within the existing ROW of the proposed project, and is east of Goose Lake and north of BS 146. This site is Hazardous Material Site No. 20 on *Appendix A, Figure 3, Sheet 1*.

A large number of ERNS sites were reported in the Banks database search for the Segment I-2 project area. The majority of the spills listed are not linked with specific properties and, therefore, do not warrant an ESA investigation.

According to data provided by the Texas RRC, underground oil and gas pipelines are located in the vicinity of the project area. In the western portion of the project area, a pipeline parallels Lanier Road/SH 146 and is oriented north/south. A second pipeline parallels and is south of BS 146 on the eastern bank of Goose Lake, and then changes orientation to north/south and crosses BS 146. A third pipeline is located west of Lee Road and parallels the previously described pipeline. A utility easement with a number of pipelines is oriented southwest to northeast and crosses Cedar Bayou at the UP Railroad, and crosses BS 146 at the east end of the Cedar Bayou bridge. Some of the pipelines from the easement diverge south of SH 146 and turn eastward. The presence of pipelines and utility lines within the project ROW will require coordination with the owners of the lines prior to commencing excavation and construction activities for the project.

3.9 VISUAL AND AESTHETIC QUALITIES

The surrounding landscape adjacent to SH 99, Segment I-2 from SH 146 to FM 1405 consists of urban areas in the western portion, with some wooded areas and/or farmland with some residential properties. The area around Fisher Road is mostly undeveloped. There have been no changes in alignment and no significant changes to the roadway design since the FEIS.

3.10 MIGRATORY BIRD TREATY ACT

According to the Migratory Bird Treaty Act, all migratory birds and their parts (including nests, eggs, and feathers) are fully protected under the law unless the interested party first obtains a special permit that allows handling of migratory birds. Special purpose transport permits are available and are only issued to those individuals/organizations that have a required knowledge, expertise, and access to a licensed veterinarian and permitted rehabilitator. There have been no changes to the project alignment since the 2002 and 2007 Re-evaluations were completed; therefore, there would be no changes in impacts to migratory birds as a result of the widening and re-construction of SH 99, Segment I-2 from SH 146 to FM 1405.

The project area would be investigated for any structures containing migratory birds or indications of nesting migratory birds. Migratory birds may arrive in the project area to breed during construction of the proposed project. Measures would be taken to avoid the take of migratory birds, their occupied nests, eggs, or young, in accordance with the Migratory Bird Treaty Act, through phasing of work or preventative measures. New overpasses would be less than 24 feet above existing ground level, and would not be expected to adversely impact migratory birds.

3.11 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act, as amended in 2005, directs that all federal agencies whose actions would impact essential fish habitat (EFH) must consult with the National Marine Fisheries Service (NMFS) regarding potential adverse affects. EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. EFH is identified and described based on areas where various life stages of 26 representative managed species and the coral complex commonly occur. According to the Gulf of Mexico Fishery Management Council (GMFMC) webpage, EFH is managed for Shrimp, Red Drum, Reef Fish, Stone Crab, Coral and Coral Reef resources, and Spiny Lobster fishery resources in the Gulf of Mexico, as well as the Coastal Migratory Pelagic Resources in the Gulf of Mexico and South Atlantic within their Fishery Management Plans (FMP).

Any project that receives federal funding must address potential impacts to EFH. The proposed project crosses Goose Lake and Cedar Bayou, which are tidally-influenced water bodies that could potentially be used as fish habitat. Coordination with the NMFS regarding proposed westbound bridges at Cedar Bayou and Goose Lake was completed in 2006 and 2008, respectively. NMFS concurred with the conclusions in the EFH assessment provided by TxDOT that the proposed projects would have minimal impact on EFH, and no further consultation with NMFS is required for the westbound Goose Lake bridge that is currently being constructed (*Appendix D)*. TxDOT has re-evaluated the current proposed project, and determined that no adverse effects to EFH would result from the proposed bridge replacement/widening at Goose Lake and the proposed westbound bridge at Cedar Bayou. TxDOT is coordinating with NMFS regarding this assessment.

3.12 VEGETATION

Existing vegetation was discussed in the FEIS. Review of recent aerial photographs indicates no substantive change in land use or vegetative cover in the project area. Because of revisions to the preliminary roadway schematic design since the FEIS, the proposed ROW required for the portion of the project between SH 146 and FM 1405 has been reduced slightly, thereby decreasing the acreage of wooded areas within the ROW from approximately 24 acres to approximately 22.3 acres. Qualified biologists conducted surveys within the project study area and found no change in land use within the proposed ROW. During site visits conducted in spring 2010, investigators noted vegetation removal activities on a wooded tract of land located east of Tri-Cities Beach Road and south of the existing SH 99 ROW. The purpose for the vegetation removal was not apparent. Approximately 2.4 acres of the tract would be acquired as part of the proposed project ROW. Other than the vegetation removal activities noted, the vegetation description in the FEIS remains valid.

Invasive Species and Beneficial Landscape Practices

On February 3, 1999, the President issued EO 13112 to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts. Invasive species as defined by EO 13112 is "an alien species, whose introduction does or is likely to cause economic or environmental harm or harm to human health." Revegetation would comply with EO 13112 to the greatest extent practicable. Soil disturbance would be minimized to reduce the opportunity for the establishment of invasive species in the ROW area associated with the project.

In accordance with the Executive Memorandum on Beneficial Landscape Practices, TxDOT would adhere to the following sustainable landscape measures and practices where cost effective and to the extent practicable:

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

4.0 ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 LAND USE

The proposed project would be constructed primarily within existing ROW but would also require the acquisition of approximately 46 acres of ROW between SH 146 and FM 1405 (*Appendix A, Figure 3* and *Appendix C*). Of the 46 acres of required ROW, 1 percent is oil and gas production areas, and 99 percent is undeveloped. As discussed below, some displacements of structures and property would occur. The proposed project does not bisect any established neighborhoods or isolate any neighborhoods or communities, nor would it disrupt orderly planned development of the project area. The proposed project is consistent with the plans and policies of local governmental entities. No significant change to the overall land use in the area is anticipated as a direct result of implementation of the proposed project.

4.1.1 Right-of-Way and Displacements

The proposed project would require the acquisition of approximately 46 acres of ROW. Acquisition of the proposed ROW would impact approximately 14 parcels. There would be no single-family or multi-family residential displacements. The project would require some utility relocations, potentially including overhead electrical power lines, pipeline equipment, and cable and telephone lines. The proposed roadway would cross one large electrical utility easement, as shown on *Appendix A, Figure 3, Sheet 3*. Potential relocations, listed in *Table 4-1*, are based on review of aerial photographs (H-GAC database [MrSIDs] images, January 2008) and site reconnaissance via public roadways conducted in April and August 2009, and March 2010. Some areas where displacements could occur are located within the existing ROW. Based on the preliminary roadway design, some of these areas may not be impacted. An estimated 10 free-standing signs associated with adjacent commercial activities would also need to be relocated. Potential impacts as a result of displacing oil and gas wells are described in *Section 4.8, Hazardous Materials*. The proposed ROW acquisition would follow the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970. The potential displacements listed in *Table 4-1* are shown on *Appendix A, Figure 3*, except for the free-standing signs.

Table 4-1. Potential Displacements

ID No.	Name	Business	Other
1	Missouri Church of Christ parking area and lawn – within existing ROW		1*
2	Oil and Gas well		1*
3	Parking and lay-down area at South Texas Sand Blasting and Painting - within existing ROW	1*	
4	Baytown Valero gas station building and parking lot – within existing ROW	1*	
5	Pelican Rocky's Junction Ice House- covered parking area within existing ROW	1**	
6	Oil and Gas well		1
7	Pipeline equipment (lift station)		1*
8	Entrance Gate to Family Farm/Ranch		1**
	Signs		10

* Structure/land area is within TxDOT ROW but would likely not be displaced based on planned roadway design.
** Partial displacement and/or property acquisition
Source: Segment I-2 Study Team 2010

4.2 SOCIAL RESOURCES

4.2.1 Population and Demographics

As discussed in *Section 4.1,* the proposed project would not require any single-family or multi-family residential relocations. The population and the overall racial/ethnic distribution of the population, or other demographic factors, would not be expected to be affected by the proposed project.

4.2.2 Neighborhoods and Community Cohesion

Impacts to economic, environmental, and social attributes of the project area resulting from the proposed project are expected to be minimal. Local and regional economic growth would be the determining factors in the future development in this area. Residential and commercial/industrial areas are located adjacent to the proposed project or in the project vicinity; however, the proposed project would require the acquisition of approximately 46 acres of ROW, most of which is undeveloped land, and would not require residential displacements. The proposed project does not bisect any established neighborhoods or isolate any neighborhoods or communities, nor would it disrupt orderly planned development of the project area.

4.2.3 Environmental Justice

Minority and low-income population data from the 2000 U.S. Census is discussed in *Section 3.2.3*. Four Census tracts, 6 Census block groups, and 37 Census blocks were identified within the project area from SH 146 to Fisher Road. Four of the block groups are located within Harris County and two are located in Chambers County.

Of the 37 Census blocks and 6 Census block groups located within the study area, 10 Census blocks have high minority populations and no Census block groups have low median household incomes, as shown in *Table 3-2*. Income data is available from the U.S. Census bureau at the Census block group level and above.

The number and type of relocations potentially required for the proposed project are discussed in *Section 4.1.1, Right-of-way and Displacements* . Although 10 Census blocks have high minority populations, no residential displacements or proposed ROW is being acquired in residential areas. A noise impact is anticipated to two residential receivers located within Census Tract 2544, Block Group 3, Block 3001, which has a high minority population, approximately 53.7 percent. Noise abatement is not proposed, as discussed in *Section 4.4, Noise*. Noise impacts to residential communities were analyzed according to the FHWA's Noise Abatement Criteria.

Implementation of the proposed project would not result in disproportionately high and adverse impacts to minority or low-income populations. Disproportionate impacts to minority and low-income groups are not expected, as the development of this facility would benefit adjacent neighborhoods by improving mobility in the area. Regional impacts to environmental justice individuals or communities are discussed below.

4.2.4 Limited English Proficiency

As discussed in *Section 3.2.4*, approximately 7.8 percent of persons within the project area speak English less than "very well" and 3.1 percent are "linguistically isolated." Of the LEP population, approximately 84.6 percent speak Spanish, 12.7 percent speak Indo-European languages, 0 percent

speak Asian/Pacific island languages, and 2.6 percent Other languages. TxDOT has ensured that opportunities for community input in the National Environmental Policy Act (NEPA) process have been and will continue to be provided. Public involvement for highway improvement projects that use federal aid highway funds will be consistent with applicable state and federal law and 43 Texas Administrative Code (TAC) §2.43 (b) (relating to Highway Construction Projects-State Funds). As stated in 43 TAC §2.43 (b), public involvement shall be encouraged as an important element of project planning, and meetings shall be initiated by the pertinent district office and will depend on and be consistent with the type and complexity of each state project. During the EIS planning process, seven public meetings and a public hearing were held, starting in March 1992 and ending with the public hearing in January 1995. Meetings were announced in local newspapers, and public meeting notices were mailed to elected officials. An additional public meeting was held on October 20, 2005 in Mont Belvieu, Texas. This public meeting presented changes to Segment I-2 from IH 10(E) to Fisher Road, which includes a portion of the proposed project addressed in this Re-evaluation. To comply with EO 13166, newspaper announcements were published in a Spanish language newspaper (Rumbo de Houston), and Spanish-speaking individuals were available for assistance during the public meeting.

Due to proposed design changes and tolling of the roadway from SH 146 to Fisher Road, a public meeting was conducted on July 27, 2010 during preparation of this Re-evaluation. Approximately 118 individuals registered at the public meeting at the Baytown Community Center. The meeting was an open house format. Public notices were published in the *Houston Chronicle*, *Baytown Sun*, and *La Voz* (Spanish Newspaper). The following common comments or public concerns were documented:

- requests for roadway improvements and safety improvements
- concerns about speed limits, roadway access, tolling, and roadway flooding

TxDOT finalized a public meeting summary, including responses to comments, in January 2011. The summary is available on the Grand Parkway website at: http://www.grandpky.com/segments/i-2/ and a link to that website is on the TxDOT website..

4.2.5 Economic Impacts

Roadway construction activities would create new job opportunities and income potential in the area in the short term. The number of construction-related jobs would vary, depending on the phasing of project construction. The total jobs that would be created, directly and indirectly, by implementation of the proposed project are estimated to be 2,980 and 2,891 jobs, respectively. The total additional income that would be created, directly and indirectly, by implementation of the proposed project is estimated to be $59.9 and $120.1 million, respectively, based on the Texas Input/Output model (Texas State Comptroller 2009). The total statewide effect from the proposed project is estimated to be $567.6 million, based on the Regional Economic Models, Inc. (REMI) model (Texas State Comptroller 2009). The acquisition of proposed ROW would displace one or two oil or gas wells, and an estimated 10 free-standing signs. Displacees may be reimbursed for incurred costs based on TxDOT policies and procedures.

4.2.6 Toll Impact to Environmental Justice Communities

In April 2009 (revised July 2009), H-GAC published a document titled *Draft Regional Toll Analysis Summary for Inclusion in Houston Area Toll Road Environmental Documents*, that assesses the impact of toll roads on environmental justice communities in the Houston regional area. The regional toll analysis is included in *Sections 4.15* and *4.16*. The conclusion of this study discusses regional benefits for those using non-toll facilities, which includes potential time savings on trips; the average time savings is between 2.32 and 5.05 minutes per trip. Therefore, no disproportionate adverse effects to EJ populations from the regional tolled roadway network are expected. Initially, the evaluation identified 2000 Census block groups that contained 51 percent or more of minority and/or low-income populations. After the EJ block groups were identified, EJ Traffic Analysis Zones (TAZs) or "EJ Zones" were identified that had 50 percent or more of its area identified as an EJ population. The entire region, including the EJ Zones, would realize a benefit in travel time savings because of the added capacity the tolled roadway facilities provide to the regional roadway network.

Within the SH 99, Segment I-2 study area, existing public roadways and non-toll facilities would be available to EJ populations. However, free access on the SH 99, Segment I-2 toll lanes would not be available. Roads that are free now would remain free after the proposed project is constructed. The stated purpose of SH 99, Segment I-2 is to provide access and increased mobility to the freeway (highway) network, help expedite the implementation of several major thoroughfare plans, and to provide added capacity around the City of Houston for evacuations from the Gulf Coast prior to or during a hurricane. Tolling would be waived during periods of emergency evacuation. Some traffic would likely utilize the tolled facility to achieve improved travel time or to avoid signalized intersections. The proposed project is not located on a public transit route. If future public transit routes are expanded to include the proposed project; coordination regarding access would occur between the local transit authority and TxDOT.

The cost for the toll would be based on the distance traveled on the tolled lanes. The toll collection fee would be collected via an electronic toll collection system, meaning there would be no toll collection booths and there would not be an option for paying with cash. The effects of a toll facility on low-income and minority persons/populations are expected to be minimal due to the availability of existing free roadways and shared use of the bridges. Roadway capacity for free traffic would not be decreased and existing frontage access would be maintained.

4.3 AIR QUALITY

The proposed project on which this Re-evaluation focuses is the section of SH 99, Segment I-2 from SH 146 to FM 1405 and the Fisher Road overpass. The project area is partly in Harris County and partly in Chambers County. FHWA made a conformity determination for the 2035 RTP Update and the 2011-2014 TIP on January 25, 2011. As discussed in *Section 1.1*, three of the four proposed construction projects are consistent with the area's financially constrained 2035 RTP Update. The CSJ for the proposed Fisher Road overpass is expected to be added to an amendment to the 2035 RTP Update, which is anticipated to be adopted in the summer of 2010. The three CSJs currently included in the 2035 RTP Update and 2011-2014 TIP are shown on the RTP Update and TIP pages included in *Appendix B*. All projects in H-GAC's 2011-2014 TIP that are proposed for federal or state funds are consistent with federal guidelines. The program considers energy, environment, air quality, cost, and mobility. The FHWA will not take final action for the Segment I-2 project until it is consistent with the RTP and TIP and corresponding conformity determination.

The modeling procedures for ozone require long-term meteorological data and detailed area-wide emission rates for all potential sources (industry, business, and transportation). TCEQ models ozone concentrations for the SIP, and H-GAC approves highway projects conforming to the SIP in the Houston metropolitan area. To meet the ambient ozone criterion, the reasonable further progress (RFP) SIP requires the Houston region to budget its motor vehicle emissions within 186.13 tons of nitrogen oxides per day and 86.77 tons of VOCs per day in 2008. The proposed project would reduce congestion, and although traffic is expected to increase in the future, potential impacts to air quality would be partly offset by reductions in average vehicle emissions, as younger vehicles with more effective pollution controls replace older vehicles on the highway.

Traffic volumes for the proposed project do not exceed 140,000 AADT; therefore, a TAQA is not required because previous analyses of similar projects did not result in violation of NAAQS. There may be short-term, localized effects to air quality (e.g., increase in dust) in the immediate area adjacent to the project during construction. The effects to air quality during reconstruction and widening would be temporary, and measures such as watering construction areas to control dust could minimize adverse effects to air quality during construction.

4.3.1 Mobile Source Air Toxics

4.3.1.1 Project-Specific MSAT Information

Numerous technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project (see “Unavailable Information for Project Specific MSAT Impact Analysis” at the end of this section for more information). In Chapter 3 of its Regulatory Impact Analysis (RIA) for the 2007 MSAT rules, EPA states that there are a number of additional significant uncertainties associated with the air quality, exposure, and risk modeling. The modeling also has certain key limitations such as the results are most accurate for large geographic areas, exposure modeling does not fully reflect variation among individuals, and non-inhalation exposure pathways and indoor sources are not taken into account. Chapter 3 of the RIA is found at: http://www.epa.gov/otaq/regs/toxics/fr-ria-sections.htm.

However, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative assessment cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions, if any, for build and no-build alternatives. The qualitative analysis below is derived in part from a study conducted by FHWA titled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives* found at: www.fhwa.dot.gov/environment/airtoxic/msatcompare/msatemissions.htm.

Generally, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for this project is slightly higher than that for a 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 along the new roadway 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 MOBILE6.2 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will

offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

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 MSAT emissions by 57 to 87 percent between 2000 and 2020. Even greater reductions are expected by 2030 from EPA's 2007 MSAT rule. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. 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 traffic lanes for this project would have the effect of moving some traffic closer to the residential neighborhoods, schools, and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under the Build alternative than under the No-Build alternative. The localized increase in MSAT concentrations would likely be pronounced along the roadway where additional traffic lanes would be built along the entire project length. However, as discussed previously, the magnitude and the duration of these potential increases compared to the No-Build alternative cannot be accurately quantified due to the inherent deficiencies of current models. In sum, when a highway is widened and, as a result, moves closer to receptors, 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, MSATs 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 cause region-wide MSAT levels to be significantly lower than current levels in almost all cases.

Sensitive Receptor Assessment

There may be localized areas where ambient concentrations of MSATs are slightly higher for the Build alternative than in the No-Build alternative. Sensitive receptors include facilities likely to contain larger concentrations of sensitive populations (hospitals, schools, licensed day care facilities, and elder care facilities). Dispersion studies have shown that air toxics start to drop off at 100 meters (328 feet) from the roadway, and by 500 meters (1,640 feet) most studies have shown it is difficult to distinguish the roadway from background toxin concentrations in an area. Sensitive receptors identified within 100 and 500 meters of the proposed ROW are shown in *Table 3-5*.

4.3.1.2 Unavailable Information for Project-Specific MSAT Impact Analysis

This document includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools and lack of health-based MSAT standards do not enable the prediction of project-specific health impacts of the emission changes associated with the alternatives in this project. Due to these limitations, the following discussion is included in this Re-evaluation in accordance with Council on Environmental Quality (CEQ) regulations that address incomplete or unavailable information (40 CFR §1502.22 (b)).

4.3.1.2.1 Information That is Unavailable or Incomplete

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several elements, including emissions modeling, dispersion modeling to estimate ambient concentrations from the estimated emissions, exposure modeling to estimate human exposure to the estimated concentrations, and determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

4.3.1.2.1.1 Emissions

The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables of emissions of MSATs in the context of highway projects. While MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE6.2 is a trip-based model. Emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For PM, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emission rates used in MOBILE6.2 for both PM and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

These deficiencies compromise the capability of MOBILE6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations. However, MOBILE6.2 is currently the only available tool for use by FHWA and TxDOT and may function adequately for larger-scale projects for comparison of alternatives. Because MOBILE6.2 is currently the only available tool for use by FHWA/TxDOT, it is used for comparison of alternatives in larger scale projects.

4.3.1.2.1.2 Dispersion

The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE 3 and CAL3QHC, were developed and validated more than a decade ago to predict episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models are more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. Along with these general limitations of dispersion models, FHWA is also faced with a lack of air toxics monitoring data in most areas for use in establishing project-specific MSAT background levels.

4.3.1.2.1.3 Exposure Levels and Health Effects

Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude reaching meaningful conclusions about project-specific health impacts. Exposure assessments are not practical because it is difficult to accurately calculate annual levels of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any estimated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, many studies show that MSATs are either statistically associated with adverse health outcomes through epidemiological studies (frequently based on emission levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses.

Exposure to toxics has been a focus of several EPA efforts. The agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure at the county level. While not intended for use as a measure or benchmark of local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or state level.

The EPA is in the process of assessing the risks of various kinds of exposures to pollutants. EPA's Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs from the 2001 rule and the 2 additional MSATs added with the 2007 rule, was taken from the IRIS database *Weight of Evidence Characterization* summaries and represents the EPA's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures. Information on the two additional MSATs of concern was taken from the 2007 MSAT rule preamble.

Benzene is characterized as a known human carcinogen.

- **Acrolein:** potential carcinogenicity cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.

- **Formaldehyde:** Probable human carcinogen, based on limited evidence in humans and sufficient evidence in animals.

- **1,3-butadiene:** Characterized as carcinogenic to humans by inhalation.

- **Acetaldehyde:** Probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.

- **Diesel exhaust (DE):** Likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust, as reviewed in this document, is the combination of diesel particulate matter and diesel exhaust organic gases. Diesel exhaust also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

- **Naphthalene:** Possible human carcinogen based on limited evidence and extrapolations from rodent studies conducted at higher doses. Based on external peer review of the IRIS Reassessment of the Inhalation Carcinogenicity of Naphthalene, additional analyses are being considered

- **Polycyclic Organic Matter (POM)**: The class of compounds listed as POM are considered probable human carcinogens based on animal data. Polycyclic aromatic hydrocarbons (PAHs) are considered to be a subset of POM. Maternal exposure to PAHs in a population of pregnant women was associated with several adverse birth outcomes, including low birth weight and reduced length at birth, as well as impaired cognitive development at age three.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes, particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA (or TxDOT for state funded projects) cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable the performance of a more comprehensive evaluation of the health impacts specific to this project.

In the preamble to the 2007 MSAT rule, EPA summarized recent studies with the following statement: “Significant scientific uncertainties remain in our understanding of the relationship between adverse health effects and near-road exposure, including the exposures of greatest concern, the importance of chronic versus acute exposures, the role of fuel type (e.g., diesel or gasoline) and composition (e.g., % aromatics), relevant traffic patterns, the role of co-stressors including noise and socioeconomic status, and the role of differential susceptibility within the “exposed populations” (Volume 73 *Federal Register* Page 8441 [February 26, 2007] “Control of Hazardous Air Pollutants from Mobile Sources.”

4.3.1.3 Relevance of Unavailable or Incomplete Information

While available tools do allow the reasonable prediction of emission changes between alternatives for larger roadway projects, the amount of MSAT emissions from each project alternative and MSAT

concentrations or exposures created by each project alternative cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human health and the environment."

In this document, a qualitative assessment has been provided relative to the build and -no-build alternatives of MSAT emissions and has acknowledged that the project Build alternative may result in increased exposure to MSAT emissions in certain locations, although the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

4.4 NOISE

This analysis was done in accordance with TxDOT's *Guidelines for Analysis and Abatement of Highway Traffic Noise*, which is approved by FHWA. Noise abatement criteria for various land use activity areas (*Table 4-2*) are used as one means to determine when a traffic noise impact will occur.

Table 4-2. Noise Abatement Criteria

Activity Category	L_{eq} (dBA)	Description
A	**57** (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	**67** (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	**72** (exterior)	Developed lands, properties or activities not included in categories A or B above.
D	**--**	Undeveloped lands.
E	**52** (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Note: Primary consideration is given to all exterior areas (Category A, B, or C) where frequent human activity occurs. However, interior areas (Category E) are used if adjacent areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.
Source: FHWA 1997

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

Absolute criterion: the predicted noise level at a receiver approaches, equals, or exceeds the noise abatement criteria. "Approach" is defined as one dBA below the criterion. For example, a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the Noise Abatement Criteria. "Substantially exceeds" is defined as more than 10 dBA. For example, a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area. FHWA's Traffic Noise Model was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type, and speed of vehicles, highway alignment and grade, cuts, fills, and natural berms, surrounding terrain features, and the locations of activity areas likely to be affected by the associated traffic noise.

Existing and predicted traffic noise levels were modeled at receiver locations (*Table 4-3* and *Appendix A, Figure 3*) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and that may potentially benefit from feasible and reasonable noise abatement. As indicated in *Table 4-3*, predicted noise levels would result in traffic noise impacts and the following noise abatement measures are considered: traffic management, alteration of horizontal or vertical alignment, acquisition of a buffer zone of undeveloped property, and construction of noise barriers.

Before a noise abatement measure can be proposed for the project, it must be both feasible and reasonable. To be feasible, an abatement measure must reduce the predicted noise level at an affected receiver by at least five dBA, and to be reasonable, it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction in the predicted noise level of at least five dBA.

Table 4-3. Traffic Noise Levels (L_{eq} [dBA])

Receiver	**NAC Category**	**NAC Level**	**Existing** (dBA)	**Predicted** (dBA)	**Change (+/-)** (dBA)	**Noise Impact**
R1 – Residence	B	67	56	63	+7	No
R2 – Church	E	52	38	45	+7	No
R3 – Residence	B	67	57	64	+7	No
R4 – Church	E	52	40	45	+5	No
R5 – Apartments	E	52	35	42	+7	No
R6 – Residence	B	67	59	69	+10	Yes
R7 – Residence	B	67	52	63	+11	Yes
R8 – Residence	B	67	54	59	+5	No
R9 – School	E	52	26	33	+7	No
R10 – Park	B	67	56	63	+7	No
R11 – Residence	B	67	53	62	+9	No

Source: Segment I-2 Study Team 2009

Traffic management: altering the flow of traffic to lower noise levels would degrade the designed effectiveness and function of the proposed project. Substantial speed reduction would be required to lower noise levels by a perceptible amount, which would be detrimental to the efficient movement of traffic.

Alteration of horizontal or vertical alignment: any alteration of the existing alignment would not be cost-effective or reasonable.

Buffer zone: acquiring undeveloped property for a buffer zone would avoid, not abate, traffic noise impacts; therefore, this measure is not feasible.

Noise barriers: this is the most common noise abatement measure. Noise barriers would not be feasible and reasonable for the two impacted receivers.

Receiver R6: this receiver represents a single-family home with a driveway facing the roadway. A continuous noise barrier would restrict access to this receiver. Gaps in a noise barrier would satisfy access requirements, but the resulting non-continuous barrier segments would not achieve the minimum feasible reduction of five dBA.

Receiver R7: this is a single-family home that is not adjacent to the ROW. A noise wall would not provide the minimum required feasible reduction of 5 dBA.

Land use activity areas located adjacent to the roadway consist of Category E (schools and churches), Category B (Residential and Parks), and Category D (undeveloped land) properties. There is no Noise Abatement Criteria for undeveloped land. However, to avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs should ensure, to the maximum extent possible, no new activities are planned or constructed along or within the predicted noise impact contours (*Table 4-4*).

Table 4-4. Predicted Noise Impact Contours

Land Use	Impact Contour	Distance From ROW
Residential	66 dBA	Approximately 150 - 200 feet
Commercial	71 dBA	Within ROW

Source: Segment I-2 Study Team 2009

Noise associated with 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 tolerable. None of the receivers would be exposed to construction noise for long durations; therefore, extended disruption of normal activities is not expected. The plans and specifications would require the contractor to make reasonable efforts 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 would be made available to local officials to ensure, to the maximum extent possible, future developments are planned, designed, and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

4.5 WETLANDS AND OTHER WATERS OF THE UNITED STATES

Wetlands and other waters of the United States impacts have been evaluated for the proposed construction of Segment I-2 from SH 146 to Fisher Road. However, until the USACE has approved the delineated boundaries and jurisdictional status of all of the potential waters of the United States, including wetlands, the impacts can only be estimated. During final design, the project, including the bridges over Cedar Bayou and Goose Lake, may be modified, which could change the final impacts to waters of the United States. *Table 3-6* shows a total of 34.538 acres of potential waters of United States, including wetlands, that are within the proposed and existing ROW. This total includes areas associated with the open waters of Black Duck Bay, Goose Lake, and Cedar Bayou, which are within the limits of the identified project ROW, but are not areas that would be acquired and owned by TxDOT as roadway ROW. The table shows that an estimated 1.828 acres would be impacted by the proposed project. *Table 3-6* includes an estimated impact of approximately 0.017 acre for construction of piers and columns associated with the bridge over Cedar Bayou, (approximately 0.005 acre in Cedar Bayou and 0.012 acre in adjacent wetlands), and an estimated impact of approximately 0.003 acre for construction of 12 piers in Goose Lake. Anticipated impacts to potentially jurisdictional waters of the United States, including wetlands, are primarily in the western portion of the proposed project associated with water bodies, water courses, and wetlands in the area. Impacts to the identified waters/wetlands would be permanent, as the installation of piles and piers, and the discharge of fill material would be necessary to construct the proposed roadway improvements. There are a total of approximately 5.4 acres of 8 potentially non-jurisdictional wetlands and one swale that are within the proposed project ROW. Approximately 3.4 acres of 7 of these potentially non-jurisdictional wetlands would be filled as a result of construction of the proposed project.

Collectively, anticipated impacts to potentially jurisdictional waters of the United States, including wetlands, to construct the proposed roadway improvements exceed 1.8 acres. The majority of the wetlands impacts is to wetlands adjacent to navigable waters (i.e., waters subject to regulation under Section 10 of the Rivers and Harbors Act of 1899). It is expected that USACE authorization of anticipated impacts would require evaluation under an Individual Permit as opposed to authorization under one or more nationwide permits. Construction of the proposed bridges over Goose Lake and Cedar Bayou, both of which are navigable waters, would require authorization from the U.S. Coast Guard under authority of Section 9 of the Rivers and Harbors Act of 1899.

In accordance with the provisions of Section 404(b)(1) Guidelines, an applicant must demonstrate that the proposed project has avoided and minimized effects to waters of the United States, including wetlands, to the greatest extent practicable before compensatory mitigation can be proposed. The proposed ROW to be acquired is adjacent to the existing ROW, and avoids and minimizes effects to surrounding areas to the greatest extent practicable. A review of USACE requirements would be conducted as design plans are finalized. Compensatory mitigation for Section 404 effects would be coordinated with the USACE and performed in accordance with the terms of the approved permit(s).

4.5.1 Floodplains

The proposed project includes bridging or culverting of all regulatory floodways such that increases in base flood elevations would not exceed one foot, per Federal Emergency Management Agency (FEMA) regulations. Coordination with the local Floodplain Administrator is required and will be conducted. Feasible and practicable bridging of 100-year floodplains will be further evaluated during final design. In accordance with 23 CFR 650.113, FHWA shall not approve a proposed action

that includes a significant floodplain encroachment unless it finds that the proposed encroachment is the only practicable alternative.

A hydraulic study will be performed during final design of the proposed project to identify areas sensitive to local flooding. The study will provide detailed hydraulic information necessary to determine the use of culverts and bridges at each stream crossing, and to confirm that the proposed project does not increase the risk of flooding. Hydraulic features for the project would be designed in accordance with current TxDOT and FHWA design policies and standards. Roadway drainage facilities would permit conveyance of the 100-year flood without causing significant impacts to the main lanes of the proposed roadway, streams, or adjacent property. The proposed design would not adversely impact base flooding elevations to a level that would violate applicable floodplain regulations and ordinances. To the extent practicable, the design would also minimize the area of a floodplain impacted by the roadway. Fill placement in the floodplain would be mitigated with equivalent floodplain storage in the vicinity of the roadway. The location of detention basins, if required, would be determined during the hydraulic study, and would be analyzed in additional environmental documents.

Cross drainage and floodplain mitigation facilities associated with the proposed project would be designed to accommodate a 100-year flood event. Project-related increases in base flood elevations would not be allowed to exceed one foot, per FEMA regulations. Review of the final drainage and mitigation analyses by regulatory agencies would confirm that adequate measures have been taken to ensure that the project’s floodplain encroachment would not increase the risk of flooding to adjacent properties. Areas sensitive to local flooding would be identified during the final design phase of the project. If areas of severe flooding are identified, design criteria may be more restrictive than those specified in local county orders.

The proposed project would be designed to meet the requirements for approval as a hurricane evacuation route. The project design would include placement of the main lanes for the proposed roadway above 100-year frequency flood elevations.

4.5.2 Water Quality

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

West of Cedar Bayou, in Harris County, this project is located within the boundaries of the Phase II Baytown Municipal Separate Storm Sewer System (MS4) , and would comply with the applicable MS4 requirements. East of Cedar Bayou, in Chambers County, this project is not located within the boundaries of a regulated MS4.

The project will impact less than 1,500 linear feet of stream and 3 acres of waters of the U.S. and will not affect rare/ecologically significant wetlands. The Tier I 401 Certification requirements for the Section 404 Individual Permit will be met by implementing approved erosion controls, sediment controls, and post-construction total suspended solids (TSS) controls. A Tier I Checklist will be completed and submitted to TCEQ and the USACE.

The amount of disturbed earth would be limited so that the potential for excessive erosion is minimized and sedimentation outside of the ROW is avoided. Existing vegetation would be preserved to the extent practicable. Temporary erosion and sedimentation controls would be in place according to the construction plans prior to commencement of construction-related activities and inspected on a regular basis to ensure maximum effectiveness. Disturbed areas would be stabilized to prevent construction-related soil erosion and sedimentation during wet weather conditions. Approved erosion and sedimentation control BMPs would be maintained and remain in place until the area has been stabilized.

Permanent soil erosion control features would be constructed as soon as feasible during the early stages of the contract through proper sodding and/or seeding techniques. Disturbed areas would be restored and stabilized as soon as the construction schedule permits, and temporary sodding would be considered where large areas of disturbed ground would be left bare for a considerable length of time. Temporary erosion control measures would be coordinated with the permanent soil erosion control features that are to be part of the completed project to assure economical, effective, and continuous erosion control throughout the construction and post construction periods. In addition, efforts would be made to prevent long-term water pollution by reducing fertilizer and pesticide use during the installation and maintenance of landscaping.

The contractor would take appropriate measures to prevent, minimize, and control hazardous materials spills in the construction staging areas. Removal and disposal of all materials by the contractor would be in compliance with applicable federal and state laws, with no degradation of ambient water quality. Implementation of the proposed project would not result in any direct impacts to surface water quality or affect public water supply.

4.6 THREATENED AND ENDANGERED SPECIES

The FEIS documented a no effect finding to federally listed threatened or endangered species. Updated lists of federally and state listed threatened and endangered species, and state listed species of concern, were reviewed.

Federally Listed Species

No habitat is present in the project area for federally listed species. The proposed project would have no effect on federally listed species.

State Listed Species

Habitat for plains spotted skunk and American eel, two state listed species of concern, occurs within or adjacent to the ROW. Neither species has been documented within the project area. The proposed project may impact both species of concern, because suitable habitat is present. Potential habitat for the state listed threatened alligator snapping turtle exists within Goose Lake and Cedar Bayou. Bridge construction could disturb suitable habitat, which could displace or disrupt the alligator snapping turtle. Avoidance and minimization measures would be implemented to prevent debris from falling into the waterbodies. Although the alligator snapping turtle has not been documented in the project area, the proposed project may impact the alligator snapping turtle. Habitat exists in Goose Lake and Cedar Bayou for the state listed endangered Brown Pelican. Construction would occur within existing ROW at Goose Lake and Cedar Bayou. The Brown Pelican would likely avoid the ROW during construction. Construction activities could disturb the Brown Pelican. The

proposed project may impact the Brown Pelican. The proposed project would have no impact to other state listed species listed in *Table 3-7* due to lack of habitat.

4.7 CULTURAL RESOURCES

4.7.1 Historical Structures

The 1997 FEIS documented 26 structures in the project vicinity for possible inclusion in the NRHP. Coordination with the SHPO was concluded in February 1996. It was determined that none of the identified structures was eligible for inclusion in the NRHP. Except for the proposed overpass at Fisher Road, the planned project has been constructed from FM 1405 to IH 10(E). The historic resources investigation for this Re-evaluation addressed the project from SH 146 to FM 1405.

A review of NRHP listings, the list of SALs, and the list of RTHLs indicated that no historically significant resources have been previously documented within the APE for the proposed project between SH 146 and FM 1405. It has been determined through consultation with the SHPO that the APE for the proposed project is 150-ft from the proposed ROW. A reconnaissance survey conducted in May and August 2009 revealed that there are eleven historic-age resources (built prior to 1968) on five legally distinct parcels located within the project APE. The survey cut-off date is based on the current let date of 2013. There are two Official Texas Historical Markers commemorating the Baytown Orphanage and Ashbel Smith, M.D. in the project APE. The markers would not need to be relocated for the project as proposed and would not be affected during construction of the project.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects," Appendix 4 (2) of the PATU between FHWA, the SHPO, the Advisory Council on Historic Preservation, and TxDOT, and the 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 (*Appendix D*).

4.7.2 Archeological Resources

Coordination with the SHPO was concluded in December 1996. It was determined that construction of Alternative 6 would have no effect on archeological or historic properties. Alternative 6 is the proposed route for SH 99, Segment I-2; therefore, no further consultation with the SHPO would be necessary. TxDOT concluded in 2011 that there is no potential for the proposed project to affect significant archeological materials; therefore, additional archeological investigations are not warranted and consultation with the SHPO is not necessary (*Appendix D*). In the unlikely event that evidence of archaeological deposits is encountered during construction, work in the immediate area would cease and TxDOT's archaeological staff would be contacted to initiate accidental discovery procedures under the provisions of the Programmatic Agreement among TxDOT, THC, FHWA, and the Advisory Council on Historic Preservation, and the MOU between TxDOT and THC.

4.8 HAZARDOUS MATERIALS

Potential hazardous material impacts associated with the proposed project would be current operating sites and facilities, and historical sites and facilities that have already been impacted or have the potential to be impacted within the existing or proposed ROW. A general review of the potential for encountering hazardous materials during project construction was identified in *Section 3.8*.

Petroleum Storage Tanks

According to the environmental database records (*Section 3.8*), there are 6 LUST sites within 0.5 mile of the proposed project. LUSTs can lead to soil and groundwater contamination, including soils proposed to be excavated during construction of the proposed project. No LUSTs are known to be in the proposed ROW; however, if found in the proposed ROW, the LUST sites would be addressed during the ROW negotiation and acquisition process. Coordination with property owners, tank owners, operators, and TCEQ would be an ongoing process up to and during construction. If the removal of any UST is necessary, removal would be conducted in accordance with 30 TAC § 334, Subchapter C, Technical Standards and any other applicable requirements. Excavation, pumping, and/or dewatering activities of contaminated soil or water would require proper treatment and disposal. The rule provides specific procedures for the removal and handling of a UST system and associated materials, and provides for the proper management of work and public safety during construction. All tanks would be removed from the ground and proper closure activities conducted prior to construction. In addition, implementation of a Materials Management Plan would require proper handling of anticipated and unanticipated contaminated materials during the construction phase of the project.

Oil and Gas Well Installations and Pipelines

A general review of oil and gas well installations in Harris and Chambers Counties indicates previous exploration and development of the area. Applicable plugging and supervision requirements are provided in 16 TAC § 3.14 under the jurisdiction of the Texas RRC. Well plugging would need to be performed by cementing companies, service companies, or operators approved by the Texas RRC. Arrangements with the responsible well operator for proper plugging according to applicable regulations would be addressed during the ROW acquisition and negotiation process. If not plugged prior to construction, the wells would be addressed per TxDOT Standard Specification Item 103, Disposal of Wells. If contamination were encountered at any of the identified well or abandoned well sites, remediation would be conducted prior to construction. If a well were damaged during construction, the responsible party would be required to correct the damage and remediate any pollution resulting from the damage.

During preliminary investigations, multiple pipelines were noted traversing the proposed project. The locations of the pipelines are described in *Section 3.8* and shown on *Appendix A, Figure 3*. Negotiations would be conducted with the pipeline owners to properly relocate or deepen the affected pipelines, if necessary.

Asbestos-Containing Materials

Asbestos may be associated with existing bridge structures. In accordance with the Texas Department of State Health Services (DSHS) Notification Rules (25 TAC 295.61), the bridge structure(s) must be inspected by a licensed asbestos inspector prior to any demolition or renovation. The DSHS must be notified at least ten days prior to demolition or renovation (if asbestos-containing materials above EPA thresholds are to be disturbed) utilizing the DSHS Asbestos Demolition/ Renovation Notification Form.

Construction

Temporary above-ground storage tanks (ASTs) and equipment, vehicles, and machinery that contain oil and diesel fuel are typically utilized during major construction projects. Temporary ASTs are regulated and their use would require spill containment and control strategies such as secondary containment. Typical impacts include leaking valves, hoses, or small spills that occur during refueling activities or small leaks that may occur from equipment, vehicles, and/or machinery. However, these impacts are infrequent and typically do not pose a serious risk to the environment. Activities related to hazardous materials use and storage during construction would conform to TxDOT standards and include appropriate spill containment and control strategies.

Should hazardous constituents be unexpectedly encountered in the soil and/or shallow groundwater during construction, appropriate measures for the proper assessment, remediation, and management of the contamination would be initiated in accordance with applicable federal and state regulations.

4.9 VISUAL AND AESTHETIC QUALITIES

There have been no significant changes to the roadway design since the original EIS. This portion of Segment I-2 from SH 146 to FM 1405 would follow an existing roadway alignment. An existing two-lane bridge over Cedar Bayou would remain and a new bridge north of and parallel to the existing bridge would be constructed. The eastbound bridge over Goose Lake would be reconstructed to meet current design standards. Proposed overpasses in the project area from SH 146 to Fisher Road would typically be less than 20 feet above existing ground, and would be a minor visual change in an existing roadway corridor. Visual impacts to the surrounding area would be minimal; therefore, the original finding in the EIS remains valid.

4.10 MIGRATORY BIRD TREATY ACT

Several bird species potentially occurring in the project area are considered migratory; however, the proposed project would not affect the migration patterns of these species. In the event that migratory birds or their nests are observed prior to construction activities, measures would be taken to avoid harm to migratory birds, their nests, eggs, or young.

To ensure compliance with the Migratory Bird Treaty Act, vegetation clearing and work within the proposed project area would be conducted outside of the normal nesting season (March 1 through August 31) or measures would be taken to discourage birds from nesting in existing structures. Additionally, contractors would be notified about and be responsible for complying with the Migratory Bird Treaty Act for migratory birds that may inhabit the project area throughout the construction period of the proposed project.

4.11 ESSENTIAL FISH HABITAT

Essential fish habitat (EFH) is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The portion of Segment I-2 from SH 146 to FM 1405 crosses Cedar Bayou, a tidally influenced water body that is approximately three miles upstream from Galveston Bay.

Six piers are expected to be placed below mean high water to construct the bridge over Cedar Bayou, and 12 piers are expected to be placed below mean high water to construct the bridges over Goose

Lake. Additional piles are also anticipated to construct a fender system for the bridges. Coffer dams composed of either steel sheet piling or earthen material would be used to construct the piers. Water column habitat would be subject to brief periods of variable turbidity during bridge construction. With the exception of the bridge piers and the additional piles for the fender systems, there would be no permanent change to the habitat types in the project area. Mobile species that may utilize these portions of Cedar Bayou and Goose Lake would be able to avoid the areas during construction activities. In addition, impacts to water quality from construction would be minimized and avoided where possible through the use of approved best management practices. Due to the nature and location of the proposed project, EFH would not be adversely impacted.

Coordination with the NMFS regarding proposed westbound bridges at Cedar Bayou and Goose Lake was completed in 2006 and 2008, respectively. NMFS concurred with the conclusions in the EFH assessment provided by TxDOT that the proposed projects would have minimal impact on EFH, and no further consultation with NMFS is required for the westbound Goose Lake bridge that is currently being constructed (*Appendix D)*. TxDOT has re-evaluated the current proposed project, and determined that no adverse effects to EFH would result from the proposed westbound bridge at Cedar Bayou and the proposed bridge replacement/widening at Goose Lake. TxDOT is coordinating with NMFS regarding this assessment.

4.12 VEGETATION

Impacts to vegetation were discussed in the 1997 FEIS. There have been minor changes to the vegetation resources in the project area. Revisions to the preliminary schematic roadway design since the FEIS have slightly reduced the amount of proposed ROW acreage that would need to be acquired, thereby decreasing the acreage of wooded areas within the proposed ROW from approximately 24 acres to approximately 22.3 acres. Vegetation removal activities, including the removal of mature trees, were noted in spring 2010 on a wooded tract of land located east of Tri-Cities Beach Road and south of the existing SH 99 ROW. The proposed ROW for this portion of Segment I-2 would acquire approximately 2.4 acres of this tract. Because there have been only minor changes in vegetative cover since the FEIS, the assessment of impacts to vegetation resources remains valid.

Invasive Species and Beneficial Landscape Practices

In accordance with EO 13112 on invasive species and the Executive Memorandum on beneficial landscaping, landscaping would be limited to seeding and replanting the ROW with native species of plants where possible. A mix of native grasses and native forbs would be used to re-vegetate the ROW per TxDOT Standard Specifications. Any landscaping that may be included with the proposed project would be in compliance with the EO and the guidelines for environmentally and economically beneficial landscape practices.

4.13 FARMLAND PROTECTION POLICY ACT

Coordination with the United States Department of Agriculture Soil Conservation Service (now known as the Natural Resources Conservation Service [NRCS]) was concluded May 30, 1991. Soil types along the proposed project are in Capability Classes that the NRCS considered potentially subject to the Farmland Protection Policy Act (FPPA). A Farmland Conversion Impact Rating form (Form AD-1006) was completed. The total Site Assessment Criteria points did not exceed 60; therefore, coordination with the NRCS was not required. Because it has been nearly 20 years since

coordination occurred with the NRCS, a NRCS CPA-106 form *Farmland Conversion Impact Rating For Corridor Type Projects* was completed (*Appendix E*). The project scored less than 60 on the impact rating form; therefore, no further coordination with the NRCS is required. The original determination in the FEIS for the FPPA remains valid.

4.14 CONSTRUCTION

Traffic control during project construction would be in accordance with Part VI (Traffic Controls for Street and Highway Construction and Maintenance Operations) of the *Texas Manual on Uniform Traffic Control Devices*. During construction, travel lanes in each direction would be maintained. However, short-term lane closures may occur during off-peak hours. Access to adjacent property would be maintained during construction. Street intersections would be constructed in phases to maintain through traffic.

There may be some short-term noise impacts resulting from construction of the project. It is possible that areas adjacent to the project ROW would experience above-normal noise levels during road construction. To minimize construction noise, provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems. Due to the relatively short-term exposure periods imposed on any one receiver, extended disruption of normal activities is not considered likely. Reasonable effort would be made to minimize construction noise.

There may be short-term, localized effects to air quality (e.g., increase in dust) in the immediate area adjacent to the project during construction, which may temporarily degrade air quality through dust and exhaust gases associated with construction equipment. Measures to control dust would be considered and incorporated into the final project design and construction specifications.

The proposed project includes the demolition of a bridge structure. The structure may contain asbestos-containing materials. Asbestos inspections, specifications, notification, abatement, and disposal, as applicable, would be conducted in compliance with federal and state regulations.

TxDOT would require its contractors to take appropriate measures to prevent, minimize, and control accidental spills that may occur during roadway construction. All construction equipment and materials would be removed as soon as the schedule permits.

4.15 INDIRECT IMPACTS

The CEQ defines indirect effects as "…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). There are three general categories of indirect effects: encroachment-alteration effects, access-alteration effects (or project-influenced effects); and effects related to project-influenced development.

The 1997 FEIS addressed the indirect impacts associated with the proposed construction of a four-lane at-grade arterial and the impacts of preserving a 300 to 400-foot corridor (ROW width) for future transportation needs sufficient to accommodate a six-lane facility. The 2007 Re-evaluation

included an analysis of potential indirect impacts of Segment I-2, including documentation of changes in land use and economic activity in the study area since the FEIS. The analysis performed for the 2007 Re-evaluation was in accordance with the requirements and processes outlined in applicable regulations and guidance.

This indirect impact analysis supplements the analyses included in the 1997 FEIS and the 2007 Re-evaluation. In addition to addressing changes in the study area since 2007 and changes to the proposed project, the indirect impact analysis follows the 7-step analysis process suggested in TxDOT's "Guidance on Preparing Indirect and Cumulative Impact Analyses, June 2009."

Since the time of the last environmental documentation for this project, the proposed ROW has been reduced by approximately 4 acres. This section reviews and reassesses the indirect effects analyses of the 1997 FEIS and addresses subsequent design and operational changes to the project.

4.15.1 Step 1 - Scoping

A geographic study area for the proposed Segment I-2 project was developed for the FEIS. The boundary extended from two to eight miles from the project alignment, and includes 106 square miles. This study area was utilized as a geographic area of analysis for development of alternative alignments and the assessment of indirect and cumulative impacts of the proposed project. This same study area will be used as the Area of Influence (AOI) for the assessment of indirect impacts for this Re-evaluation. The AOI is shown on *Appendix A, Figure 6,* and is appropriate for use in this Re-evaluation for the following reasons:

1. The 1997 FEIS and the recent 2007 Re-evaluation utilized this study area for indirect impact analyses. The documents were approved by TxDOT and FHWA, indicating agreement that this boundary was reasonable and the analysis was consistent with CEQ regulations. In addition, agencies, the public, and other stakeholders participated in the study scoping meeting, public hearing, and had the opportunity to review and comment on both the DEIS and FEIS. No change was made to the study area.

2. The AOI boundary extends from two to eight miles from the project alignment, and includes 106 square miles. The boundary encompasses all or portions of Beach City, Baytown, Mont Belvieu, and Cove – areas with existing development. Undeveloped areas are also within the AOI; most of the undeveloped area is east of Cedar Bayou and within the extraterritorial jurisdiction (ETJ) of the City of Baytown. Approximately 40 percent of the AOI boundary is along the shorelines of Galveston Bay, Tabbs Bay, and other water bodies, and the eastern boundary is close to other water bodies that are constraints to development – Cotton Lake, HL&P cooling pond, and Lost River. The large AOI encompasses areas that would have the potential to develop or redevelop as a result of the proposed project.

3. Because Segment I-2 is a limited-access roadway where it was constructed on new location from Fisher Road to IH 10(E), it does not provide an opportunity for adjacent properties to have direct access to the roadway in those areas, which is one factor that can influence where development occurs. *Appendix A, Figure 7* shows the areas of developed land in the AOI in 1978, 1995, and 2008. An evaluation of changes in land use since the FEIS shows that some new development and redevelopment has occurred in the AOI since 1995, including some near SH 99. In the past 7 years, retailers, including Wal-Mart and Home Depot, have located distribution centers in western Chambers County, in part due to access to the SH 99,

IH 10(E), rail and barge service, and the Port of Houston's Barbours Cut Container Port. The analysis of land development trends does not indicate that the proposed project has had a substantial influence on land development in the AOI, or that the AOI should be expanded for this Re-evaluation.

The use of the FEIS "study area" as the AOI for this Re-evaluation is based on the approval of the indirect impact analyses in previous environmental documents for the proposed project; a review of current land use in, and development constraints associated with, the 106-acre AOI; and a review of land use trends in the AOI. Indirect impacts will be analyzed for the time period from construction of the proposed project to 2035, the horizon year of the 2035 RTP.

4.15.2 Step 2 - Identify the Study Area's Goals and Trends

Most of the land within the AOI is in the City of Baytown and its ETJ. A portion of the AOI north of IH 10 is in Mont Belvieu. The population of Mont Belvieu was 2,637 in 2009, an increase of approximately 300 persons since 2000 (Long-Term Community Recovery Plan, April 2009; 2000 Census data). The City of Mont Belvieu has not published a comprehensive plan for development in the city, but has a list of proposed capital projects including transportation and landscape improvements on Eagle Drive, the road on which city buildings, public schools, and other attractions are located; a third city water tower and well; and a new city park.

Baytown's City and ETJ boundaries are shown on figures in *Appendix F*. The City of Baytown has grown from a population of nearly 23,000 in 1950 to 66,430 in 2000. The population is expected to increase to 90,500 by 2025 (City of Baytown 2025 Comprehensive Plan). The City made its first venture into land use regulation with the adoption of zoning in 1995. The City of Baytown adopted the "Baytown 2025 Comprehensive Plan" in May 2007. The comprehensive plan is an official public document that is a general guide for how Baytown plans to grow and operate. The City expects the plan to serve as a general "blueprint" for future development (and redevelopment) in and around Baytown with an emphasis on improving the community's desirability as a place to live, work, play, and shop; document the character of the community, as well as anticipated issues, trends, opportunities, and challenges facing the City; provide a common vision supported by a series of goals and objectives for the next 20 years (from 2005 to 2025); define policies to guide daily decision-making regarding Baytown's physical and economic growth; and establish a core set of strategies for aggressive implementation that emphasizes action and results.

The plan addresses a geographic area that encompasses most of the AOI. The plan includes these elements: Growth Capacity, Mobility, Land Use, Economic Opportunity, and Quality of Life. The goals for each of these elements are stated in the plan and listed below.

Growth Capacity

- Adequate supply, distribution, collection, and treatment systems to provide superior service to existing customers while also accommodating projected future growth
- Existing and projected flooding risks are eliminated or mitigated

Mobility

- A transportation network that is consistent with the Future Land Use Plan, accommodates existing and projected growth, and meets the diverse mobility needs of Baytown residents
- A well maintained, safe, and efficient mobility system
- A transportation network that provides optimum connectivity between existing, upcoming, and potential destinations

Land Use

- Development patterns resulting in the efficient use of land, infrastructure, and fiscal resources
- A community of diverse uses coexisting in a compatible manner with stable neighborhoods, viable commercial centers, and a healthy industrial economy
- Dynamic neighborhoods that offer residents a variety of housing options, and are well connected to other neighborhoods, commercial uses, employment centers, and community facilities
- Sensitive environmental areas are protected for the health and safety of the community
- The expansion of Baytown's city limits occurs in an orderly manner that promotes quality growth, economic development, and fiscal responsibility

Economic Opportunity

- Sites and infrastructure meet the needs of target industries and a growing population
- The City offers a place for residents to live, play, and work; it is a more appealing place to live for young professionals and individuals employed by target industry companies

Quality of Life

- A system of well-maintained parks, open spaces, trails, recreation areas, and public facilities to accommodate the needs of Baytown's current and future residents
- An interconnected network of greenways that are multipurpose, accessible, and convenient, which provides pedestrian and bicycle connections among neighborhoods, parks, schools, workplaces, and community focal points
- Library facilities and programs that continue to be community assets
- An enhanced community image that reflects Baytown's unique historical, cultural, and natural assets and promotes the community as a desirable place to live, work, and visit

The City of Baytown will use the plan to identify appropriate areas for development based on land use compatibility, infrastructure availability and environmental constraints, and to direct residential and nonresidential growth in appropriate areas. City planners believe that uncontrolled growth in

Baytown's ETJ can detract from many of the plan's goals. The City plans to annex areas in the ETJ to have greater control over the type, location, intensity, and quality of development.

The 2025 Comprehensive Plan includes a future land use map, which identifies areas where future development is likely to occur. This existing land use (Year 2006) and future land use maps are included in *Appendix F* of this Re-evaluation. It is expected that new industrial development would occur in existing rural areas along FM 1405, both north and south of SH 99. Commercial and residential uses would increase on both sides of SH 99, south of IH 10. Commercial/high-density residential uses would increase along Garth Road north and south of IH 10, and along the undeveloped areas adjacent to IH 10 between Garth Road and SH 146. The City recognizes that development activity is largely determined by market factors and the individual decisions of property owners and developers. In some cases, the City may offer incentives to encourage the type of development outlined in the Comprehensive Plan (i.e., redevelopment of difficult sites).

The H-GAC's RTP defines transportation systems and services in the area containing the boundaries of the AOI. The RTP addresses regional transportation needs that are identified through forecasting current and future travel demand, developing and evaluating system alternatives and selecting those options which best meet the mobility needs of the region. The proposed facility is included in the plan.

4.15.3 Step 3 - Inventory the Study Area's Notable Features

The AOI for the proposed project consists of developed areas and areas of flat coastal plains with scattered pasture and woodland. Approximately 40 percent of the AOI is developed, mostly within the cities of Baytown, Mont Belvieu, Beach City, and Cove. The AOI is bordered by Galveston Bay and Tabbs Bay, and is traversed from north to south by Cedar Bayou. Goose Creek is in the southwestern area of the AOI; the upstream portion has been cleared and modified in the past and is regularly maintained or is lined with concrete. The lower third of the channel is subject to tidal influences and is characterized by meandering loops through brackish to intermediate marsh. The creek drains into Goose Lake, a tidally influenced natural lake that becomes Tabbs Bay. Cedar Bayou and Goose Lake are navigable. Bayland Park is on the shore of Goose Lake and Tabbs Bay. WC Britton Park is on the shore of Goose Lake. Roseland Park is adjacent to Cedar Bayou, approximately 500 feet north of the SH 99 bridge. There are many other parks and recreational resources, such as marinas and boat ramps, in the AOI. Sensitive natural areas include bird rookeries and coastal resources.

The prevailing land uses within the study area consist of urban and rural development, with the majority of the area east of Cedar Bayou dedicated to farming, ranching, and industrial activities. Current land use in western Chambers County can be generally characterized as sparsely populated and primarily undeveloped. Land use patterns in the area are changing, however, as a large business park and a major auto raceway have been developed east of Cedar Bayou. Proposed residential and commercial development projects suggest a trend of increasing population and employment densities.

Existing land use categories in the study area include residential, industrial, commercial, public (such as schools), and parks. The landscape remains predominantly rural, reflecting the area's agricultural tradition. Industrial uses, primarily geared to the petrochemical industry, are also present, and are concentrated in the Mont Belvieu area. Single-family residential subdivisions have been developed in recent years, attracting more retail and service establishments. As mentioned in the *Western*

Chambers County Transportation Plan, 2003, a number of residential subdivisions are currently planned for western Chambers County. Single-family residential and commercial uses account for a small portion of the area adjacent to the proposed roadway. Since 2001, retailers like Wal-Mart and Home Depot have developed distribution centers in western Chambers County, in part due to access to SH 99 and IH 10, as well as rail and barge service and the Port of Houston's Barbours Cut Container Port.

The Baytown area has been home to many influential events in Texas history. The first offshore drilling operation in Texas was in the area, which led to the construction of a refinery by the Humble Oil and Refinery Company (now ExxonMobil). The refinery caused the development of the town with the company supplying housing, roads, and utilities. The history of the Baytown area is documented at the Baytown Historical Museum and in the historical monuments and markers throughout the area such as the Republic of Texas Plaza, Bicentennial Park, the Wooster School, and Brown-McKay House.

4.15.4 Step 4 - Identify Impact-Causing Activities of Proposed Action and Alternatives

The proposed project would include the construction of Segment I-2 from SH 146 to FM 1405 as a 4-lane tollway with two 2-lane frontage roads and interchanges, overpasses at some interchanges, construction of an overpass at Fisher Road, and installation of two additional toll gantries along the existing SH 99 roadway section between FM 1405 and Fisher Road. The proposed project includes construction of eight bridges, including bridges across Cedar Bayou and Goose Lake. The acquisition of approximately 46 acres of ROW would be required between SH 146 and FM 1405. The portion of Segment I-2 from FM 1405 to IH 10(E) improved access to a predominantly rural area. The portion of the project addressed in this Re-evaluation is along an existing roadway corridor, from BS 146 to FM 1405 and on SH 99 at Fisher Road.

Most of the proposed construction would be within existing, previously disturbed roadway ROW. In areas of new ROW, vegetation would be removed, and areas that are not occupied by roadway pavement would be revegetated. Additional pavement within the existing ROW would require land clearing, and in some locations, there would be excavation or fill to meet design elevations. BMPs would be in place during construction to control soil erosion, and exposed soils would be revegetated when construction is complete.

Bridge replacement and widening at Goose Lake and new bridge construction at Cedar Bayou would disturb ground vegetation within a portion of the project ROW. All of the land that would be disturbed is within existing ROW. BMPs would be in place to control soil erosion, and the area would be revegetated when construction is complete. Construction of in-water bridge pilings would disturb areas under water. No permanent habitat alteration is anticipated. The natural flow and intertidal nature of the water bodies would be maintained during construction.

4.15.5 Step 5 - Identify Potentially Substantial Indirect Effects for Analysis

The analysis performed for the 1997 FEIS did not identify any potential substantial indirect effects of the proposed project from SH 225 to IH 10(E). The project section from FM 1405 to IH 10(E) is constructed and has been open to traffic since March 25, 2008. An updated review of potentially substantial indirect effects of the project was performed for this Re-evaluation. The resources considered are listed in *Table 4.7*.

Encroachment-alteration effects

Ecological effects: Construction of Segment I-2 from FM 1405 to IH 10(E) primarily affected existing or recently farmed land that was partly overgrown by Chinese tallow. Drainage improvements affected agricultural and irrigation drainage ditches that provided little habitat for wildlife. The proposed project between SH 146 and FM 1405, and the Fisher Road overpass, are in existing roadway corridors that traverse urban areas and agricultural land. Proposed ROW to be acquired would impact some wooded areas adjacent to the existing ROW, and the FEIS determined that no substantial indirect effects to habitat would be expected. Proposed bridges at Goose Lake and Cedar Bayou would span open waters within the limits of the identified existing roadway ROW. No habitat fragmentation, degradation of habitat, disruption of natural processes, pollution effects on species, or disruption of ecosystem functioning would be expected as a result of construction and operation of the proposed project. Use of BMPs during and after construction would minimize impacts to the water quality of Goose Lake and Cedar Bayou, and would not substantially alter the ecology of these water bodies.

Socioeconomic effects: The 1997 FEIS documented that the proposed project is consistent with land use planning in the AOI. Construction of the first section of the project from FM 1405 to IH 10(E) provides increased access and mobility in the AOI, as a new location roadway. The roadway is a limited-access roadway and has not caused substantial indirect effects to neighborhoods, public facilities, or other socioeconomic resources in the area. Baytown's 2025 Comprehensive Plan states that completion of projects in the thoroughfare plan, including Segment I-2, are important to maintain desirable levels of service on area roadways for expected population and economic growth. The FEIS documented that Segment I-2 is expected to enhance economic growth in the area by improving access and mobility; the current proposed project from SH 146 to FM 1405 would improve mobility.

No substantial encroachment-alteration effects would be anticipated as a result of the proposed project and, therefore, no additional study is of these potential effects is included in this Re-evaluation.

Induced growth effects – The FEIS documented that while land use changes in the AOI are primarily influenced by the local economy and population growth, Segment I-2 would cause a small amount of induced development. Land use planning and development trends since the FEIS was completed support this analysis. The portion of Segment I-2 that has been constructed has limited-access, and the proposed section from SH 146 to FM 1405 is along existing roadways. Neither of these sections would be expected to substantially influence growth in the AOI, although Segment I-2 may support business and residential growth. The 2007 Re-evaluation had the same conclusion. Induced growth effects do not appear to have the potential to be substantial, but will be discussed further because of design changes and proposed tolling from SH 146 to Fisher Road. The AOI is part of the EPA designated 8-county nonattainment area for ozone.

Effects related to induced growth – Potential effects related to induced growth will be evaluated as an update to the previous environmental documents and to address project design and operational changes.

4.15.6 Step 6 - Analyze Indirect Effects and Evaluate Results

The construction of SH 99 from FM 1405 to IH 10(E) provides improved mobility within the study area, which would appeal to potential residents and developers. Access and mobility are factors in development decisions. The induced development effects of Segment I-2 are not quantified; therefore, the effects related to induced development are not quantified in the subsections below.

Segment I-2 is a limited-access roadway between FM 1405 and IH 10(E). Because the proposed project would have some indirect effects to land use, some indirect effects on agricultural land and prime farmland soils would be expected, primarily near areas where Segment I-2 crosses existing roadways. As part of the FEIS, the proposed Segment I-2 was scored using the NRCS AD 1006 form and the resulting score totaled less than 60 points; therefore, no coordination with NRCS was required. A current NRCS-CPA-106 form was completed as part of this Re-evaluation (*Appendix E*). The resulting score again totaled less than 60 points, indicating that coordination with the NRCS is not required.

If new commercial or residential facilities are built as a result of induced land use changes, emergency responders (i.e., police, fire departments, and ambulance services) would have additional responsibility of covering incidents at these facilities.

In the FEIS, the closest residential neighborhoods to Segment I-2 were identified as West Chambers County Estates and Southeastern Baytown. Although most of the project area adjacent to the Segment I-2 corridor is undeveloped land, some new low-density residential areas have developed along FM 2354, east of Segment I-2.

The proposed SH 99, Segment I-2 would follow an alignment that uses existing lanes and the Fred Hartman Memorial Bridge between the SH 225/SH 146 intersection and Missouri Street. From Missouri Street, Segment I-2 would improve BS 146, SH 99, and part of Fisher Road as a controlled access facility. Segment I-2 from Fisher Road to IH 10(E) is a newly constructed roadway. The proposed tolling of the portion of Segment I-2 from IH 10(E) to Fisher Road would not be expected to impact the traveling public, including low-income and minority persons/populations, due to the availability of existing non-tolled roadways within the study area. Nearby non-tolled options, including SH 146, FM 565, FM 2354, and FM 3180, provide access to IH 10(E) and the surrounding community. The traveling public, including minority and/or low-income persons, may choose to utilize the non-tolled roadways in the vicinity specifically for cost-saving measures. The non-tolled existing roadways would be used by motorists who do not want to use, or cannot afford to use, the proposed tolled facility. The use of alternative roads may result in a difference in travel time due to lower posted speed limits and signalization compared with travel time on the tolled facility.

Induced development would cause increased stormwater runoff during and after construction. It is expected that potential impacts would be avoided or mitigated through compliance with state and local regulation and, therefore, the indirect impact to water quality would be minor.

Development within floodplains would be in accordance with the National Flood Insurance Program and local regulations, and the proposed project would not indirectly impact the 100-year floodplain. No indirect impacts to floodplains would be anticipated from construction of Segment I-2.

Induced development could impact wetlands and vegetation. If wetlands were impacted by other developments, it is expected that mitigation would offset the impacts in accordance with permitting requirements. Vegetation would be permanently removed, except in areas that may be revegetated.

Because the proposed project would have some indirect effects to land use, some indirect effects to cultural resources could occur. Developers may not be required to consider impacts to known or unidentified historic and archeological resources prior to developing property. Because induced growth effects would not be substantial, it is not expected that indirect effects to cultural resources would be substantial. No impacts to the notable historic/cultural resources described in *Section 4.15.3* would be anticipated.

Induced development could result in use of hazardous materials during activities such as land clearing and building construction. Hazardous materials can indirectly affect soil, water, groundwater, and humans if exposed by road construction activities. If needed, contractors would need to conduct remedial action prior to or during construction, and use of appropriate management measures would limit the potential for adverse impacts to soil, water, groundwater, air, and from human exposure. During construction, appropriate measures would be taken to prevent, or minimize and control hazardous materials spills in construction assembly areas. Removal and proper disposal of all materials by contractors would comply with applicable state and federal requirements, and hazardous materials use during construction activities would not be expected to adversely impact soil, water, groundwater, air, or humans.

Induced development may lead to activities or business development that could contribute to increased hazardous air pollutants/VOCs that are precursors to ozone. However, all area sources must meet federal regulations and SIP standards. Construction of residential and commercial facilities due to induced development may contribute to dust and diesel exhaust; however, these effects would be temporary. Therefore, air quality impacts would be minor.

4.15.7 Step 7 - Assess Consequences and Consider/Develop Mitigation

Indirect effects to land use may include the development of residential and commercial areas. However, because large amounts of undeveloped land are present in the AOI to accommodate future growth, a substantial adverse impact to existing neighborhoods, community facilities, or public resources would not be expected.

Land use changes may result in the unavoidable, permanent conversion of areas currently in farmland or agricultural uses to urban uses. Conversion to residential, commercial, or industrial developments would represent a loss of agricultural land, but would serve to meet the housing and employment demands of the region.

Development of areas in the AOI located within mapped floodplains is likely to occur. Adherence to state and local floodplain regulations would not cause adverse impacts to floodplains and would reduce flood risks to structures or facilities constructed within the floodplain.

Development is also likely to occur in areas where aquatic resources are present. Impacts to jurisdictional and possibly non-jurisdictional wetlands and other waters of the United States would be mitigated in accordance with applicable regulations and permit requirements. Vegetation resources would be expected to be impacted by development activities. Natural vegetation would likely be removed and replaced in developed areas with ornamental plantings that are routinely maintained.

Potential adverse impacts to water quality from construction or routine operation/maintenance activities in developed areas can be mitigated through the implementation of BMPs and compliance with applicable regulations. Likewise, potential impacts from hazardous materials can be minimized through the implementation of appropriate measures and compliance with applicable regulations and guidelines related to the transportation, use, and storage of hazardous materials. No indirect impacts are expected to be substantially adverse, and no mitigation is proposed by TxDOT.

Regional Indirect Effects of Toll Facilities

The freeway and toll road system is a major component of the Houston-Galveston regional roadway network. Currently, the freeway/toll road system represents nearly 19 percent of regional lane miles and carries more than 48 percent of vehicle miles traveled. The 2009 regional roadway network consists of nearly 24,571 total lane miles. This includes nearly 658 tolled lane miles and 289 managed lane miles (*Table 4-5*). By 2035, these numbers are expected to increase to 32,855 lane miles of which 2,049 are tolled lane miles and 853 are managed lane miles. *Exhibit 2* shows the tolled and managed lane improvements to the regional roadway network by year 2035.

Table 4-5. Regional Roadway Network (lane miles)

Network	Freeway	Toll Roads	Managed Lanes	Arterial	Total Lane Miles
2009 Network	3,669	658	289	19,955	24,571
2035 Network	4,339	2,049	853	25,614	32,855

Source: H-GAC 2009.

In addition, the transit system has 485,000 daily passenger boardings and is expected to increase to nearly 725,000 by 2035. This increase will be attributed to:

- Expansion of transit services (increased bus and rail transit services)
- New transit modes (commuter rail transit and signature express bus service)
- Transit connectivity to multiple employment centers
- Coordination of transit services among regional public transportation providers

METRO's 2035 Long Range Plan recommends significant expansion of the current transit system and includes a network of integrated high capacity transit facilities on major travel corridors. This plan also identifies service expansions beyond the Metropolitan Transit Authority's (METRO) service area. New improvements scheduled for implementation through the year 2035 include high occupancy tolls, a new intermodal terminal, park-n-ride facilities, and several new high-capacity transit corridors throughout the region. Additional key elements of the plan include:

- 89 miles of fixed guideway transit – Light Rail Transit (LRT)
- 84 miles of Commuter Rail Transit (CRT)
- 40 miles of Signature Bus service

Exhibit 3 shows the future corridor and capital facilities projects in the 2035 METRO Long Range Plan.

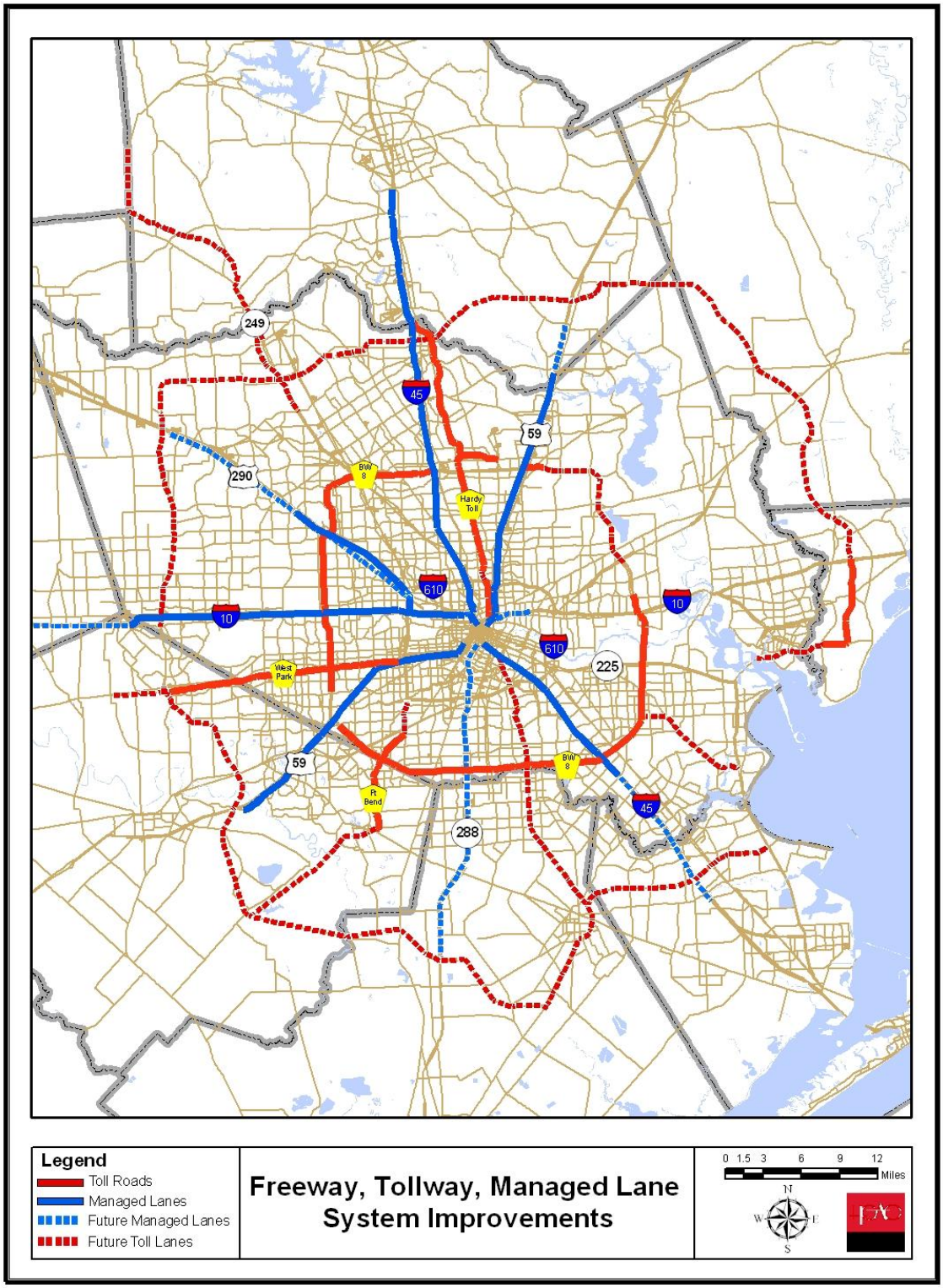


Exhibit 2. Proposed 2035 Regional Roadway Network

Source: H-GAC 2009.

Exhibit 3. 2035 Future Corridor and Capital Facilities Projects

Source: Metro 2007.

Indirect Toll Impacts Conclusion

The expanding regional roadway network, including tolled facilities and managed lanes, along with the expanding transit network could have indirect and cumulative impacts. However, the impacts are not isolated to one location and would be better considered at the regional level. As a result, the consideration of the regional tolled roadway network is included in the cumulative impacts portion of this document.

4.16 CUMULATIVE EFFECTS ANALYSIS

This section presents the cumulative effects analysis conducted for this Re-evaluation. This section includes an introduction to the background and project-specific requirements for the cumulative effects evaluation followed by a description of the methodology utilized to perform the analysis. Subsequent subsections provide the resource-specific cumulative effects evaluations, followed by a summary of the results of the analysis.

4.16.1 Introduction

The CEQ regulations define cumulative effects as:

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

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

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

4.16.2 Methodology for Cumulative Impact Analysis

An eight-step process was followed to assess cumulative impacts, based on TxDOT's *Guidance on Preparing Indirect and Cumulative Impact Analyses*. The steps are listed in *Table 4-6.*

Table 4-6. Steps for Identifying and Assessing Cumulative Impacts

1	Identify the resources to consider in the analysis
2	Define the study area for each resource
3	Describe the current status/viability and historical context for each resource
4	Identify direct and indirect impacts that might contribute to a cumulative impact
5	Identify other reasonably foreseeable future effects
6	Identify and assess cumulative impacts
7	Report the results
8	Assess the need for mitigation

Source: TxDOT 2010.

The eight steps used in this cumulative effects analysis are described below.

Step 1: Identify the Resources to Consider in the Analysis

The first step in performing the cumulative impact analysis was to identify which resources to consider in the analysis. The cumulative impact analysis should focus only on (1) those resources substantially impacted (directly or indirectly) by the proposed project; and (2) resources currently in poor or declining health or at risk, even if project impacts are relatively small (less than significant).

Construction of the proposed project would not be expected to have substantial direct or indirect impacts to any resources evaluated. *Table 4-7* summarizes direct and indirect impacts of the proposed project, presents a determination of which resources would be carried forward and evaluated in the cumulative effects analysis, and identifies the resources and effects categories that were eliminated from the cumulative effects evaluation.

Step 2: Define the Study Area for Each Resource

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

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

The current status/viability and historical context of each resource is described and presented in each resource subsection. This information is important to establish the baseline condition and trend the resource is experiencing, and to be able to estimate the magnitude of effects to the resource. The historical context is described to provide an explanation of the factors that have caused the current health, condition, or status of the resource. As previously mentioned, health refers to the general overall condition, stability, or vitality of the resource and the trend of that condition. Past actions represent the projects or activities in the area that have collectively caused the current status, health, vitality, and trend of the resources summarized in each resource section. Where possible, a quantitative assessment of the current health condition and the trend it is experiencing was provided; however, for many resources, quantitative data were not available to document the current health or trend of the resource. For these resources, a qualitative discussion of the resource health and trend is presented, and the types of actions that have caused or influenced resource health and trends are discussed.

Step 4: Identify Direct and/or Indirect Impacts that Might Contribute to a Cumulative Impact

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

Step 5: Identify Other Reasonably Foreseeable Future Effects

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

Step 6: Identify and Assess Cumulative Impacts

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

Step 7: Report the Results

The results of the cumulative effects analysis are reported herein. Direct effects are summarized under each resource and indirect effects were reported in the *Indirect Impacts* section above. Both are summarized below as they are included in the cumulative effects analysis. The assumptions and analysis methods used are described in each resource section. Direct effects are from *Sections 4.1* to *4.14*, and indirect effects were reported in *Section 4.15*.

Step 8: Assess the Need for Mitigation

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

Table 4-7. Determination of Resources/Issues Considered in Cumulative Effects Analysis

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Land Use			
The prevailing land uses within the study area consist of urban and rural development with the majority of the area east of Cedar Bayou dedicated to farming, ranching, or industrial activities.	Segment I-2 required approximately 586 acres of ROW (per FEIS), of which 64 percent was existing roadway ROW, farmed fields, or pastures, and 36 percent was wooded. Acquisition of most of the project ROW is complete, and the initial project section is constructed from FM 1405 to IH 10(E). West of FM 1405, approximately 46 acres of ROW would be acquired, of which approximately 22 acres is wooded, and the rest is pasture or disturbed land adjacent to the existing ROW.	Some induced development would be expected, primarily near areas where Segment I-2 crosses existing roadways.	Yes
Farmland			
Farmlands in Texas are increasingly being developed, with 2.2 million acres of rural land in Texas converted to developed use in a five-year period between 1992 and 1997.	Some areas that appear to be used for agricultural purposes (e.g., livestock pasture) are located within the proposed ROW and would be impacted by the proposed project. The impact would be minor compared to the acreage in the region used for agricultural purposes. There are 19 acres of land in the proposed ROW designated as prime farmland soils that would be impacted by the proposed project.	Within the AOI, there are approximately 34,300 acres of land with prime farmland soils. Some areas currently in agricultural use or underlain by prime farmland soils would likely be impacted by induced development and changes in land use in the study area. The analysis of potential land use impacts indicates that Segment I-2 would not be expected to substantially influence growth in the AOI. Therefore, indirect impacts to farmlands and prime farmland soils are not expected to be substantial.	No

Table 4-7 *cont.*

Communities/Quality of Life (The communities/quality of life resource/issue encompasses human environment effects. The issues listed below were evaluated.)			
Displacements and Relocations			
Current Health of Resource	**Direct Impacts**	**Indirect Impacts**	**Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation**
	The FEIS documented that no residential or business displacements would be required, and this Re-evaluation indicates this is still valid. Parking areas may be reduced at several businesses. Land is available in the area to accommodate displacements.	Induced development could cause displacements and relocations, though undeveloped land exists. Most land planned for development is currently vacant and/or used for agriculture/pasture.	No
Community and Public Resources			
Community and public resources such as parks, schools, churches, and daycare facilities are located in the project area to serve residents of the region.	Segment I-2 would not displace community or public resources or bisect any neighborhoods. Local emergency responders should have improved transit times.	If new commercial or residential facilities are built as a result of induced land use changes, emergency responders (i.e., police, fire departments, and ambulance services) would have additional responsibility of covering incidents at these facilities.	No
Environmental Justice, Population, and Demographics			
	There would be no direct impacts to low-income or minority persons. The project-level impacts of tolling on low-income individuals would be that motorists who choose to use tolled lanes would pay a toll regardless of their income; the tolling of the proposed improvements may constitute a greater burden on lower-income motorists. However, there would be access to free travel between SH 146 and Fisher Road using the roadway frontage roads and main lanes of the Goose Lake and Cedar Bayou bridges. Overall improved mobility in the vicinity of the project area would benefit all roadway users.	No indirect impact to population and demographics would be expected as a result of the proposed project. Expected improved mobility would benefit the entire traveling public, including low-income and minority persons.	No

Table 4-7 *cont.*

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Economic Resources			
	Roadway construction activities would create new job opportunities and income potential in the area in the short term. Direct impacts include those arising from purchases made by the new construction sector.	No adverse impact on adjacent property values or the local tax base is anticipated. Indirect economic benefits of the proposed project are estimated to be 1,371 jobs and $57 million in additional income during project construction. Indirect economic benefits would also be associated with induced development within the study area.	No
Noise			
	Traffic noise levels at two residential receivers would approach, equal, or exceed the Noise Abatement Criteria level in the predicted year. However, mitigation was not considered feasible because noise would not be reduced by a minimum of 5 dBA.	Induced development could cause changes in noise levels. Construction noise would be temporary. If undeveloped areas become urbanized, typical urban noise sources would be present.	No
Visual and Aesthetic Qualities			
The project area from SH 146 to the BS 146/SH 99 intersection is mostly developed, with a variety of urban land uses along the roadway. East of that intersection, the project area is rural, characterized by agricultural land uses and some developed residential/business/ industrial uses in the vicinity of SH 99.	SH 99 has introduced a new visual element in the immediate area where it is already constructed. West of FM 1405, the proposed project would be located in an existing roadway corridor, so the visual impacts would be less than for a new roadway. Proposed overpasses at some intersecting streets would be at higher elevations than existing, but are mostly in developed, urban areas and would be a minor visual change in the existing roadway corridor.	Some induced development could occur in the RSA and would change the visual quality of the area.	No

Table 4-7. ***cont.***

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Air Quality			
Ozone and Carbon Monoxide The proposed project is located within Harris and Chambers Counties, which are in the HGB area that is currently classified as a "severe" nonattainment area for the 8-hour ozone standard. The attainment date is June 15, 2019. According to studies conducted by H-GAC, the regional Metropolitan Planning Organization, air quality has been improving in the Houston-Galveston area over the past 30 years and is expected to continue to improve. The HGB area is currently in attainment for all NAAQS, except for ozone. **Mobile Source Air Toxics** According to EPA studies, MSATs are expected to be much lower in the future compared to current levels due to improvements in vehicle technology and fuels.	Except for the proposed overpass at Fisher Road, the proposed project is consistent with the area's financially constrained 2035 RTP Update and 2011-2014 TIP proposed by H-GAC and approved by FHWA on January 25, 2011 as conforming to the SIP. The Fisher Road overpass should be added to the RTP/TIP with an amendment in summer of 2011. Through transportation conformity, transportation projects proposed for implementation within the HGB nonattainment area are required to demonstrate consistency with the area's SIP for attaining the ozone standard. There may be short-term, localized effects to air quality (e.g., increase in dust, diesel exhaust) during construction in the immediate area adjacent to the project.	The AOI is part of the EPA designated 8-county nonattainment for ozone. The AOI is currently in attainment for all other NAAQS pollutants. Based on the results of Steps 1 through 4 that evaluated the possible project-related actions that can indirectly impact air, it was determined that the proposed project would not be anticipated to cause major indirect air quality impacts in the AOI. No change in attainment status is anticipated within the AOI area as the result of emissions associated with the proposed project. In order for the region to achieve ozone attainment, a variety of point, non-point, and mobile source emission reduction strategies must be implemented for the entire HGB nonattainment area as outlined in the SIP. Indirect air quality impacts from MSATs are unquantifiable due to existing limitations to determine pollutant emissions, dispersion, and impacts to human health. Induced development may lead to activities or business development that could contribute to increased hazardous air pollutants/VOCs that are precursors to ozone. MSAT emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., new light-duty and heavy duty on road fuel and vehicle rules, the use of low sulfur diesel fuel). Even with an increase in VMT and possible temporary emission increases related to construction activities, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on road emissions, MSATs, and the ozone precursors VOC and NOx. As the proposed project is not anticipated to result in indirect air quality impacts, further discussion in Steps 6-7 is not necessary.	Yes

Table 4-7. ***cont.***

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Water Quality			
Water quality has been impacted in Harris and Chambers Counties primarily due to agricultural practices, oil and gas production, and the conversion of undeveloped land to an urban environment. Cedar Bayou is on the TCEQ's 2008 Texas Water Quality Inventory and 303(d) list, indicating that it does not meet water quality standards. The water quality issues are dioxin and PCBs in edible tissue, and bacteria concerns.	During construction, exposed soil could run off into streams and increase turbidity and sediment loading downstream. Use of BMPs would minimize the impact to water quality. The presence of pavement would increase the non-permeable area, thus increasing stormwater runoff. Landscaping efforts and roadway design would minimize potential water quality effects from increased runoff. Bridges at Goose Lake and Cedar Bayou would be constructed utilizing construction methods and BMPs in accordance with regulations that protect water quality; therefore, adverse impacts to these waters would not be expected.	The proposed project would have minimal indirect effects on land use. Indirect effects to water quality would be minor because land developers would have to comply with local, state, and federal water quality standards for protection of water quality.	Yes
Floodplains			
Development has caused encroachment in floodplains. Development in the floodplain is typically offset with detention.	The project ROW includes approximately 73 acres of floodplain. The project would not raise base floodplain elevations.	Development within floodplains caused by induced land development would be in accordance with federal and local regulations. Stormwater detention and hydraulic features would offset any fill in the floodplain or increase in impermeable cover.	No
Wetlands/Waters of the United States			
Changes in land use have impacted wetlands.	Direct impacts would include an estimated 1.351 acres impact to potentially jurisdictional wetlands and 0.477 acre of other potentially jurisdictional waters of the United States.	Induced development could affect waters of the United States and wetlands. Future development would need to comply with Section 404 of the CWA for any impacts to jurisdictional waters of the United States, including wetlands.	Yes

Table 4-7. ***cont.***

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Vegetation			
Vegetation species occurring throughout the region are not anticipated to be diminished to a level by which it may become threatened or endangered.	Direct impacts of the entire Segment I-2 project were predicted to include up to 503 acres of ROW, approximately 213 acres were wooded, and approximately 373 acres were farmed fields or pasture. Segment I-2 between SH 146 and Fisher Road would impact approximately 22 acres of wooded area. Vegetation removal activities were noted in spring 2010 on a wooded tract adjacent to the existing ROW, of which approximately 2.4 acres would be acquired as part of the proposed project ROW.	It is expected that the proposed roadway improvements would have some effect on land use, and some indirect impacts to vegetative communities. Most of the vegetation in the area is agriculture, pasture, and urban.	Yes
Wildlife			
Future development may cause fragmentation and habitat loss, which affects species in the immediate vicinity. The majority of wildlife species in the area occur throughout southeast Texas and populations are not in jeopardy.	Loss of habitat would be minimal. The preferred alternative crosses land that is either currently being farmed or has been farmed in the past; however, some fragmentation of existing habitat would occur. Direct impact to wildlife could be mortality as a result of construction.	It is expected that the proposed roadway improvements would have some effect on land use, and could indirectly impact wildlife habitat.	No
Wild and Scenic Rivers			
Not Applicable	Not Applicable	Not Applicable	Not Applicable
Coastal Barriers			
The study area is not within the boundaries of the Coastal Barrier Resources system.	Construction of this portion of Segment I-2 would not impact coastal barrier resources.	Because the study area is not within the boundaries of the Coastal Barrier Resources system, indirect impacts resulting from induced development/land use changes in the study area would not impact coastal barrier resources.	No

Table 4-7. ***cont.***

Current Health of Resource	Direct Impacts	Indirect Impacts	Resource/Issue to be Included in Cumulative Effects Analysis in this Re-evaluation
Coastal Management Zone			
The entire project is located within the limits of the Coastal Management Zone.	Construction of the proposed project within the existing and proposed ROW would occur on land and water resources located within the Coastal Management Zone. However, the project is not expected to adversely impact or significantly degrade natural resources or water quality.	Development occurring within the Coastal Management Zone that may be induced by the proposed project would require that the developers coordinate with the Texas General Land Office for consistency with the goals and objectives of the Texas Coastal Management Program, as applicable.	No
Essential Fish Habitat			
Tidal waters are Black Duck Bay, Goose Lake, and Cedar Bayou.	In 2006, the NMFS concurred that construction of the westbound Cedar Bayou bridge would not affect EFH. In 2008, the NMFS concurred that replacement of the westbound Goose Lake bridge would not affect EFH Coordination with NMFS regarding the currently proposed Goose Lake bridge replacement/widening and westbound Cedar Bayou is ongoing.	No indirect impact to EFH habitat is expected as a result of the proposed project.	No
Threatened and Endangered Species			
Impacts to individuals likely occur, especially plant species, threats to overall populations are not expected. Suitable habitat would continually be lost through land conversion.	No effects to federally listed species would occur. Impacts to the state-listed threatened species – alligator snapping turtle may occur. Coordination with NMFS regarding threatened/endangered marine species is ongoing.	No indirect impacts to threatened and endangered species would be expected as a result of the proposed project.	No
Cultural Resources: Historic and Archeological			
Historic and archeological resources are potentially present within the region surrounding the project.	No known historic or archeological resources are within the proposed project ROW or the Area of Potential Effect. No further coordination with the State Historic Preservation Officer is needed.	Potential impacts to historic and archeological resources from indirect development would need to be coordinated by the individual developers, as appropriate.	No

Source: Segment I-2 Study Team 2011

4.16.3 Land Use

Resource Study Area (RSA)

The land use RSA is the approximately 106 square-mile study area used for the SH 99, Segment I-2 EIS, and is the same study area used for the indirect effects analysis in this Re-evaluation. The study area is shown on *Appendix A, Figure 7,* and includes a portion of Harris County east of the Houston Ship Channel and the western portion of Chambers County. The time period of the cumulative effects analysis for land use is from 1978, a year that aerial mapping is available for the project area and prior to the completion of the FEIS for Segment I-2, to 2035, the horizon of the current 2035 RTP.

Current Status/Viability and Historical Context

Current Status/Viability

In 2003, the Texas A&M University System, in cooperation with American Farmland Trust, published *Texas Rural Lands: Trends and Conservation Implications for the 21st Century*. The 2003 *Texas Rural Lands* study found that Texas leads all other states in the loss of rural farming and ranching lands. According to the study, "if the trend continues at the same rate for the next two decades, much more of the land in south, central, and east-central portions of the state will become fragmented." As discussed in *Section 3.1*, land use adjacent to the proposed SH 99, Segment I-2 consists of a mixture of mostly undeveloped wooded areas and/or farmland, a few residential properties, and some business and industrial properties. Existing land use categories in the study area include residential, industrial, commercial, public (such as schools), and parks. The prevailing land uses within the study area consist of sparsely populated urban and rural development with the majority of the area east of Cedar Bayou dedicated to farming, ranching, or industrial activities.

According to the *Western Chambers County Transportation Plan*, current land use in western Chambers County can be generally characterized as sparsely populated and primarily undeveloped. The landscape remains predominantly rural, reflecting the area's agricultural tradition. Industrial uses, primarily geared to the petrochemical industry, are also present, and are concentrated in the Mont Belvieu area.

Historical Context

The 2003 *Texas Rural Lands* study evaluated historic, current, and future trends in rural land use within the State of Texas. The study found that rural land, including farmlands, in Texas is increasingly being developed, with 2.2 million acres of rural land in Texas converted to urban use in a five-year period between 1992 and 1997.

Appendix A, Figure 7 shows the approximate areas of existing and past developed land use within the RSA. The RSA is approximately 67,800 acres. Aerial photography from years 1978, 1995, and 2008 was reviewed to determine the extent of past and present development within the RSA. Cities and communities in the study area include Baytown, Cove, Mont Belvieu, Beach City, and rural areas adjacent to the proposed project within western Chambers County. Developed acreage in the RSA was 11,335 acres in 1978; 16,685 acres in 1995; and 27,255 in 2008. The total developed area in the RSA increased from approximately 17 percent in 1978, to 25 percent in 1995, to 40 percent in 2008.

Summary of Direct Effects

Segment I-2 is in an area with a long-term development trend. Construction of Segment I-2 could result in some additional development, near its northern terminus. As stated in the FEIS, the area may attract new industrial and commercial development due to its proximity to the Houston Ship Channel, existing rail lines, IH 10(E), the Houston Metropolitan Area, and existing industrial complexes in Baytown, Pasadena, and Mont Belvieu. Segment I-2 would require approximately 586 acres of ROW.

Summary of Indirect Effects

Some indirect land use changes are expected to occur as a result of the proposed project. Minimal development in the study area occurred between 1997 and 2008. The proposed roadway would be a limited access roadway, except in the urban area between SH 146 and the existing BS 146/SH 99 intersection. Some induced development would be expected, primarily near areas where Segment I-2 crosses existing roadways. Leveling and grading typical with development and construction would alter local topography; however, since the developments would be similar to the existing structures, no major topographic alterations would be anticipated. Construction activities would increase erosion potential in areas of disturbed ground cover and soils, and the presence of pavement and buildings would increase the non-permeable area thus increasing stormwater runoff. Land use changes cannot be accurately predicted or quantified, as they would be dependent on individual land owners' desires, economic conditions, and other factors.

Other Reasonably Foreseeable Future Effects

Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are possible. Reasonably foreseeable projects include roadway projects and large master planned communities. These reasonably foreseeable projects could contribute to land use changes in the study area. Reasonably foreseeable roadway projects in the RSA include the following, with the estimated construction letting date in parentheses:

- FM 3360 from Hatcherville Road to SH 146, construct new 4-lane undivided roadway, project status long range (2018)
- FM 565 from FM 2354 to FM 1405, reconstruct and realign roadway, project status short range (2013)
- IH 10(E) at Cotton Bayou and Hackberry Gully, widen bridges and frontage road, project status short range (2012)
- SH 146 from Ferry Road to IH 10(E), widen and upgrade to 6-lane freeway, project status short range (2011)
- SH 99, Segment I-1 from Liberty County line to IH 10(E), construct 4-lane tollway with limited frontage roads and interchanges, project status short range (2011)
- IH 10(E) from SH 146 to FM 563, widen from 4 to 8 lanes, with bridges, project status long range (2023)

Land use patterns in the area are changing and suggest a trend to increasing population and employment densities. According to the *Western Chambers County Transportation Plan*, a number of residential subdivisions are currently planned for western Chambers County. Large residential developments (totaling approximately 800 acres) along FM 565 north of IH 10 and near the intersection of FM 3360 and SH 146 are under construction or are currently being planned.

In 2001, commercial developments in Cedar Crossing (a master-planned industrial park) included a one million square foot Home Depot warehouse and in 2005, Wal-Mart opened a four million square foot development. The Cedar Crossing Industrial Park comprises 15,000 acres of prime acreage with 12,000 acres available for development. The area may attract new commercial and industrial development due in part to its access to the Houston Ship Channel, IH 10(E), as well as rail and barge service and the Port of Houston's Barbours Cut Container Port. Developers in the area are anticipating more industrial development to occur in the area.

Results of Cumulative Effects Analysis

Cumulatively, the proposed project would cause some indirect changes to land use and directly convert approximately 586 acres of land to roadway ROW. Some direct impacts to land within the RSA as a result of other planned private development are expected. Land uses in the SH 99, Segment I-2 RSA would change over time as population and employment increases, resulting in development of vacant land and redevelopment of other land uses.

Need for Mitigation

The 2003 Texas Rural Lands study indicated that Purchase of Development Rights (PDR) programs are used in other states to slow the land use conversion and fragmentation of farms, ranches, and wildlife habitats. According to the study, PDR programs buy development rights from willing landowners, and based on simulation models, the study found that Texas would benefit most if a PDR was to be implemented in areas where relatively large ownerships (greater than 2,000 acres) are present. Because the mean farm size in Harris County is 124 acres and the mean farm size in Chambers County 451 acres (USDA Census of Agriculture, 2002), a PDR program by the State of Texas would not be an effective mitigation within the RSA.

4.16.4 Water Resources

Resource Study Area (RSA)

The RSA for cumulative impacts to water resources was developed by identifying the watersheds that intersect the proposed roadway improvements. The RSA for water resources is over 772,928 acres in eastern Harris County and western Chambers County (*Appendix A, Figure 8*). During the last 20 years, agencies and local governments have moved toward managing water quality by using the watershed approach (EPA 2005). TCEQ manages the Water Pollution Control Program in Texas, FEMA and Harris County manages and oversees floodplains in Harris County, FEMA and Chambers County manages and oversees floodplains in Chambers County, and the U.S. Army Corps of Engineers has jurisdiction over waters of the United States in Texas. The cumulative effects RSA boundary for water resources was defined by connecting the outer limits of the Cedar Bayou watershed and a portion of the San Jacinto River watershed.

Current Status/Viability and Historical Context

Water Quality

Water bodies flowing through the project area include Cedar Bayou and Goose Lake. No long-term water quality impacts are expected as a result of the proposed project. Subsurface water would not be required for this project; therefore, no adverse effects to groundwater are expected to occur. The proposed project is not expected to alter rainfall drainage patterns or contaminate or otherwise adversely affect the public water supply, water treatment facilities, or water distribution systems. The proposed bridge construction would not change, divert, or add to the existing water resource. Construction phase impacts may occur, but BMPs would be implemented throughout the duration of the project.

Clean Water Act: Section 303(d)

The proposed project is located within the San Jacinto River Basin and the Trinity-San Jacinto Coastal Basin. Section 303(d) of the federal CWA requires state agencies to make a list of water bodies with impairments or water quality concerns. Cedar Bayou Tidal is an impaired water body near the proposed project that is listed in the Section 303(d) 2008 list. Cedar Bayou (Segment ID 0901_01) is listed for dioxin and polychlorinated biphenyls (PCBs) in edible tissue and bacteria concerns. Goose Lake is not listed in the 303(d) list. Since Cedar Bayou (Segment ID 0901_01) is on the 303(d) list and crosses or is in close proximity to the proposed project, coordination with TCEQ is required.

Floodplains

Flooding has been an issue and continues to be an issue in east Harris County and Chambers County, due to an increase in development and the relatively flat topography. Historically, development in the floodplains of Cedar Bayou has contributed to flooding and an increase in runoff. EO 11988 requires federal agencies to avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. Additionally, both counties and other local agencies regulate development in floodplains.

Summary of Direct Effects

Water Quality

Construction could impact water quality on a temporary basis. During construction, exposed soil could runoff into streams and increase turbidity and sediment loading downstream. Operation of the roadway would cause an increase in stormwater runoff due to an increase in impermeable cover, and the runoff could contain oil and grease constituents that could be carried to water bodies outside of the roadway.

Floodplains

Segment I-2 would cross the floodplains of Black Duck Bay, Goose Lake, and Cedar Bayou. A hydraulics study for Cedar Bayou was conducted during the Segment I-2 EIS, and reported that the proposed bridge construction over Cedar Bayou would have a negligible effect on the 100-year floodplain of Cedar Bayou, and no impacts would occur to the Black Duck Bay or Goose Lake

100-year floodplains. Hydraulic features for the project would be designed in accordance with current TxDOT and FHWA design policies and standards. Roadway drainage facilities would permit conveyance of the 100-year flood without causing significant impacts to the main lanes of the proposed roadways, streams, or adjacent property. The proposed design would not adversely impact the base flooding elevations to a level that would violate applicable floodplain regulations and ordinances. To the extent practicable, the design would also minimize the area of a floodplain impacted by the roadway. Fill placement in the floodplain would be mitigated with equivalent floodplain storage in the vicinity of the roadway, if necessary.

Summary of Indirect Effects

Water Quality

Land development, as an indirect impact of Segment I-2, could potentially cause increased stormwater runoff during and after construction. It is expected that potential impacts would be avoided or mitigated through compliance with state and local regulations, and therefore the indirect impact to water quality would be minor.

Floodplains

Development within floodplains would be in accordance with the NFIP and local regulations, and the proposed project would not indirectly impact the 100-year floodplain. No indirect impacts to floodplains would be anticipated from the construction of Segment I-2.

Other Reasonably Foreseeable Future Effects

Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are possible. Reasonably foreseeable projects include roadway projects and large master planned communities. Reasonably foreseeable roadway projects in the RSA include those identified in S*ection 4.16.3*, as well as other proposed development in the water resources RSA.

These reasonably foreseeable projects could cause potential temporary and permanent degradation or loss of water resources from an increase in stormwater runoff, and possible stream modifications due to an increase in stormwater runoff. It is expected that compliance with water quality regulations would minimize impacts to water quality.

Results of Cumulative Effects Analysis

Water Quality

The proposed project would increase impervious roadway surface and indirectly induce land development in the area. The increase in developed area creates new sources for point and non-point source pollution, such as potential contaminants into the area via household chemicals, domestic pet waste, and pollutants from automobiles. Construction could impact water quality on a temporary basis. During construction, exposed soil could runoff into streams increasing turbidity and sediment loading downstream. The proposed roadway would cause an increase in stormwater runoff due to an increase in impermeable cover, and the runoff could contain oil and grease constituents that could be carried to water bodies outside of the roadway.

Floodplains

The proposed project would partly be constructed on floodplains, but would not adversely impact the base flooding elevations to a level that would violate applicable floodplain regulations and ordinances. Indirect development and other planned projects in the RSA would be designed in accordance with floodplain regulations, would not adversely impact the base flooding elevations, and therefore would not impact floodplains in the region

Need for Mitigation

Water Quality

Potential impacts of the proposed roadway to water quality would be mitigated through development and implementation of a Stormwater Pollution Prevention Plan (SW3P). The plan would address measures to prevent or correct erosion that may develop during construction. BMPs for temporary and permanent soil erosion and sedimentation controls would be implemented, as would measures to prevent and control hazardous materials spills during construction. Stormwater discharges would be collected in retention/detention areas or directed to culverts and open drainageways. Increased stormwater/vegetation contact and slowed flows through retention/detention areas would promote settling of suspended solids and reduce potential pollutant concentrations. Short-term and long-term BMPs implemented as part of the proposed project would minimize water quality degradation of surface waters and groundwater in the study area.

Floodplains

The proposed roadway would be designed in compliance with appropriate local, state, and federal standards to ensure that floodplain encroachment does not increase the risk of flooding to adjacent properties. Adverse impacts would be mitigated through measures such as implementation of BMPs during construction and development of detention facilities to offset anticipated increased flows.

4.16.5 Wetlands, Vegetation, and Waters of the United States

Resource Study Area (RSA)

Wetlands

The cumulative effects RSA was developed by identifying the watersheds that intersect the proposed roadway improvements. The RSA for wetlands is over 772,928 acres in areas of east Harris County and western Chambers County (*Appendix A, Figure 8*). Over the past approximately 20 years, agencies and local governments have moved toward managing water quality by using the watershed approach. The USACE has jurisdiction over waters of the United States in Texas. The cumulative effects RSA boundary for wetlands was defined by connecting the outer limit of the watersheds that intersected the proposed roadway improvements. The watersheds are Cedar Bayou and a portion of the San Jacinto River watershed.

Vegetation

The RSA for vegetation is the same as the RSA for land use, approximately 106 square miles (*Appendix A, Figure 7*). The RSA for land use encompasses primarily farmland/ranchland.

Waters of the United Sates

The RSA for waters of the United States is the same as for wetlands. A watershed approach was used for the same reasons as described above in wetlands.

Current Status/Viability and Historical Context

Wetlands and Vegetation

There have been substantial losses to wetlands and other habitats, resulting in reduced wildlife habitat diversity, in Harris and Chambers Counties since the 1950s. Continued urbanization and industrialization of the Houston area will cause continued pressure on remaining habitats and the ecosystem.

Waters of the United States

Waters of the United States within the watersheds have been modified to reduce flooding in east Harris County and Chambers County. The majority of the modifications have included channelizing original streams channels. Rectifying stream channels usually requires the removal of streamside vegetation and straightening meanders in the streams. This improves flow but reduces the natural diversity of the stream channels and potentially removes riparian habitat. Streams in the Cedar Bayou watershed have been altered over time. The majority of the streams consist of channels of uniform width, and side slopes with little undisturbed vegetation.

Summary of Direct Effects

Wetlands

Twenty (20) wetland areas potentially subject to jurisdiction under the CWA were identified within the existing and proposed ROW with a total area of approximately 9.9 acres (*Table 3-6*). Approximately 1.351 acres of the 9.9 acres would be permanently impacted by the project. A small portion of one wetland area would be temporarily impacted during construction, by use of wooden mats instead of temporary fill, to help preserve and ensure the integrity of the wetland.

Vegetation

As documented in the FEIS, most of the vegetation impacts from Segment I-2 from SH 225 to IH 10(E) were to occur on agricultural and pastureland communities; a total of approximately 373 acres. Vegetation impacts would also occur to wooded areas, which total approximately 213 acres within the project corridor. Of the 213 acres of wooded areas, approximately 185 acres consisted of Chinese tallow forests. These areas were likely once pastureland and/or agricultural land that were left to natural abandonment. The remaining 28 acres were mixed pine-hardwood and mixed hardwood forests. The majority of the impacts would occur to open habitat areas or to the Chinese tallow forests. A large portion of eastern Harris County and Chambers County are primarily pastureland/agricultural land and wooded areas dominated by the invasive Chinese tallow. Segment I-2 between SH 146 and Fisher Road would impact approximately 22 acres of wooded area. Vegetation removal activities have occurred on a tract of wooded land located east of Tri-Cities Beach Road and south of the existing SH 99 ROW. Approximately 2.4 acres of this tract would be acquired as part of the proposed project ROW. The loss of these habitats would have a negligible effect on species diversity in the region.

Waters of the United States

Numerous waters of the United States are in the study area, including Black Duck Bay, Goose Lake, and Cedar Bayou. Black Duck Bay, Goose Lake, and Cedar Bayou are navigable waterways. Two bridges would be constructed, and one bridge would be widened. At the Goose Lake crossing, one bridge would be widened to accommodate 2 main lanes and an auxiliary lane, and one bridge would be replaced. The replacement bridge would be configured the same as the widened bridge. A new 2-lane bridge would be constructed at Cedar Bayou. Six bridge piers would be constructed in Cedar Bayou, resulting in an impact of 0.005 acre. The existing fender system would be extended to aid in navigation under the proposed bridge. Approximately 0.012 acre of impact would occur as a result of the extension of the fender system. A total of approximately 0.017 acre of Cedar Bayou would be impacted. A Section 9 U.S. Coast Guard (USCG) permit would be required. Initial coordination has occurred with the USCG. The replacement bridge over Goose Lake would include 12 piles that total approximately 0.003 acre. Approximately 0.007 acre of Black Duck Bay would be impacted by drainage improvements for the project. As discussed above, construction activities could temporarily impact water quality in area streams. An increase in suspended sediments could occur at or near construction sites; however, BMPs such as hay bales, silt fences, and rock berms would be used during construction to minimize potential impacts to the immediate construction area.

Summary of Indirect Effects

Wetlands and Vegetation

Implementation of the proposed project could indirectly cause some development. If wetlands were impacted by other developments, it is expected that mitigation would offset the impacts in accordance with permitting requirements. Other developments would be expected to impact vegetation in the areas of development. Existing vegetation would likely be removed and replaced with ornamental plantings that are routinely maintained.

Waters of the United States

No indirect impacts to waters of the United States, excluding wetlands, would be anticipated as a result of Segment I-2.

Other Reasonably Foreseeable Future Effects

Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are possible. Reasonably foreseeable projects include roadway projects and large master planned communities. Reasonably foreseeable projects in the RSA include planned roadway improvements and other proposed development in the water resources RSA. These reasonably foreseeable projects could cause permanent degradation or loss of pastureland and small amounts of forest land, and potential loss and degradation of wetlands and waters of the United States.

Results of Cumulative Effects Analysis

Wetlands

The proposed Segment I-2 from SH 146 to FM 1405 would directly impact an estimated 1.351 acres of potentially jurisdictional wetlands and would cause some land development that could affect wetlands beyond the project ROW. If development continues at the pace of the last 11 years, minor

amounts of wetlands would be filled. Per wetlands guidelines and regulations, impacts to jurisdictional and possibly non-jurisdictional wetlands would be mitigated.

Vegetation

The majority of the vegetation within the RSA has been impacted by urbanization or farming practices. Most of the vegetation that would be impacted by the proposed project is contained within existing or abandoned farmland/ranchland. As other development occurs in the area, vegetation would be eliminated through construction of housing, business centers, and commercial developments.

Waters of the United States

The proposed project would impact approximately 0.005 acre of waters of the United States associated with bridge and fender construction in Cedar Bayou, approximately 0.003 acre of Goose Lake for the replacement bridge over Goose Lake, and approximately 0.007 acre of Black Duck Bay for drainage improvements (*Table 3-6*). Approximately 0.462 acre of other waters potentially subject to USACE regulation would be impacted by construction of the proposed roadway improvements. This would be a total impact of approximately 0.477 acre to waters of the United States other than wetlands. The impact would be caused by the placement of concrete piers for the bridges and wood piles for the fender systems, and fills associated with roadway construction. These improvements would not substantially increase flows or raise the 100-year base flood elevation. Other than a minor cumulative impact to water quality, which is discussed above, only minor impacts to waters of the United States are expected. Little or no indirect impacts are anticipated.

Need for Mitigation

Wetlands

During construction of the project, approximately 1.351 acres of potentially jurisdictional wetlands would be permanently impacted by the project. A review of USACE requirements would be conducted as design plans are finalized. Compensatory mitigation for effects on Section 404 waters would be coordinated with the USACE and performed in accordance with the terms of the approved permit(s).

Vegetation

Unavoidable vegetation impacts are expected to occur as part of proposed construction of Segment I-2. Due to funding limitations, TxDOT Houston District is not proposing compensatory mitigation for non-regulatory habitat at this time. Mitigation for cumulative effects, other than direct effects, would not be considered by TxDOT.

Waters of the United States

The proposed project would have minor impacts to waters of the United States (non-wetland impacts) and mitigation is not proposed.

4.16.6 Air Quality

Resource Study Area (RSA)

The RSA selected for evaluating air quality associated with NAAQS and transportation conformity was the HGB area that has been designated by EPA as a severe nonattainment area for ozone. The counties included in this area are: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. This large area represents the management unit for mobile source pollutants as regulated by federal, state, and local government agencies. The NAAQS criteria pollutants include ozone, carbon monoxide, particulate matter, nitrogen dioxide, sulfur dioxide, and lead. Unlike the other resources evaluated, air quality impacts from mobile sources are evaluated and managed on a regional basis primarily through the H-GAC, in coordination with the EPA, TCEQ, TxDOT, and FHWA. This transportation management area (TMA) is home to over 5 million residents and contains over 7,000 square miles. The affected transportation network for this project was derived from comparing traffic volume changes of ±5 percent differences for the 2025 and 2035 Build verses No-Build Scenarios. All major roads with traffic volume changes of ±5 percent differences for the entire HGB transportation network were included in the MSAT emissions analysis.

Current Status/Viability and Historical Context

The EPA establishes limits on atmospheric pollutant concentrations through enactment of the NAAQS for six principal, or criteria, pollutants. The EPA designated eight counties in the HGB area as nonattainment for ozone. The region is currently in attainment for all other criteria pollutants. Although there have been year-to-year fluctuations, the ozone trend continues to show improvement. The trend of improving air quality in the region is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies, and H-GAC regional clean air initiatives. However, hazardous air pollutants and MSATs are regulated under the CAA, and in 2007 the EPA issued a set of final rules on *Control of Hazardous Air Pollutants for Mobile Sources*, as discussed in *Section 3.3*. Other regulatory controls for motor vehicle efficiency and improved fuels (gasoline and diesel) and other air toxics reductions are in place or will be phased in to reduce MSATs in the future. The population increase of Harris County and the surrounding region has led to an increase in VMT and mobile source emissions. Industrial activities and growing suburban development has led to land uses that contribute to regulated emissions. However, all area sources (i.e., dry cleaners, gas stations, etc.) and point sources (i.e., industrial facilities) must follow federal regulations and meet SIP standards.

Summary of Direct Effects

Direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity, and the resulting projected increases in VMT. Emission reductions as a result of EPA's new fuel and vehicle standards are anticipated to offset impacts associated with VMT increases.

Summary of Indirect Effects

Induced land development would be primarily residential and commercial/industrial uses, bringing with it the types of associated businesses that generate emissions that can contribute to a decline in air quality. This type of indirect commercial development may lead to activities or business

development that could contribute to increased HAPs/VOCs, which are precursors to ozone. Based on current development trends, the proposed project would not be expected to induce construction of large industrial facilities with associated air emissions. Although some induced development could increase the rate of emissions, all area sources must follow state and federal regulations and meet SIP standards. Induced development may also contribute to dust and other air pollutants; however, these effects would occur over the time period of analysis and would be temporary.

Based on the results of Steps 1 through 4 that evaluated the possible project-related actions that can indirectly impact air, it was determined that the proposed project would not be anticipated to cause indirect air quality impacts in the AOI. No change in attainment status is anticipated within the AOI area as the result of emissions associated with the proposed project. In order for the region to achieve ozone attainment, a variety of point, non-point, and mobile source emission reduction strategies must be implemented for the entire HGB area as outlined in the SIP. Indirect air quality impacts from MSATs are unquantifiable due to existing limitations to determine pollutant emissions, dispersion, and impacts to human health. MSAT emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., new light-duty and heavy duty on road fuel and vehicle rules, the use of low sulfur diesel fuel). Even with an increase in VMT and possible temporary emission increases related to construction activities, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on road emissions, MSATs, and the ozone precursors VOC and NOx.

Other Reasonably Foreseeable Future Effects

The temporal boundary of the cumulative impact analysis is 2035. This corresponds to the region's RTP and population projections. Reasonably foreseeable projects within the air RSA include all proposed projects in the 2035 RTP. Many other transportation projects are planned within the air RSA that would contribute to MSATs. According to the 2035 RTP, the RSA is expected to grow to 8.8 million residents by 2035.

Results of Cumulative Effects Analysis

Any increased air pollutant or MSAT emissions resulting from increased capacity, accessibility, and development are projected to be more than offset by emissions reductions from EPA's new fuel and vehicle standards or addressed by EPA's and TCEQ's regulatory emissions limits programs. Projected traffic volumes are expected to result in no impacts on air quality; improved mobility and circulation may benefit air quality. Increases in urbanization would likely have a negative impact on air quality. However, planned transportation improvements in the project area as listed in a conforming RTP and TIP, coupled with EPA's vehicle and fuel regulations fleet turnover, are anticipated to have a cumulatively beneficial impact on air quality.

As discussed in *Section 3.3*, MSATs for the entire air quality RSA are expected to decrease due to improved vehicle technology, changes in fuel (gasoline and diesel), and other regulatory controls of air toxics that are currently in place or will be phased in to reduce MSATs in the future.

The population in the HGB area is expected to increase by 60 percent between 2005 and 2035. Rapid population growth would continue to create air quality challenges for the HGB area. The TCEQ continues to evaluate potential options to further reduce pollutant emissions. Growth patterns will lead to increased VMT, and induced land changes would increase area source emissions that

contribute to HAP/VOC emissions. Quantifying the associated emissions of future area sources is not possible due to uncertainties of future land use.

The TCEQ establishes the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general comprehensive plan. Regulatory emission limits set by TCEQ and EPA are established to attain and maintain the NAAQS by assuring any emissions sources resulting from new development or redevelopment will not cause or contribute to a violation of those standards. The proposed project and the other reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the 2035 RTP and the 2008-2011 TIP, as amended, which were found to conform to the TCEQ SIP on July 21, 2010. In accordance with 43 CFR 93.124, the motor vehicle emissions budget within the SIP represents the emission allowance allocated to mobile sources in order to attain the NAAQS within a given area. The emissions resulting from all projects within the conforming transportation plan combined with cleaner fuels, improved emission control technologies, alternative modes of transportation, and regional clean air initiatives should result in continually improving air quality in the area. In addition, the projected traffic volume and the minimal to no impact causing actions such as changes in land use designations, mobility, or vehicle fleet make-up, would not result in anticipated cumulative impacts to air quality. Based on the aforementioned reasons, cumulative air quality impacts were not evaluated.

Need for Mitigation

A variety of federal, state, and local regulatory controls as well as local plans and projects have had a beneficial impact on regional air quality. The CAA, as amended, provides the framework for federal, state, tribal, and local rules and regulations to protect air quality. The CAA required the EPA to establish NAAQS for pollutants considered harmful to public health and the environment. In Texas, the TCEQ has the legal authority to implement, maintain, and enforce the NAAQS. The TCEQ establishes the level of quality to be maintained to control the quality of the state's air by preparing and developing a general comprehensive plan. Authorization in the Texas Clean Air Act (TCAA) allows the TCEQ to do the following: collect information and develop an inventory of emissions; conduct research and investigations; prescribe monitoring requirements; institute enforcement; formulate rules to control and reduce emissions; establish air quality control regions; encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities. Local governments having some of the same powers as the TCEQ can make recommendations to the commission concerning any action of the TCEQ that may affect their territorial jurisdiction, and can execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA or the rules or orders of the TCEQ.

The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies to reduce emissions, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the non-attainment areas. These regulatory controls, as well as other local transportation and development initiatives implemented throughout the Houston metropolitan area by local governments and other

entities provide the framework for growth throughout the area consistent with air quality goals. As part of this framework, all major transportation projects, including the proposed project, are evaluated at the regional level by the H-GAC for conformity with the SIP.

The cumulative impact of reasonably foreseeable future growth and urbanization on air quality within this area would be minimized by enforcement of federal and state regulations, including the EPA and TCEQ, which are mandated to ensure that such growth and urbanization would not prevent attainment with the ozone standard or threaten the maintenance of the other air quality standards.

4.16.7 Regional Cumulative Effects of Tolled Facilities and Managed Lanes

As the Metropolitan Planning Organization (MPO) for the Houston Galveston region, the Houston-Galveston Area Council (H-GAC) is charged with enabling and creating a regional perspective for transportation and mobility. The 2035 Regional Transportation Plan (RTP) provides the major strategies that would accommodate forecasted growth and preserve mobility in the region. H-GAC prepared a planning-level assessment, *Regional Cumulative and Indirect Effects of Toll Facilities*[1] report, to determine how the 2035 RTP regional toll roadway network could indirectly or cumulatively affect socioeconomic and natural resources. Resources evaluated in this planning study included Environmental Justice (EJ) populations (low-income and/or minority populations as defined in Executive Order (EO) 12898[2]), air quality, water resources, vegetation, and land use. However, the majority of the H-GAC analysis focused on the potential impact of the regional toll roadway network on EJ populations in the region. For more information on the resources evaluated and for more detail on the EJ analysis, please see the H-GAC *Regional Cumulative and Indirect Effects of Toll Facilities* report**.**

The indirect impact portion of this document identified the need to consider impacts of the expanding regional roadway network, specifically the expansion of toll facilities and managed lanes (*Exhibit 2*). An evaluation of the regional cumulative effects of these facilities was considered for potential impacts on Environmental Justice (EJ) populations, air quality, water quality, vegetation, and land use. The Resource Study Area (RSA) for this evaluation is the Houston-Galveston Area Council (H-GAC) eight county region.

Environmental Justice

Methodology

H-GAC conducted an evaluation to determine the effects of a regional tolled roadway network on EJ populations. Initially, the evaluation identified those 2000 Census block groups which contained 51 percent or more of minority and/or low income populations. Once the EJ block groups were identified, EJ TAZs were identified if 50 percent or more of its area was identified as an EJ population. Approximately 46 percent of the TAZs are EJ TAZs. In addition, they contain nearly a third of the regional population (*Table 4-8*). *Exhibit 4* depicts the EJ TAZ for low income populations and/or minority populations.

[1] HGAC, Regional Cumulative and Indirect Effects of Toll Facilities April 2009.
[2] Executive Order 12898: Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations.

Table 4-8. Traffic Analysis Zone Data

	2000 Population	Percent of Regional Population	Number of TAZ	Percent of Total TAZ
Total EJ TAZ Population	1,634,500	31	1,383	46
Total Regional Population	5,214,051	100	3,000	100

Source: H-GAC 2009.

Following the identification of the EJ TAZs, two regional roadway network scenarios were utilized, the 2035 RTP Build Scenario and the 2035 RTP No-Build Scenario, to conduct an analysis on travel time for persons within the EJ TAZs and non-EJ TAZs. The Build Scenario includes the new tolled lanes, managed lanes, and high occupancy tolled (HOT) lanes projects identified in the 2035 RTP (*Exhibit 5*). The No Build Scenario includes the current roadway network, the fiscally constrained 2035 RTP roadway network and the Katy Freeway HOT lanes (*Exhibit 6*).

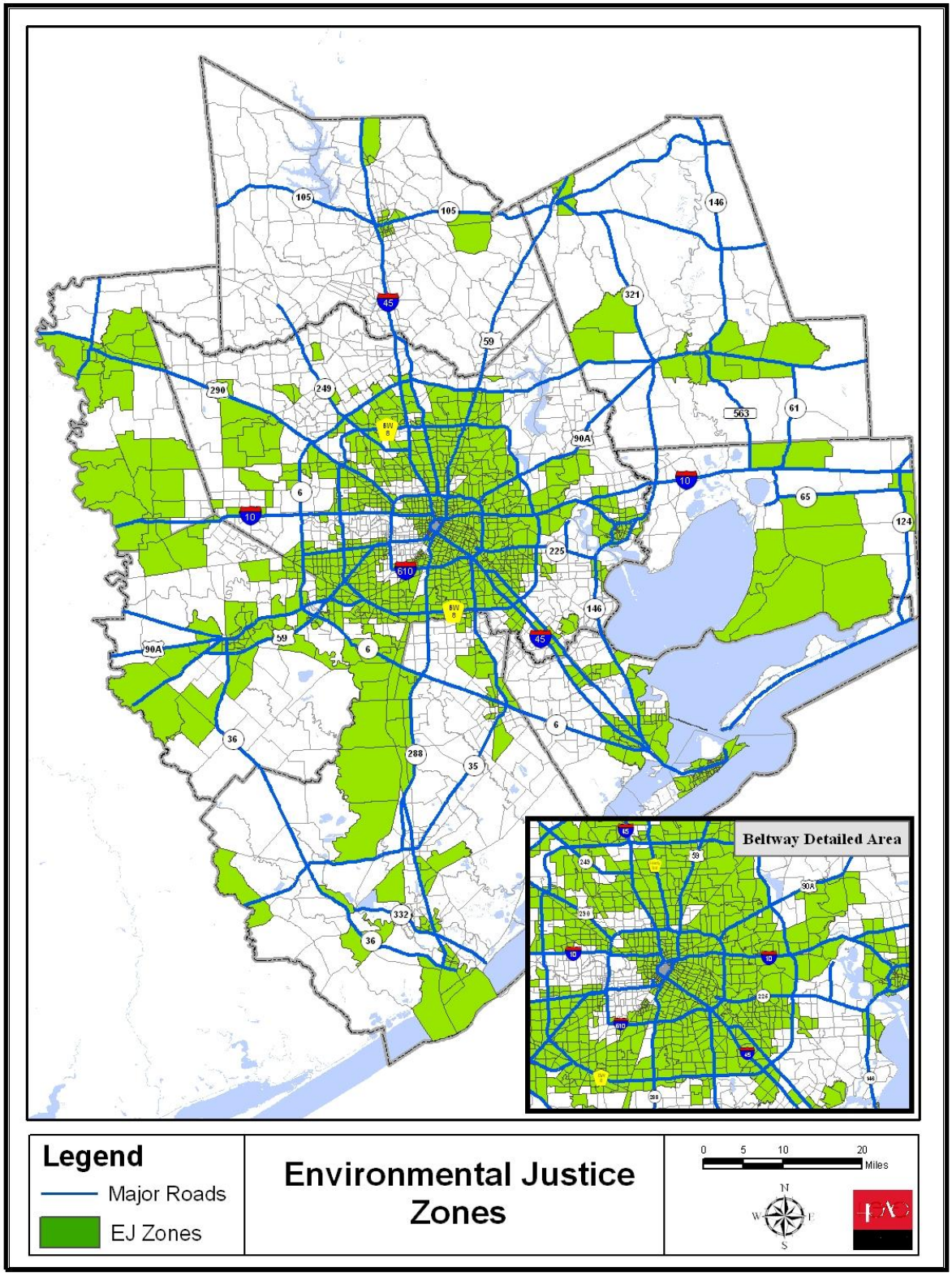


Exhibit 4. Environmental Justice Traffic Analysis Zones

Source: H-GAC 2009.

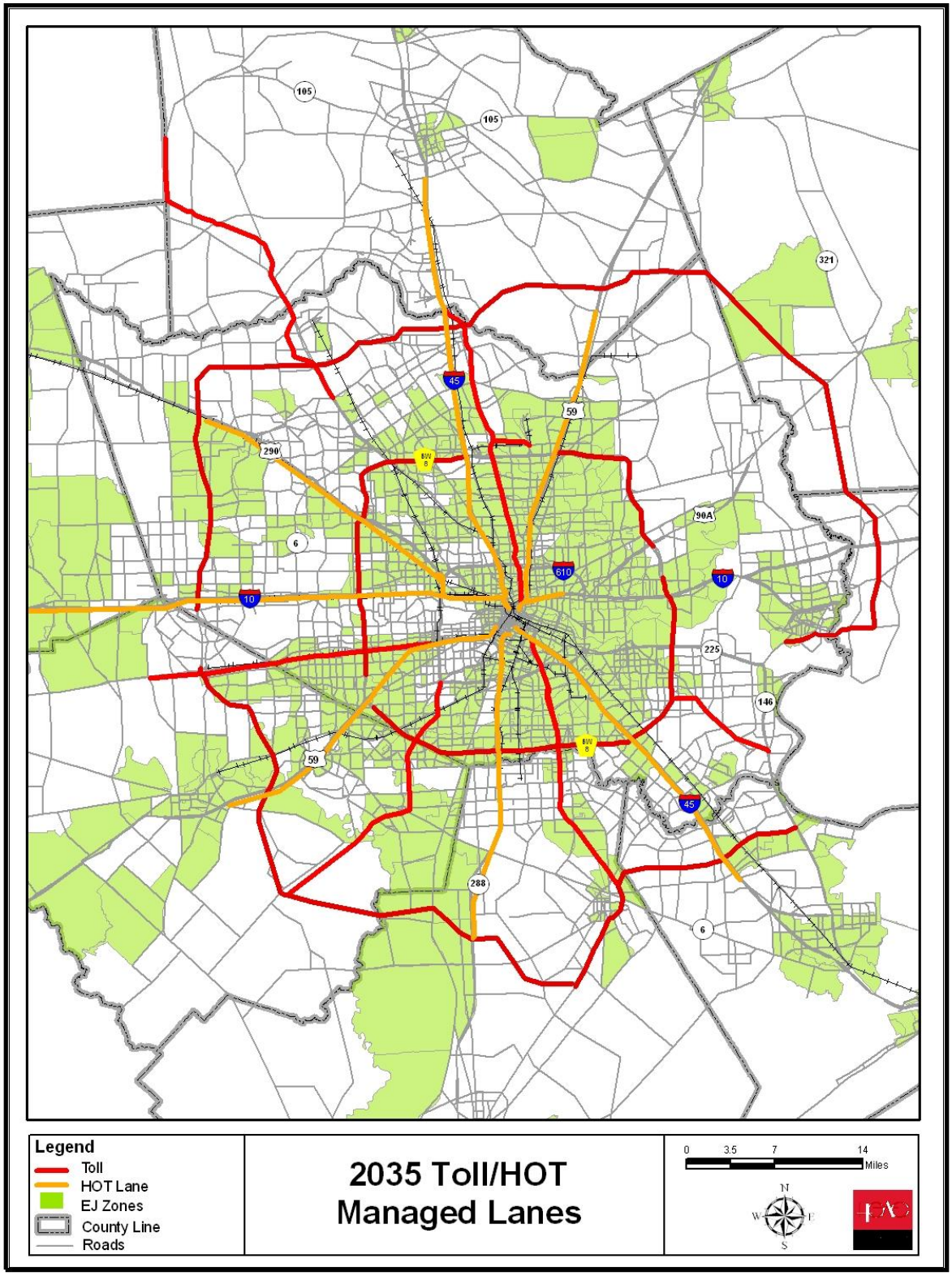


Exhibit 5. 2035 Build Scenario Regional Roadway Network

Source: H-GAC 2009.

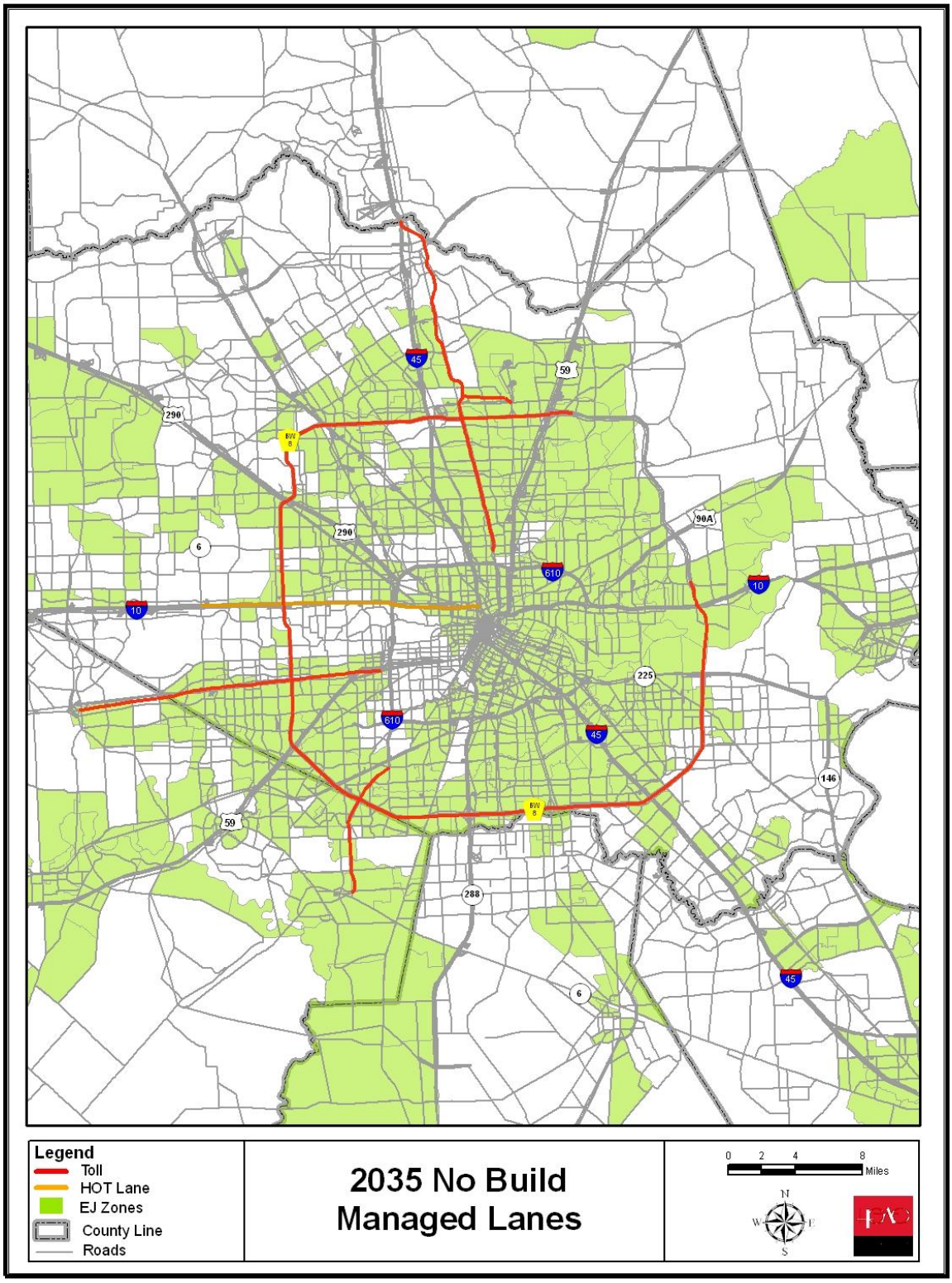


Exhibit 6. 2035 No-Build Regional Roadway Network

Source: H-GAC 2009.

Analysis Assumptions and Limitations

The region's travel demand models do not provide a means for tracking travel at an individual household level, but do provide a means for tracking travel at a zonal level. For purposes of the analyses, the zones are specified as either EJ zones or non-EJ zones based on the socioeconomic characteristics of the zonal populations. Some regional travel models employ a generalized cost assignment procedure for toll analyses. The H-GAC models perform toll analyses at the mode choice level. Hence, the H-GAC travel model uses a multi-class assignment procedure rather than a generalized cost procedure.

The mode choice models are applied by trip purpose. For the mode choice toll analyses, two travel time estimates are developed from each zone to all other zones: 1) the travel time using both toll and non-toll links (commonly referred to as "toll path" travel times), and 2) the travel time using only non-toll links (commonly referred to as the "free path" travel time). In the mode choice model, if the toll path does not offer a shorter travel time between two zones than the free path travel time, the trip is not considered a "candidate" for the toll facility. If a trip can save travel time using a toll path over a free path then it is considered a "candidate" trip. Of course, not all candidate trips will choose to use a tolled path. The probability of a candidate trip using a tolled path is a function of a number of variables such as the magnitude of the potential travel time savings, the toll costs and the income characteristics of the zones residents. Aspects of this approach are employed in the analyses presented in this report.

In mode choice model applications, there is a single highway network which is used to estimate the travel times for toll paths and free paths. For the regional toll analyses, there are two networks: the "Build" network (i.e., the forecasted roadway network containing the subject toll facilities) and the "No-Build" network (i.e., the network containing all the forecasted roadways except the subject toll facilities). Existing and committed toll facilities are contained in both networks. In this analytical setting, simply comparing the toll path versus free path option will not identify the candidate trips for only the new toll facilities being studied. Indeed, such a grouping would include trips using both existing and proposed toll facilities.

To focus on candidate trips for the new toll facilities, the travel time for toll paths in the Build network is compared to the toll path travel time in the No-build network. Trips that have a shorter toll path travel time in the Build network than the toll path travel time in the No-build network are defined as candidate trips for the new toll facilities. The trips from EJ zones are stratified as either candidate trips or non-candidate trips using the data from the two networks. Likewise, the trips produced by the Non-EJ zone are similarly stratified. Stated differently, the trips for a given trip purpose is segmented into four groups:

1. Trips produced by EJ zones that are classified as "Candidate" trips
2. The remaining trips produced by EJ zones are classified as non-"Candidate" trips
3. Trips produced by non-EJ zones that are classified as "Candidate" trips
4. The remaining trips produced by non-EJ zones are classified as non-"Candidate" trips

Using toll path travel times and free path travel times from the Build and the No-Build networks, there are four travel times for each trip, (i.e. 1) Build network-toll path option, 2) Build network-free

path option, 3) No-Build network-toll path option, and 4) No-Build network – free path option). By computing the average trip lengths for each of the options, the impacts of the two networks on the choice options can be quantified, compared, and analyzed.

Using this approach, the results allow the comparison of the toll and free path options for each network for each segmentation of trips. Clearly, the implementation of new toll facilities should be expected to benefit those who might choose to use a toll facility. Of perhaps more interest is determining if there are any expected overall disadvantages to those who might chose not to use a toll facility or that are not candidates for using one of the new toll facilities.

One of the interesting side benefits of the approach used is that it calls attention to the fact that there will be some potential travel time savings realized for trip makers who chose not to use a toll facility. These time savings would be expected to accrue from the reduced congestion on free facilities due to trips diverted to toll facilities.

These analyses are regional level analyses and focus on average regional results. Such analyses do not isolate any zone specific analyses or the impacts in the immediate proximity of the new proposed facilities. These impacts were addressed by the analyses performed for the individual facilities. Indeed, the purpose of these analyses are to determine if there are any cumulative regional impacts to the EJ populations represented by the zones designated as EJ zones.

To determine the time analysis for the different scenarios, trips were divided into home based work (HBW) trips and home based non-work (HBNW) trips for both tolled and free facilities. *Table 4-9* shows the 2035 HBW person trips and the average trip length (ATL) in minutes for the Build and No-Build Scenarios.

The results for the home based work trips analysis indicate:

- The addition of the tolled facilities to the regional roadway network under the Build Scenario results in a reduction of travel time in the EJ and Non-EJ Zones for all trips on tolled facilities (4.77 and 8.75 minutes respectively).

- The addition of the tolled facilities to the regional roadway network under the Build Scenario results in a reduction of travel time in the EJ and Non-EJ Zones for all trips on free facilities (2.32 and 5.05 minutes respectively).

- Overall, the Build Scenario provides a reduction in travel time for both the tolled and free facilities within the regional roadway network for all zones. As a result, there is no potential for a disproportionate negative effect to the Environmental Justice populations from the regional tolled roadway network. In fact, the entire region, including the EJ Zones, will recognize a benefit in travel time savings because of the added capacity the tolled roadway facilities provide to the regional roadway network.

Table 4-9. AM Peak Home Base Work Trips

			AM Peak Average Trip Length (ATL) in minutes for Free and Tolled Facilities under the Build and No-Build Network Scenarios				Difference in AM Peak ATL in minutes	
			Build Network Scenario		Non-Build Network Scenario			
Zones	2035 HBW Trip Scenarios	Number of 2035 HBW Person Trips	ATL Using Tolled Facility	ATL Using Free Facility	ATL Using Tolled Facility	ATL using Free Facility	Difference in ATL for the Tolled Facility (No-Build – Build)	Difference in ATL for Free Facility (No-Build – Build)
EJ Zone	Trips that save 0+ minutes using a new tolled facility	1,174,445	38.59	42.87	43.36	45.19	4.77	2.32
	Trips that cannot save 0+ minutes using a new tolled facility	1,487,852	20.81	20.89	21.66	21.76	0.85	0.87
Non-EJ Zone	Trips that save 0+ minutes using a new tolled facility	1,590,356	50.76	56.51	59.51	61.56	8.75	5.05
	Trips that cannot save 0+ minutes using a new tolled facility	1,627,399	23.40	23.46	24.61	24.70	1.21	1.24

Table 4-10 shows the 2035 HBNW person trips and the ATL in minutes for the Build and No-Build Scenarios.

Source: H-GAC 2009.

Table 4-10. AM Peak Home Based Non-Work Trips

			AM Peak Average Trip Length (ATL) in minutes for Free and Tolled Facilities under the Build and No-Build Network Scenarios				Difference in AM Peak ATL in minutes	
			Build Network Scenario		Non-Build Network Scenario			
Zones	2035 HBW Trip Scenarios	Number of 2035 HBW Person Trips	ATL Using Tolled Facility	ATL Using Free Facility	ATL Using Tolled Facility	ATL using Free Facility	Difference in ATL for the Tolled Facility (No-Build – Build)	Difference in ATL for Free Facility (No-Build – Build)
EJ Zone	Trips that save 0+ minutes using a new tolled facility	960,791	26.14	27.68	28.94	29.20	2.80	1.52
	Trips that cannot save 0+ minutes using a new tolled facility	5,393,943	12.94	12.97	13.28	13.31	0.34	0.34
Non-EJ Zone	Trips that save 0+ minutes using a new tolled facility	1,235,114	31.09	33.29	36.57	36.85	5.48	3.56
	Trips that cannot save 0+ minutes using a new tolled facility	5,817,081	14.98	15.04	15.69	15.72	0.71	0.68

Source: H-GAC 2009.

The results for the HBNW trips analysis indicate:

- The addition of the tolled facilities to the regional roadway network under the Build Scenario results in a reduction of travel time in the EJ and Non-EJ Zones for all tolled facilities (2.80 and 5.48 minutes respectively).
- The addition of the tolled facilities to the regional roadway network under the Build Scenario results in a reduction of travel time in the EJ and Non-EJ Zones for all free facilities (1.52 and 3.56 minutes respectively).

- Overall, the Build Scenario provides a reduction in travel time for both the tolled and free facilities within the regional roadway network for all zones. As a result, there is no potential for a disproportionate negative effect to the Environmental Justice populations from the regional tolled roadway network. In fact, the entire region, including the EJ Zones will recognize a benefit in travel time savings because of the added capacity the tolled roadway facilities provide to the regional roadway network.

In addition, it is evident that the Build Scenario, which includes the regional tolled roadway network, reduces congestion in the region. As seen in *Table 4-11*, the daily VMT decreases by over 1.5 million miles in the Build Scenario versus No-Build Scenario. Furthermore, daily vehicle hours traveled (VHT) decreases by nearly 7 percent for the region for the 2035 regional roadway network. This gives evidence that the 2035 roadway network with tolled facilities will improve the overall system performance and provide travel time savings to both EJ and non-EJ populations.

Table 4-11. 2035 Regional VMT and VHT

	Build	No-Build
Daily VMT	273,566,820	275,140,200
Daily VHT	8,027,063	8,563,797
AM VMT	54,441,814	54,624,299

Source: H-GAC 2009.

Overall Environmental Justice Toll Network Findings

For HBW and HBNW trips, EJ population trips that are candidate toll users are benefited by the introduction of the new toll facilities in terms of both the toll and free path travel times. Equally important, EJ population trips that are not candidate toll users benefit by the introduction of the new toll facilities as the free path travel time average trip length is reduced between the No-Build and Build scenarios. As such, EJ populations experience an overall benefit under the Build Alternative for their HBW and HBNW travel.

Although EJ zones are spread throughout the region, they are generally clustered within Beltway 8 and are not in close proximity to the majority of future toll facilities as the Non-EJ zones are. Consequently, as the ATL of the EJ zones are less than the ATL of non-EJ zones, the EJ zones cannot derive as much travel time savings as the longer trips from Non-EJ zones. However, this analysis did not explicitly examine the impact on average trip length. A substantial amount of future transit improvements are targeted at EJ zones; the ATLs for the populations within those zones will tend to improve due to increased access to improved transit facilities. As previously mentioned METRO's 2035 Long Range Plan recommends significant expansion of the current transit system and includes a network of integrated high capacity transit facilities on major travel corridors. This plan also identifies service expansions beyond the METRO service area. New improvements scheduled for implementation through the year 2035 include high occupancy tolls, a new intermodal terminal, park-n-ride facilities, 40 miles of Signature Bus lines, and several new high capacity transit corridors throughout the region including the 89 miles of LRT, and 84 miles of CRT.

An analysis was also conducted to determine the annual financial burden of utilizing the toll road system for HBW trips. The analysis assumed a 2035 toll rate per mile of 19.96 cents (current toll rate of 10 cents per mile with an annual escalation rate of 2.5 percent). In addition the analysis

assumed that an average HBW trip length is 23.30 miles and the SOV user makes 250 round-trips per year using the toll facility. Under this scenario, the annual cost would be approximately $2,325 per year. However, the accrual cost should be substantially less since the likelihood of a trip using only tolled facilities is diminutive.

Although EJ populations will see an increase in spending for toll facilities, the entire region will also see an increase in spending and usage as the toll and managed lane system expands. Both EJ and Non-EJ populations will benefit from future toll facilities. In fact, the 2035 RTP relies heavily on toll funding to finance a portion of future added capacity projects, both free and toll. Additionally, for both populations who choose to use non-toll options, the Build scenario for 2035 will provide a roadway network that will operate at better traffic conditions than the No-Build scenario and would provide an increased benefit for those users over the No-Build scenario.

In September 2009, the toll rates were increased in the Houston metropolitan area by 3.75%. With the implementation of the new toll policy, the EZ-tag toll users were assessed a $0.05 increase for all main-lane toll plazas on the Sam Houston, Westpark, and Hardy Toll Roads for a 2-axle passenger vehicle. The price for cash paying users did not change. As a result, the previously discussed toll analysis for EJ populations was re-evaluated to insure that no disproportionately high and adverse cumulative impact would occur because of the toll increase. The findings of this analysis demonstrate that there is a slight decrease in overall toll demand among EJ and non-EJ populations as a result of the toll increase (1.5%-2.0% for HBW trips and 0.5%-1.0% for HBNW trips). The consistency in the toll demand decrease among the EJ and non-EJ populations suggestions that the 3.75% toll rate increase will have minimal impact on demand for the toll system. The implementation of the toll system will still allow the 2035 roadway network to improve the overall transportation system performance and provide travel time savings to both EJ and non-EJ populations.

Based on the previous discussion and analysis, the Build scenario for the 2035 RTP, even with the toll increase implemented, would not cause cumulative disproportionately high and adverse effects on EJ populations as per Executive Order 12898 regarding environmental justice.

Air Quality

The CAAA of 1990 require transportation plans, programs, and projects in nonattainment areas, which are funded or approved by the FHWA or FTA, to conform to the SIP. This ensures that transportation plans, programs, and projects do not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Under the Clean Air Act, the EPA established criterion called the NAAQS to determine the health threat of criteria pollutants, generally located within CMSAs. If a CMSA has a health threat, it is designated as a ‘non-attainment’ area until compliance is achieved. The Houston-Galveston region is classified as a non-attainment area for the 1997 8-hour Ozone standard, and it has been further classified as “severe”.

Transportation conformity is an analytical methodology that establishes the connection between projected on-road emissions from the RTP and the known reductions in the motor vehicle emission budget from the SIP. Through the process of transportation conformity, the RTP uses the SIP on-road mobile strategies and air quality targets to demonstrate if the RTP complies with the federal air quality requirements. Vehicle emissions resulting from the implementation of transportation projects in the 2035 RTP cannot exceed emission budgets established by the SIP. The Houston-Galveston region must demonstrate that the 2008 - 2011 TIP, as amended, and the long-range plan (2035 RTP)

result in less VOCs and NO_x than established and approved by EPA for each analysis year. On November 9, 2007, the USDOT determined that the 2035 RTP and the 2008 – 2011 TIP, as amended, conformed to the requirements of the SIP for the Houston-Galveston ozone non-attainment area. The Level of Mobility (LOM) was developed to illustrate the degree of congestion on roadways within the region. *Exhibit 7* shows the relative distribution of morning peak period congestion levels for the current and future regional roadway network as a percentage of vehicle miles traveled in each LOM category. There will be an increase in regional congestion levels if the forecasted growth occurs. The proposed 2035 RTP Regional Roadway Network would reduce the percentage of severely congested VMT in the morning peak period, from approximately 50 percent to less than 30 percent compared to the 2035 No-Build Scenario.

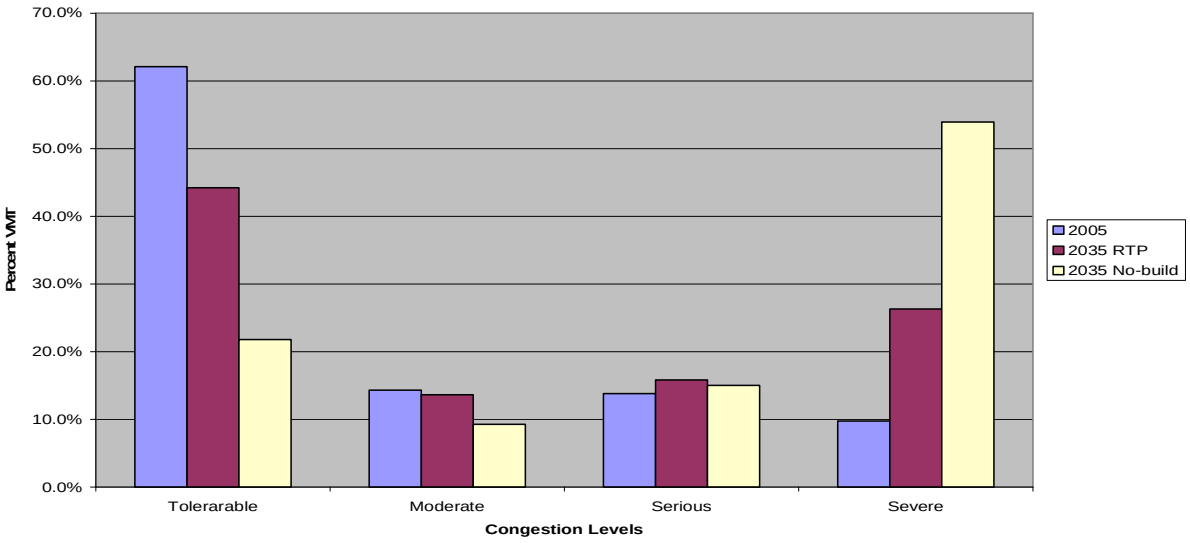


Exhibit 7. Level of Mobility – AM Peak

Source: H-GAC 2009.

Air Quality Findings

The addition of tolled facilities and managed lanes into the existing regional roadway network would not have any cumulative impacts to air quality. Moreover, a tolled roadway network adds capacity to the regional roadway network, thus allowing a better flow of traffic and decreasing the amount of cars traveling at lower speeds or idling conditions. The improved traffic flow results in less fuel combustion and lower emissions including MSATs, CO, and Ozone. As noted in the direct, indirect, and project level cumulative analysis discussions, EPA's vehicle and fuel regulations, coupled with fleet turnover, are expected to result in substantial reductions of on-road emissions, including MSATs, CO and ozone precursors.

Water Quality

The Houston-Galveston region has an abundance of water resources including rivers, lakes, and bays. The TCEQ, along with the Clean Rivers Program and numerous local agencies, are responsible for monitoring all major bodies of water and reporting those conditions in a biennial Texas Water Quality Inventory report. Section 303(d) of this report details those water bodies TCEQ has identified as impaired because of water contamination. The 303(d) list identifies several major water systems as impaired with pollutants and bacteria in the RSA. A majority of the waterways located in the Trinity-San Jacinto Coastal Basin, San Jacinto River Basin, San Jacinto-Brazos Coastal Basin, Brazos-Colorado Coastal Basin, including bays and estuaries that flow to the Gulf of Mexico, are impaired and included in the 303(d) list. The construction of the regional tolled roadway network would cross and impact the above mentioned water bodies at various locations and could cause water quality impacts. The increase of impervious cover from adding capacity to the regional roadway network greatly increases non-point source pollution and the potential to cause further impairment to the region's waterways. As stated previously, TCEQ regulates water quality through Stormwater Pollution Prevention Plans (SWP3), Municipal Separate Storm Sewer Systems (MS4), and BMPs. All construction of the regional tolled roadway network in the RTP would follow these water quality regulations that would aid in preventing further pollution to these impaired waters and to waters that are not impaired. Additionally, any land use development that would occur from the construction of these facilities would follow TCEQ's regulations for water quality through SWP3 and MS4.

Water Quality Findings

Although overall impacts cannot be avoided, the above mentioned mitigation techniques will ensure that the regional tolled roadway network would not have significant cumulative impacts to water quality.

Vegetation

Prairie, Wetland, Bottomland Forest, Upland Forest, and Riparian Corridor ecosystems are all located in the Houston-Galveston region. Each of these resources provides vital functions such as flood protection, air quality, water quality and wildlife habitat. Protection of these natural resources which contribute to our region's quality of life is an important priority when planning for our region's future growth and transportation infrastructure. This sentiment was voiced strongly at the Envision Houston Region workshops and forums.

As growth and development are part of our region's future, it is not feasible that every undeveloped parcel be preserved. However, it is feasible that the region identify and work to conserve those areas that are most ecologically sensitive. H-GAC identified areas that have sensitive environmental resources for special consideration in the transportation planning process. However, the identification is not intended to be used for project-level screening. The results are intended to be used for long-range planning purposes and screening to identify areas in which future transportation projects or development may potentially impact these sensitive resources. In addition, the identified environmental resources are areas in which mitigation efforts may be focused.

In some instances, disturbing natural resources may be unavoidable for regionally significant projects or projects located on facilities that are multiple-lane, limited access facilities, such as highways and toll roads. Due to their scale, regionally significant projects potentially have a larger impact on the environment than a local project and therefore were closely examined. Currently, projects within the

2035 RTP are individually subject to environmental requirements but have no mechanism for cumulatively identifying or mitigating environmental impacts. At the project level, the TxDOT Houston District can mitigate for loss of vegetation with the Texas Parks and Wildlife Department, and wetlands mitigation would occur through the permitting process under the jurisdiction of the U.S. Army Corps of Engineers. Locally, cities can also curb vegetation loss by implementing measures to protect vegetation areas.

Vegetation Findings

Impacts to vegetation will undoubtedly occur from the regional tolled roadway network. However, these impacts are best evaluated and mitigated at the project level.

Land Use

While we can increase system capacity, manage demand, and improve the efficiency of the existing regional roadway network, the greatest potential effect upon improving mobility and quality of life is connecting transportation and land use planning. Land use has a direct impact on the ability of the region's transportation system and agencies to deliver a variety of travel choices. The 2035 RTP has shown that sustained major investments in roadway capacity will only moderate, and will not eliminate the level of future traffic congestion. However, improved mobility is possible through better coordinated land use and transportation planning.

The Envision Houston Region process was initiated by the H-GAC and its partners to engage residents in a discussion of the region's future growth and development. The process focused on land use and transportation alternatives. Citizen input from workshops was used to develop growth scenarios representing two different types of alternative development patterns. The objective was to provide information on the projected impacts of the alternatives and to highlight the difference between the two growth scenarios developed from the workshops and the Base Case or traditional growth scenario. Brief descriptions of each scenario are found below:

- Scenario A: (Base Case) denotes the current growth and development pattern for the Houston-Galveston region, based on H-GAC's 2035 demographic forecasts. It is characterized by low-density housing development in currently undeveloped portions of the region with mixed-use development along major roadways. Jobs are concentrated in the central business district, and several other employment centers are scattered throughout the region.

- Scenario B: denotes the workshop participants' ideal growth pattern, adjusted to the *regional forecast* of household and employment growth. This scenario is characterized by development along major roadways, in a radial pattern, creating centers at major intersections.

- Scenario C: denotes the workshop participants' ideal growth pattern, adjusted to the forecast of household and employment *growth by county*. This scenario clusters mixed-use development in satellite cities and along major roadways in a radial pattern. Satellite employment centers emerge throughout the region.

Table 4-12 identifies the transportation-related data associated with the growth scenarios.

Table 4-12. Alternative Growth Scenarios

Data of Interest	Scenario A	Scenario B	Scenario C
Transit Boardings	758,000	+10%*	+20%*
Vehicle Miles Traveled	248M	-7%*	-7%*
Vehicle Hours Traveled	7M	-16%*	-15%*
NOx Emissions	46.58	46.43	43.74
VOC Emissions	50.72	48.65	47.65

Source: H-GAC 2009.
*Denotes change over Scenario A

These results reinforce the public's intuitive notions about coordinated transportation and land use planning. H-GAC has identified a three-pronged land use and transportation coordination strategy that calls for the creation of bicycle and pedestrian friendly Centers; establishment of better Connections between the centers, and designs based on the Context of the surrounding land uses. This "3C's" strategy, in addition to enhancing mobility choices, is expected to produce economic, environmental and "quality of place" benefits for the region.

In order to integrate the 3C's concepts into regional transportation planning, H-GAC has identified the following five strategies:

1. Coordinate transit and roadway planning to connect existing and planned centers with the region's multi-modal transportation network,

2. Promote roadway designs appropriate for the context of the surrounding community to ensure safe, convenient travel choices for all user modes,

3. Coordinate transportation improvements and private sector development efforts to promote projects that combine sustainable mobility and economic benefits,

4. Help fund local planning studies to assist in the development of centers, and

5. Provide funding support for infrastructure projects that enhance connections within and between centers.

In addition to expanding the regional transit system, transit ridership and efficiency can be improved by coordinating transit and land use. Development along transit lines that increases density and integrates transit with development can make transit more accessible and decrease the need for single-occupancy vehicle trips. Recommended strategies include:

- Promote community design that provides convenient access to transit systems.

- Promote transit-oriented development investments around regional transit facilities.

- Enhance access opportunities for the transportation disadvantaged.

These land use/transportation coordination tools are tools that can be used in the H-GAC region to reduce the need for additional infrastructure, including utilities, transportation, water, and tolled facilities for the region. Without sustainable land use, the additional cost of new infrastructure items will increase beyond the current estimated costs.

The proposed 2035 regional roadway network is in support of the predicted land use changes and growth in the region. To meet the demand of the expansive growth and changes in land use from development, the aim of the 2035 regional roadway network is to supply the transportation portion of infrastructure requirements for the expanding growth and development. Current and future predicted available funds from the federal government for transportation alone will not be able meet the demands for the transportation infrastructure needed to support the predicted changes. Tolled roads and managed lanes are methods that the RTP employs to ensure the transportation demands from future growth is met when considering the limited transportation funds available.

Land Use Findings

The proposed 2035 regional tolled roadway network may affect land use within the MPO boundaries by creating land development and/or redevelopment opportunities. However, the regional tolled roadway network is only one factor in creating favorable land development conditions; other prerequisites for growth in the region include demand for new development, favorable local and regional economic conditions, adequate utilities, and supportive local land development policies. The proposed 2035 regional tolled roadway network may influence and facilitate the additional planned regional land use conversion, redevelopment, and growth.

Cumulative Toll Impact Conclusion

The regional tolled roadway network would cause some impacts to natural and socio-economic resources. However, the regional tolled roadway network would have a beneficial impact on EJ populations and air quality in the Houston-Galveston area. Overall, with the 2035 build scenario, which includes the regional tolled roadway network in place, travel efficiencies in the region will benefit both EJ and non-EJ populations. The net benefit may be slightly greater for the non-EJ populations because the average trip length in these zones is greater than the average trip length from the EJ zones. The additional vehicle lane miles that the regional tolled roadway network provides enables traffic to flow more efficiently thereby reducing emissions associated with cars traveling at lower speeds or idling conditions.

In addition, regional mitigation for air quality and EJ populations are also addressed by the H-GAC as part of 2035 RTP. The transportation planning process at the MPO regional level is required to incorporate measures to minimize the potential to affect the environment and communities, including populations protected under Title VI of the Civil Rights Act of 1964 and Executive Order 12898 and air quality which is protected by the CAAA. Any transportation facility including the regional tolled roadway network would be required to meet these standards in order to be included in the TIP/STIP and RTP. Furthermore, all new projects to be added to the TIP/STIP and RTP must be in conformance with the SIP.

Although land use impacts cannot be mitigated at a regional level, they can at a municipal level because these entities have direct control over land use. However, the MPO can aid in land use impact avoidance at the regional level by only funding transportation projects consistent with the regional vision and by working with municipalities to address regional infrastructure changes in their

comprehensive plans. State and Federal regulatory agencies are required to institute policies and monitor project-level effects to the natural and cultural resources that are found in their jurisdictions. Avoidance, minimization and mitigation strategies are used to support those policies in order to reduce impacts to these resources.

Finally, as required by NEPA, appropriate mitigation for direct impacts would occur at the project level. Because of these mitigation measures, the regional proposed tolled roadway network is not anticipated to have a substantial cumulative impact on the resources considered in this section.

4.17 CONCLUSION

Since the time of the last environmental documentation for this project, there are several proposed design changes in the area of the project between SH 146 and FM 1405, and a proposed overpass at Fisher Road. The current proposed project is described in detail in *Section 1.2*. Tolling of SH 99 is proposed between SH 146 and Fisher Road, connecting to the existing SH 99 tollway. A public meeting was conducted on July 27, 2010 during preparation of this Re-evaluation. TxDOT finalized the public meeting summary, including responses to comments, in January 2011. The summary will be posted on TxDOT's website by summer of 2011.

There have been no changes in condition that have resulted in significant social, economic, indirect, or cumulative consequences not previously addressed. This Re-evaluation details that project modifications assessed in this re-evaluation would not result in impacts substantially different than those considered in the previously approved studies. Implementation of these changes would not appreciably increase the potential for impacts beyond those considered in previous assessments. No additional public involvement is required, and further environmental studies are not warranted.

5.0 AGENCY/PUBLIC COORDINATION

5.0 AGENCY/PUBLIC COORDINATION

5.1 AGENCY COORDINATION

The most recent project coordination with the Chambers County Historical Commission and the Harris County Historical Commission was conducted in 2009. Letters were sent to these agencies regarding their knowledge concerning the location of any historically or archeologically significant properties in the subject area that might be eligible for inclusion in, or under nomination to, the NRHP. Although no recorded historical or archeological sites were reported by these groups, the Chambers County Historical Commission representative reported that broken pottery has been found below the water surface along the banks of Cedar Bayou. No specific location or documentation of this was provided by the representatives (*Appendix D).*

Coordination with the NMFS was initiated in 2006 regarding the potential effects to EFH resulting from the proposed bridge construction over Cedar Bayou. Coordination with the NMFS was concluded on October 26, 2006. NMFS concurred with the conclusions in the EFH assessment provided by TxDOT that the proposed project would have minimal impact on EFH and no further consultation with NMFS is required for the proposed project at Cedar Bayou (*Appendix D*). Coordination with the NMFS regarding the proposed eastbound bridge replacement at Goose Lake was initiated in 2010, and is ongoing.

Coordination with the USACE and the USCG regarding permit authorization for bridge construction over a navigable waterway, Cedar Bayou, was initiated in 2006. TxDOT will continue to coordinate with both agencies to obtain permits for bridge construction at Goose Lake and Cedar Bayou.

Coordination would be initiated with the USACE for impacts to approximately 1.8 acres of waters of the United States, including wetlands. A Department of the Army Individual Permit (IP) Application would be prepared and submitted to the USACE. Compensatory mitigation for potential impacts to regulated waters of the U.S. would be coordinated with the USACE and performed in accordance with the terms of the approved permit(s). The IP would be obtained prior to construction letting.

5.2 PUBLIC COORDINATION

Public involvement for highway improvement projects that use federal aid highway funds will be consistent with applicable state and federal law and 43 Texas Administrative Code (TAC) §2.43 (b) (relating to Highway Construction Projects-State Funds). As stated in 43 TAC §2.43 (b), public involvement shall be encouraged as an important element of project planning and meetings shall be initiated by the pertinent district office and will depend on and be consistent with the type and complexity of each state project.

During the EIS planning process, seven public meetings and a public hearing were held, starting in March 1992 and ending at the public hearing in January 1995. Meetings were announced in local newspapers, and public meeting notices were mailed to elected officials. To comply with EO 13166, newspaper announcements provided opportunities for citizens to request language interpreters. Following completion of the EIS, and during preparation of the Re-evaluation that addressed proposed tolling of Segment I-2 from IH 10(E) to Fisher Road, a public meeting was held on October 20, 2005, in Mont Belvieu, Texas. To comply with EO 13166, newspaper announcements were published in a Spanish language newspaper, and Spanish-speaking individuals were available to

discuss the project during the public meeting. Due to proposed design changes and tolling of the roadway from SH 146 to Fisher Road, one public meeting was conducted on July 27, 2010 during preparation of this Re-evaluation. Approximately 118 individuals registered at the public meeting at the Baytown Community Center. The meeting was an open house format. Public notices were published in the *Houston Chronicle*, *Baytown Sun*, and *La Voz* (Spanish Newspaper). The following common comments or public concerns were documented:

- requests for roadway improvements and safety improvements
- concerns about speed limits, roadway access, tolling, and roadway flooding

TxDOT prepared a public meeting summary, including responses to comments, in January 2011. The summary will be posted on TxDOT's website in the summer of 2011.

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