U.S. DEPARTMENT OF TRANSPORTATION
Federal Highway Administration

RECORD OF DECISION

October 2010

Grand Parkway (State Highway 99) Segment G
From Interstate Highway 45 (IH 45)
To United States Highway 59 (US 59)
Harris and Montgomery Counties, Texas

FHWA-TX-EIS-03-03-F

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I. INTRODUCTION and SUMMARY

This document is the Federal Highway Administration's (FHWA) Record of Decision (ROD) regarding Segment G of the Grand Parkway State Highway 99 (SH 99) project. This ROD approves FHWA's selection of the Preferred Alternative Alignment as described in the Grand Parkway SH 99 Segment G Final Environmental Impact Statement (FEIS) dated January 15, 2009. The FEIS and the entire project record are available for review by written request to the Texas Division of the FHWA. This approval constitutes FHWA's acceptance of the Selected Alternative for the Grand Parkway Segment G and completes the environmental process for the 13.7-mile section of SH 99 from Interstate Highway 45 (IH 45) to United States Highway 59 (US 59). As set forth in this ROD, the Selected Alternative best serves the need for and purpose of this project.

The proposed Grand Parkway SH 99 is planned as an approximate 180+ mile circumferential new location transportation facility around the Houston metropolitan area. The proposed facility would traverse Harris, Montgomery, Liberty, Chambers, Galveston, Brazoria, and Fort Bend Counties, Texas and provide access to radial highways such as IH 10, IH 45, US 290, US 59, and SH 249.

For Segment G, the alternative alignments were developed within the project area (Corridor D) to fulfill the need for and purpose of the project, to minimize potential environmental impacts, and to respond to public/landowner and resource agency comments. A Recommended Alternative Alignment was identified in the Draft Environmental Impact Statement (DEIS, January 2007). This selection was based, in accordance with 23 CFR 771.105, on the best overall public interest with input from public and resource agencies and analysis and comparison of the potential effects on the physical, biological, and human environments of each alternative alignment.

After consideration of the agency and public comments received on the DEIS, as well as updated environmental data, a Preferred Alternative Alignment was selected in the FEIS. It incorporated a shift near a new subdivision named Creekside Village that had been planned for development at the end of Riley Fuzzel Road. The alignment was shifted slightly to the south to avoid residential impacts. A complete description of the Preferred Alternative Alignment, henceforth referred to as the Selected Alternative, is provided in detail in the FEIS Volume II, Section 2.3.3.6. As set forth in this ROD, the Selected Alternative best serves the need for and purpose of this project, avoids and minimizes impacts, and responds to public/agency comments.

This ROD is executed in conformance with the Council on Environmental Quality (CEQ) regulation implementing the National Environmental Policy Act of 1969 (NEPA) and documents

FHWA compliance with NEPA and all other applicable federal statutes, regulations, and requirements. The sections that follow provide information that has been essential in the decision-making process.

II. DECISION

The FHWA decision is to approve the Selected Alternative (see Exhibit 1 in this ROD), which is an approximately 13.7-mile long, four-lane controlled access toll road with intermittent frontage roads located within a 400-foot right-of-way (ROW) and will be built to accommodate a 70 mile-per-hour design speed. The Selected Alternative begins at IH 45 and ends at US 59. It is a combination of alternative alignments developed in the DEIS (Alternative Alignment D, which is a composite of Alternative Alignment A/C in Reach 8; Alternative Alignment D in Reach 9; Alternative Alignment A/B in Reach 10; Alternative Alignment A in Reach 11; and Alternative Alignment C in Reach 12; (see Exhibits 2a and 2b in this ROD or refer to Exhibit G–40 of the FEIS)), with the exception of one minor shift as described in the FEIS Volume II, Section 2.3.3.6. Identifying the Preferred Alternative Alignment as the Selected Alternative is based upon its ability to meet the need for and purpose of the project, public and agency input, and the minimization and avoidance of environmental resources and human environment, including indirect and cumulative impacts (FEIS Volume II, Section 5.0). Segment G is found to have independent utility and logical termini. Exhibit 1 presents the full length of the Selected Alternative, and Exhibits 2a and 2b present the land uses along the Selected Alternative.

The basis for this ROD is supported by the information presented in the FEIS (as summarized in Volume II, Section 2.3) and supporting technical documents; the associated project record; and input received from the public and interested local, state, and federal agencies. FHWA considered the potential impacts of the project and alternative courses of action under NEPA while balancing the need for safe and efficient transportation with national, state, and local environmental protection goals. In accordance with 23 U.S.C. 109(h), FHWA makes decisions based on the overall public interest taking into account the need for safe and efficient transportation and public services, while avoiding or minimizing adverse natural environmental and community effects.

With respect to the process of avoiding and minimizing natural environmental and community effects, the alternatives analysis process included efforts to balance impacts across different resources. In accordance with United States Code (USC) Title 23, Chapter 1, Section 109 (c)(2)(B), development of the Grand Parkway alignments included consideration for context sensitive solutions and guidance provided in the FHWA publication, “Flexibility in Highway Design” (published by FHWA in 1997). As stated in the FHWA guidance, “For each potential project, designers are faced with the task of balancing the need for the highway improvement

with the need to safely integrate the design into the surrounding natural and human environments" (FHWA, 1997, pp.xi-xii). Also, in applying context sensitive solution principles, the alternative development process engaged the public in balancing community, cultural, aesthetic, environmental, and transportation needs.

The FHWA decision provides the necessary environmental approval under NEPA for the construction of this new location highway facility within Harris and Montgomery Counties, Texas. Segment G of the Grand Parkway is needed because there are inefficient connections between suburban communities and major radial roadways, the current and future transportation demand exceeds capacity, many roadways within the study area of Segment G have a high accident rate, and there is an increasing strain on transportation infrastructure from population and economic growth. The purpose of the project is to efficiently link the suburban communities and major roadways, enhance mobility and safety, and respond to economic growth.

Additionally, the Grand Parkway would also provide an additional hurricane emergency evacuation route for the greater Houston area consistent with Minute Order No. 82325 signed October 25, 1984. The circumferential route connects to numerous radial facilities that are often congested during an evacuation. As an example, when as many as two million people fled the Houston metroplex before Hurricane Rita on September 22, 2005, evacuees followed roadways leading to Austin, San Antonio, and Dallas. Severe congestion ensued and contra-flow lanes were eventually opened. The Grand Parkway could alleviate a portion of the congestion during mass evacuations thus creating safer and more efficient evacuation conditions.

The ROW required for the Selected Alternative will encompass approximately 748 acres. The Selected Alternative will include fully elevated, directional interchanges between SH 99 and IH 45 and between SH 99 and US 59. In addition, there will be an interchange between SH 99 and the Hardy Toll Road. Exact location of interchanges will be determined during the final design phase of the project in coordination with local governments. Preliminary design of the Selected Alternative includes frontage roads in the following locations: 1) from 0.7 miles east of the Hardy Toll Road extending north-eastward along Riley Fuzzel Road for approximately 2.7 miles; and 2) from US 59 west to Valley Ranch Thoroughfare (new roadway under construction). Grade separated intersections with entrance and exit ramps may be built at junctions with the following roads: IH 45 frontage roads, Hardy Toll Road and Union Pacific Rairoad (UPRR), Riley Fuzzel Road near Spring Trails subdivision, Rayford Road, Birnham Woods Drive, Townsen Road (future), unnamed subdivision street in Riverwalk Subdivision (future), Farm-to-Market Road (FM) 1314, Valley Ranch Thoroughfare (future), and US 59 frontage roads. Preliminary design, with locations of frontage roads and ramps, is shown in Exhibit G–55 of the FEIS. Additional grade separations without entrance and exit ramps, such as at Northgate Crossing Boulevard, will be incorporated during final design to allow for movement of traffic across the project area.

Estimated total project cost for the Segment G Selected Alternative is $476.7 million. This total includes 2008 estimates for engineering, ROW acquisition, utility relocation, and construction, and does not include operations or maintenance costs after highway construction is complete. The total cost estimate also includes construction of half the interchanges at the project termini; the estimates do not include the half of the interchange that is approved within the Grand Parkway Segment F-2 at IH 45 (under a separate document) or the half of the interchange that is proposed (in a separate document) within the Grand Parkway Segment H at US 59.

Environmental issues and proposed mitigation related to the construction of the Selected Alternative are detailed in the following sections.

III. ALTERNATIVES CONSIDERED

Throughout the transportation planning and project development process, a wide range of alternatives were considered using appropriate levels of environmental and engineering analysis. The alternatives were analyzed and advanced for a more detailed study based on their ability to meet the identified project needs; their impact on the environment; and input received from the public, elected officials, and environmental resource agencies. A detailed discussion of the alternative development process is included in the FEIS Volume II, Section 2 and its supporting documentation.

The alternatives developed for this project included both a No-Build Alternative and Build Alternatives:

A. No-Build Alternative

Under the No-Build Alternative, Segment G of the Grand Parkway would not be constructed. This alternative consists of a continuation of the existing transportation facilities and incorporates the execution of planned and/or committed roadway improvements; Transportation System Management (TSM); Travel Demand Management (TDM); modal transportation improvements such as bus transit, high-occupancy vehicle (HOV) lanes, rail transit, and new planned roadway construction in the study area; and short-term, minor restoration activities, such as resurfacing, bridge repairs, and minor road widening. Committed improvements are those projects included in the 2025 Regional Transportation Plan (RTP) excluding new construction of the Grand Parkway.

The Segment G study area is developing and will continue to experience growth. The No-Build Alternative will result in high traffic volumes being confined to the existing roadway network leading to increased congestion. The No-Build Alternative is expected to result in higher maintenance costs to existing roadways within the Segment G study area due to increased traffic volumes on those facilities.

The lack of adequate improvements to system linkage and roadway capacity would result in the No-Build Alternative failing to satisfy the need for and purpose of the project. Although the No-Build Alternative does not satisfy the need for and purpose of the project, it was retained as a basis for comparison with the alternatives carried forward for detailed study.

B. Build Alternative

1. Corridor Study

The Build Alternative (Grand Parkway Segment G) is considered a new location transportation facility. The location of the Build Alternative was initially established through the development and evaluation of a Corridor Analysis. Four corridors (Corridors A–D) were developed and evaluated by using a multistep process to identify corridor locations within the study area (FEIS Volume I and II, Section 2.1).

The Preferred Alternative Corridor was identified based on its ability to best fulfill the need for and purpose of the project while avoiding and minimizing the potential for environmental impacts. The resource inventory analysis and public and agency coordination led to the selection of Corridor D as the Preferred Alternative Corridor. Corridor D was carried forward for alternative alignment development and evaluation (FEIS Volume II, Section 2.1.6.2 and Section 2.1.7).

2. Alignment Study

Within the Preferred Alternative Corridor (Corridor D), referred to as the “project area,” four alternative alignments were developed: Alternative Alignments A through D (Exhibits 2a and 2b in this ROD or FEIS Volume III, Exhibit G–40). These alignments were developed to avoid and minimize sensitive resources, including existing and planned residential developments, bottomland hardwood forest and other forested vegetation, schools, cemeteries, floodplains, and wetlands, among other considerations (FEIS Volume II, Table 2-7).

These four alternative alignments are detailed in the FEIS (Volume II, Section 2.3.1 and Volume III, Exhibit G–40) and generally take the following course from IH 45 before terminating at US 59: beginning at IH 45 approximately 2.9 miles north of FM 2920, Alternative Alignments A, C, and D travel east, crossing the Hardy Toll Road and Spring Creek before heading in a more northeastern direction, approximately 2.5 miles from IH 45. Alternative Alignment B begins approximately 0.2 miles south of the IH 45 and Hardy Toll Road interchange, then heads southeast along the Hardy Toll Road for approximately 1.2 miles before shifting to the east for its crossing of Spring Creek, where it then curves to the northeast and meets the other alternative alignments along Riley Fuzzel Road. All alternative alignments parallel Riley Fuzzel Road until after the crossing of Woodsons Gully. South of the Creekside Village subdivision, Alternative Alignment A turns to the southeast, while Alternative Alignment C heads in a more easterly direction, and Alternative Alignments B and D head in a more northeastern direction.

Alternative Alignment A takes a sinuous path to its crossing of the West Fork San Jacinto River and traverses two large wetland complexes along this path; Alternative Alignment C takes a direct route to the West Fork San Jacinto River and crosses one large wetland complex along this path; from Woodsons Gully, Alternative Alignments B and D continue to follow the same path for approximately 3,000 feet, at which point Alternative Alignment B turns to the east for its crossing of the West Fork San Jacinto River as opposed to the more northeastern route taken by Alternative Alignment D (see Exhibits 2a and 2b to view the changing land cover along the different ROWs). All Alternative Alignments head in a generally eastern direction from their crossing of the West Fork San Jacinto River, with Alternative Alignment A curving to rejoin other alternative alignments to the north, and Alternative Alignment D curving to rejoin other alternative alignments to the south. Alternative Alignments A, B, and D all cross FM 1314 at the same location, just southwest of the Winchester Place subdivision, at which point Alternative Alignment B turns sharply to the south/southeast before curving to the east again. Alternative Alignment C crosses FM 1314 approximately one-quarter mile south of the other alternative alignments before continuing to the northeast and joining Alternative Alignments A and D for traversing the Timberland Estates subdivision. Before crossing White Oak Creek, Alternative Alignments C and D turn to the southeast toward the Valley Ranch subdivision and a more perpendicular crossing of White Oak Creek closer to the eastern end of the project area. Alternative Alignment A stays to the north, crossing White Oak Creek, a tributary to White Oak Creek, and the Valley Ranch and Silver Trails subdivisions. To the south of all the other alternative alignments, Alternative Alignment B crosses the Timberland Estates subdivision and stays heading easterly, joining Alternative Alignments C and D for crossing White Oak Creek and the Valley Ranch subdivision. All alternative alignments terminate at the same location along US 59, at Community Drive between White Oak Middle School to the southwest and New Caney High School to the northeast.

These alternative alignments considered for Segment G vary in length from 13.63 to 13.74 miles and vary in ROW from 713 to 748 acres. All alternative alignments would be a four-lane controlled access toll road with intermittent frontage roads within a 400-foot ROW.

In order to more clearly present and evaluate the impacts of the alternative alignments, the project area was divided into sections called reaches (see divisions between Reaches 8, 9, 10, 11, and 12 in the FEIS Volume III, Exhibit G–40). The reaches run between points where two or more of the alternative alignments overlap because of the density of environmental constraints. The alignment reaches were used as a tool for examining “hybrid” combinations of the alternative alignments. Although the four alternative alignments can stand alone, different combinations of alternative alignments within each of the five reaches were also analyzed for their potential independent and aggregate effects in order to select an alternative alignment. The environmental effects, including natural, cultural, and socioeconomic resources were evaluated for each of the alternative alignments reaches. In addition, the public comments were

analyzed to provide input to the identification of the Preferred Alternative Alignment, described in the FEIS Volume II, Section 2.3.3.6 and Section 4.25. A summary of these impacts is included in the FEIS Volume II, Tables 2-7 and 4-38.

3. Identification of the Preferred Alternative Alignment

The analyses of four factors were used as vital criteria for screening alternative alignments in order to arrive at the Preferred Alternative Alignment: relocations, floodplains/floodways, wetlands, and public comment. The two natural resources were identified as critical resources to avoid or minimize impacts because of their importance to the local area. In the case of Grand Parkway Segment G, and because Houston has a history of flooding, natural resources that affect floodwater control and retention were avoided to the extent feasible and practicable when considering engineering and other constraints in the development and evaluation of the alternative alignments. Public outreach and the number of relocations were also key factors in the identification of the Preferred Alternative Alignment for Segment G. The identification of the Preferred Alternative Alignment was a process that continually sought to avoid and minimize environmental impacts while at the same time serving to fulfill the need for and purpose of the proposed project.

As seen in Table 1 and in the FEIS Volume II, Section 2.3.3.5, Table 2-10 (Summary of Alternative Alignment Screening Results), a tabular summary of these criteria results did not present a clear decision for the selection process. However, upon closer examination of each option within each reach of the project area, a Recommended Alternative Alignment was selected for presentation in the DEIS (January 2007), and after further analysis, a Preferred Alternative Alignment was selected for presentation in the FEIS based on the following:

- In Reach 8, the screening results most strongly supported the selection of the more southern route (Overlapping Alternative Alignment A, C, or D as identified on FEIS Exhibit G–40). Public response and analysis of relocations favored this route. Additionally, with the more northern route (Alternative Alignment B), the merging of IH 45 and Hardy Toll Road traffic along the Grand Parkway posed engineering challenges that would have necessitated an increase in ROW width and increased relocation impacts (see FEIS Exhibit G–40).

- In Reach 9, the screening supported the selection of either Alternative Alignment A or D. While any alternative alignment was equally preferable with respect to pubic response and relocations, Alternative Alignments A and D were each preferable with respect to one other screening criterion (floodplain and wetland impacts, respectively). However, Alternative Alignment D was designed in Reach 9 in close coordination with resource agencies in order to best avoid impacts to natural resources. Therefore, Alternative Alignment D would be the best overall choice in Reach 9.

- In Reach 10, no alternative alignment stood out as the best choice from the screening criteria. Therefore, the more northern alignment (Alternative Alignment A, B, or D) was selected since Alternative Alignment C would not be possible with the selection of Alternative Alignment D in Reach 9. Additionally, the more northern route would have one less stream crossing and less farmland acreage impacted than the more southern alignment.

- In Reach 11, the screening supported the selection of Alternative Alignment B. However, Alternative Alignment A was selected in part for engineering considerations since it would provide for a more perpendicular crossing of FM 1314. Additionally, even though Alternative Alignment B had fewer relocations, the noise impacts were much greater in Alternative Alignment B than Alternative Alignment A (67 vs. 4, respectively). Also, public support was strongly in favor of Alternative Alignment A (FEIS Volume II, Table 2-8), and with the selection of Alternative Alignment C in Reach 12 (see next bulleted item), Alternative Alignment B would not be an option in Reach 11 (see FEIS Exhibit G–40). Detailed comparisons of alternative alignments are presented in Table 1.

- In Reach 12, the screening supported the selection of either Alternative Alignment A or Alternative Alignment B. The Study Team had strongly considered and selected Alternative Alignment C because of less potential visual and noise impacts to the established residences in the Silver Trails subdivision as compared to Alternative Alignment A. One of the reasons for lack of support for Alternative Alignment C in the screeing process during the 2000 workshops was that it passed through the Valley Ranch development. However, since 2000, coordination with developers of this growing community has allowed for reduced impacts to these new residences and increased public support for Alternative Alignment C.

While the impacts to these criteria were not the only considerations in selecting an alternative, their impact evaluation played a particularly important role in the decision process. After consideration of the analysis above, Alternative Alignment D (which is a composite of Alternative Alignment A/C in Reach 8, the added Alternative Alignment D in Reach 9, Alternative Alignment A/B in Reach 10, Alternative Alignment A in Reach 11, and Alternative Alignment C in Reach 12) was selected for presentation in the DEIS as the Recommended Alternative Alignment.

Between the release of the DEIS (January 2007) and the FEIS (January 2009), comments received on the DEIS, updated analyses, and coordination led to the slight shifting of the Recommended Alternative Alignment in one area near a new subdivision named Creekside Village that was planned for development at the end of Riley Fuzzel Road (at the junction of Reach 8 and Reach 9; see the FEIS Exhibit G–46). The Grand Parkway alignment was shifted slightly to the south to avoid residential impacts in this subdivision. Other than the slight shift at

Creekside Village, the Preferred Alternative Alignment as presented in the FEIS was equivalent to the Recommended Alternative Alignment as presented in the DEIS. A summary of the potential impacts for the four alternative alignments and the Preferred Alternative Alignment is provided in the FEIS Volume II, Table 2-7 or Table 4-38. This ROD approves the selection of the Preferred Alternative Alignment, as presented in the FEIS Volume II, Section 2.3.3.6, as the Selected Alternative. The Selected Alternative best serves the need for and purpose of this project.

4. Conclusion

As seen in Table 1, each alternative alignment had similar overall environmental impacts and the summary of these criteria results did not present a clear decision for the selection process to identify the environmentally preferred alignment. However, upon closer examination of each option within each reach of the project area, the Selected Alternative is the Environmentally Preferred Alternative based on analysis and comparison of the potential effects on the physical, biological, and human environments of each alternative alignment and public and agency input from the public involvement process as summarized in the following paragraph. In accordance with USC Title 23 Chapter 1 Section 109 (c)(2)(B), development of the Grand Parkway alignments included consideration for context sensitive solutions and guidance provided in the FHWA publication “Flexibility in Highway Design” (published by FHWA in 1997). As stated in FHWA guidance, “For each potential project, designers are faced with the task of balancing the need for the highway improvement with the need to safely integrate the design into the surrounding natural and human environments” (FHWA, 1997, pp.xi-xii).

The Selected Alternative would have nearly the fewest number of relocations (110); Alternative Alignments A and B would have only one and four fewer relocations (109 and 105, respectively). In Reach 9, the Selected Alternative will cross the West Fork San Jacinto River in a location preferred by natural resource agencies. Floodplain and floodway impacts are between those predicted for other alternative alignments; however, much of the acreage crossed by the Selected Alternative will be bridged near the West Fork San Jacinto River. The Selected Alternative compares favorably (has the same or less impact) against most other alternatives with respect to riparian and bottomland hardwood forest, number of stream crossings, impact to school property, and public/private water well impacts. Impacts to wetlands are higher when compared to most other alternatives; however, many of the wetlands crossed by the Selected Alternative will be bridged near the West Fork San Jacinto River. Based on preliminary noise analysis, the Selected Alternative will have a higher number of noise impacts than other alternative alignments presented in the FEIS for consideration; however, it should be noted that a detailed noise analysis was only performed on the Selected Alternative. Public feedback and preference was taken into consideration throughout the alternatives analysis

evaluation as presented in the FEIS Volume II, Section 2.3.3.1. Public involvement included opportunities to comment at workshops in 2000, provide comments at any time to the Grand Parkway Association (GPA) or Texas Department of Transportation (TxDOT), and provide comment on the DEIS and FEIS. These comments were taken into careful consideration and are located in the project's Administrative Record. This feedback, as well as continuous updates to land use data and public and agency coordination since the publication of the DEIS in January 2007 and publication of the FEIS in January 2009 resulted in a Selected Alternative based on public preference, environmental constraints, and engineering constraints.

In determining the Environmentally Preferred Alternative, FHWA and TxDOT balanced the impacts and factors of each alternative. Further avoidance and minimization of impacts will continue throughout the final design of the Selected Alternative and mitigation measures will be enacted for unavoidable impacts. **Table 1** provides a summary of impacts of the Selected Alternative as compared to the other alignment alternatives as they were presented in the FEIS (January 2009).

Table 1: Summary of Impacts by Alternative Alignment and Reach for Segment G

Alternative Alignment	Reach	Length (miles)	Land Use		Changes in Community Cohesion	Environmental Justice (EJ) Issues	Air Quality Impacts	Traffic Noise Impacts[1]	Residence Displacements	Commercial Displacements	School Properties [2]	Churches	Cemeteries	Parks	Natural Resources														Cultural Resources				Oil and Gas Wells	Potential Hazardous Material Sites	Water Wells	
															Special Resource Areas					Aquatic Resources				Flood Zones												
			Visual and Potential Access Impacts	Separation of Farmland from Homestead											Threatened & Endangered Species	Species of Concern	Remnant Prairie Topography (acres)	Bottomland Hardwoods (acres) [3]	Riparian Forest (acres)[3]	Adjacent Wetlands (acres)[4]	Isolated Wetlands (acres)[4]	Total Wetlands (acres)[4]	Stream Crossings [5]	100-Year Floodplain (acres)	Floodway (acres)[5]	Prime Farmlands (acres)	Statewide Important Farmland Soils	Recorded Archeology Sites	Historic Properties	Century Farm Sites	High Probability Area (acres) [6]			Public[7]	Private
A	8	4.92	Yes	No	Yes	No	No	137	18	-	-	-	-	-	-	-	-	23.9	-	13.9	2.3	16.2	5	31.8	35.2	59.9	22.0	-	-	-	211	1	1	10	1
	9	4.43	No	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	53.2	-	19.4	20.8	40.2	4	35.5	20.4	-	192.2	-	-	-	179	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	1.94	Yes	No	Yes	No	No	4	69	-	-	-	-	-	-	-	-	-	-	-	22.7	22.7	1	-	-	2.9	73.8	-	-	-	51	-	-	3	-
	12	2.02	Yes	No	Yes	No	No	-	22	-	-	-	-	-	-	-	-	32.3	-	2.7	2.2	4.9	4	27.8	8.8	1.3	16.3	-	-	-	94	-	-	-	-
Total		13.70	-	-	-	-	-	141	109	0	0	0	0	0	0	0	0	109.4	0	36.0	48.0	84.0	14	95.1	64.4	64.1	315.6	0	0	0	538	1	1	16	1
B	8	4.96	Yes	No	Yes	No	No	134	38	1	1	-	-	-	-	-	-	19.2	-	4.3	2.1	6.4	5	32.2	33.5	18.1	32.1	-	-	-	231	-	1	9	-
	9	4.27	No	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	43.6	-	23.2	7.2	30.4	3	13.7	49.4	4.6	139.4	-	-	-	170	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	2.09	Yes	No	Yes	No	No	67	64	-	-	-	-	-	-	-	-	-	-	-	5.0	5.0	-	-	-	-	11.1	-	-	-	45	-	-	-	-
	12	1.92	Yes	No	Yes	No	No	14	3	-	-	-	-	-	-	-	-	20.8	-	3.1	3.3	6.4	3	15.6	5.9	1.3	14.5	-	-	-	100	-	-	-	-
Total		13.63	-	-	-	-	-	215	105	1	1	0	0	0	0	0	0	83.6	0	30.6	17.6	48.2	11	61.5	88.8	24.0	208.4	0	0	0	549	0	1	12	0
C	8	4.92	Yes	No	Yes	No	No	137	18	-	-	-	-	-	-	-	-	23.9	-	13.9	2.3	16.2	5	31.8	35.2	59.9	22.0	-	-	-	211	1	1	10	1
	9	4.10	No	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	58.0	-	26.9	4.5	31.4	5	52.5	24.5	-	168.4	-	-	-	171	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1.5	17.7	-	-	-	19	-	-	1	-
	11	2.19	Yes	No	Yes	No	No	-	169	-	-	-	-	-	-	-	-	-	-	-	10.3	10.3	1	-	-	16.2	46.4	-	-	-	56	-	-	3	-
	12	2.05	Yes	No	Yes	No	No	-	22	-	-	-	-	-	-	-	-	62.4	-	4.0	1.9	5.9	4	60.5	7.5	1.3	20.8	-	-	-	107	-	-	-	-
Total		13.65	-	-	-	-	-	156	209	0	0	0	0	0	0	0	0	144.3	0	44.8	19.0	63.8	16	144.8	67.2	78.9	275.3	0	0	0	564	1	1	15	1
D	8	4.92	Yes	No	Yes	No	No	137	18	-	-	-	-	-	-	-	-	23.9	-	13.9	2.3	16.2	5	31.8	35.2	59.9	22.0	-	-	-	211	1	1	10	1
	9	4.42	No	No	Yes	No	No	-	1	-	-	-	-	-	-	-	-	46.4	-	14.6	0.4	15.0	4	11.3	52.9	0.1	159.7	-	-	-	177	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	1.94	Yes	No	Yes	No	No	4	69	-	-	-	-	-	-	-	-	-	-	-	22.7	22.7	1	-	-	2.9	73.8	-	-	-	51	-	-	3	-
	12	2.05	Yes	No	Yes	No	No	-	22	-	-	-	-	-	-	-	-	62.4	-	4.0	1.9	5.9	4	60.5	7.5	1.3	20.8	-	-	-	107	-	-	-	-
Total		13.72	-	-	-	-	-	141	110	0	0	0	0	0	0	0	0	132.7	0	32.5	27.3	59.8	14	103.6	95.6	64.2	287.6	0	0	0	549	1	1	16	1
Recommended[8]	8	4.92	Yes	No	Yes	No	No	137	18	-	-	-	-	-	-	-	-	23.9	-	13.9	2.3	16.2	5	31.8	35.2	59.9	22.0	-	-	-	211	1	1	10	1
	9	4.42	No	No	Yes	No	No	-	1	-	-	-	-	-	-	-	-	46.4	-	14.6	0.4	15.0	4	11.3	52.9	0.1	159.7	-	-	-	177	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	1.94	Yes	No	Yes	No	No	4	69	-	-	-	-	-	-	-	-	-	-	-	22.7	22.7	1	-	-	2.9	73.8	-	-	-	51	-	-	3	-
	12	2.05	Yes	No	Yes	No	No	-	22	-	-	-	-	-	-	-	-	62.4	-	4.0	1.9	5.9	4	60.5	7.5	1.3	20.8	-	-	-	107	-	-	-	-
Total		13.72	-	-	-	-	-	141	110	0	0	0	0	0	0	0	0	132.7	0	32.5	27.3	59.8	14	103.6	95.6	64.2	287.6	0	0	0	549	1	1	16	1

Table 1 (Cont.): Summary of Impacts by Alternative Alignment and Reach for Segment G

Alternative Alignment	Reach	Length (miles)	Land Use		Changes in Community Cohesion	Environmental Justice (EJ) Issues	Air Quality Impacts	Traffic Noise Impacts[1]	Residence Displacements	Commercial Displacements	School Properties [2]	Churches	Cemeteries	Parks	Natural Resources														Cultural Resources				Oil and Gas Wells	Potential Hazardous Material Sites	Water Wells	
															Special Resource Areas					Aquatic Resources				Flood Zones												
			Visual and Potential Access Impacts	Separation of Farmland from Homestead											Threatened & Endangered Species	Species of Concern	Remnant Prairie Topography (acres)	Bottomland Hardwoods (acres) [3]	Riparian Forest (acres)[3]	Adjacent Wetlands (acres)[4]	Isolated Wetlands (acres)[4]	Total Wetlands (acres)[4]	Stream Crossings [5]	100-Year Floodplain (acres)	Floodway (acres)[5]	Prime Farmlands (acres)	Statewide Important Farmland Soils	Recorded Archeology Sites	Historic Properties	Century Farm Sites	High Probability Area (acres) [6]			Public[7]	Private
Preferred – FEIS, January 2009	8	4.93	Yes	No	Yes	No	No	195	18	-	-	-	-	-	-	-	-	23.4	-	13.7	2.3	16.0	5	31.7	35.7	59.9	26.2	-	-	-	212	1	1	10	1
	9	4.43	No	No	Yes	No	No	26	1	-	-	-	-	-	-	-	-	44.0	-	19.4	0.5	19.9	4	10.7	52.2	0.1	158.6	-	-	-	177	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	1.94	Yes	No	Yes	No	No	43	69	-	-	-	-	-	-	-	-	-	-	-	22.7	22.7	1	-	-	2.9	73.8	-	-	-	51	-	-	3	-
	12	2.05	Yes	No	Yes	No	No	16	22	-	-	-	-	-	-	-	-	62.4	-	4.0	1.9	5.9	4	60.5	7.5	1.3	20.8	-	-	-	107	-	-	-	-
Total		13.74	-	-	-	-	-	280	110	0	0	0	0	0	0	0	0	129.8	0	37.1	27.4	64.5	14	102.9	95.4	64.2	290.7	0	0	0	550	1	1	16	1
Selected – ROD	8	4.93	Yes	No	Yes	No	No	195	18	-	-	-	-	-	-	-	-	23.4	-	13.7	2.3	16.0	5	31.7	35.7	59.9	26.2	-	-	-	212	1	1	10	1
	9	4.43	No	No	Yes	No	No	26	1	-	-	-	-	-	-	-	-	44.0	-	19.4	0.5	19.9	4	10.7	52.2	0.1	158.6	-	-	-	177	-	-	1	-
	10	0.39	Yes	No	Yes	No	No	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.3	-	-	-	3	-	-	2	-
	11	1.94	Yes	No	Yes	No	No	43	69	-	-	-	-	-	-	-	-	-	-	-	22.7	22.7	1	-	-	2.9	73.8	-	-	-	51	-	-	3	-
	12	2.05	Yes	No	Yes	No	No	16	22	-	-	-	-	-	-	-	-	62.4	-	4.0	1.9	5.9	4	60.5	7.5	1.3	20.8	-	-	-	107	-	-	-	-
Total		13.74	-	-	-	-	-	280	110	0	0	0	0	0	0	0	0	129.8	0	37.1	27.4	64.5	14	102.9	95.4	64.2	290.7	0	0	0	550	1	1	16	1

Notes: Totals may not appear to equal sum of reaches because of rounding.
[1] = Impacts account for traffic assuming construction of all four segments (E, F-1, F-2, and G) of the Grand Parkway (i.e., worst-case scenario with respect to noise impact). Preferred Alternative Alignment noise impacts are based on a revised analysis conducted for the FEIS;
[2] = Impact in Alternative Alignment B is to undeveloped Spring ISD property;
[3] = See definition of Bottomland Hardwoods and Riparian Forest in the Glossary;
[4] = As with all land cover data, numbers for original alternative alignments reflect new land use calculations. Additionally, for the FEIS, a more detailed analysis of wetlands was conducted in the Preferred Alternative Alignment. See Section 4.10 for further explanation;
[5] = Includes stream crossings, lakes, and ponds;
[6] = Total of Map Units 1, 2, 2a, 3, and 3a;
[7] = Wellhead Capture Zones;
[8] = Recommended Alternative Alignment is the same as that presented in the DEIS, however, impact calculations account for updated land use;
"-" = No resource located within reach

Source: Study Team, 2007

IV. SECTION 4(f) and SECTION 6(f)

The Department of Transportation Act of 1966 (as amended and codified in 49 USC §303) prohibits the Secretary of Transportation from approving any program or project that "…requires the use of publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state or local significance…or any land from an historic site of national, state or local significance…unless there is no feasible or prudent alternative to the use of such land, and such program includes all possible planning to minimize harm to such [land]…from such use" (Department of Transportation Act of 1983, 49 USC §303). Section 6(f) of the Land and Water Conservation Fund Act prohibits the conversion of property acquired or developed with a grant under the Land and Water Conservation Fund (LWCF) Act to a non-recreational site without the approval of the U.S. Department of Interior's (DOI) National Park Service. Section 6(f) directs DOI to ensure that replacement lands of equal value, location, and usefulness are provided as conditions to such conversions.

As part of the NEPA process, FHWA has evaluated the Grand Parkway project for Section 4(f) and Section 6(f) impacts pursuant to 49 USC §303(c) and 23 CFR §774. No publicly owned parklands, recreation areas, or wildlife and waterfowl refuge of national, state, or local significance, are located within the ROW.

A Section 106 review and consultation proceeded in accordance with the *First Amended Programmatic Agreement among the FHWA, the TxDOT, the Texas State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings* (PA-TU), as well as the Memorandum of Understanding (MOU) between the Texas Historical Commission (THC) and TxDOT. FHWA determined that the Selected Alternative will not impact any previously recorded National Register of Historic Places (NRHP)-listed or eligible historic properties. Furthermore, the Selected Alternative will not impact any Recorded Texas Historic Landmarks, State Archeological Landmarks (SALs) (nonarcheological), or Official State Historical Markers. There are no impacts to any Section 6(f) public lands, and there is no constructive use of or impact to any known Section 4(f) property by the Selected Alternative.

One archeological historic property (36 CFR 800.16(l)) was identified within the surveyed portions of the area of potential effects (APE). Site 41MQ197 appears to contain buried, intact archeological deposits and has the potential for listing on the NRHP. Based on the 2009 surveys discussed in Section V.N, it is recommended that impacts to the site be avoided. If the site, based on final design, cannot be avoided then Site 41MQ197 will require additional investigations to determine if it is eligible for nomination to the NRHP. No other archeological sites were identified within the surveyed portions of the Selected Alternative ROW. The total number of archeological sites within the Selected Alternative will not be known until the

completion of an archeological field survey. For more detail on the cultural resource surveys of the Selected Alternative, refer to Section V.N ("Cultural Resources"). The unsurveyed portions of the Selected Alternative will be surveyed once access is obtained. As of June 2010, approximately 40 percent of the entire proposed ROW (approximately 200 acres) has been surveyed. Approximately 60 percent of the project will need to be surveyed once access is obtained. If archeological sites are identified within the Selected Alternative, additional investigations may be necessary to determine if they are eligible for nomination to the NRHP. If unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA-TU and MOU.

If any site identified by archeological field survey within the Selected Alternative, including Site 41MQ197, is found to be eligible for the NRHP, actions and consultation will be initiated to avoid, minimize, or mitigate adverse effects to that site. If an NRHP-eligible site cannot be avoided in the final design process, consultation will include development of a mitigation plan. This mitigation plan will be developed and reviewed by TxDOT in consultation with the THC and FHWA. Design modifications may be sufficient to reduce the severity of the effect to a non-adverse level. Mitigation of unavoidable adverse effects typically includes archeological data recovery and full archival documentation. Section 4(f) coordination will only be performed for archeological sites warranting preservation in place.

V. MEASURES TO MINIMIZE HARM

During the project development process, refinements were made to the various alternatives to avoid or minimize impacts to sensitive environmental resources, where possible. Design and construction of Grand Parkway Segment G will include all practicable measures to avoid potential environmental impacts by the Selected Alternative (FEIS Volume II, Sections 4.1 through 4.26). For the resources/issues that will be impacted by the Selected Alternative, the following sections provide a summary of the impacts, the measures taken to minimize harm, and the commitments to continue to minimize potential harm. TxDOT and FHWA will require, and ensure, that all agencies/entities involved with the development of Segment G follow all commitments of this ROD, mitigation regulations, and specific mitigation measures developed for this project and approved by TxDOT and FHWA. Opportunities to reduce the width of the ROW will be evaluated during final design, which will have the potential of reducing the amount impact to each of the resources discussed in the following sections. Appendix A lists the mitigation measures and commitments for the project.

A. Land Use

The Selected Alternative, in accordance with 23 USC 109 (c)(2)(B), is consistent with state and local government plans and policies on land use and growth. The majority of the ROW consists

of non-urban land uses. The Selected Alternative will convert forestland and other undeveloped land to transportation use and will cause a reduction in land available for development or green space. The Selected Alternative will require relocations of homes. Additionally, the Selected Alternative would intersect arterial roadways (within specific reaches). However, all major roadways would be accommodated through grade separations, allowing for free flow of traffic across the corridor. Because of the nature of the current land use in the area, forestland and other undeveloped land would be disrupted to a greater degree than neighborhoods. Techniques for avoidance and minimization of impacts to land use were used in the selection of the Selected Alternative. These techniques included grade separations provided for all major arterial roadways that cross the Selected Alternative to avoid termination of through-travel, and intermittent frontage roads have been provided when required to provide adjacent property access and connectivity to major highways (IH 45 and US 59). Additionally, opportunities to reduce the amount of ROW will be identified during the final design stage.

B. Geology, Soils, and Farmland

The Selected Alternative will impact approximately 64.2 acres of Prime Farmland Soils and 290.7 acres of Statewide and Local Important Farmland Soils. Actual impacts will be less, as vegetation within the ROW will remain in place to the extent feasible and practicable in order to minimize impacts to soils and reduce erosion. The use of silt fences and other erosion control measures during construction will prevent erosion of native soils and reduce the runoff of soil particles into area streams. Furthermore, implementing re-vegetation of native species along constructed corridors will prevent future erosion after construction and thereby increase the success rate of re-vegetation efforts. The need for mitigation of geologic resources is not anticipated. Mitigation for prime farmland is not required, as per Natural Resources Conservation Service (NRCS) ranking (FEIS Volume III, Appendix J).

C. Social

Community impacts expected as a result of the Selected Alternative include potential increase in property values adjacent to the project, particularly at nodes of access to the facility; potential degradation of aesthetics and community character for individual single-family homes and the residential developments adjacent to the facility; and temporary construction impacts. Additionally, the Selected Alternative will affect approximately 7.5 acres of property owned by Harris County, previously owned by the YMCA Camp Pine Tree (a private recreation area) within Reach 8 and access to the True-Holiness Church of God in Christ. The Harris County property, previously known as the YMCA Camp Pine Tree will be a facilities park utilized by Harris County work crews and Harris County Constable's office. Additional plans for the Harris County facility include corporate picnics and day retreats. Harris County is aware of the proposed Selected Alternative and is including this alternative in any plans for the property.

The Selected Alternative will be adjacent to the following subdivisions: Northgate Crossing, Spring Trails, Fox Run, Spring Bridge Ranch, Benders Landing, Legends Ranch, Lockeridge Farms, Creekside Village, the Cumberland Communities, Winchester Place, Timberland Estates, and Valley Ranch. Generally, the Selected Alternative follows property lines as a means of reducing community cohesion impacts and will cause the displacement of 110 residences. The Recommended Alternative Alignment as presented in the DEIS (January 2007) was shifted for presentation in the FEIS (January 2009) as a means of reducing impact to the Creekside Village subdivision. Although, the Selected Alternative will pass through the middle of the Northgate Crossing, Timberland Estates, and Valley Ranch subdivisions (see Exhibits 2a and 2b). To reduce impacts, coordination took place with the Timberland Estates, Northgate Crossing, Benders Landing, Spring Trails, and Valley Ranch developers since initial development of the alignments in 2000, and a grade separation is planned for incorporation to the Selected Alternative in Northgate Crossing. Additionally, based on early coordination with Northgate Crossing and Spring Trails, the subdivisions set aside an undeveloped strip of land in an appropriate location for the Selected Alternative. The Valley Ranch and Spring Trails subdivisions were platted to accommodate the Selected Alternative in such a way that no residential structures would be displaced. Portions of Timberland Estates subdivision located east of FM 1314, and mostly within Reach 11, are currently under construction with approximately 50 percent built-out as of the date of this report. This subdivision, which consists mostly of manufactured homes and some (permanent) single-family homes, was platted before alternative alignments were developed, so all alternative alignments and the Selected Alternative would directly impact this subdivision. The Selected Alternative passes in the northern portion of this subdivision and would result in the displacement of several existing and platted homes.

No disproportionately high or adverse impacts to minorities or low-income populations will occur as a result of the Selected Alternative, which is in compliance with Executive Order 12898 on Environmental Justice (EJ) and Title VI of the Civil Rights Act of 1964 (42 USC § 2000d et seq). Analysis indicated that the percentage of minority and/or low-income populations within the project area is low. The residents in these communities also appear to maintain similar incomes with their immediate neighbors. Additionally, No schools, churches, cemeteries, or memorial parks are located within the Selected Alternative ROW. Consideration was also given to the fact that this project will be part of a regional tolled roadway network. The results of the analysis are presented in Section V.U (Regional Cumulative and Indirect Effects of Toll Facilities).

Because of the congestion relief, improved mobility, and safer travel afforded by the Grand Parkway, the Selected Alternative will have an overall beneficial effect on public safety. The Grand Parkway would improve safety on existing study area roadways as through-traffic is diverted to the proposed limited access facility. Emergency, including EMS and Fire Safety vehicles will be traveling on less congested roadways once the Grand Parkway is constructed,

as shown in the FEIS Volume II, Section 2.2.5. Additionally, the Grand Parkway will provide access for safety vehicles to cross the San Jacinto River and provide more efficient and prevalent service to a greater number of service areas on both sides of the river. Although some congestion may be present at interchange locations, the time savings from traveling a free-flow interstate quality facility instead of congested roadways with traffic signals is expected to be greater.

Every effort has been made in the development of the Selected Alternative to avoid or minimize adverse effects to sensitive resources. Opportunities to further reduce the amount of ROW will be identified during the final design stage. Re-vegetation and minimization of ROW clearing will be employed to reduce visual impacts. During the construction phase, short-term effects related to noise and dust will be minimized. Traffic delays will be minimized through coordination between TxDOT, contractors, and affected neighborhoods or landowners (in the areas immediately adjacent to the Selected Alternative ROW) and by developing a construction schedule that will allow for a minimum delay for movement across the Selected Alternative ROW. In addition, efforts will be made to provide appropriate construction detours, informative signage, and maintenance of access to residences, farms, businesses, and community facilities where practicable. Grade separations will be incorporated into the design of the Selected Alternative, allowing for adequate movement of school buses and emergency vehicles across the Segment G project area.

No specific mitigation related to EJ will be necessary. However, additional meetings could be held to discuss noise abatement or landscaping with affected landowners prior to and during the construction of the highway.

D. Economics

The economic analysis developed for the Grand Parkway Segment G project evaluated the potential direct, indirect, and induced impacts that will occur as a result of this project. The analysis utilized a computer-based modeling program called Implan Professional (Version 2.0). Through the model, construction cost data were input to calculate the direct, indirect, and induced impacts, which were translated into gross revenues by industry sectors. The construction costs were applied to the Highway, Street, Bridge, and Tunnel Construction industry. The model predicted the effects that the highway construction will have on the Harris County economy as money flows into the Highway, Street, Bridge, and Tunnel Construction industry and is then spent and re-spent within the county.

As these dollars are spent and re-spent within the county, the model translates the money into direct, indirect, and induced impacts to value added, total output, employment, and indirect business taxes. These four categories are defined as:

- Value added is a measurement of the value added to intermediate goods and services. Value added is equal to the total of employee compensation, proprietor income, other property income, and indirect business taxes.
- Total Output is a measure of the total value of purchases by intermediate and final consumers or by intermediate outlays plus value added.
- Employment impacts show the number of new jobs that will be created as a result of the project as dollars are spent directly within the highway construction industry and as dollars are re-spent within the economy and new jobs are created in other industries within the county.
- Indirect business tax impacts measure the amount of local and state sales taxes (combined) that will occur because of highway construction.

Indirect and induced impacts occur as goods and services are provided to the sectors that provide the goods and services directly for the construction of the highway. The results of the input-output models were queried to determine the top 10 industries most affected by highway construction within the categories of total output, value added, employment, and indirect business taxes.

The economic impacts related to the development of the Selected Alternative include a temporary increase in construction-related employment, an increase in other employment areas, a reduction in travel costs, and additional local and regional income generation from sources such as transportation-related taxes. The specific economic effects from the Selected Alternative were evaluated for a toll road project with an estimated total project cost of $476.7 million. This total includes 2008 estimates for engineering, ROW acquisition, utility relocation, and construction and does not include operations or maintenance costs after highway construction is complete. The total cost estimate also includes construction of half the interchanges at the project termini; the estimates do not include the half of the interchange that is approved within the Grand Parkway Segment F-2 at IH 45 (in a separate document) or the half of the interchange that is proposed (in a separate document) within the Grand Parkway Segment H at US 59.

As a result of the proposed project, it is anticipated that an estimated total output impact of $1.072 billion, which will be provided to the local economy. Additionally, there will be a total value added impact of $542.2 million. The project will have an impact on the temporary employment of approximately 7,620 employees in construction-related jobs. The estimated indirect business tax impacts in Harris County will be approximately $28.3 million.

The direct, indirect, and induced economic impacts of the Selected Alternative are considered beneficial to the project area and no mitigation is planned.

E. Pedestrians and Bicyclists

The Selected Alternative will cross proposed bicycle lanes and shared use paths/trails along Spring Creek and Riley Fuzzel Road as identified by the Houston-Galveston Area Council (H-GAC) in the RTP; however, the ease of pedestrian and bicyclist movement will be impacted only at points along existing roadways where entrance and exit ramps will be constructed for the proposed Grand Parkway. The Selected Alternative will accommodate existing and future crossings for both pedestrians and bicyclists at intersections, bridges, and over/underpasses affecting or providing direct access to designated pedestrian and/or bicycle facilities by offering crosswalks, pedestrian signals, and appropriate signage at grade separated intersections.

F. Air Quality

The Grand Parkway Segment G will not contribute to additional violations or prolong attainment of the National Ambient Air Quality Standards (NAAQS) for ozone. Segment G conforms to the emissions budget established for the approved 1-hour standard for ozone, but an 8-hour emissions budget has not been approved for the Houston area. Modeling indicates that local concentrations of carbon monoxide (CO) are not expected to exceed national standards at any time along Segment G and that local CO concentrations are not expected to exceed national standards should the four contiguous segments (E, F-1, F-2, and G) be built. The following tables show the CO levels for the Selected Alternative:

Table 2: Project CO Concentrations (Segment G)

Year	Segment	1 Hr CO (ppm) Standard 35 ppm	1 Hr % NAAQS	8 Hr CO (ppm) Standard 9 ppm	8 Hr % NAAQS
2012 (completion)*	G	4.80	13.7%	2.92	32.4%
2025 (design year)	G	5.30	15.1%	3.28	36.4%

Note: NAAQS for CO is 35 ppm for 1 hour and 9 ppm for 8 hours. Analysis includes a 1-hour background concentration of 4.5 ppm and an 8-hour background concentration of 2.8 ppm.
*2012 traffic volumes are extrapolated from 2010 and 2015 traffic data using a compound annual growth rate at 2.8 percent.
Source: Study Team, 2007

Table 3: CO Emission Factors (G/Mi) at 65 MPH

Year*	Grams/Mile CO
2012	6.718
2025	5.389

Notes: * Traffic Volume projections are found in Volume I, Table 2-4. Year 2012 traffic volumes are extrapolated from 2010 and 2015 traffic data using a compound annual growth rate at 2.8 percent.
Source: H-GAC, 2005a; TxDOT, 2006a; and Study Team, 2007

Analysis of Mobile Source Air Toxics (MSAT) indicates that a substantial decrease in MSAT emissions can be expected for both the Build and No-Build future cases (2015 and 2025) versus the base year (2000). Total MSAT emissions in Segment G are predicted to decrease by approximately 81 percent by 2025 compared with 2000 levels, which is largely due in part to the implementation of the U.S. Environmental Protection Agency's (EPA) new motor vehicle emission control standards. The MSAT analysis was prepared in accordance with TxDOT's 2006 *Air Quality Guidelines* for the six priority MSAT: acetaldehyde, acrolein, benzene, butadiene, formaldehyde, and diesel particulate matter (DPM). Table 4 illustrates the relative amount of total MSAT emissions for the Selected Alternative (Build Alternative) and the No-Build Alternative.

There may be localized areas where ambient concentrations of MSAT are slightly higher for the Build Alternative than for the No-Build Alternative. Dispersion studies have shown that the "roadway" air toxics start to drop off at about 100 meters. By 500 meters, most studies have found it very difficult to distinguish the roadway from background concentrations in any given area. An assessment of sensitive receptors (facilities most likely to contain large concentrations of the more sensitive populations, including hospitals, schools, licensed day cares, and elderly care facilities) was completed. There are no sensitive receptors within the 328-foot (100-meter) air quality dispersion threshold of the Selected Alternative. Within the 1,640-foot (500-meter) air quality dispersion threshold of the Selected Alternative, there are four sensitive receptors: Robert L. Crippen Elementary School (1,560 feet from the edge of the ROW), Jungle Learning Center (1,560 feet from the edge of the ROW), New Caney High School Child Development (950 feet from the edge of the ROW), and New Caney High School (950 feet from the edge of the ROW).

Table 4: MSAT Emissions for Segment G Traffic Study Area (Tons/Year)

Compound		Year/Alternative			
	2000	2015		2025	
	Base Year	No-Build	Build	No-Build	Build
Acetaldehyde	23	13	12	11	12
Acrolein	3	1	1	1	1
Benzene	133	43	41	36	37
Butadiene	20	6	5	5	5
Formaldehyde	77	20	19	19	19
DPM	196	31	31	13	13
Totals – Segment G	452	114	109	85	87

Note: This table shows emissions for the entire Segment G traffic study area without the Selected Alternative (No-Build) and with the Selected Alternative (Build).

Source: EPA Mobile6.2 model (See FEIS Volume III, Appendix F, Part 4 for detailed methodology); Study Team, 2007

Emissions from diesel powered and other construction equipment will occur with the Selected Alternative for the Grand Parkway Segment G. These construction emissions will be temporary in nature. As each task is completed, the equipment will move out of the immediate area. Any temporary increases in criteria pollutants or MSAT will not be considered to negatively affect long-term health of nearby populations. In addition, emissions will be mitigated through improvements in diesel fuel by both the Texas Low Emission Diesel (TxLED) program started on October 31, 2005, and the federal low sulfur diesel program started in mid-2006 for highway diesel fuel and 2007 for nonroad diesel fuel.

Because the variables affecting construction emissions (e.g., type of construction vehicles, timing and phasing of construction activities, haul routes, etc.) cannot be identified until the project is ready for construction, no estimate of construction emissions can be undertaken. However, project construction will be conducted in accordance with all federal, state, and local regulations that govern construction activities and emissions. In addition to tailpipe emissions, fugitive dust may be generated during project construction. Specific dust suppression mitigation measures that can be utilized will be identified in a dust control plan prepared prior to project construction.

The Grand Parkway Segment G was included in the H-GAC's 2025 RTP and was included in the Fiscal Year (FY) 2006-2008 Transportation Improvement Plan (TIP) as a project undergoing environmental review and scheduled for implementation beyond the three-year TIP time frame. The 2025 RTP and FY 2006-2008 TIP were adopted by the H-GAC in April 2005 and found to conform to the State Implementation Plan (SIP) by the U.S. Department of Transportation (FHWA/Federal Transit Administration [FTA]) on June 3, 2005 and October 31, 2005, respectively. Additionally, the Grand Parkway Segment G has been added to the draft FY 2011-2014 TIP as well as the 2035 RTP update, which is scheduled to be adopted by winter 2010-2011.

The Grand Parkway Segment G is included in and consistent with the H-GAC's 2035 RTP and FY 2008-2011 TIP, as amended. On August 24, 2007, H-GAC adopted the 2035 RTP and FY 2008-2011 TIP. FHWA/FTA found the 2035 RTP and 2008-2011 TIP to conform to the SIP on November 9, 2007.

Changes in modeled parameters between the 2025 RTP and the 2035 RTP (such as traffic volumes, populations, employment, number of households, and vehicle miles traveled [VMT]) have been evaluated to determine if any additional analysis is warranted before FHWA takes final environmental action. This evaluation confirmed that the changes in the modeled parameters were minor and therefore, no additional analysis is warranted. The analysis of 2025-2035 RTP modeled parameters can be found in the project record.

Consideration was also given to the fact that this project will be part of a regional tolled roadway network. The results of the analysis are presented in Section V.U (Regional Cumulative and Indirect Effects of Toll Facilities).

G. Noise Analysis

A detailed traffic noise analysis was conducted for the Selected Alternative. Results reported in the FEIS indicated that 79 representative receivers (representing a total of 280 residences) will be impacted by traffic noise. Noise abatement measures were evaluated for each of the impacted representative receiver locations (FEIS Volume II, Section 4.7, Table 4-23). Based on results of the noise abatement analyses, noise barriers will be feasible and reasonable at several locations along the Selected Alternative, and therefore are proposed for incorporation into the project subject to the completion of the project design, utility evaluation, and polling of adjacent property owners.

H. Water Quality

1. Surface Water

Quality and quantity of stormwater runoff will be altered by the Selected Alternative in two ways: (1) direct effects from construction, and (2) effects from long-term operation of the roadway. Available stormwater detention storage for in-line detention within the proposed 400-foot ROW is approximately 140.6 acres-per-foot and an additional 27.2 acres-per-foot is needed for offsite detention (outside the proposed 400-foot ROW). These numbers do not include potential storage required for floodplain mitigation. Additionally, the exact location and sizes of proposed detention facilities may change during final design. Some basins may be combined in final design.

The Selected Alternative will cross the four major streams flowing through the project area: Spring Creek, Woodsons Gully, West Fork San Jacinto River, and White Oak Creek. The alignment will also cross two tributaries to Spring Creek, a perennial tributary to Woodsons Gully, three tributaries to West Fork San Jacinto River (including Black Branch), and four tributaries to White Oak Creek. These crossings are almost all transverse, reducing the length of impact along the stream corridor. All of the major streams listed above would be bridged by the proposed facility, and the remaining streams would be bridged or culverted.

The increase of impervious square footage from adding capacity to the regional roadway network increases the potential for non-point source pollution and the potential to cause further impairment to the region's waterways. The Texas Commission on Environmental Quality (TCEQ) regulates water quality through Storm Water Pollution Prevention Plans (SWP3), Municipal Separate Storm Sewer Systems (MS4s), and Best Management Practices (BMPs). All construction of the Selected Alternative would follow these water quality regulations, which would aid in preventing further pollution to these impaired waters and to waters that are not

already impaired. Chapter 26.023 of the Texas Water Code gives authority to the TCEQ to establish water quality standards for all state waters. Each designated stream or river segment has specific desired water uses and numerical criteria developed by the TCEQ. Waterbodies that do not support their water quality standards and for which existing controls are not adequate are placed on the 303(d) List of impaired waterbodies (as required under Clean Water Act [CWA] Section 303(d)). The 2006 303(d) List (TCEQ, 2007) was the most recent data available at the time the FEIS was written. For purposes of this ROD, the 2006 303(d) List was compared to the 2008 303(d) List (TCEQ, 2009), the most recent data available, and there are no changes in the water quality concerns for water crossings that traverse the project area.

An SWP3 will be prepared prior to construction and followed throughout the construction phases to minimize the discharge of sediment laden stormwater to the Segment G project area streams. The project SWP3 will be prepared pursuant to the TxDOT manual, *Storm Water Management Guidelines for Construction Activities*. At the completion of construction, the TxDOT specifications, *Seeding for Erosion Control* will be followed to restore and reseed all disturbed areas.

Opportunities to reduce the width of the ROW will be evaluated during final design, which will have the effect of reducing the amount of cleared vegetation and therefore, the chances for erosion. Mitigation for unavoidable impacts will incorporate the following BMPs at appropriate stages during construction. For erosion control, sod may be utilized until the area has been stabilized. For sedimentation, a combination of silt fencing and hay bale dikes will be utilized and maintained and will remain in place until project completion. The existing ditches will be used for retention storage during construction. For post-construction BMPs, a combination of retention and vegetative filter strips will be utilized to control total suspended solids after construction. Vegetation within newly constructed and existing ditches will be replanted after construction and will act as vegetative filter strips. Other areas of the ROW will be seeded with native species of grasses, shrubs, or trees as needed per TxDOT or similar specifications.

Additionally, in accordance with Clean Water Act Section 402, where stormwater from the Segment G project will discharge to an MS4, the MS4 permittee will be notified of the construction activity.

2. Groundwater

The construction of the Selected Alternative may require groundwater pollution prevention measures for 16 public water supply wells. Additionally, one private water supply well will be impacted.

Avoidance and minimization of impacts to the public and private water supply wells have been incorporated to the preliminary design of the Selected Alternative and will be performed during final design of the project. Measures will include minor alignment shifts to minimize the impact to source water protection areas and/or avoid direct impacts to the public and private water supply

wells. Any water supply wells affected by construction will be mitigated using measures, such as providing a new well or connection to the public or private water system, if feasible. Wells taken out of service will be sealed in accordance with the specifications outlined by the Water Well Drillers Board of the Texas Department of Licensing and Regulation (TDLR).

A stormwater management plan will be developed in accordance with TxDOT criteria to reduce the risk of contaminating local aquifers. The stormwater management basins will collect and control spills of hazardous materials, sediments, and other particulates found in highway runoff. The use of established BMPs will be employed to prevent highway stormwater runoff from entering the aquifer at wellheads.

An emergency spill control pollution prevention plan will be developed and coordinated with local officials. Special stormwater management measures will be designed to isolate potentially hazardous spills, for treatment and removal, before entering an aquifer. The BMPs identified in the previous section (Section V.H.1, *Surface Water*) will be considered and incorporated into the final design of the Selected Alternative.

I. Permits

Mitigation options associated with the wetland impacts requiring the Section 404 permit are discussed in the Wetlands and Vegetative Communities section of this ROD (Section V.J), and the mitigation discussion for the activities requiring the Texas Pollutant Discharge Elimination System (TPDES) permit are presented in Water Quality section of this ROD (Section V.H). The appropriate Section 404 permit and TPDES permit will be obtained from the U.S. Army Corps of Engineers (USACE) and the TCEQ, respectively, prior to construction.

J. Wetlands and Vegetative Communities

The Selected Alternative was developed in accordance with Executive Order 11990, Protection of Wetlands, which directs federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands on federal property. Refer to Section II (Decision) for discussion regarding the need to balance impacts in the process of selecting a new highway alignment.

These vegetation impacts are based on land cover calculations using two different methods of wetland assessment in the ROW of the Selected Alternative: field survey delineations of wetlands for approximately 40 percent of the ROW, where access was granted, and photo interpretation of wetlands for approximately 60 percent of the ROW. Additional investigations will be completed for the Selected Alternative prior to completion of the Section 404 permit. This additional investigation consists of a formal wetland delineation, which began in the fall of 2007. The delineation is being conducted in accordance with USACE's 1987 *Corps of Engineers Wetlands Delineation Manual* and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Region* (USACE, 2008). As of the

completion of the FEIS, right-of-entry (ROE) had not yet been obtained for approximately 60 percent of the total ROW. Results of this investigation are awaiting additional property owner access and will require verification by the USACE Galveston District.

The Selected Alternative encompasses a total of 748 acres. Approximately 56 percent, or 417.3 acres, has designated vegetative land covers. This vegetative acreage does not include any farmland or rangeland and is comprised of 352.8 acres of forest, approximately 24.3 acres of non-forested wetland, and approximately 40.2 acres of forested wetland. Impact calculations do not account for bridging, which would reduce the wetland acreage impact particularly in the vicinity of West Fork San Jacinto River. It should be noted that over 40 percent of the identified wetlands along the entire Selected Alternative alignment (27.4 out of 64.5 acres) were determined to be isolated and not potentially jurisdictional as of June 2010. These results are pending additional field investigations and final USACE verification. The surveyed ROW does not include any riparian forest; however, the forest acreage includes 129.8 acres of bottomland hardwoods.

1. Regulatory

Per the USACE Section 404(b)(1) guidelines, mitigation includes measures that avoid, minimize, and/or compensate for unavoidable losses to resources that cannot be further minimized. The assessment of mitigation measures (avoidance, minimization, and compensation) is an integral part of the NEPA/Section 404 process. The preferred means of mitigation is avoidance, which is inherent in impact evaluation analysis and alternative development/assessment. For those adverse impacts that cannot be avoided, other mitigation efforts must be considered. These efforts first include minimization of potentially adverse impacts and second, compensation for those remaining adverse impacts that cannot be further reduced.

Initial mitigation measures in the planning or alignment of the Selected Alternative minimize the probable occurrence of habitat (vegetation communities) and wetland impacts (both adjacent and isolated) through route location (avoidance) and construction practices. Activities to minimize the impacts to habitats from highway construction will include minimizing devegetation of the construction area wherever safety allows, decreasing the amount of fill placement where feasible, and implementation of BMPs, including an erosion and sedimentation control plan. Specific impact minimization to wetland areas will include the roadway design (use of bridge crossings instead of filled embankment); the use of detention basins and revegetated swales to minimize runoff, sedimentation, turbidity, leaching of soil nutrients, and leaching of chemicals from petroleum products, pavement, and waste material; and maintaining flow patterns to ensure wetland hydrology in spite of roadway design requirements.

Since some degree of impact will be unavoidable, regardless of the care applied during the planning, design, and construction of a highway, a plan will be developed for compensatory mitigation to replace functions, values, and features or habitat that may be disturbed.

The most recent mitigation rule from the USACE and EPA requires evaluation of mitigation alternatives with a stated preference for mitigation banks, in lieu fee (ILF) and applicant-responsible mitigation (ARM), in that order. There are a limited number of mitigation banks in the Galveston District and fewer with service areas that include the project location or that are available to the regulated public.

Both the Blue Elbow Swamp Mitigation Bank and the Coastal Bottomlands Mitigation Bank are solely for TxDOT use. The Neches River Cypress Swamp Preserve is sold out of credits. The Palacios Mitigation Bank service area does not accommodate Harris or Montgomery Counties in its service areas.

There are three wetland mitigation banks within the Galveston District with available credits for Harris and Montgomery County impacts. The Greens Bayou Mitigation Bank (GBMB), Mill Creek Wetland Mitigation Bank (MCWMB), and Katy-Cypress Mitigation Bank (KCMB) service areas may be able to accommodate the project location and impacts.

Within the Galveston District, there is only one currently operating ILF program: Spring Creek Greenway Project (SCGP). Montgomery County leads this conservation initiative for riparian forest conservation along Spring Creek and the West Fork San Jacinto River; Spring Creek is a primary tributary of the San Jacinto River. Both water courses flow into Lake Houston. Spring Creek forms part of the boundary between Montgomery and Harris Counties. The SCGP is considered an important regional conservation initiative and seeks to conserve riparian forest in the same locale as the impacts. Compensation for impacts from Segment G are compatible with the goals of SCGP.

On occasion, on-site restoration (i.e., immediately adjacent to the new highway) of degraded wetland habitat or creation of wetland habitat within the highway ROW through creative use of detention basins, borrow pit areas, or drainage runoff channels may be appropriate. Where such measures may not effectively restore resource functions and values, off-site mitigation measures may be more appropriate. Per correspondence with U.S. Fish and Wildlife Service (USFWS), on-site mitigation for highway projects may not be considered adequate for replacement of all lost wetland functions and values. On-site mitigation may be considered as a supplement to additional off-site mitigation. Further coordination with USFWS, Texas Parks and Wildlife Department (TPWD), and the USACE may eliminate the use of on-site mitigation as an option for this project, especially in light of better off-site mitigation options that adequately compensate for impacts to wetland functions and values.

Off-site mitigation projects for wetlands must be designed to reestablish, to the extent reasonable, similar wetland functions, values, and type as the pre-existing site. Off-site mitigation would be conducted in the same geographic vicinity or in proximity, and most likely within the same watershed as the project, particularly for wetlands. Wetland mitigation may include expanding existing wetlands, restoration with hydrophytic species, or regulating water levels in impoundments or streams. Mitigation alternatives associated with on-site mitigation and off-site mitigation will continue to be investigated and evaluated by the GPA, TPWD, USFWS, EPA, and USACE. Mitigation measures for site-specific activities will be identified, to the extent practicable, throughout project development as additional information becomes available.

A Section 404 permit must be obtained from the USACE prior to construction of the Selected Alternative. A compensatory mitigation plan will be submitted to the USACE with the Section 404 permit application. The mitigation plan will include a discussion of the avoidance and minimization measures used in the routing and design of the roadway per the USACE Section 404(b)(1) guidelines. The approved mitigation plan will be a condition of the USACE Section 404 permit for the Grand Parkway Segment G project. The approved mitigation plan will provide a detailed discussion of mitigation commitments, including those that must be implemented during construction. Mitigation that involves wetland creation and/or enhancement would include post-project monitoring of mitigation sites to ensure success. At a minimum, mitigation required for impacts as part of the USACE Section 404 permitting process will result in a no net loss of wetlands in accordance with current USACE guidelines.

Every effort has been made to avoid and minimize wetland impacts, both adjacent and isolated, to the extent practicable during the planning process (Corridor and Alignment selection). This effort will continue through construction of the proposed Grand Parkway Segment G. Preliminary design of the Selected Alternative includes bridging perennial stream crossings with portions of the adjacent wetlands and bottomland hardwood forest. Further minimization of impact through bridging would be considered during final design. Impacts that cannot be avoided or further minimized will be mitigated per the project mitigation plan as approved by the USACE.

2. Nonregulatory

Nonregulated resources (e.g., isolated wetlands, remnant prairie topography, or riparian habitat) identified as environmentally sensitive, socially desirable, or ecologically valuable have been avoided to the extent practicable during the Preferred Alternative Corridor and Preferred Alternative Alignment selection process in the DEIS and FEIS. Nonregulated resources are often included as part of a wetland mitigation plan, on a case-by-case basis. It is anticipated that a nonwetland component will be incorporated, at the discretion of the TxDOT Houston District, into the mitigation plan to compensate for unavoidable impacts to nonregulated natural

resources per the provisions outlined in TxDOT's Memorandum of Agreement (MOA) with TPWD and USFWS recommendations.

In accordance with Provision (4) (A) (ii) of the TxDOT's MOU with TPWD signed in 1998 and at the TxDOT Houston District's discretion, habitats given consideration for nonregulatory mitigation during project planning include:

1. Habitat for federal candidate species (impacted by the project) if mitigation will assist in the prevention of the listing of the species;
2. Rare vegetation series (S1, S2, or S3 TPWD designations) that also locally provide habitat for a state-listed species;
3. All vegetation communities listed as S1 or S2, regardless of whether or not the series in question provides habitat for a state-listed species;
4. Bottomland hardwoods, native prairies, and riparian sites; and
5. Any other habitat feature considered to be locally important that the TxDOT Houston District chooses to consider.

No known locations of threatened or endangered species' nest sites or discrete populations occur within the Segment G project area (based on Texas Natural Diversity Database [NDD] file reviews, coordination with TPWD and USFWS, and field surveys). Refer to Section V.M. for the current status of threatened and endangered species and their preferred habitats within the Segment G ROW. Unique or suitable habitats required by threatened and endangered species are not known to occur within the Segment G project area. Only one federal candidate species, the Louisiana pine snake, may occur within the Grand Parkway Segment G project area. Although unlikely to occur within the Segment G project area, suitable habitat for the Louisiana pine snake (i.e., sandy areas of longleaf pine and hardwood communities as described in the FEIS Volume I, Section 3.17.1) would primarily be found northeast of the Segment G project area. Given the location and extent of this species' preferred habitat relative to the Segment G project area, mitigation for impacts to any potential Louisiana pine snake habitat within the Segment G project area would be unlikely to assist in the prevention of the listing of this species.

No rare vegetation series are known or expected to occur within the Segment G project area (TPWD, 2006a). Impacts to riparian forest have been avoided by development and selection of the Selected Alternative based on current information. However, compensation for bottomland hardwood forest impacts, at the discretion of the TxDOT Houston District, would be considered and addressed in the mitigation plan to be submitted for agency review and approved prior to construction.

Additional nonregulatory mitigation may be considered by TxDOT Houston District as appropriate. The TxDOT and FHWA shall continue to coordinate with the federal and state natural resource agencies and project stakeholders to develop a final compensatory mitigation plan that protects, enhances, and preserves the integrity of the natural environment. In accordance with the Executive Memorandum of August 10, 1995, all agencies shall comply with NEPA as it relates to vegetation management and landscape practices for all federally assisted projects. The Executive Memorandum directs that where cost effective and to the extent practicable, agencies will (1) use regionally native plants for landscaping; (2) design, use, or promote construction practices that minimize adverse effects on the natural habitat; (3) seed to prevent pollution by, among other things, reducing fertilizer and pesticide use; (4) implement water-efficient and runoff reduction practices; and (5) create demonstration projects employing these practices. Landscaping included with this project will comply with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices. In accordance with Executive Order 13112, native plant species of grasses, shrubs, and or trees will be used in the landscaping and in the seed mixes where practicable per TxDOT or similar specifications. No invasive or noxious species will be used to revegetate the ROW and soil disturbance will be minimized to ensure that invasive species do not establish in the ROW.

K. Wildlife

Impacts to wildlife can, in part, be assessed through examining the impacts to vegetative and aquatic habitats. Other than direct conversion of land cover, other impacts to wildlife include effects from pollution associated with construction and use of the roadway, mortality resulting from collisions with motor vehicles, and increased opportunity for spread of exotic and/or noxious species. Since forest habitat is a major component of the area surrounding the Selected Alternative, forest fragmentation effects are a concern. The project will be implemented in full compliance with all provisions and regulations outlined in and pursuant to the Migratory Bird Treaty Act (16 USC 703-711).

Initial mitigation measures in the planning process of the project minimized the probable occurrence of habitat (vegetation communities) and wetland impacts through route location (avoidance). TPWD and USFWS staff were consulted to determine the most suitable river crossing for avoidance and minimization of impacts. This coordination led to the development of Alternative Alignment D in Reach 9, which was later integrated to the Selected Alternative. In Reach 9, the Selected Alternative crosses the West Fork San Jacinto in a location that avoids habitat impact to the greatest extent recommended by USFWS.

For impacts that cannot be avoided or further minimized, a mitigation plan will be developed to compensate for unavoidable impacts to regulated natural resources (e.g., jurisdictional wetlands

and prime farmlands) as applicable. It is anticipated that a nonwetland component would be included in the mitigation plan to compensate for unavoidable impacts to nonregulated natural resources at the discretion of the TxDOT Houston District. TxDOT BMPs, designed to limit water quality degradation from construction activities, will be included in the mitigation plan. These practices will minimize fill washing into perennial streams, intermittent drainages, and wetlands; limit movement of machinery in the construction corridor at stream and wetland crossings; provide adequate erosion and siltation control; and ensure adherence to proper cleanup procedures.

L. Waterbody Modifications and Floodplains

All regulatory floodways will be bridged or culverted by the Selected Alternative, and all feasible and practicable bridging of 100-year floodplains will be examined during final design.

1. Hydrology and Drainage

The Selected Alternative will cross the four major streams flowing through the project area: Spring Creek, Woodsons Gully, West Fork San Jacinto River, and White Oak Creek. The alignment will also cross two tributaries to Spring Creek, a perennial tributary to Woodsons Gully, three tributaries to West Fork San Jacinto River (including Black Branch), and four tributaries to White Oak Creek. These crossings are almost all transverse, reducing the length of impact along the stream corridor. All of the major streams listed above would be bridged by the proposed facility, and the remaining streams would be bridged or culverted. The Selected Alternative will increase the amount of impervious area within the watersheds, resulting in increased surface runoff, and will impact overland flow patterns.

Sheet flow patterns will be considered when designing the drainage structures. Mitigation measures may include cross drainage structures or long elevated bridge structures to allow sheet flow to remain unchanged relative to existing conditions. Hydraulic structures will be designed pursuant to TxDOT and FHWA standards to accommodate periods of high flows without impacting downstream areas. Adverse impacts to the watersheds are expected to be negligible. Final project design will include final drainage and mitigation analyses that will be reviewed by local, state, and federal regulatory agencies.

The Grand Parkway Segment G Drainage and Impact Analysis (August 2008) presents the preliminary hydraulic design of the facility. The drainage impact study included a preliminary drainage design and mitigation analysis of the Preferred Alternative Alignment. The impacts of the project on hydrology, drainage, floodplains, and floodways were analyzed using the guidelines and criteria set forth in the TxDOT *Hydraulic Design Manual*, dated March 2004. The final hydraulic design of the roadway will be completed in accordance with the applicable federal, state, and local policies.

2. Floodways and Floodplains

The Selected Alternative ROW includes 95 acres of regulatory floodway and 103 acres of 100-year floodplain. All of the floodways will be bridged with the possible exception of a portion of the floodway adjacent to Woodsons Gully. Final design will include further evaluation of bridging floodplains and final drainage and mitigation analyses. Additionally, all feasible and practicable bridging of 100-year floodplains will be further evaluated during final design.

The Selected Alternative was designed to avoid impacts to floodplains, to the maximum extent feasible and practicable. For instance, the alternatives generally cross the tributaries in a transverse or perpendicular way, thus tending to minimize the encroachment. Avoidance of floodplains for both the corridor analysis and alternative alignment analysis, with the exception of the No-Build Alternative, is not possible because the watercourses in the project area run relatively perpendicular to the study area and traverse the entire study area.

Rainfall runoff rates will be expected to increase slightly because of an increase in impervious cover within the 400-foot ROW associated with construction of the Selected Alternative. As preliminarily designed, the Selected Alternative will add approximately 129 acres of impervious surface. However, natural and beneficial floodplain values will not be altered because of implementation of results from final drainage and mitigation analyses conducted during final project design. Cross drainage and mitigation facilities associated with the roadway and drainage improvements will be designed to handle a 100-year flood event. Project-related increases in base flood elevations will not be allowed to exceed one foot, per Federal Emergency Management Agency (FEMA) regulations. Review of the final drainage and mitigation analyses by regulatory agencies will confirm that adequate measures have been taken to ensure that the project's floodplain encroachment will not increase the risk of flooding to adjacent properties. Areas sensitive to local flooding will 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 county orders.

A drainage impact study was performed concurrently during the study process and its findings were incorporated into the FEIS. The drainage impact study included a detailed drainage design and mitigation analysis of the Selected Alternative. The impacts of the project on hydrology, drainage, floodplains, and floodways were analyzed using the guidelines and criteria set forth in the TxDOT Hydraulic Design Manual, dated March 2004. The final hydraulic design of the roadway will be completed using the most recent floodplain data available and in accordance with all applicable federal, state, and local policies.

Policy III, in Section 1.3.3 of the Harris County Flood Control District (HCFCD) *Policy Criteria and Procedure Manual*, October 2004, states that "projects by others shall avoid increasing

flood risks or flood hazards or creating new flood hazard areas." Section 6.1.1 of the HCFCD manual states that infrastructure improvements with detention requirements are to be designed such that "flood levels downstream of the project do not increase." Similarly, Section 9 (Flood Plain Development and Watershed Analysis), specifically Section 9.1.2, Flood Plain Development Guidelines and Procedures, of the *Drainage Criteria Manual for Montgomery County, Texas* (November 1989) details the design criteria for having no net effect on the flood levels in the floodplain. Adherence to these policies dictates that the project will not cause any downstream impacts to the flood levels along the watercourses traversed by the project.

3. Floodplain Determination

In accordance with 23 CFR § 650.113, the FHWA shall not approve a proposed action, which includes a significant floodplain encroachment unless it finds that the proposed encroachment is the only practicable alternative.

As defined in 23 CFR 650, significant encroachment shall mean a highway encroachment and any direct support of likely base floodplain development that would involve one or more of the following construction- or flood-related impacts:

1. A significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route;
2. A significant risk; or
3. A significant adverse impact on natural and beneficial floodplain values.

The increase of impervious surface of the Selected Alternative would not interrupt or terminate a transportation facility needed for emergency vehicles or community evacuation routes. Additionally, the increase of impervious cover would not pose a significant risk or adversely impact natural and beneficial floodplain values.

Furthermore, the FHWA has determined that the Selected Alternative is the only practicable alternative that meets the need for and purpose of this project because the floodplain boundaries of the watercourses in the study area traverse the entire study area, and because the Selected Alternative minimizes the floodplain encroachment for the alternatives within the Preferred Alternative Corridor. The Selected Alternative also conforms to applicable state and local floodplain protection standards as described in the FEIS.

M. Threatened and Endangered Species

Analysis of potential effects to threatened and endangered species under Section 7 of the Endangered Species Act (ESA) is a continuous process. As such, additional aerial photography reviews and field data have been collected since the issuance of the FEIS for the potential

presence/absence of threatened and endangered species and their preferred habitats. Additionally, an updated list of threatened, endangered, and species of concern for Harris and Montgomery Counties is provided in Table 5. The habitat assessment of species in this table has been developed from current available data and field surveys that have occurred to date (approximately 40 percent of the ROW). The habitat assessments will be updated as additional landowner access is granted.

Table 5: State and Federal Threatened or Endangered Species of Harris and Montgomery Counties, Texas

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present
AMPHIBIANS					
Houston toad(1)	*Bufo houstonensis*	E	E†	sandy soil, breeds in ephemeral pools	No
BIRDS					
American peregrine falcon	*Falco peregrinus anatum*	T	DM†	potential migrant, nest in west Texas	Migrant
Arctic peregrine falcon	*Falco peregrinus tundrius*	SOC	DM†	potential migrant	Migrant
Bald eagle	*Haliaeetus leucocephalus*	T	DM	near water areas, in tall trees	Yes
Black rail(1)	*Laterallus jamaicensis*	SOC		marshes, pond borders, wet meadows, and grassy swamps	No
Brown pelican(1)	*Pelecanus occidentalis*	E	DM†	island near coastal areas	No
Henslow's sparrow (wintering)	*Ammodramus henslowii*	SOC		weedy fields, fields with bunch grass, vines, and brambles, need bare ground	No
Mountain plover(1)	*Charadrius montanus*	SOC		short grass plains and bare dirt (plowed fields)	Migrant
Piping plover(2)	*Charadrius melodus*	T	T†	beaches, bayside, mud or salt flats	Migrant
Red-cockaded woodpecker	*Picoides borealis*	E	E†/E	nest in 60+ year pine, forages in 30+ pine	No
Snowy plover(1)	*Charadrius alexandrinus*	SOC		coastal winter migrant	Migrant
Southeastern snowy plover(1)	*Charadrius alexandrinus tenuirostris*	SOC		winter migrant on Texas coast beaches, bayside mud or salt flats	Migrant
White-faced ibis	*Plegadis chihi*	T	†	freshwater marshes, but some brackish or salt marshes	Yes
White-tailed hawk(1)	*Buteo albicaudatus*	T	*	coastal Prairies	No
Whooping crane	*Grus americana*	E	E†	winters in Aransas NWR	No
Wood stork	*Mycteria americana*	T	E†	prairie ponds and flooded pastures	No
FISHES					
American eel(1)	*Anguilla rostrata*	SOC		coastal waterways below reservoirs to gulf	No
Creek chubsucker	*Erimyzon oblongus*	T	*	variety of small rivers and creeks, prefers headwaters	No
Paddlefish(2)	*Polydon spathula*	T	*	large, free-flowing rivers	No
Smalltooth sawfish(1)	*Pristis pectinata*	E	E†	sheltered bays, shallow banks, estuaries and river mouths	No

Table 5 (Cont.): State and Federal Threatened or Endangered Species of Harris and Montgomery Counties, Texas

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present
INSECTS					
A Mayfly(2)	*Tricorythodes curvatus*	SOC		aquatic larval phase, adults in bankside vegetation	Yes
A Mayfly(2)	*Plauditus gloveri*	SOC		aquatic larval phase, adults in bankside vegetation	Yes
Gulf coast clubtail(2)	*Comphus modestus*	SOC		medium river, moderate gradient, and streams, silty sand or rock bottoms	Yes
Texas emerald dragonfly(2)	*Somatochlora margarita*	SOC		spring-fed creeks and bogs, small sandy forested streams with moderate current	No
MAMMALS					
Louisiana black bear	*Ursus americanus luteolus*	T	T†	bottomland hardwoods; large, undisturbed forested areas	No
Plains spotted skunk	*Spilogale putoria interrupta*	SOC	†	open fields, prairies, croplands, fence rows, farm yards, brushy areas, and tall grass prairies	Yes
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	T	†/*	cavity trees in hardwood forest, concrete culverts, abandon buildings	Yes
Red wolf	*Canis rufus*	E	E†	extirpated, brushy, forested areas, coastal prairies	No
Southeastern myotis bat	*Myotis austroriparius*	SOC		cavity trees in hardwood forest, concrete culverts, abandon buildings	Yes
MOLLUSKS					
Creeper (squawfoot)(2)	*Strophitus undulates*	SOC		small to large streams, gravel to gravel and mud bottoms, silt and cobble	No
Fawnsfoot(2)	*Truncilla donaciformis*	SOC		small to large rivers, sand, mud, rocky mud, sand and mud, silt and cobble	Yes
Little spectaclecase	*Villosa lienosa*	SOC		creeks, rivers, and reservoirs, sandy substrates, slight to moderate currents, along banks in slower currents	Yes
Louisiana pigtoe	*Pleurobema riddellii*	T		streams and moderate-sized rivers, mud, sand, and gravel	Yes
Pistolgrip	*Tritogonia verrucosa*	SOC		rock, hard mud, silt, and soft bottoms, often buried deeply	No
Rock pocketbook	*Arcidens confragosus*	SOC		mud, sand, and gravel substrates, in standing or slow flowing water	No
Sandbank pocketbook	*Lampsilis satura*	T		rivers with moderate to swift flows, gravel-sand, and sand	Yes
Texas pigtoe	*Fusconaia askewi*	T		rivers with mixed mud, sand, and fine gravel in protected areas.	Yes
Wabash pigtoe	*Fusconaia flava*	SOC		creeks to rivers, mud, sand, and gravel, moderate to swift currents	Yes

Table 5 (Cont.): State and Federal Threatened or Endangered Species of Harris and Montgomery Counties, Texas

Common Name	Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present
REPTILES					
Alligator snapping turtle	*Macroclemys temminckii*	T	*	deep water of rivers and canals	Yes
Green sea turtle(1)	*Chelonia mydas*	T	T†	gulf and bay system	No
Gulf saltmarsh snake(1)	*Nerodia clarkia*	SOC		saline flats, coastal bays, brackish river mouth	No
Kemp's ridley sea turtle(1)	*Lepidochelys kempii*	E	E†	gulf and bay system	No
Leatherback sea turtle(1)	*Dermochelys coriacea*	E	E†	gulf and bay system	No
Loggerhead sea turtle(1)	*Caretta caretta*	T	T†	gulf and bay system	No
Louisiana pine snake(2)	*Pituophis melanoleucus ruthveni*	T	C†	sandy, longleaf piney woods	No
Smooth green snake(1)	*Liochlorophis vernalis*	T	*	gulf coastal prairies, prefers dense vegetation	No
Texas horned lizard	*Phrynosoma cornutum*	T	†	open, semi-arid regions, with bunch grass	No
Timber/canebrake rattlesnake	*Crotalus horridus*	T	*	swamps/floodplains of hardwood/upland pine	Yes
VASCULAR PLANTS					
Coastal gay-feather(1)	*Liatris bracteata*	SOC		coastal prairie grasslands	No
Correll's false dragon-head(2)	*Physostegia correllii*	SOC	†	wet, silty clay on streamsides, creek beds, irrigation ditches, roadside ditches, etc.	Yes
Giant sharpstem umbrella-sedge	*Cyperus cephalanthus*	SOC		on saturated, fine sandy loam soils or on heavy black clay	
Houston daisy	*Rayjacksonia aurea*	SOC		barren, sparsely vegetated saline slicks, pimple mounds, on sandy to sandy loam.	Yes
Texas meadow-rue	*Thalictrum texanum*	SOC		woodlands and woodland margins on sandy loam, on pimple mounds, clay pan savannahs	Yes
Texas prairie dawn	*Hymenoxys texana*	E	E	poorly drained areas in open grasslands; pimple mounds	Yes
Texas windmill grass	*Chloris texensis*	SOC		sandy to sandy loam soils in bare areas	No
Threeflower broomweed	*Thurovia triflora*	SOC		low vegetation, on light colored silt or fine sand over saline clay.	No

(1) Species only listed for Harris County
(2) Species only listed for Montgomery County
* These species occur on the state listing of threatened or endangered species; 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 to occur within this county by the Clear Lake office of the USFWS (2010).
Blank Not listed (2010)
E = endangered T = threatened C = candidate species SOC = species of concern DM = delisted taxon, recovered, being monitored first five years

Currently, mollusks are only state-listed species; however, the potential for federal listing is possible. TxDOT will continue to update and evaluate these species under the requirements of Section 7.

1. Texas Prairie Dawn

The Selected Alternative was evaluated by project biologists and Dr. Larry Brown in April 2009 by reviewing habitats on recent (2008) high resolution aerial photography. One site located within the ROW was identified as potential Texas prairie dawn habitat. The remaining portion of the ROW contained upland forest; unmaintained, disturbed pasture; urban development; and wetlands. A summary of Dr. Larry Brown's desktop evaluation is provided in Appendix B. Landowner access was not granted for the property containing potential Texas prairie dawn habitat; therefore, ground surveys were not completed. Additional surveys will be completed for this unsurveyed property within the ROW prior to construction to ensure that populations or colonies are not present. A Biological Assessment for this species was prepared and submitted to the USFWS in March 2010.

2. Red-cockaded Woodpecker

Additional roadside surveys were conducted by project biologists in April 2009 to identify forest stands that may provide suitable foraging or nesting habitat for the red-cockaded woodpecker. Based on the 2009 roadside surveys, potential red-cockaded woodpecker foraging habitat was identified at two locations. However, based on review of high resolution aerial photography and roadside observations, suitable nesting habitat was not identified within 0.5 miles of these areas. The red-cockaded woodpecker recovery plan states the recommended survey methodology for red-cockaded woodpecker nesting habitat must be conducted within 0.5 miles of any foraging habitat crossed by a project. This distance is recommended in the recovery plan to evaluate whether or not the potential foraging habitats are utilized by red-cockaded woodpeckers outside of the project area. Therefore, it is unlikely that these designated foraging habitats are utilized by the red-cockaded woodpecker. A Biological Assessment was prepared for this species and submitted to the USFWS in March 2010.

3. Findings

Approximately 60 percent of the ROW has not been evaluated for red-cockaded woodpecker or Texas prairie dawn habitat through ground surveys. Review of aerial photography indicates that some of these areas contain pine-hardwood communities that could provide suitable foraging habitat for the red-cockaded woodpecker, depending on the age classification of the stand. However, based on review of aerial photography and current TPWD NDD data, no red-cockaded woodpecker clusters or potential nesting habitat is believed to occur within the project area. Therefore, based on the information available at this time, a "no effect" determination is appropriate for the red-cockaded woodpecker.

Due to lack of landowner access to portions of the Selected Alternative, TxDOT has been unable to complete field surveys on one site that may contain potential habitat for the Texas prairie dawn. The potential for Texas prairie dawn populations to occur on the unsurveyed properties is discountable based on review of aerial photography and soil surveys, which indicate that Texas prairie dawn habitat is unlikely to occur on these properties. Presence/absence surveys will be conducted on the site containing potential habitat when access is granted by the landowner. At this time, presence or absence of Texas prairie dawn habitat at this site cannot be determined so a "may affect but not likely to adversely affect" determination is appropriate. The USFWS concurred with this finding in a letter dated June 11, 2010.

Based on current surveys and review of aerial imagery, no direct or indirect impacts to habitat are anticipated as a result of the Selected Alternative. However, continuing field investigations of the remaining unsurveyed properties will be required to document the presence/absence of suitable habitat for threatened and endangered species. Coordination with the USFWS will continue in order to determine whether additional protected species investigations or consultation under Section 7 of the ESA are required. No mitigation for threatened and endangered species is anticipated to be required for the Grand Parkway Segment G project.

N. Cultural Resources

The following sections detail both the results of investigations completed in compliance with applicable cultural resource laws and regulations and the findings based on the investigations. The laws and regulations (36 CFR 800.16(l)) require the consideration of the impacts of the proposed project on cultural resources, such as archeological sites and historic structures. TxDOT operates under several formal agreements that expedite its compliance with these laws and regulations.

Not all cultural resources are afforded equal treatment in the planning process under applicable cultural resources laws. Historic properties and SALs are those objects, sites, and structures that have characteristics requiring those resources be given further consideration in the project planning process. Projects should avoid and minimize impacts to historic properties and SALs when possible. They should resolve the effects of impacts, usually through some mitigation measures, when avoidance is not possible.

To preview the results of investigations conducted for this proposed project, studies identified one archeological historic property that would be affected by the proposed undertaking. Access was denied to some portions of the project area by private property owners, so archeological investigations will have to be completed at those locations after the parcels have been purchased. The following section will provide a formal account of the investigations and findings with appropriate citations to regulations and agreements. These results are discussed in more detail in the next sections, along with formal findings made in compliance with the applicable laws, regulations, and agreements.

1. Archeological Resources

The Study Team evaluated the potential for the proposed undertaking to affect archeological historic properties (36 CFR 800.16(l)) or SALs (13 TAC 26.12) in the APE. The APE comprises the existing ROW within the project limits and areas of new ROW or easements. The APE extends to a maximum depth of 75 feet below the modern ground surface. A Section 106 review and consultation proceeded in accordance with the *First Amended Programmatic Agreement among the FHWA, the TxDOT, the Texas SHPO, and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings* (PA-TU), as well as the MOU between the THC and TxDOT. The following documentation presents TxDOT's findings and explains the basis for those findings.

Portions of the proposed project were surveyed in 2002 and 2003 by the Study Team, and later, a small portion of the proposed APE was included in a survey conducted in 2008. As a result of these surveys, four previously recorded sites were found within or immediately adjacent to the APE. Three of these sites (41MQ197, 41MQ198, and 41MQ225) are prehistoric sites. The fourth, 41MQ199, is a historic-aged homestead/ranch complex. Sites 41MQ197 and 41MQ198 were determined by the previous researchers to contain archeological deposits that may contain valuable data concerning the prehistory of the area. It was recommended that impacts to these sites be avoided. No further work was recommended by the previous researchers for 41MQ199 and 41MQ225, and it was determined that these sites were not eligible for listing on the NRHP.

In 2009, the Study Team performed additional intensive surveys of unsurveyed portions of the APE, working under Texas Antiquities Permit No. 5311. During this survey, Sites 41MQ197, 41MQ198, 41MQ199, and 41MQ225 were revisited. This survey revealed no additional archeological deposits within the proposed undertaking's APE. In consultation with the THC/Texas SHPO, TxDOT found that Site 41MQ198 is no longer located within the current alignment APE, and that no further work was required for Sites 41MQ199 and 41MQ225. Site 41MQ197 appears to contain buried, intact archeological deposits and the potential for listing on the NRHP. Based on the 2009 surveys, it is recommended that, in accordance with 23 CFR 774.113(b)1, impacts to the site be avoided. If avoidance is not feasible, archeological testing is recommended to assess the research potential of the site. The 45-day review for THC concluded on July 21, 2009. TxDOT initiated additional consultation with federally recognized Native American tribes with a demonstrated historic interest in the area on June 2, 2009. This consultation also concerned the newly-surveyed areas. No objections or expressions of concern were received during the comment period, which ended July 17, 2009. On July 23, 2009, TxDOT received notice of completion of the Texas Antiquities Permit under THC (Appendix B).

TxDOT has completed evaluation of all areas where access could be obtained. The surveyed portion of the APE contains one potentially eligible archeological historic property, Site 41MQ197. ROE could not be obtained to some parcels of private property. Pursuant to

Stipulation IX.B.3 of the PA-TU, completion of the remainder of the archeological inventory is deferred until the NEPA process has concluded and property acquisition has been completed. TxDOT is still obligated to complete the inventory of archeological historic properties on parcels without ROE and to conduct NRHP eligibility test excavations at Site 41MQ197 if avoidance is not possible. If unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the PA-TU and MOU.

2. Non-Archeological Historic Resources

In accordance with the PA-TU and in accordance with the MOU between TxDOT and THC (see Section IV of this ROD for definitions of the PA-TU and MOU), TxDOT consulted with the SHPO regarding the project's potential to affect non-archeological historic properties. It has been determined that the Selected Alternative will not impact any previously recorded NRHP-listed or eligible historic properties. Within the Selected Alternative's APE, 22 historic resources were identified; however, the SHPO concurred with the finding that none of these resources are NRHP-eligible. Furthermore, the Selected Alternative will not impact any Recorded Texas Historic Landmarks, SALs (non-archeological), or Official State Historical Markers.

O. Hazardous Materials

The proposed construction of the Segment G project area poses very little risk of hazardous material impacts to the environment. The review of regulatory agency databases indicates that within the Selected Alternative ROW, there is one registered hazardous material site located two miles north of Spring on Riley Fuzzel Road near the Reach 8 and 9 junction (see FEIS Volume III, Appendix I, No. 21 on map). Based on the Railroad Commission of Texas (RRC) records, one active observation well site is located within the Selected Alternative ROW in Reach 8. Since there is an absence of any producing wells, there appears to be a nominal risk of Naturally Occurring Radioactive Material (NORM) issues. RRC records also indicate that seven petroleum pipelines cross the Selected Alternative, six of which are active. The presence of these petroleum pipelines does not appear to have negatively impacted the Segment G project area or pose a substantial potential to impact the project in the future.

Mitigation of these impacts may come in the form of remediation of impacted sites or compensation to relocate oil or gas wells or install petroleum pipelines at a greater depth. If active wells are later located within the Selected Alternative ROW, these wells will be required to be relocated or avoided by construction activities. If oil and gas wells are affected within the proposed ROW, applicable plugging and supervision requirements are provided in the Texas Administrative Code, Title 16, Part I, Chapter 3, Section 3.14 under the jurisdiction of the RRC. If the observation well (or any active wells located in the future) is not plugged prior to construction, it will be addressed per TxDOT standard specification Item 103, Disposal of Wells. Well plugging will need to be performed by cementing companies, service companies, or

operators approved by the RRC. Arrangements with the responsible well operator for proper plugging according to applicable regulations will be addressed during the ROW acquisition and negotiation process. The relocation of existing pipelines does not appear necessary. However, the pipelines may be required to be reinstalled at a greater depth prior to roadway construction. The depths of the pipelines and their locations will be clearly marked prior to construction to prevent an accidental rupture.

Mitigation of hazardous material impacts associated with the Grand Parkway Segment G project will more likely be associated with existing and historical sites that either have the potential or have already impacted the environment. A Phase I Environmental Site Assessment will be conducted at each site to assess the need for mitigation. Based on the results of the assessment, sampling and analysis activities and possible remedial activity (i.e., mitigation) may be warranted at certain sites. Any unanticipated hazardous materials and/or petroleum contamination encountered during construction will be handled according to applicable local, state, and federal regulations and TxDOT Standard Specifications and Guidelines for handling emergency discovery of hazardous materials.

The Grand Parkway Segment G project may include the demolition and/or relocation of building structures. The buildings may contain asbestos containing materials and/or lead paint. Asbestos and lead paint inspections, specifications, notification, license, accreditation, abatement, and disposal, as applicable, will comply with federal, state, and local regulations. Issues related to asbestos and lead paint will be addressed during the ROW process prior to construction.

P. Visual and Aesthetic Qualities

Because of the relatively large overall size of the project and the rural setting of the project area, the Selected Alternative will have some effect on the existing aesthetic quality of the surrounding area. The visual impact will vary with location. Views both from and of the facility will be greatest at grade separations (these locations are outlined in Section II [Decisions] of this ROD). Preliminary design of the Selected Alternative includes long bridges over Spring Creek and the West Fork San Jacinto River and the bridging of Woodsons Gully, White Oak Creek, and a perennial tributary to Woodsons Gully. As the highway approaches existing development and communities, more residents have a view of the facility, but the highway will have less effect on the overall rural viewshed. Conversely, as the highway moves farther away from these developed areas, the result may be a greater change in the overall rural visual setting, but will be observed by fewer individuals. Outside grade separations, potential views of the highway will be limited due to the relatively flat nature of the project area.

The toll facilities and all exit and entrance ramps will incorporate safety lighting, which could be considered additional negative visual and aesthetic impacts, especially where residential areas are located near toll collection facilities. Possible toll collection facilities may include Automatic

Vehicle Identification (AVI) lanes (TxTag and EZ Tag) and Automatic Collection Machine (ACM) lanes; no manned tollbooths would be present at the collection facilities. Within Segment G, a main lane toll plaza would be located most likely in Reach 9 or Reach 10.

Where reasonable and feasible, visual mitigation measures will include naturally vegetated medians, minimized ROW clearing, incorporation of design specifications to blend into the landscape, and promotion of roadside native wildflower planting programs. For roadside revegetation, landscape planting, and revegetation of natural areas impacted by construction, native plants will be considered to improve the visual aesthetics and to control the introduction of invasive species. Where reasonable and feasible, existing trees within the proposed ROW, but not within the defined clear zone, will be retained in the proposed landscaping to block the view of the roadway from adjacent properties. As currently proposed, the roadway lighting system will consist of low impact, downward directional lighting restricted to those areas where entrance/exit ramps and a main lane toll facility are located.

Q. Energy

The Selected Alternative will require short-term energy consumption during construction activity. A worst-case estimate of operational energy consumption was calculated based on traffic conditions predicted with construction of Segments E, F-1, F-2, and G of the Grand Parkway. Based on this analysis, the future expected energy consumption is less than, though similar to, that of the No-Build Alternative. The short-term construction-related energy consumption could be offset by the operational energy efficiencies gained with the use of an improved transportation facility over many decades.

As stipulated in the Need and Purpose section of the FEIS (Volume II, Section 1.0), this facility will be designed to:

- Help complete or expedite the implementation of several major thoroughfare plans;
- Provide major roadway linkages between major freeways and highways; and
- Provide an alternative route to bypass the central city.

In addition, the construction of the Grand Parkway will result in the implementation of Congestion Management System (CMS) commitments for managing traffic congestion. These congestion reduction strategies will also result in the reduction of energy consumption.

R. Construction Impacts

The Selected Alternative will have temporary construction impacts likely to include the temporary degradation of air, noise, and water quality; the temporary impedance to the maintenance and control of traffic; safety concerns because of changes in traffic patterns; the stockpiling and disposal of construction materials; the use of borrow areas; and construction

and use of haul roads. Construction activities will affect residents in the immediate area and those traveling in the vicinity.

To minimize effects to air quality, dust control measures will be implemented and open burning will not be used to dispose of vegetative debris. In order to control construction noise impacts, construction activity may be limited to more noise tolerant time periods. For information regarding noise please refer to Section V.G of this ROD. Minimization of the effects to water quality from erosion and sedimentation will be accomplished by preparing an SWP3 pursuant to TxDOT guidelines. The SWP3 may include, but not be limited to, silt fences, inlet protection barriers, hay bales, and seeding or sodding of excavated soil. Exposure of the soil surface will be minimized during any clearing activities in order to maintain soil integrity. Maintenance of the current flow of traffic on the existing roadway network will be planned and scheduled to minimize adverse impacts to the traveling public. Within construction areas, traffic control measures using standard practices would be used, as outlined in TxDOT guidelines. In addition to these standards, news releases of construction activities and schedules would be made available to the public. All reasonable safety considerations to protect the life and health of the construction workers, the public, wildlife, and property will be exercised. The construction contractor will be responsible for compliance with all federal, state, and local laws, regulations permits, and ordinances; as well as pollution control on haul roads, borrow and other material pits, waste material disposal areas, and other potential pollutants, which could be accomplished with erosion control features such as berms, dikes, temporary seeding, sediment traps, fiber mats, silt fences, slope drains, mulches, crushed stone, and others as specified by TxDOT guidelines.

S. Indirect Effects

Indirect effects are defined as those "…which are caused by an 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). Indirect effects were assessed and examples of indirect effects for the Selected Alternative could include the following:

- Development and land use changes due to improved access;
- Runoff increases due to changes in land use and increased development on land surrounding the proposed facility;
- Increased sedimentation of wetlands and streams and decreased water quality due to future development of land adjacent to the new facility;
- Loss of wildlife habitat and decreased habitat value in areas of increased land development spurred by the proposed project;

- Impact to cultural resource sites from development projects on private property that do not require cultural resource investigations because public funds or permits are not required;
- Increased use of parks and recreational areas due to improved access; and
- Stimulation of the local economy from the circulation of construction spending; improved access to employment and housing opportunities, markets, goods, or services such as health and education; an increased work force related to construction; and development stemming from the new facility.

Results of these analyses indicate that induced development may result in the above types of indirect effects. However, certain resources may be properly managed to minimize environmental impacts. Avoidance and minimization of these types of impacts may be accomplished through local land use controls and coordination with regulatory agencies. Local controls such as land use plans, zoning regulations, and subdivision and land development ordinances could allow for specific site flexibility to allow for avoidance or minimization of regulated resources. However, these types of commitments are not the responsibility of the FHWA and TxDOT since they do not have either the authority or responsibility to commit federal funds to the mitigation of impacts not directly attributable to transportation projects or the actions of others not within their direct control (Executive Order 13274). As a result, these possible indirect effects do not require mitigation by these transportation agencies.

T. Cumulative Impacts

A cumulative impact is “the impact on the environment which results from the incremental impact of the action 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). This section describes the Cumulative Effects Analysis (CEA) conducted for the proposed Grand Parkway project, Segments E, F-1, F-2, and G. The CEA developed to address future land development, both with and without Grand Parkway, Segments E, F-1, F-2 and G, and to assess cumulative effects that are “caused” by the facilities’ construction on resources, ecosystems, and human communities. This analysis follows the requirements and processes outlined in 23 CFR 771, the FHWA Technical Advisory T 6640.8A (1987), the CEQ’s 1997 handbook Considering Cumulative Effects Under the National Environmental Policy Act, FHWA’s Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process, CEQ’s 2005 Memorandum Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, the California Department of Transportation’s (Caltrans’) 2005 Guidance for Preparers of Indirect and Cumulative Impact Assessments, and TxDOT’s 2006 Guidance on Preparing Indirect and Cumulative Impact Analyses. For further detail and analysis regarding the CEA of the Grand Parkway, please refer to the Segment G FEIS Volume II, Section 5.4.2.

While FHWA position papers and technical guidance require that cumulative effects be evaluated, the agency recognizes that there is no standard approach or methodology, area of effect, or predefined impact categories. Therefore, it is necessary to evaluate each project on an individual basis, define its Area of Influence (AOI), and fully understand the current social and economic conditions and transportation infrastructure of the area.

The magnitude and significance of negative cumulative effects of the Grand Parkway project on the resources in the AOI are expected to be limited and controllable. Four resources/issues were determined to have cumulative effects, including land use (developed, undeveloped), water quality (open water), wetlands and vegetative communities (forested, scrub/shrub, grassland/herbaceous, herbaceous planted/cultivated, Katy Prairie), and MSAT. Table 6 summarizes these cumulative effects.

Table 6: Summary of Cumulative Effects (Segments E, F-1, F-2, and G)

Resource	2001 AOI[1]	Impact Type						Difference Between No-Build and Build Alternatives
		Direct[2]		Indirect 2025		Cumulative 2025		
		No-Build	Build	No-Build	Build	No-[3]Build[3]	[4]Build[4]	
Open Water (acres)	4,607	0	4	0	27	1,857	1,884	27
Developed (acres)	146,271	0	204	0	722	283,481	294,132	10,651
Undeveloped (acres)	5,740	0	10	0	40	3,442	3,482	40
Forested (acres)	150,025	0	793	0	4,360	104,686	109,046	4,360
Scrub/Shrub (acres)	33,528	0	107	0	1,573	23,407	24,980	1,573
Grassland/Herbaceous (acres)	28,409	0	113	0	1,041	19,296	20,337	1,041
Herbaceous Planted/ Cultivated (acres)	169,463	0	1,135	0	2,787	107,817	110,604	2,787
Wetlands (acres)	66,098	0	298	0	823	22,977	23,800	823
Katy Prairie (acres)	148,198	0	1,149	0	2,829	68,382	71,211	2,829
MSAT (tons/year)	1,518	0	10.2	0	6.7	291	297	6

Notes: [1] The "AOI" is the area of influence for all of Segments E, F-1, F-2, and G of the proposed Grand Parkway.
[2] Direct impacts were calculated from U.S. Geological Survey/ National Oceanic and Atmospheric Administration (USGS/NOAA) Draft 2001 NLCD data using the ROW of the 2006 Preferred or Recommended Alternative Alignments for each of Segments E, F-1, F-2, and G of the proposed Grand Parkway (Grand Parkway links only). Although minor shifts can occur to the final Selected Alternatives within each segment, results of the indirect and cumulative impacts assessment are not anticipated to be substantially affected.
[3] The No-Build would include the Direct Build Alternative's acreage due to development that would occur even without the proposed project.
[4] The 2025 Build Alternative's cumulative impacts include direct and indirect effects.
Source:, USGS/NOAA Draft National Land Cover Database, 2001; Expert Panel, 2000; Study Team, 2006

Efforts have been made to avoid and minimize project effects to all resources at both the corridor and alignment development phases of the project, and measures will be implemented to mitigate the loss of resources where practicable. When project alternatives were developed, several environmental issues were considered that influenced the location of the Grand Parkway, including the potential for involvement with §4(f) / §6(f) resources, avoiding and minimizing the filling of wetlands and floodplains, and sensitive biological communities. Other factors affecting the proposed action were also studied, including compatibility with local land use plan/policies, housing and business displacements, socioeconomic issues, and community interests. The alternatives evaluation process was based on the philosophy of avoidance first, minimization second, and mitigation last. All project-specific commitments and conditions of approval, including resource agency permitting, compliance, and monitoring requirements are stated in the FEIS and this ROD.

U. Regional Indirect and Cumulative Effects of Tolled Facilities and Managed Lanes

As the Metropolitan Planning Organization (MPO) for the Houston-Galveston region, the H-GAC is charged with enabling and creating a regional perspective for transportation and mobility. The MPO has prepared a *Regional Cumulative and Indirect Effects of Toll Facilities (2009)* in order to examine EJ, air quality, water quality, vegetation, and land use when considering the potential impact implications at the planning and programming phase of transportation projects and for disclosure in the NEPA documents. This analysis was not completed for inclusion in the EIS for Grand Parkway Segment G. The following sections present a summary of the report findings for this ROD. Much of the following summary is excerpted directly from the H-GAC report: the full report is accessible through H-GAC's website, http://www.h-gac.com.

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 VMT. The 2009 regional roadway network consists of nearly 24,571 total lane miles, which includes nearly 4 percent tolled lane miles and managed lanes. By 2035, these numbers are expected to increase to 32,855 lane miles, 6 percent of which are tolled lane miles and nearly 3 percent are managed lanes. Exhibit 3 shows the tolled and managed lane improvements to the regional roadway network by year 2035.

1. Regional Indirect Effects of Tolled Facilities and Managed Lanes

The expanding regional roadway network, including tolled facilities and managed lanes along with the expanding transit network, would 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 was evaluated in the CEA.

2. Regional Cumulative Effects of Tolled Facilities and Managed Lanes

An evaluation of the regional cumulative effects of these facilities was considered for potential impacts on EJ populations, air quality, water resources, vegetation, and land use. The Resource Study Area (RSA) for this evaluation is the H-GAC eight county region.

Environmental Justice (EJ)

Methodology

H-GAC conducted an evaluation to determine the indirect and cumulative 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 Traffic Analysis Zones (TAZs) were identified if 50 percent or more of its area was determined to be an EJ population. Exhibit 4 depicts the EJ TAZ for low-income populations and/or minority populations.

Following the identification of the EJ TAZs and in consideration of the model analysis assumptions and limitations, two regional roadway network scenarios were utilized, the 2035 RTP Build Scenario and the 2035 No-Build Scenario, to conduct an analysis on travel time for persons within the EJ TAZs and non-EJ TAZs for both scenarios. The Build Scenario consisted of all tolled and managed lane/high-occupancy toll (HOT) projects identified in the 2035 RTP (Exhibit 5). The No-Build Scenario consisted of the 2035 RTP network with the existing plus committed managed lane system; the Katy Freeway HOT lanes are included since this facility opened on April 18, 2009 (Exhibit 6). Details of the model analysis assumptions and limitations are included in the *Regional Cumulative and Indirect Effects of Toll Facilities* (2009) report, which is included in the project technical files.

To determine the time analysis for the different scenarios, trips were divided into home based work trips (HBW) and home based non-work trips (HBNW) for both tolled and free facilities.

The results for both scenarios (HBW and HBNW) trips analysis indicate:

- The addition of the tolled facilities to the regional roadway network under the Build Scenario for HBW and HBNW trips resulted in a reduction in travel time in the EJ and non-EJ zones for all tolled facilities (4.77 and 8.75 minutes for HBW trips and 2.80 and 5.48 minutes for HBNW trips, respectively).
- The addition of the tolled facilities to the regional roadway network under the Build Scenario for HBW and HBNW resulted in a reduction in travel time in the EJ and non-EJ zones for all free facilities (2.32 and 5.05 minutes for HBW trips and 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 disproportionately high or adverse effect to the EJ populations based on the travel time analysis 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 that the tolled roadway facilities provide to the regional roadway network.

In addition, the Build Scenario, which includes the regional tolled roadway network, provided an overall reduction in regional congestion. The daily VMT decreases by over 1.5 million miles in the Build Scenario versus No-Build Scenario. Furthermore, daily vehicle hours traveled (VHT) decreased by nearly 6 percent for the region for the 2035 regional roadway network. This reduction indicates that the 2035 roadway network with tolled facilities would improve overall system performance and would provide travel time savings for EJ and non-EJ populations.

EJ Findings

For HBW and HBNW trips, EJ population trips that are candidate toll trips 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 (ATL) in minutes 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.

According to the H-GAC report, the EJ zones are spread throughout the region and are generally clustered within Beltway 8 and are not in close proximity to the majority of future toll facilities when compared to the non-EJ zones. 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. A substantial amount of future transit improvements are targeted at EJ zones; the ATLs for the populations within those zones would generally improve due to increased access to improved transit facilities. 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 [CRT] and signature express bus service);
- Transit connectivity to multiple employment centers; and
- Coordination of transit services among regional public transportation providers.

METRO's 2035 Long Range Plan recommends substantial 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 HOT projects, 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 CRT; and
- 40 miles of signature express bus service.

Exhibit 7 shows the future corridor and capital facilities projects in the 2035 METRO Long Range Plan.

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 single-occupancy vehicle (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 percent. With the implementation of the new toll policy, the EZ-tag toll users were assessed a five cent increase for all main-lane toll plazas on the Sam Houston, Westpark, and Hardy Toll Roads for a two-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 to 2.0 percent for HBW trips and 0.5 to 1.0 percent for HBNW trips). The consistency in the toll demand decrease among the EJ and non-EJ populations suggests that the 3.75 percent 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 EJ.

Air Quality

The Clean Air Act Amendments of 1990 (CAAA) require transportation plans, programs, and projects in nonattainment areas, which are funded or approved by FHWA or FTA, to conform to the SIP. These amendments ensure that transportation plans, programs, and projects do not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS. Transportation conformity 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. The Houston-Galveston region must demonstrate that the 2008-2011 TIP and the Long Range Plan (2035 RTP) result in less volatile organic compounds (VOC) and nitrogen oxides (NOx) than established and approved by EPA for the base year and each horizon year. On November 9, 2007, the USDOT determined that the 2035 RTP and the 2008-2011 TIP conformed to the requirements of the SIP for the Houston-Galveston ozone nonattainment area. Based on a Level of Mobility analysis, 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.

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 MSAT, CO, and ozone. As noted in the project level direct, indirect, and 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 construction of the regional tolled roadway network would cross and impact the waterbodies within the RSA and could cause water quality impacts. The increase of impervious square footage from adding capacity to the regional roadway network increases the potential for non-point source pollution and the potential to cause further impairment to the region's waterways. TCEQ regulates water quality through SWP3, MS4, and BMPs. All construction of

the regional tolled roadway network in the RTP would follow these water quality regulations, which would aid in preventing further pollution to these impaired waters and to waters that are not already impaired. Additionally, any land use development that would occur from the construction of these facilities would be required to 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 adverse cumulative impacts to water quality.

Vegetation

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 indentifies and works 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 TPWD, and wetlands mitigation would occur through the permitting process under the jurisdiction of the USACE. 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 as follows:

- 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.

These results reinforced the public's intuitive notions about coordinated transportation and land use planning. H-GAC 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 "3Cs" 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 3Cs 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 the development can make transit more accessible and decrease the need for SOV trips. Recommended strategies include:

- Promote community design that provides convenient access to transit systems;
- Promote transit-oriented development investments around regional transit facilities; and
- 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 to 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.

Conclusion

The regional tolled roadway network would cause some indirect and/or cumulative impacts to natural and socioeconomic 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 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 ATL in these zones is greater than the ATL from the EJ zones. Furthermore, the additional vehicle lane miles that the regional tolled roadway network provides enable traffic to flow more efficiently thereby reducing emissions associated with cars traveling at lower speeds or idling conditions.

The regional priced facility system would cause minor impacts to some of the resources discussed in this analysis. Regional mitigation for some of these resources is addressed by the H-GAC. As part of 2035 RTP, H-GAC addresses two issues related to air quality and EJ populations. The transportation planning process, at a regional level, provides ways to minimize any potential impacts that could occur. The priced facility projects would be included in the State Transportation Improvement Program (STIP)/TIP and RTP, and the STIP/TIP and RTP would conform to the SIP. This assures each project is in compliance with the STIP/TIP and the RTP for air quality under the CAAA and EJ under Title VI of the Civil Rights Act of 1964 and Executive Order 12898.

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.

VI. MONITORING OR ENFORCEMENT PROGRAM

All commitments and conditions of approval stated in the FEIS (FEIS Volume II, Section 4.26 – Mitigation Measures and Commitments and FEIS Volume I, Section 5.4 or FEIS Volume II, Section 6.4 – Agency and Public Coordination) will be monitored by FHWA, TxDOT, and other appropriate federal, state, and local agencies to insure compliance per the appropriate approved permit(s). All commitments and conditions will be included in the Environmental Permits, Issues and Commitments (EPIC) sheets of the project's final design plans.

VII. COMMENTS RECEIVED ON THE FEIS

The Notice of Availability for the FEIS for Segment G of the Grand Parkway, SH 99, was published in the Federal Register and Texas Register on February 6, 2009. The comment period officially closed on March 16, 2009. A 39-day review period was provided, extending the review period beyond the minimum required 30 days (40 CFR 1506.10(b)(2)). A total of 19 comment letters and e-mails were received on the FEIS. Those groups/agencies that provided comments on the FEIS included Benders Landing Property Owners Association, Montgomery County Precinct 3 Commissioner Ed Chance, Benders Landing Association, TPWD, and North Houston Association (NHA). All comments were reviewed and fully considered. All substantive comments were addressed and responses are included in Appendix C. The comments and responses within Appendix C are organized in two tables (Table 1. Segment G FEIS Commenter Index and Table 2. Segment G FEIS Comments and Responses). Table 1 organizes the comments and directs the reader to the appropriate responses in Table 2. All comments received during the review period have been previously received and specifically addressed in the DEIS or FEIS. The responses in Table 2 address the comment and/or refer the reader to the appropriate section of the FEIS document.

VIII. CONCLUSION

Based upon the information presented in the FEIS and supporting technical documents; the associated project record; and input received from the public and interested local, state, and federal agencies; the FHWA decision, after its own independent review and consideration of the referenced information, is to provide approval for the construction of Segment G of the Grand Parkway as a new location highway facility within Harris and Montgomery Counties. This decision selects the Preferred Alternative, described in the Grand Parkway Segment G FEIS dated January 15, 2009, as four-lane controlled access toll road with intermittent frontage roads located within a 400-foot ROW. The Selected Alternative is approximately 13.7 miles long and will be built to accommodate a 70 mile per hour design speed. The Selected Alternative begins at IH 45 and ends at US 59. An exhibit of the Selected Alternative is attached to this ROD (Exhibit 1).

Date: 12/29/2010

For Federal Highway Administration

EXHIBIT 1: Grand Parkway Segment G
Selected Alternative

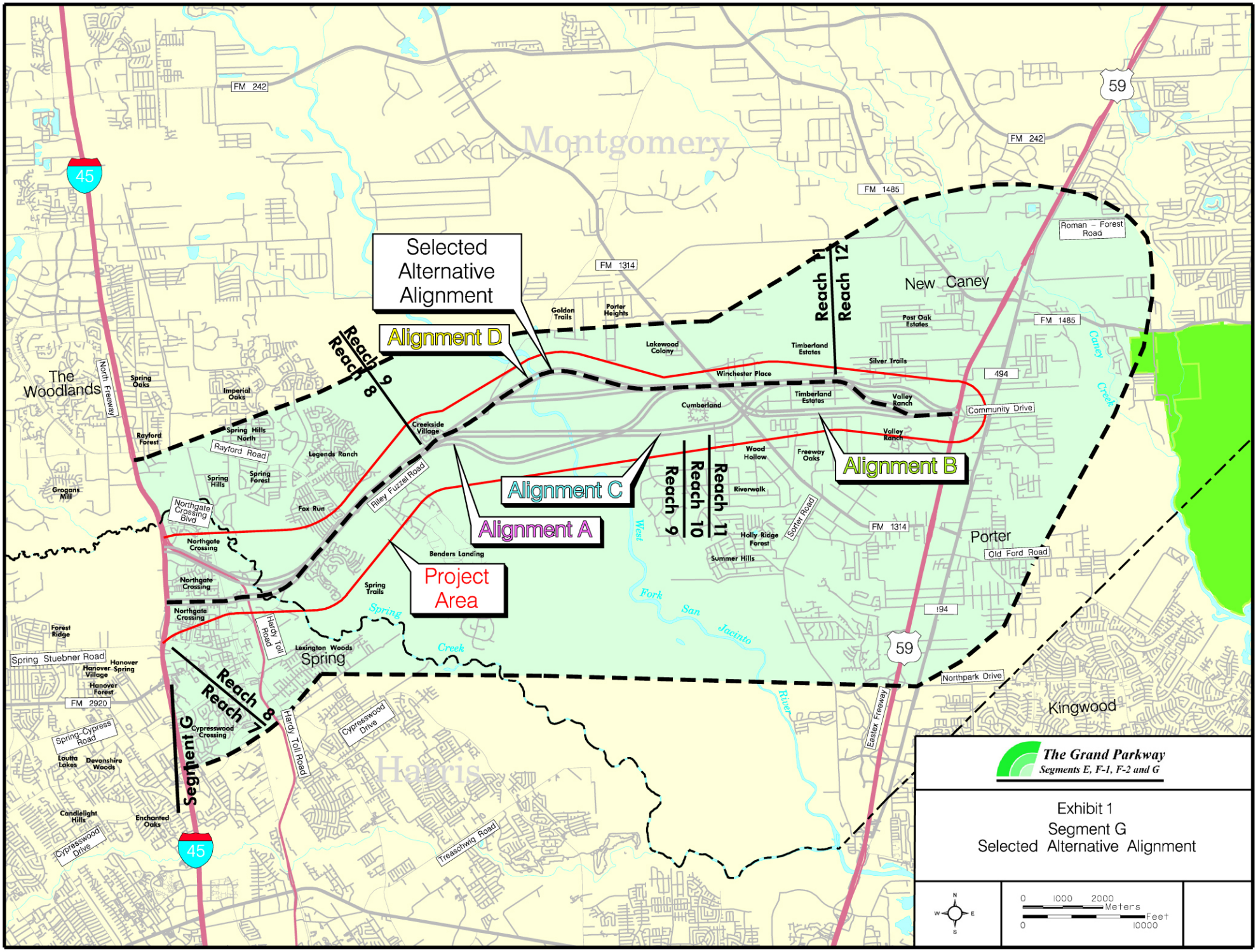
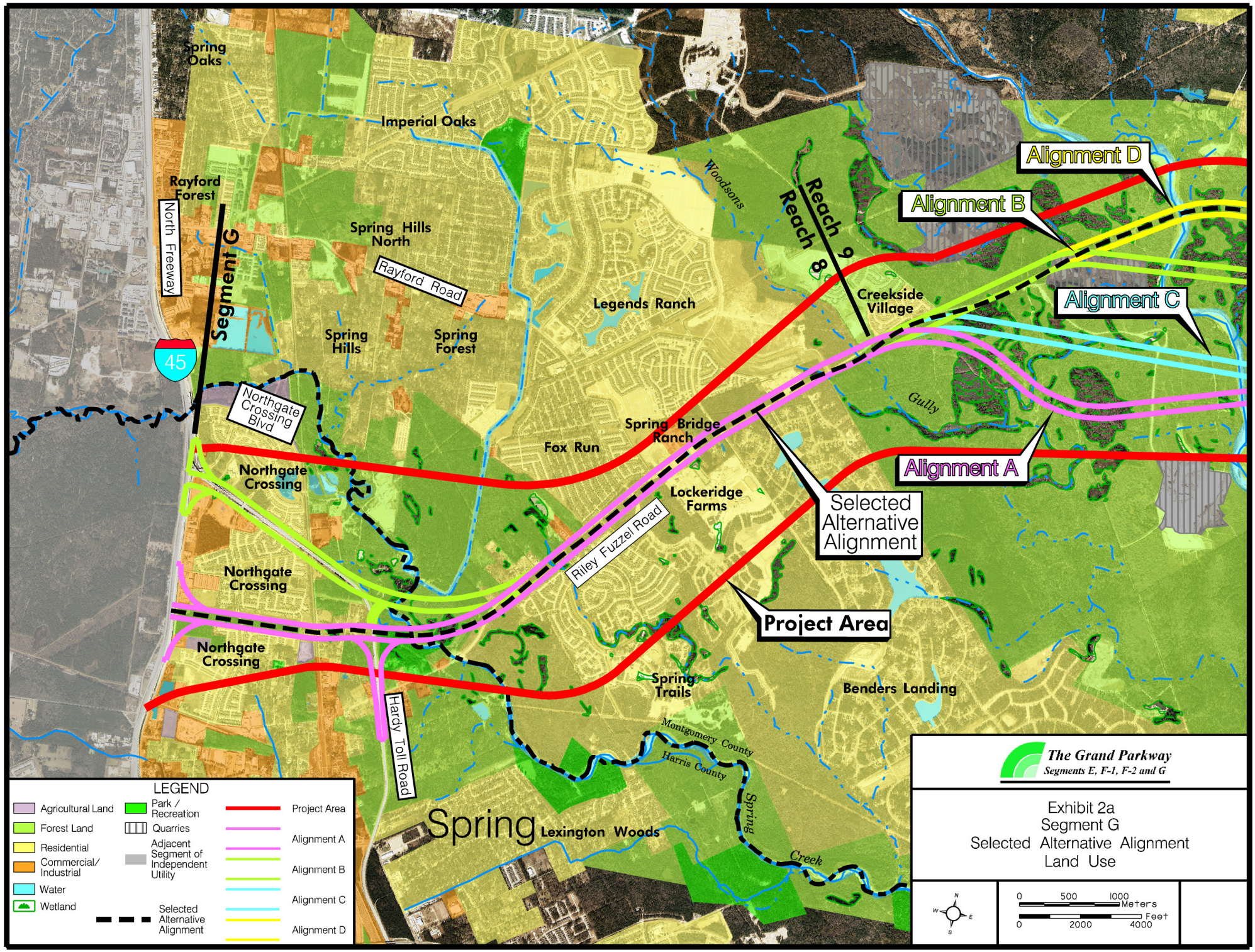

Selected Alternative Alignment
Alignment D
Alignment C
Alignment A
Alignment B
Project Area
Reach 8
Reach 9
Reach 10
Reach 11
Reach 12
Segment G
Montgomery
Harris
The Woodlands
New Caney
Porter
Spring
Kingwood
FM 242
FM 1485
FM 1314
FM 2920
59
45
494
194
North Freeway
Rayford Road
Riley Fuzzel Road
Northgate Crossing Blvd
Spring Stuebner Road
Spring-Cypress Road
Hardy Toll Road
Cypresswood Drive
Treaschwig Road
Roman - Forest Road
Community Drive
Old Ford Road
Northpark Drive
Eastex Freeway
Sorter Road
West Fork San Jacinto River
Spring Creek
Caney Creek
Golden Trails
Porter Heights
Lakewood Colony
Timberland Estates
Post Oak Estates
Silver Trails
Winchester Place
Cumberland
Valley Ranch
Creekside Village
Wood Hollow
Freeway Oaks
Riverwalk
Holly Ridge Forest
Summer Hills
Benders Landing
Spring Trails
Spring Oaks
Imperial Oaks
Spring Hills North
Rayford Forest
Legends Ranch
Spring Hills
Spring Forest
Groggans Mill
Fox Run
Northgate Crossing
Forest Ridge
Hanover Spring Village
Hanover Spring
Hanover Forest
Cypresswood Crossing
Lexington Woods
Loutta Lakes
Devonshire Woods
Candlelight Hills
Enchanted Oaks
The Grand Parkway
Segments E, F-1, F-2 and G
Exhibit 1
Segment G
Selected Alternative Alignment
N
S
E
W
0 1000 2000 Meters
0 10000 Feet

EXHIBIT 2: Land Use Within the Grand Parkway Segment G Selected Alternative


Spring Oaks
Imperial Oaks
Rayford Forest
North Freeway
Segment G
Spring Hills North
Rayford Road
Spring Hills
Spring Forest
45
Northgate Crossing Blvd
Northgate Crossing
Northgate Crossing
Northgate Crossing
Legends Ranch
Fox Run
Spring Bridge Ranch
Lockeridge Farms
Riley Fuzzel Road
Hardy Toll Road
Spring Trails
Spring Lexington Woods
Montgomery County
Harris County
Spring Creek
Benders Landing
Woodsons
Gully
Reach 8
Reach 9
Creekside Village
Alignment D
Alignment B
Alignment C
Alignment A
Selected Alternative Alignment
Project Area
LEGEND
Agricultural Land
Forest Land
Residential
Commercial/ Industrial
Water
Wetland
Park / Recreation
Quarries
Adjacent Segment of Independent Utility
Selected Alternative Alignment
Project Area
Alignment A
Alignment B
Alignment C
Alignment D
The Grand Parkway
Segments E, F-1, F-2 and G
Exhibit 2a
Segment G
Selected Alternative Alignment
Land Use
N
W
E
S
0 500 1000 Meters
0 2000 4000 Feet

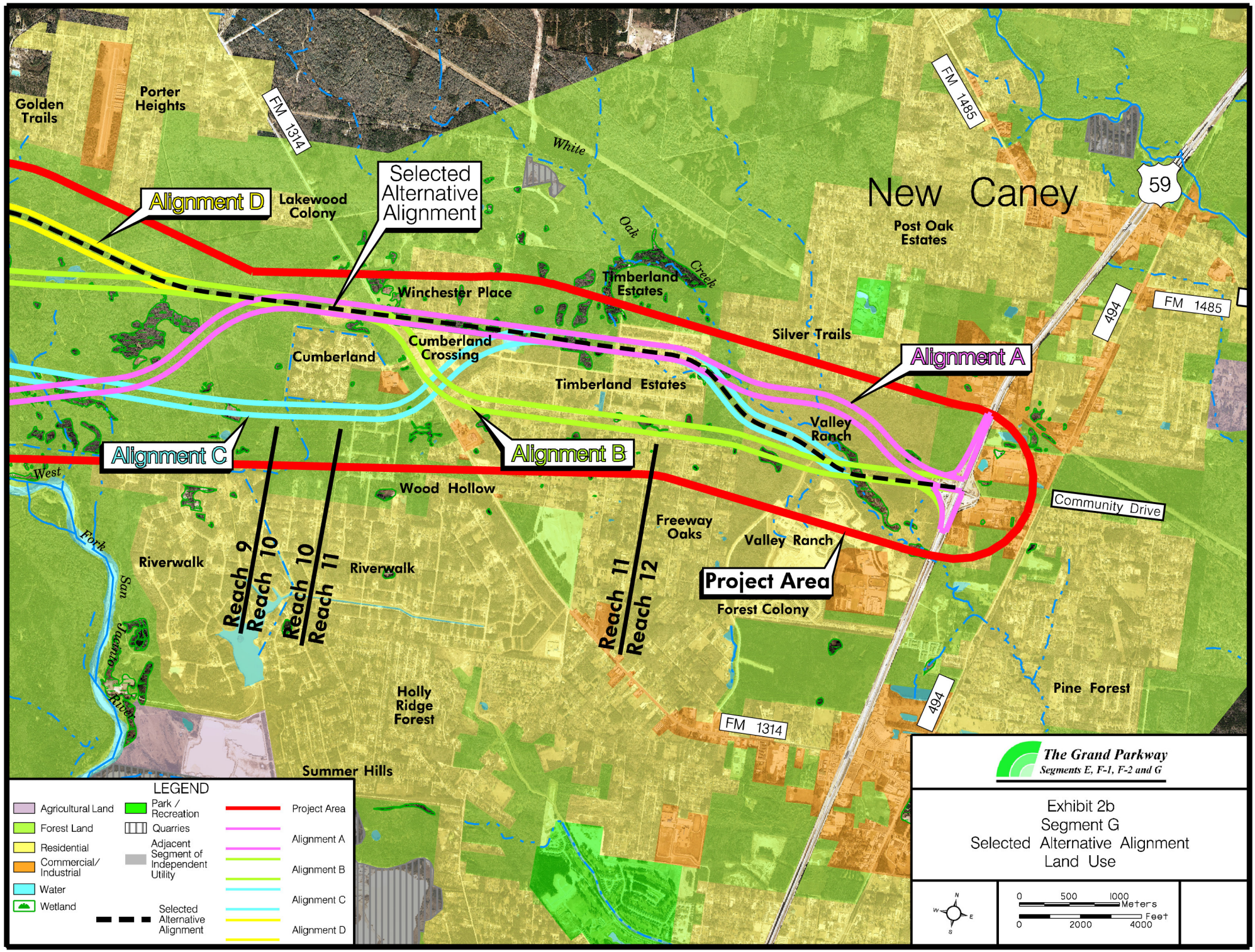

Golden Trails
Porter Heights
FM 1314
Lakewood Colony
Alignment D
Selected Alternative Alignment
White
Oak
Creek
Winchester Place
Timberland Estates
New Caney
Post Oak Estates
FM 1485
59
494
FM 1485
Silver Trails
Alignment A
Cumberland
Cumberland Crossing
Timberland Estates
Valley Ranch
Alignment C
Alignment B
West
Fork
San Jacinto River
Wood Hollow
Community Drive
Freeway Oaks
Valley Ranch
Riverwalk
Riverwalk
Reach 9
Reach 10
Reach 10
Reach 11
Reach 11
Reach 12
Project Area
Forest Colony
Holly Ridge Forest
FM 1314
494
Pine Forest
Summer Hills
LEGEND
Agricultural Land
Forest Land
Residential
Commercial/ Industrial
Water
Wetland
Park / Recreation
Quarries
Adjacent Segment of Independent Utility
Selected Alternative Alignment
Project Area
Alignment A
Alignment B
Alignment C
Alignment D
The Grand Parkway
Segments E, F-1, F-2 and G
Exhibit 2b
Segment G
Selected Alternative Alignment
Land Use
N
W
E
S
0 500 1000 Meters
0 2000 4000 Feet

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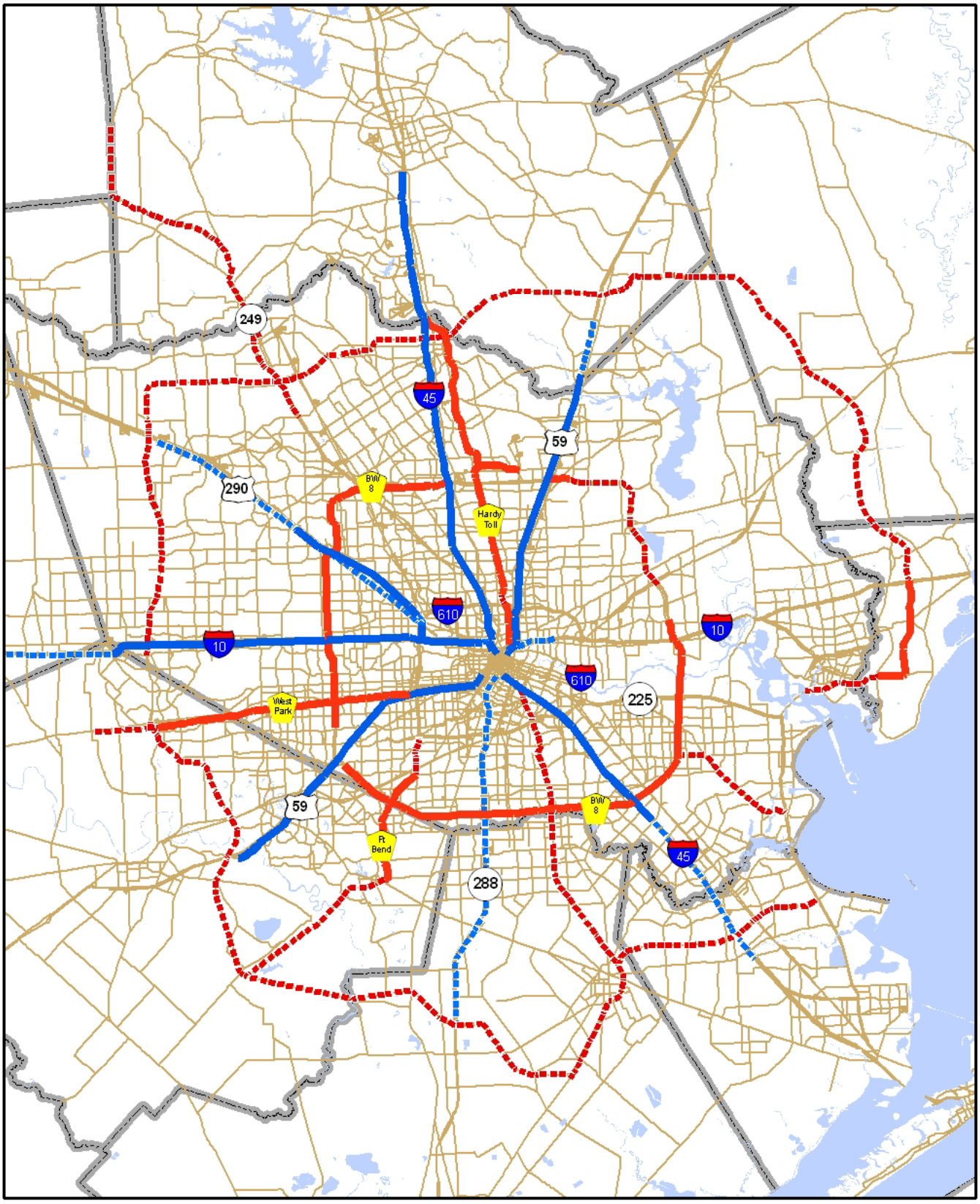
EXHIBIT 3: Proposed 2035 Regional Roadway Network (Source: H-GAC)



Legend

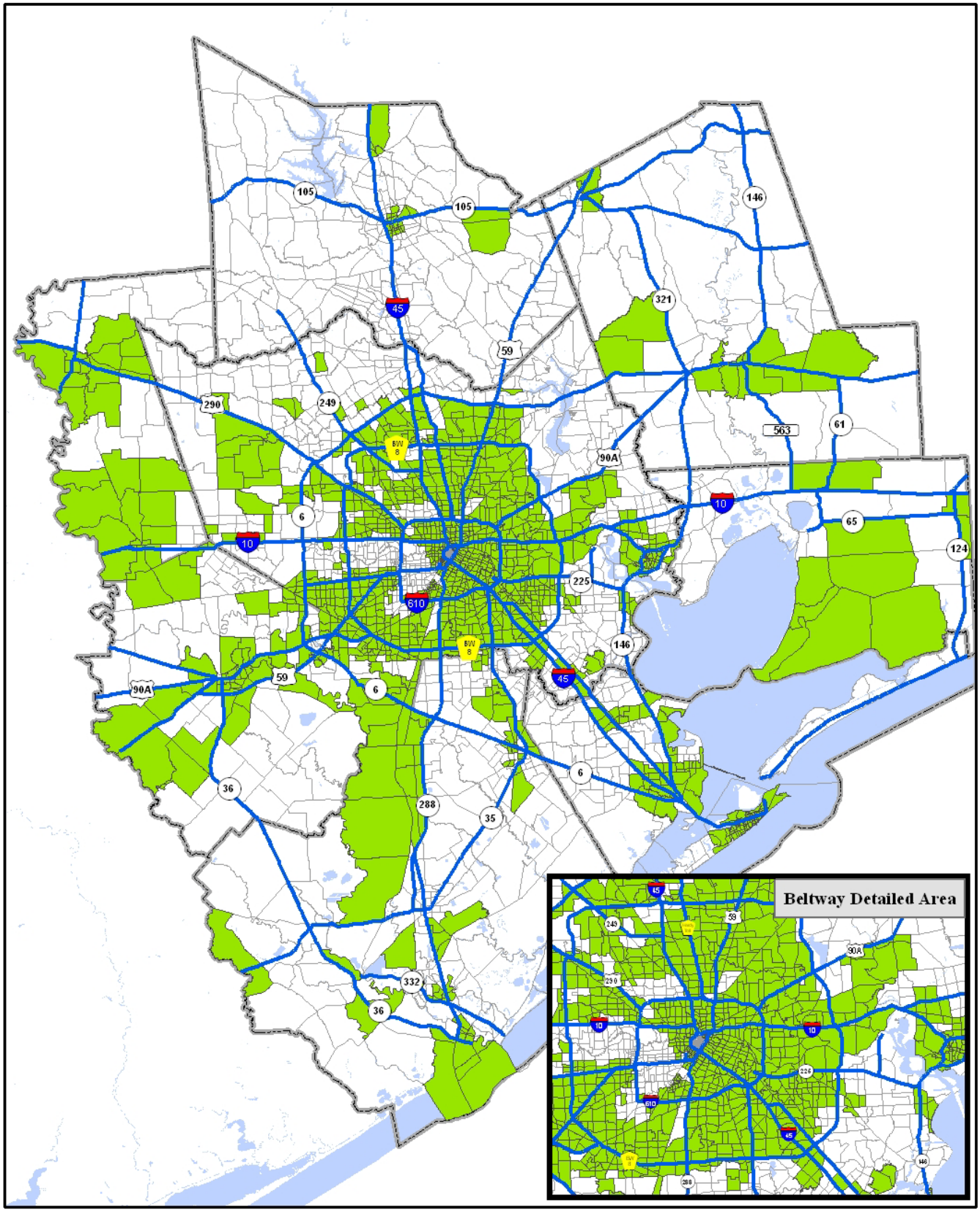
- Toll Roads
- Managed Lanes
- Future Managed Lanes
- Future Toll Lanes

Freeway, Tollway, Managed Lane System Improvements

0 1.5 3 6 9 12 Miles

N W E S

EXHIBIT 4: Environmental Justice Traffic Analysis Zones (Source: H-GAC)



Legend

Major Roads

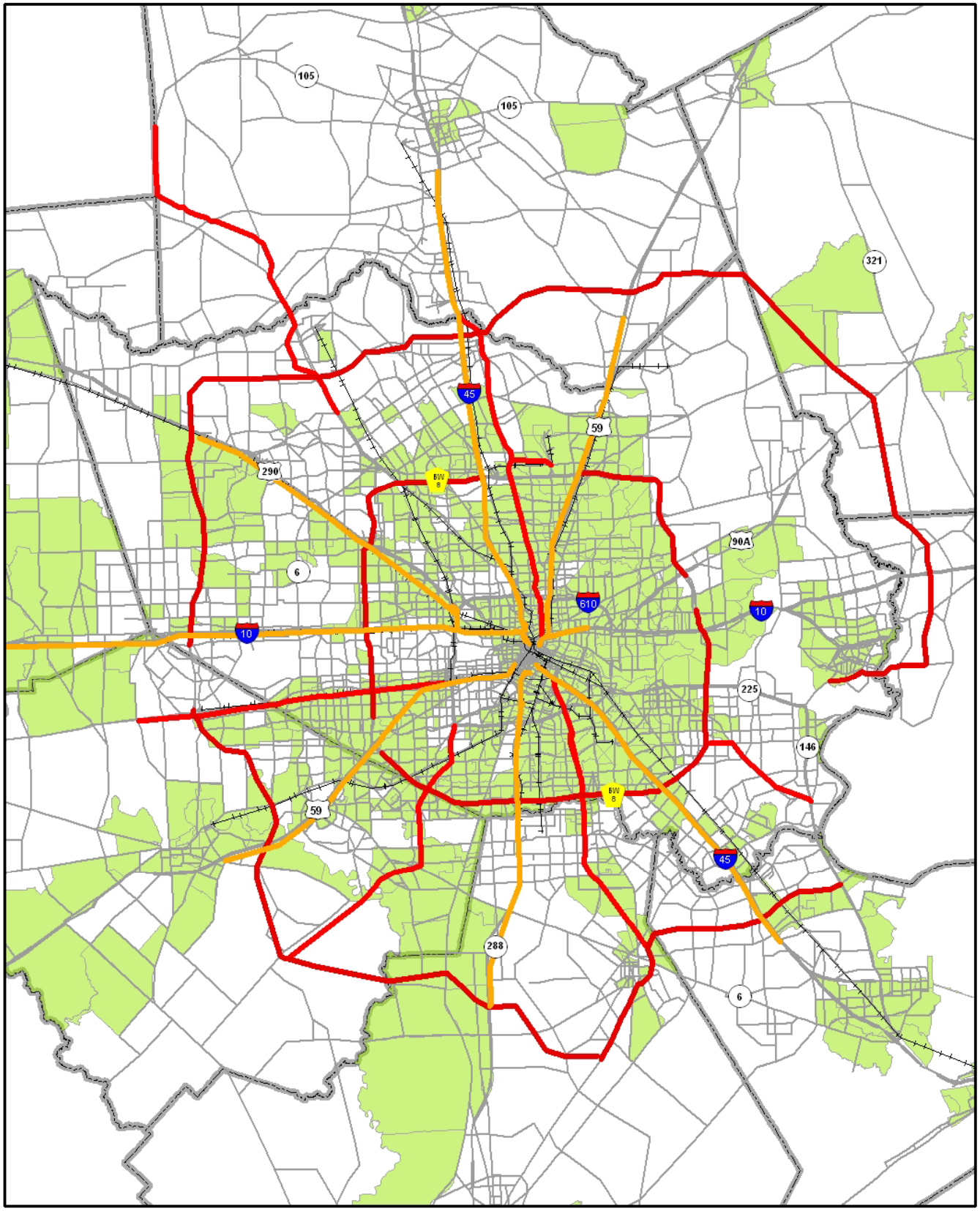
EJ Zones

Environmental Justice Zones

0 5 10 20 Miles

N W E S

EXHIBIT 5: 2035 Build Scenario Regional Roadway Network (Source: H-GAC)



Legend

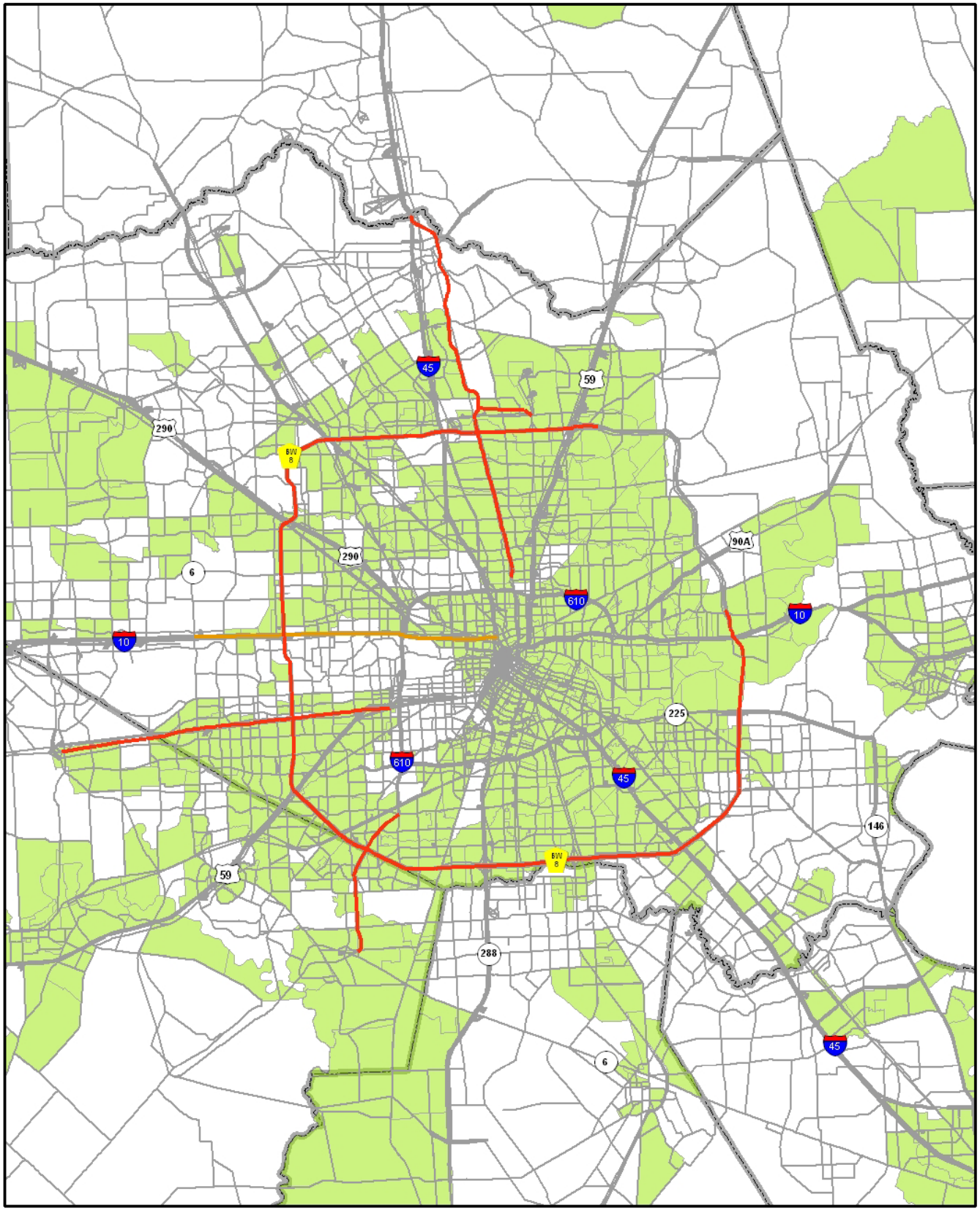
- Toll
- HOT Lane
- EJ Zones
- County Line
- Roads

2035 Toll/HOT Managed Lanes

0 3.5 7 14 Miles

N W E S

EXHIBIT 6: 2035 No-Build Regional Roadway Network (Source: H-GAC)



Legend

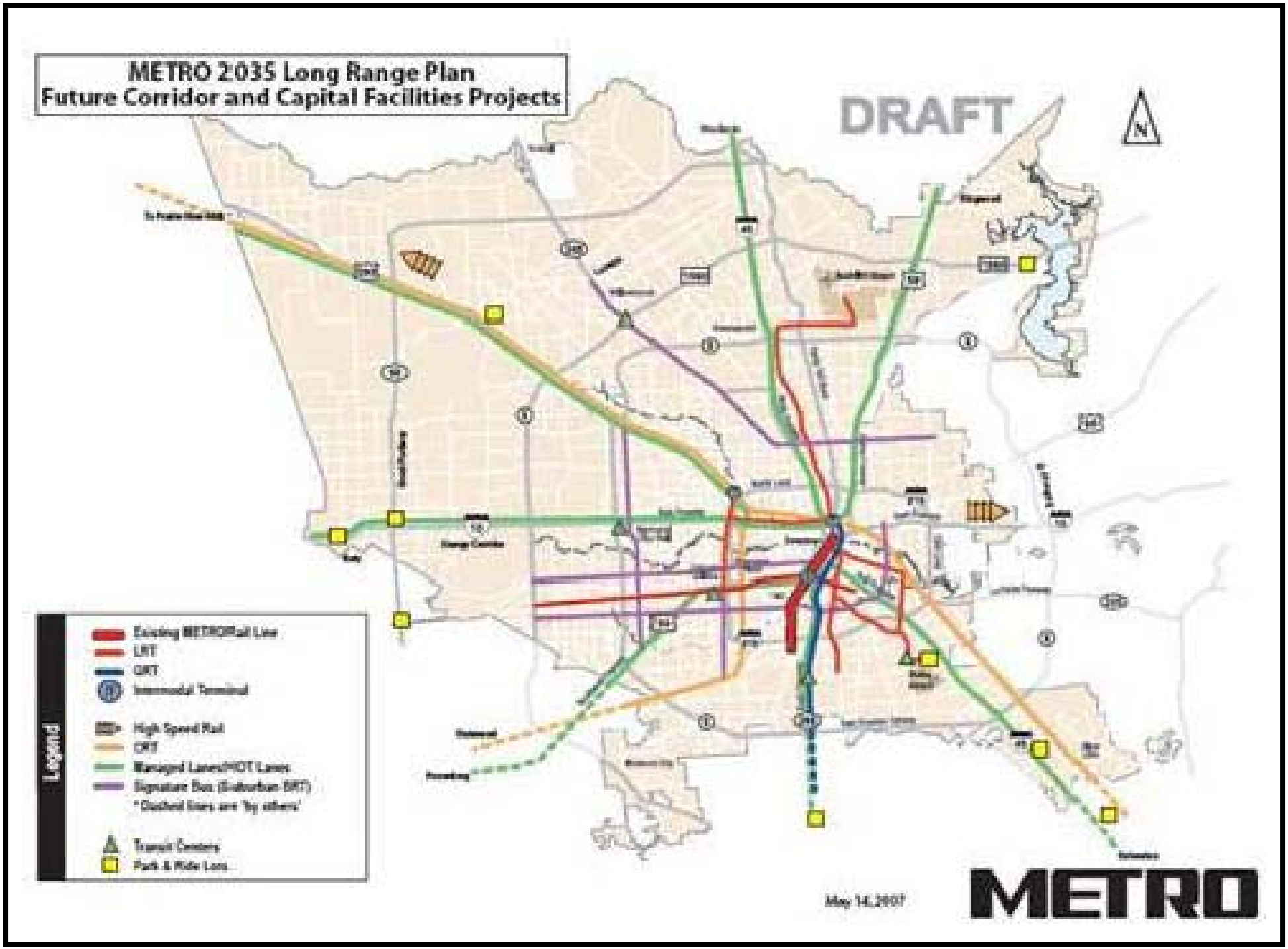
- Toll
- HOT Lane
- EJ Zones
- County Line
- Roads

2035 No Build Managed Lanes

0 2 4 8 Miles

N W E S

EXHIBIT 7: 2035 Future Corridor and Capital Facilities Projects (Source: METRO)


METRO 2035 Long Range Plan
Future Corridor and Capital Facilities Projects
DRAFT
N
Legend
Existing METRORail Line
LRT
QRT
Intermodal Terminal
High Speed Rail
CRT
Managed Lanes/HOT Lanes
Signature Bus (Suburban BRT)
* Dashed lines are 'by others'
Transit Centers
Park & Ride Lots
May 14, 2007
METRO

Appendix A: List of Mitigation Measures and Commitments

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Grand Parkway (State Highway 99) Segment G Mitigation Measures Per the Final Environmental Impact Statement and this Record of Decision

- Grade separations for all major arterial roadways that intersect the alignment to avoid termination of through traffic.
- Include intermittent frontage roads in design for property access and connectivity to major highways (IH 45 and US 59).
- Provide noise barriers where determined to be both feasible and reasonable, subject to the completion of the project design, utility evaluation, and polling of adjacent property owners. The Federal Highway Administration published a final rule updating 23 CFR 772 on July 13, 2010. This final rulemaking will require each State DOT to revise their current noise policy in accordance with this rule and submit it to FHWA for review and approval to ensure uniform and consistence application nationwide. This final rule making and the State DOT's revised noise policy becomes effective on July 13, 2011. Any final design analysis completed prior to July 13, 2011 will comply under the old rule and the old State DOT noise policy. However, any final design analysis completed after July 13, 2011 must comply with the new rule for 23 CFR 772 and the revised State DOT Noise Policy. Any subsequent project design changes may require reevaluation of the preliminary noise barrier proposal. The final decision to construct noise barriers will not be made until after project design, utility evaluation, and polling of adjacent property owners. Meetings will be held to discuss noise abatement with affected landowners prior to and/or during construction.
- Landscaping included with this project will comply with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices. In accordance with Executive Order 13112, native plant species of grasses, shrubs, and or trees will be used in the landscaping and in the seed mixes where practicable per TxDOT or similar specifications. No invasive or noxious species will be used to revegetate the ROW and soil disturbance will be minimized to ensure that invasive species do not establish in the ROW.
- Preserve vegetation in the right-of-way (ROW) to the extent feasible and practicable to minimize impacts to soil and reduce erosion.
- Use of silt fences and other erosion control measures during construction.
- Identify opportunities to reduce the ROW during the final design process.
- Complete necessary field surveys for wetlands, cultural resources, and threatened and endangered species once access is obtained.
- Provide construction detours, informative signage, and maintenance of access to residences, farms, businesses, and community facilities where practicable.

- Maintenance of the current flow of traffic on the existing roadway network will be planned and scheduled to minimize adverse impacts to the traveling public. Within construction areas, traffic control measures using standard practices would be used, as outlined in TxDOT guidelines. In addition to using these standards, news releases of construction activities and schedules would be made available to the public.
- Minimize traffic delays during construction through coordination between the Texas Department of Transportation (TxDOT), contractors, and affected neighborhoods or landowners; and construction scheduling.
- Conduct additional public coordination during the final design process regarding landscaping and noise abatement.
- Provide crosswalks, walk signals, and appropriate signage at grade-separated intersections to protect bicyclists and pedestrians. Reconstruct, as necessary, existing bicycle/pedestrian facilities in order to preserve continuity and function.
- Adhere to all federal, state, and local regulations that govern construction activities in regard to air emissions.
- Prepare a dust control plan prior to construction.
- Prepare a Storm Water Pollution Prevention Plan (SWP3) pursuant to the TxDOT manual, *Stormwater Management Guidelines for Construction Activities* to minimize the discharge of sediment laden stormwater.
- Utilize best management practices (BMPs) during construction and post-construction. Construction BMPs may include sod placement, silt fencing, and hay-bale dikes to remain in place until project completion. Utilize additional BMPs to minimize fill washing into perennial streams, intermittent drainages, and wetlands during construction; to limit movement of equipment within the construction corridor at stream and wetland crossings; and to ensure proper cleanup procedures in these areas.
- Use existing ditches for retention storage during construction.
- Use post-construction BMPs, including retention and vegetated filter strips, replanting of new and existing ditches, and seeding of ROW areas other than ditches with native plants, shrubs, and trees, as needed, following the TxDOT specifications, *Seeding for Erosion Control*.
- Notify any Municipal Separate Storm Sewer System (MS4) permittees of construction activities potentially resulting in stormwater discharges to their MS4.
- During final design, minimize impacts to source-water protection areas and/or avoid direct impacts to public and private water supply wells.
- Provide a new well or a connection to a public or private water supply system in the event of construction impacts to any water supply well.
- Seal any wells taken out of service according to the specifications of the Water Well Drillers Board of the Texas Department of Licensing and Regulation (TDLR).

- An emergency spill control pollution prevention plan will be developed and coordinated with local officials. Special stormwater management measures will be designed to isolate potentially hazardous spills, for treatment and removal, before entering an aquifer. The BMPs identified in Section V.H.1, (Surface Water) will be considered and incorporated into the final design of the Selected Alternative
- The use of established BMPs will be employed to prevent highway stormwater runoff from entering the aquifer at wellheads.
- Full compliance with all regulatory requirements of agencies (e.g., Texas Parks and Wildlife Department [TPWD], U.S. Fish and Wildlife Service [USFWS], U.S. Army Corps of Engineers [USACE], Environmental Protection Agency [EPA], and Texas Commission on Environmental Quality [TCEQ]).
- Submit a compensatory mitigation plan to the USACE as part of the Section 404 permit review process. In addition to regulated resources, include mitigation for non-regulated resources in the mitigation plan, in accordance with Provision 4(a)(ii) of TxDOT's 1998 MOU with the TPWD.
- Conduct final drainage and mitigation analyses for the project during final design to determine necessary mitigation measures at each stream and floodway crossing.
- The depths of the pipelines and their locations will be clearly marked prior to construction to prevent an accidental rupture.
- All feasible and practicable bridging of 100-year floodplains will be further evaluated during final design.
- For any proposed construction or development in a special flood hazard area (SFHA), coordinate with the county floodplain administrator for permitting.
- Design the proposed roadway and drainage improvements to handle a 100-year flood event without affecting floodways.
- Avoid, through design, National Register of Historic Places (NRHP)-eligible sites. If avoidance is not possible, consult with the Texas Historical Commission (THC) and include a mitigation plan for unavoidable impacts as part of the consultation.
- Conduct a Phase 1 Environmental Site Assessment (ESA) at each site that may cause or already has caused a hazardous materials impact to the environment. Develop a plan, based on the results of the Phase 1 ESA, to mitigate any impacts.
- Any unanticipated hazardous materials and/or petroleum contamination encountered during construction will be handled according to applicable local, state, and federal regulations and TxDOT Standard Specifications and Guidelines for handling emergency discovery of hazardous materials.
- Address issues of asbestos and lead paint during the ROW process, prior to construction.

- Relocate or avoid active oil or gas wells during construction. Handle any affected wells per the Texas Administrative Code, Title 16, Part 1, Chapter 3, Section 3.14, under supervision of the Texas Railroad Commission (RRC). Make arrangements with the well operator during the ROW acquisition process for plugging wells.
- The location of abandoned dry holes will be flagged to avoid accidental disturbance.
- Use visual mitigation measures, where reasonable, such as naturally vegetated medians, minimized ROW clearing, design specifications to blend into the landscape, and promotion of roadside native wildflower programs.
- Native plants will be considered to improve the visual aesthetics and to control the introduction of invasive species.
- Where reasonable and feasible, existing trees within the proposed ROW, but not within the defined clear zone, will be retained in the proposed landscaping to block the view of the roadway from adjacent properties.
- Install roadway lighting systems in areas of entrance/exit ramps and toll collection facilities. Use low-impact, downward-directional type lighting systems.
- Open burning will not be used to dispose of vegetative debris.
- All reasonable safety considerations to protect the life and health of the construction workers, the public, wildlife, and property will be exercised.
- Limit construction to “noise tolerant periods.”
- The construction contractor will be responsible for compliance with all federal, state, and local laws, regulations permits, and ordinances; as well as pollution control on haul roads, borrow and other material pits, waste material disposal areas, and other potential pollutants, which could be accomplished with erosion control features such as berms, dikes, temporary seeding, sediment traps, fiber mats, silt fences, slope drains, mulches, crushed stone, and others as specified by TxDOT guidelines.

Appendix B: Coordination Letters

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Division of Ecological Services
17629 El Camino Real #211
Houston, Texas 77058-3051
281/286-8282 FAX 281/488-5882

June 11, 2010

Bryan W. Phillips
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, Texas 78701-2483

Dear Mr. Phillips:

Thank you for your letter, dated March 29, 2010, concerning the proposed construction of Segment G of State Highway 99, which is also known as the Grand Parkway. The proposed project will extend for approximately 13.7 miles between IH 45 and US 59 in Harris County and Montgomery County, Texas.

The Texas Department of Transportation (TxDOT), as the designated non-federal representative for the Federal Highway Administration, has determined that the proposed project will have no effect on the federally listed red-cockaded woodpecker (*Picoides borealis*). TxDOT has also determined that the project may affect, but is not likely to adversely affect the Texas prairie dawn-flower (*Hymenoxys texana*).

The U.S. Fish and Wildlife Service (Service) concurs with TxDOT's determination that the proposed project is not likely to adversely affect the Texas prairie dawn-flower. This concurrence is based upon a review of your project information and Service files. Please note that no coordination or contact with the Service is necessary for no effect determinations, nor does the Service concur with no effect determinations.

In the event the project changes or additional information on the distribution of listed or proposed species or designated critical habitat becomes available, the project should be reanalyzed for effects not previously considered.

Our comments are provided in accordance with the provisions of the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

Please contact me at 281/286-8282 if you have questions or need further assistance.

Sincerely,

Edith Erfling

Edith Erfling
Acting Field Supervisor, Clear Lake ES Field Office

TAKE PRIDE® IN AMERICA

From the Office of
Larry E. Brown, Plant Taxonomist
6223 Henniker Drive
Houston, Texas 77041 - 5844

Home Phone Number: 832 - 467 - 3348
Cell Phone Number: 832 -515 - 8174
E-mail Address: Larry-theplantman@att.net
Alternate E-mail Address: Ruby.brown@att.net

June 04, 2009

To Whom It May Concern, I have been hired by PBSJ to help with a survey for *Hymenoxys texana* (Prairie Dawn) along the proposed right of way of Segment G of the Grand Parkway. This segment extends from IH 45 to U.S. 59 in Harris and Montgomery Counties Texas.

Methods Used in Survey

Prairie dawn only grows with early flowers from late February into March and forming seeds and later flowers in April. It occurs as small colonies on sparsely vegetated areas of pale, fine-sandy, and compacted soil. The 2009 survey was in April thus numerous plants in full anthesis will be on suitable sites. These sites are sometimes at the base of mima (pimple) mounds. Prairie Dawn is a heliophyte, growing in full sun in undisturbed native prairies. It is not present under trees in woodlands nor on highly disturbed fields such as those caused by plowing and thus overturning the top soil. Soil disturbed sites are often covered with a mixture of introduced and native weedy species thus not the vegetation of native prairies.

PBSJ provided me with fine aerial photographs with the current alignment clearly indicated. I used these aerials to identified potential sites. One site was in a open areas with a pale colored soil exposed. The potential habitat site is outlined in red lines at site 1 on sheet 7 of 20. The pale color could have potentially been due to the death of plants, from hay stacks, or small sandy roads and other man made factors. Areas identified as having no potential Prairie Dawn habitat were densely wooded areas, open areas with a uniform brown color, and those with contour lines show plowed soils.

Potential Prairie Dawn habitat was located at site 1. Land owner permission was denied on this site. Site 1need further investigation after land owner permission is granted.

Qualifications

I have a Ph.D. in plant taxonomy from Texas A&M University. I have conducted about 100 surveys for Prairie Dawn over the past 20 years and have some 30 papers published in floristic plant biology. I am also the co-author of the federal recovery plan for *Hymenoxys texana*.

Survey conditions

The survey of section F-2 in 2009 was conducted in April. At this time Prairie Dawn plants are in full anthesis on suitable sites. Three full days were devoted to this segment. We motored to

the potential sites picked out on the aerials but most of the time we needed to walk for access to them. Nathan Olday from PBS&J was on the survey each day and Jeremy Marshall from PBS&J also assisted with the surveys

Summary of survey

We saw no Prairie Dawn plants during the April 2009 survey. Eight sites seemed to have suitable habitat, but at sites 8 and 12 we were unable to verify Prairie Dawn there because we were unable to secure permission from the land owner for a close-up examination.

Larry E. Brown,

Larry E. Brown

Plant Taxonomist and
Environmental Consultant

TEXAS PARKS & WILDLIFE

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Commissioners

Peter M. Holt
Chairman
San Antonio

T. Dan Friedkin
Vice-Chairman
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Mark E. Bivins
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J. Robert Brown
El Paso

Ralph H. Duggins
Fort Worth

Antonio Falcon, M.D.
Rio Grande City

Karen J. Hixon
San Antonio

Margaret Martin
Boerne

John D. Parker
Lufkin

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

March 13, 2009

Dianna Noble
Environmental Affairs Division
Texas Department of Transportation
125 E. 11th Street
Austin, Texas 78701-2483

RE: Grand Parkway/SH 99 Segment G, from IH 45 to US 59, Harris and Montgomery Counties. CSJs: 3510-06-001, 3510-06-903; 3510-07-001; 3510-07-901

Dear Ms Noble:

Texas Parks and Wildlife Department (TPWD) received your request regarding an environmental review of the proposed project. Department staff reviewed the information provided for possible impacts to fish and wildlife resources of the state.

The project entails the proposed construction of Segment G of the Grand Parkway, which would consist of an approximately 13.74-mile long, four main-lane controlled access highway with intermittent frontage roads located within a 400-foot right-of-way (ROW). The proposed roadway would reduce the through radial traffic along SH 249 and IH 45 and would provide a continuation of the existing and planned portions of the Grand Parkway.

Impacted Areas

The preferred alternative alignment would be approximately 13.74 miles in length. The preferred alignment would have the following impacts:

352.8 acres of forest areas, of which, 129.9 acres consist of bottomland hardwoods
40.2 acres of forested wetlands
24.3 acres of non-forested wetlands
14 stream crossings including 4 major crossings at Spring Creek, Woodsons Gully, West Fort San Jacinto River, and White Oak Creek
95.42 acres of floodplain

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

To manage and conserve the natural and cultural resources of Texas and to provide hunting, fishing and outdoor recreation opportunities for the use and enjoyment of present and future generations.

Cumulative Impacts

The FEIS states that compensatory mitigation will be considered for both regulated and non-regulated habitats and that the Grand Parkway Association (GPA) would coordinate with the federal and state natural resource agencies and project stakeholders to develop a final compensatory mitigation plan that protects, enhances, and preserves the integrity of the natural environment. Although the proposed project is linear, the construction of the roadway would encourage the development of properties adjacent to project area and further impact natural resources throughout the area. The Council on Environmental Quality (CEQ) regulations (40 CFR §1500-1508) that implement the National Environmental Policy Act require cumulative effects to be addressed. Cumulative effects are the total effect, including both direct and indirect effects, on a given resource, ecosystem and human community of all actions taken. Indirect effects would include commercial and residential development, other infrastructure, etc.

TPWD recommends considering the cumulative impacts to fish and wildlife resources resulting from the construction of SH 99 in determining the needs for compensatory mitigation needs. Particular attention should be paid to the Katy Prairie region which serves as an important wintering area for waterfowl and has faced significant impacts due to urban sprawl from the Houston region.

Forested Area

The Segment G corridor encompasses a significant forested area and these areas within Harris and Montgomery Counties are continually being lost as the Houston urban sprawl continues outward. Impacts to this relatively unfragmented pine and hardwood forest and other forested areas within the project area should be minimized and appropriate compensatory mitigation should be considered for any unavoidable impacts due to both direct and cumulative sources. Coordination of all impacts to the forested areas should be coordinated with Jamie Schubert with our Coastal Program; he can be reached at 281-534-0135.

Stream Crossings

Stream crossings, especially major stream crossing, can be particularly disruptive to habitat and wildlife behavior. Streams, including the aquatic waterway and associated riparian zone, are extremely important nesting, foraging, and travel corridors for a broad array of aquatic and terrestrial wildlife, and often provide significant reservoirs for native plant species and biodiversity in general. TPWD

recommends that bridges and other stream crossing be designed to minimize barriers to hydrology, vegetation and wildlife. Bridge spans should be sufficient to avoid emergent vegetation and streamside wetlands, and permit re-establishment of riparian vegetation. Channelization should be held to the absolute minimum necessary to protect transportation infrastructure.

Mitigation

Section 4.10.3 of the FEIS discussed proposed mitigation of regulatory and non-regulatory resources. According to the FEIS the assessment of mitigation efforts are still being considered and have not been finalized. Mitigation of all impacts to the aquatic resources (both regulated and non-regulated areas) should be coordinated with Jamie Schubert with our Coastal Program.

Native Vegetation

Section 4.10.3.2 of the FEIS states that native plant species of grasses, shrubs, and/or trees, where practicable, would be used in revegetation efforts within the project area. TPWD recommends utilizing site-specific native plant species in the restoration of disturbed areas.

TPWD advises review and implementation of these recommendations. If you have any questions, please contact Amy Hanna at (361) 576-0022.

Sincerely,

Amy Hanna

Amy Hanna
Wildlife Habitat Assessment Program
Wildlife Division

/ajh:5589

See Theiss - HOU

7 29 09

Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

July 21, 2009

Section 106/Antiquities Code of Texas: Review and Comments (Permit #5311)
State Highway (SH) 99 (Segment G) Roadway Project (CSJ: 3510-06-001, -06-903, -07-901)
Houston District; Harris and Montgomery Counties

Dr. James E. Bruseth
Department of Antiquities Protection
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Tx DOT RECEIVED
AUG 0 6 2009
HOUSTON MAIL OPERATIONS

SCANNED ON
AUG 0 6 2009
MAIL OPERATIONS HOUSTON

Dear Dr. Bruseth:

The proposed project will be undertaken with Federal funding. In accordance with Section 106 and the First Amended Programmatic Agreement among the Texas Department of Transportation (TxDOT), the Texas State Historical Preservation Officer (TSHPO), the Federal Highway Administration (FHWA), and the Advisory Council on Historic Preservation and the Antiquities Code of Texas and the Memorandum of Understanding between the Texas Historical Commission (THC) and TxDOT, this letter continues consultation for the proposed undertaking.

The proposed project would construct the State Highway (SH) 99 outer loop; between Interstate Highway (IH) 45 and United States Highway (US) 59, in Harris and Montgomery Counties. The proposed roadway would be a four-lane, controlled-access toll road with intermittent frontage roads located within a 400-foot (ft) wide right-of-way (ROW). The proposed project includes bridges over drainages and grade separations at various intersections. The proposed project is approximately 13.6 miles in length. Approximately 781 acres of new right-of-way (ROW) would be acquired; all work would remain within the proposed 400-ft wide corridor. The area of potential effect is defined as the project length, the proposed ROW and any existing ROW that may be utilized, and the depth of construction impacts, no more than 75-ft in depth. This additional consultation is the result of a reevaluation of the proposed project for inadvertent discrepancies with previously surveyed areas within the APE and attempting to rectify these discrepancies before the proposed ROW that was denied right-of-entry (ROE) is acquired and will soon need an archeological survey as well.

PBS&J, a consultant for the Houston District, conducted a background review and an intensive survey under Permit #5311 for the proposed project. Four previously recorded archeological historic properties were identified within the APE of this proposed segment, 41MQ197, 41MQ198, 41MQ199, and 41MQ225; three of these are prehistoric occupation sites and one (41MQ225) a historic-age farmstead and homestead. The Geologic Atlas of Texas, Houston Sheet (Bureau of Economic Geology: 1982) indicates that the proposed project APE is within an area mapped as Pleistocene Lissie Formations. The Lissie surface has negligible potential to contain artifacts dating from demonstrated, culturally relevant periods. The Soil Survey of Harris County, Texas (USDA-SCS: 1976) indicates that the proposed project APE crosses areas mapped as the Katy-Aris soil association, Clodine-Addicks-Gessner soil association, Wockley-Gessner soil association, and the Segno-Hockley soil association.

DPD

The Houston Potential Archeological Liability Map (PALM) indicates the proposed project crosses the following PALM map units. PALM Unit #4, recommending no archeological survey needed. PALM Unit #3a, recommending deep mechanical trenching, PALM Unit #2a recommending surface survey of intact pimple mounds only. PALM Unit #2 recommending an archeological surface survey only. PALM Unit # 1, recommending an intensive archeological survey with shovel-testing and mechanical trenching, if deep impacts are anticipated.

PBS&J surveyed approximately 206.4 acres during this survey. A total of 161 shovel-tests were excavated during the pedestrian survey. No unrecorded cultural resources were encountered during the survey. Recorded sites 41MQ197-198 and 41MQ225 were all reexamined to assess integrity, archeological materials were encountered at all sites. PBS&J recommends that no further archeological work is needed within the portion of the APE that has had the inventory completed. They further recommend that Site 41MQ197 is the only site that warrants eligibility testing for possible listing on the National Register of Historic Places or as a State Archeological Landmark.

Please find attached for your review and comments the PBS&J draft report; *An Cultural Survey of the Preferred Alignment for Segment G of the Grand Parkway Project, Harris County, Texas*. TxDOT recommends that the report is satisfactory and acceptable; minor comments have already been submitted to PBS&J. PBS&J has already responded to TxDOT's comments and are making the appropriate changes for the final report. TxDOT requests your concurrence that; 1) the areas surveyed by this 2009 survey are complete and do not warrant any additional archeological investigation, 2) Site 41MQ197 warrants eligibility testing if avoidance is not feasible, and 3) the remainder of the proposed project APE that has been denied ROE still warrants archeological investigation to complete the inventory. TxDOT further recommends that the remainder of the archeological inventory be deferred to allow NEPA processing and property acquisition to proceed; once the property has been acquired, TxDOT shall be obligated to complete the inventory. If you have no objections to the above request and recommendation, and have no comments on this report and find it acceptable, please sign below to indicate your concurrence and stamp the draft cover as acceptable.

Thank you for your consideration in this matter. If you have any questions or further need of assistance, please contact Allen Bettis of the TxDOT Archeological Studies Program at (512) 416-2747.

Sincerely,

Allen C. Bettis Jr.
Archeological Studies Program
Environmental Affairs Division

cc w/o attachments: Karla Cordova – PBS&J – Houston
Susan Theiss – Houston District APD
ACB DGN PA File

Concurrence: 7-23-09 Date:
for F. Lawerence Oaks, State Historic Preservation Officer

Document No. 090126
PBS&J Job No. 100008903

A Cultural Resources Survey of the Recommended Alignment for Segment G of the Grand Parkway Project Harris and Montgomery Counties, Texas

Texas Antiquities Permit No. 5311
CSJ Nos.: 3510-06-903, 3510-06-001, and 3510-07-901

Prepared for:

Texas Department of Transportation
7721 Washington
Houston, Texas 77251

DRAFT REPORT ACCEPTABLE
Please submit 20 final report copies
by
for F. Lawerence Oaks
State Historic Preservation Officer
Date 7-23-09
Track#

Prepared by:

PBS&J
1250 Wood Branch Park Drive
Suite 300
Houston, Texas 77079

Principal Investigator:
Karla J. Córdova

Report Author:
Darren Schubert
Philip Bishop

July 2009

Appendix C: Comments and Responses

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Responses to Comments on the Segment G FEIS

The Public Comment period for the SH 99, Grand Parkway Segment G Final Environmental Impact Statement (FEIS) was open from February 6, 2009 to March 16, 2009. During this time, the public was invited to submit comments in written format or by e-mail. The Segment G FEIS was circulated to federal, state, and local agencies during this period for review, and was made available to the public at the following seven locations:

1. Grand Parkway Association, 4544 Post Oak Place, Suite 222, Houston, TX 77027;
2. Texas Department of Transportation, 7721 Washington Ave., Houston, TX 77007;
3. Houston Public Library, (Texas Room) 500 McKinney, Houston, TX 77002;
4. Harris County Public Library, Baldwin Boettcher Branch, 22248 Aldine Westfield Rd., Humble, TX 77338
5. Harris County Public Library, Kingwood Branch, 4102 Rustic Woods, Kingwood, TX 77345;
6. Harris County Public Library, R.B. Tullis Branch, 21569 US Hwy 59, New Caney, TX 77357;
7. Montgomery County Library, South Regional Branch, 2101 Lake Robbins Drive, The Woodlands, TX 77380

In addition, hard copies or CDs of the document were available by request for a fee, and the document was free to view at the website www.grandpky.com. All comments were considered by the Federal Highway Administration (FHWA).

The tables below present 1) a list of commenters along with letter-number references for each comment made by that commenter, and 2) comments received along with responses from the Grand Parkway Association (GPA) in coordination with the Texas Department of Transportation (TxDOT) and the FHWA (see Figure 1 for further explanation). It should be noted that each of the comments received on the Segment G FEIS were either addressed in the text of the FEIS or the comments were addressed in Response to Comment on the Draft EIS (DEIS) or in Volume IV of the FEIS. Each of the responses below has been referenced to the appropriate location in the FEIS.

For organizing responses (Table 2 below), comments were categorized into one of seven categories, as follows:

A. Need for and Purpose of the Project
B. Alternatives
C. Socioeconomic Issues
D. Natural and Physical Environmental Issues
E. Indirect and Cumulative Impacts
F. Environmental Documentation
G. General Comment

Figure 1. How to Find Comments and Responses

Name of person making the comment

Table 1. Segment G FEIS Commenter Index

Last Name	First Name	Representing	Type Received Written/ E-mail	Commenter Number	Comment(s) Made (see Table 2 for Responses)
Doe	John	Himself	Written	RG-1	A1

Organization represented

Number label assigned to original comment

Category/Number combination that corresponds to comment in Table 2 (see below left)

One of seven categories used to group comments

Table 2. Segment G FEIS Comments and Responses

Comment Category	Comment	Response
A	**Need for and Purpose of the Project**	
A1	The text or summary of the comment made by the person named in Table 1 will appear here.	The response from the Study Team will appear here.

Category and sequential number assigned to each comment made

Comment submitted

Study Team's response

Table 1. Segment G FEIS Commenter Index

Last Name	First Name	Representing	Type Received	Commenter Number[1]	Comment(s) Made[2] (See Table 2 for Responses)
Andrews	Marie	Self	Email	RG-001	A1, B1, B2, B3, C1, C2, D1, D2, D3, D4, E1
Bennatt	Ted	Self	Email	RG-002	F1
Bouffard	Rod	Benders Landing Property Owners Association	Letter	RG-003	C3, D4
Collins	Robert	Commissioner Ed Chance	Email/Letter	RG-004	A2, B4, G2
Collins	Jeff	Self	Email	RG-005A	F2
Collins	Jeff	Self	Email	RG-005B	B4
Cox	Frank	Self	Email	RG-006	A2, B4
Daniel	Shane	Self	Email	RG-007	A2, B4, G2
Gamble	Nancy	Benders Landing Association	Email	RG-008	D4
Hanna	Amy	Texas Parks and Wildlife (TPWD)	Letter	RG-009	D6, D7
Holcomb	Jim	Self	Email	RG-010	A2, B4
Jarrard	Brian	Self	Email	RG-011	B4
Kohl	Willis	Self	Email	RG-012	B2, D3, D4
Lenz	Paula	North Houston Association (NHA)	Email/Letter	RG-013	A2, B4
Mihalov	Lesa	Self	Email	RG-014	G1
Neagle	Colin	Self	Email	RG-015	B4
Rehak	Bob	Self	Email	RG-016	D1, D5
Vaughan	Skip	Self	Email	RG-017	A2, B4, G1

Comments highlighted with a black box in the last column have been identified as comments received on the FEIS dated January 2009 that are new and/or substantive.

Table 1. Segment G FEIS Commenter Index (Cont.)

Last Name	First Name	Representing	Type Received	Commenter Number[1]	Comment(s) Made[2] (See Table 2 for Responses)
Widacki	A.J.	Self	Email	RG-018A	B4, G1
Widacki	A.J.	Self	Email	RG-018B	A2, B4
Woodward	Carl	Self	Email	RG-019	D8

Notes: [1] The "Commenter Number" (e.g., "RG-3") is a label given to the original comment (i.e., email or letter) and is composed of the Segment G document name ("R" for ROD and "G" for Segment G) and an assigned number ("-3"). This label is shown in a box on a copy of the actual correspondence, all of which are available for viewing at the Grand Parkway website www.grandpky.com.

[2] Each of the "Comment(s) Made" corresponds to a comment category and number shown in the far left column of Table 2. The letter (A through G) equals the category (e.g., "Need for and Purpose of the Project"), and the number equals the comment within that category.

Comments highlighted with a black box in the last column have been identified as comments received on the FEIS dated January 2009 that are new and/or substantive.

Comments highlighted with a black box in the last column have been identified as comments received on the FEIS dated January 2009 that are new and/or substantive.

Table 2. Segment G FEIS Comments and Responses

Comment Category[1]	Comment	Response
A	Need for and Purpose of the Project	
A1	Commenter does not see that the Grand Parkway economical.	As indicated in Segment G FEIS Volume IV, Section 2 response to comment A1, Segment G has been identified by H-GAC, in their 2025 RTP and 2035 RTP as a needed project to improve the Houston region's mobility. As noted in the FHWA publication *The Importance of Purpose and Need in Environmental Documents* (September 18, 1990), the purpose and need in an EIS ". . . establishes why the agency is proposing to spend large amounts of taxpayers' money while at the same time causing significant environmental impacts." The purpose and need section explains that the "expenditure of funds is necessary and worthwhile and that the priority the project is being given relative to other needed highway projects is warranted. In addition, although significant environmental impacts are expected to be caused by the project, the purpose and need section should justify why impacts are acceptable based on the project's importance." Segment G has been identified by the Houston-Galveston Area Council (H-GAC) in their 2035 Regional Transportation Plan (RTP) as a needed project to improve the Houston region's mobility. The Grand Parkway Segment G is included in the H-GAC's 2035 RTP and FY 2008-2011 Transportation Improvement Program (TIP), as amended. On August 24, 2007, the H-GAC adopted the 2035 RTP and 2008-2011 TIP. The USDOT (FHWA/Federal Transit Authority [FTA]) found the 2035 RTP and 2008-2011 TIP to conform to the SIP on November 9, 2007. The construction cost estimate for Segment G is included in Volume II, Section 4.4 of the FEIS. See also response to Comment C2 in this table regarding loss of property value.
A2	Commenter states although there will be some environmental impact due to the road construction, the long-term environmental benefits of more efficiently moving traffic will far outweigh the minor current detriments.	Comment acknowledged.
B	Alternatives	
B1	Commenter noted that the Grand Parkway should connect to the Hardy Toll Road.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment B12, the use of the Hardy Toll Road corridor for both the Grand Parkway and the Hardy Toll Road from IH 45 south to the Riley Fuzzel crossing was examined as an alternative. Even with the additional right-of-way (ROW), preliminary designs of this alternative showed many operational deficiencies. The primary operational deficiency was insufficient weaving distances for both westbound/ northbound Grand Parkway/Hardy and eastbound/southbound Grand Parkway/ Hardy.

Comments highlighted with a black box in the last column have been identified as comments received on the FEIS dated January 2009 that are new and/or substantive.

Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
B	Alternatives	
B1	(Cont.)	(Cont.) Additionally, preliminary designs showed insufficient capacity on direct connector ramps, substandard geometry required on the Northbound IH 45 to Eastbound Grand Parkway connector, and that the existing ramps to Northgate Crossing Boulevard and the Hardy / IH 45 frontage roads would need to be eliminated. These deficiencies made the alternative undesirable to carry forward as the Preferred Alternative Alignment.
B2	Commenter is concerned that the Grand Parkway will not improve traffic congestion problems in the area and may make them worse.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment B5, a comparison of the Build Alternative versus No-Build Alternative relative to existing and future traffic volumes in the area is presented in Section 2.2, Volume II in the DEIS. Almost all of the arterial and collector facilities are expected to see a decrease in traffic volumes in 2015 and 2025 once Segment G of the Grand Parkway is constructed, as this portion of the freeway is expected to divert travelers from slower, more congested roadways. Because the Grand Parkway will be on new alignment, the disruption to existing traffic should be minimal because the majority of the construction activity will be along the new roadway.
B3	Commenter opposes the Preferred Alternative Alignment as presented in the FEIS.	Comment acknowledged.
B4	Commenter supports the Preferred Alternative Alignment as presented in the FEIS.	Comment acknowledged.
C	Socioeconomic Issues	
C1	Commenter is concerned with community cohesion.	As indicated in response Comment C14 in Volume IV, Section 2 of the FEIS the impacts of the project on community cohesion, as well as the social impacts, are addressed in the FEIS in Section 4.3.1, Volume II.
C2	Commenter is concerned about property values.	As indicated in Segment G FEIS, Volume IV, Section 2 response to Comment C8, the FEIS addresses economic impacts from the construction of the alternative alignments under the Build Alternative and for the No-Build Alternative for Segment G of the Grand Parkway. More specifically, as stated in the FEIS, Appendix L in Volume III provides more detailed information on tax and employment impacts. Additionally, please refer to Section 4 of Volume I or Section 5 of Volume II in the FEIS for indirect and cumulative impacts assessment.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
C	Socioeconomic Issues	
C2	(Cont.)	(Cont.) The 2001 National Cooperative Highway Research Program (NCHRP) Report 456, *Guidebook for Assessing the Social and Economic Effects of Transportation Projects* (D. Forkenbrock and G. Weisbrod), notes that "changes in property values are driven by, and hence mirror, the value associated with local changes in accessibility, safety, noise, visual amenity, community cohesion, and business productivity. In general, a transportation project would only lead to changes in property values (and in subsequent land use) if it caused a direct change in one or more of these other local factors that affect the desirability of a location" (p. 159). "The property value effects of an individual transportation project are often positive in some areas and negative in other areas. The variability of these effects results from differences in the individual factors: some effects, such as accessibility, can occur over a wide area, while other effects, such as noise, often involve a much smaller area. A new highway may reduce property values adjacent to the route between off-ramps because of the greater noise and reduced view, but increase property values near off-ramps because of the improved accessibility and potential business productivity. . . The property value effects of an individual transportation project can differ for residential and commercial land" (p. 161). "The estimation of monetary values is not only inexact, it also raises public concern over whether some property owners would potentially reap future windfalls in wealth, while others would potentially suffer from unavoidable losses. In fact, it is the policy of most public agencies in the United States to compensate property owners only when their property must be taken or if they would be unable to continue with their current activities at the location in question. If local property owners would be able to continue their activities, public agencies would not compensate them for subsequent downturns in property values – nor would they ask owners to pay if property values subsequently increased" (p. 162).

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
C	Socioeconomic Issues	
C3	Commenter has concerns with sections of the FEIS regarding traffic noise and abatement. In addition to the comments below, the commenter would like to protest the determination of noise abatement measures in their area (Bender's Landing) and would like to schedule a meeting to discuss the issue further. Additional concerns include: 1) Request for missing data in Table 4-23 (Vol II, FEIS). Commenter would like to compare, even if absent a recommendation to construct barriers. 2) Commenter asks how the noise abatement study reconciles the cost of abatement per property value versus cost per benefiting receiver in regards to tax base? 3) Commenter inquires if the overpass as well as on/off ramps were taken into consideration when determining noise impacts to Benders Landing? 4) Commenter inquires why all communities on Riley Fuzzel except Benders Landing have been proposed for noise abatement funding.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment C5 the GPA has worked directly with landowners, local and state governmental agencies, elected officials, and the public to complete the Grand Parkway. The GPA has been open to any meeting with any person or group, as is noted in Section 5.4.4 of Volume I and Section 6.4.4 of Volume II of the DEIS and the FEIS. Representatives of the GPA can be reached at http://www.grandpky.com. According to TxDOT's *Guidelines for Analysis and Abatement of Highway Traffic Noise*, public notification is only required for property owners adjacent to a proposed noise barrier. However, once final design is completed, further coordination will be initiated by either TxDOT and/or GPA with Bender's Landing Association. 1.) Table 4-23 Noise Barrier Analysis for the Preferred Alternative Alignment provides dimensions and cost estimates for proposed barriers. Columns were marked as not applicable because a noise barrier was determined not to be feasible. According to TxDOT's *Guidelines for Analysis and Abatement of Highway Traffic Noise* (1996), feasible "generally pertains to the ability of a noise abatement measure to provide a 'substantial reduction' (at least 5 dBA) in noise levels." Noise barriers were modeled within the ROW at heights from 10 to 20 feet tall. Noise barriers were modeled in front of the berms and on top of the berms. None of the barriers resulted in a 5 dBA reduction in noise levels at any of the modeled receiver locations. Since a noise barrier was determined not feasible dimensions and costs for the barrier were not included in the table. The noise model files and the spreadsheets used to determine feasibility are in the project record and can be reviewed by coordinating with the TxDOT Houston District. 2.) The noise abatement does not consider property values in barrier analysis for approval of noise abatement measures. Noise barriers analysis is based only if a barrier is feasible (reduces noise levels by 5 dBA) and reasonable (costs less than $25,000 per benefitted receiver).

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
C	Socioeconomic Issues	
C3	(Cont.)	(Cont.) 3.) The noise model includes all horizontal and vertical alignment data. The model included the overpass and the exit ramps adjacent to Bender's Landing. Noise modeling accounts for noise levels from automobiles based on a programmed speed. For the noise model used in the FEIS, the proposed posted speed limit was modeled for all traffic. Noise levels increase with speed, so a faster speed provides a worst case scenario and in an increased likelihood for a barrier. 4.) Noise impacts are determined when predicted levels approaches the Absolute Criterion or the Relative Criterion. The Absolute Criterion is a predicted noise level of 66 dBA or greater. The Relative Criterion is when a predicted noise level substantially (10 dBA) exceeds the existing noise level. The communities along Riley Fuzzel that were below the NAC level and have proposed noise barriers showed predicted impacts based on the Relative Criterion. The model showed that barriers were both reasonable and feasible for that community. Barriers modeled adjacent to Bender's Landing were determined to be neither feasible nor reasonable. This means a barrier was predicted to provide neither a substantial reduction in noise and would exceed the cost of $25,000 per benefitted receiver.
D	Natural and Physical Environmental Issues	
D1	Commenter is concerned with disruption and loss to the local eco-system in the proposed project area.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment D19, because of the rapid growth in this area, such as Northgate Crossing, Legends Ranch, Benders Landing, Cumberland Crossing, Valley Ranch, and other developments, we recognize and acknowledge that impacts to wildlife and their habitat will be lost regardless of the Grand Parkway. See Volume II, Section 4.10 (Wetlands and Vegetative Communities) and Section 4.11 (Wildlife) for discussions of impacts to wildlife and habitat, including aquatic habitat and forest communities. The document clearly recognizes the potential for loss of habitat and impacts to wildlife. As with all new location projects, these issues along with habitat fragmentation cannot be avoided. For impacts that cannot be avoided or further minimized, a mitigation plan will be developed to compensate for unavoidable impacts to regulated natural resources (e.g., wetlands and prime farmland). It is anticipated that a non-wetland component would be

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
D	Natural and Physical Environmental Issues	
D1	(Cont.)	(Cont.) included in the mitigation plan to compensate for unavoidable impacts to non-regulated natural resources. Impacts to wildlife and habitat including aquatic habitat and forest communities are also discussed in Section 4.10 (Wetlands and Vegetative Communities) and Section 4.11 (Wildlife), Volume II of the FEIS. Impacts to the natural environment have been first avoided and then minimized to the extent feasible and practicable as balanced with other impacts to the economic and cultural environments. For unavoidable impacts, a detailed mitigation and monitoring plan approved by the U.S. Army Corps of Engineers (USACE), Texas Parks and Wildlife Department (TPWD), Texas Commission on Environmental Quality (TCEQ), and other reviewing agencies for regulatory and non-regulatory resources will be developed during the Section 404 permitting phase of the project and before construction. Issuance of a Section 404 Permit will not be sought until further design is complete to allow for a complete Section 404 Permit Package including the mitigation plan. This will not occur until after issuance of a ROD; however, the public will be afforded an opportunity to comment on the issuance of the Section 404 permit. This opportunity is via the Secretary of the Army, acting through the Chief of Engineers with the USACE. The USACE will post a notice and opportunity for public hearings on the issuance of Section 404 Permits for the Grand Parkway for the discharge of dredged or fill material into waters of the United States at specified sites.
D2	Commenter is concerned the Grand Parkway will detract from the scenic and aesthetic beauty of the area.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment C7, the FEIS acknowledges that there will be both visual and aesthetic impacts associated with the Grand Parkway. Please refer to Section 4.20 in the Summary and Volume II regarding Visual and Aesthetic qualities. In addition, please see Section 4, Volume I or Section 5, Volume II of the Segment F-2 FEIS for a discussion of indirect and cumulative impacts associated with the Grand Parkway.
D3	Commenter concerned about flooding and drainage.	As indicated in Segment G FEIS, Volume IV, Section 2 response to Comment, a Location Hydraulic Study has been conducted for the Grand Parkway Segment G, and final design of the Selected Alternative will include final drainage and mitigation analyses, which will be reviewed by regulatory agencies to confirm that adequate measures have been taken to ensure that floodplain encroachment does not increase the risk of flooding to adjacent property. All structures will be designed according to FHWA and TxDOT standards.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
D	Natural and Physical Environmental Issues	
D3	(Cont.)	(Cont.) In accordance with these standards, the roadway is being designed in such a way that there is a net zero effect on existing drainage patterns and systems. Any impacts to existing storm water detention areas would need to be offset by compensatory mitigation somewhere else, possibly within the limits of the proposed ROW. Mitigation of impacts includes Best Management Practices (BMPs) during construction and detention facilities to offset increased flows. With regard to indirect development associated with the Grand Parkway, any construction or development in a floodplain must be coordinated with the county. As indirect development occurs, the developers themselves will be responsible for mitigating any effects their development has on the local drainage patterns in accordance with local drainage policies. Additionally, please see Section 4.12.5, Volume II in the FEIS to read further information on mitigation for impacts to flooding and drainage.
D4	Commenter is concerned about noise impacts.	As indicated in Segment G FEIS, Volume IV, Section 2 response to Comment D4, noise impacts have been addressed in the FEIS. The FHWA Traffic Noise Model was used to analyze existing (2000) and predicted (2025) noise levels. If a receiver will be impacted by noise, noise mitigation has been considered. The construction of noise abatement barriers has been proposed in areas where the construction of these barriers would be both reasonable and feasible. TxDOT is mitigating noise impacts through the cost-effective use of noise abatement barriers. The DEIS (2007) provided a noise analysis of each of the alternative alignments. The FEIS provides a new analysis of the Preferred Alternative Alignment, as well as an analysis of traffic noise abatement measures (mitigation options). See Section 4.7 of Volume II (Traffic Noise) of the FEIS.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
D	Natural and Physical Environmental Issues	
D5	Commenter is concerned that the Grand Parkway will extend in the next segment of the Grand Parkway through wetlands of Lake Houston Wilderness Park.	As indicated in Segment G FEIS, Volume IV, Section 2 response to comment B45, The Grand Parkway Segment G connects at least two major transportation corridors to ensure independent utility, as well as independent significance, as required by FHWA regulations 23 CFR 771.111[f]. Segment G has its logical termini at IH 45 and US 59 providing independent utility even if implemented separate from the other proposed segments. As noted in the Introduction of the FEIS Volume I, the Grand Parkway Segments E, F-1, F-2, and G study area is divided into four segments to facilitate planning, design, and construction because limited state and federal funding provides no assurance that all the Grand Parkway segments would be constructed. In response to public and resource agency comments concerning potential cumulative effects of all four segments and the need to assess all four segments as facilities with independent utility and logical termini, an EIS is being prepared for each segment. FHWA, TxDOT, and the GPA concurred that the EIS organizational structure was considered the most efficient way to handle sections of independent utility and address concerns and comments from the resource agencies. Volume I of the EIS includes analyses and results common to all four segments and presents all four segments, including project description, need and purpose, alternatives considered, affected environment, indirect and cumulative effects, and agency and public coordination. Volume II provides a detailed assessment of an individual segment relative to the specific study area and presents issues, permits, and federal actions particular to each segment, including the need and purpose, alternatives considered, affected environment, environmental consequences, avoidance, minimization, and mitigation measures, indirect effects, and agency and public coordination associated with that segment. Volume III contains exhibits and appendices referenced throughout both Volumes I and II of the EIS.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
D	Natural and Physical Environmental Issues	
D5	(Cont.)	(Cont.) As indicated in Segment G FEIS, Volume IV, Section 2 response to Comment D28, TxDOT has committed to TPWD that the intent of the Grand Parkway is not to go through Lake Houston Park but to go either to the north or south of it. Appendix B in the FEIS (Volume III) contains a letter dated August 30, 2001 that discusses TxDOT's commitment to developing Segment G and the possible future development of Segment H and I-1 without disrupting the continuity of Lake Houston Park. For further information on the status of Segment H and I-1 please refer to the Grand Parkway website: www.grandpky.com for detailed information. See response to Comment D1 in this table regarding loss of habitat, wildlife, and local ecosystem.
D6	Commenter recommends considering impacts to fish and wildlife resources and impacts to relatively unfragmented pine and hardwood forest and other forested areas within the project area. Commenter also recommends that bridges and other stream crossing be designed to minimize barriers to hydrology, vegetation, and wildlife.	As indicated in Segment G FEIS, Volume IV, Section 2 response to comment D10 there are currently no regulated compensatory mitigation requirements for upland forests. However, for unavoidable impacts, a detailed mitigation and monitoring plan, approved by the USACE, TPWD, Texas Commission on Environmental Quality (TCEQ), and other reviewing agencies for regulatory and non-regulatory resources, will be developed during the Section 404 permitting phase of the project and before the issuance or as a condition of the ROD. Avoidance and then minimization of impacts to these forests was a part of the alignment development and selection process. For those forest impacts that were unavoidable, Section 4.26.10, Volume II in the FEIS provides a discussion of mitigation. The Selected Alternative reduces the amount of forest fragmentation that could have occurred in the project area by skirting the edges of the large tracts of forest. In addition, please see Section 4.10.2.3, Volume II of the FEIS provides details on impacts to non-wetland forests. See also 4.11.1, Volume II of the FEIS for a discussion of forest fragmentation. Sufficient hydrology to drive compensatory forested wetland restoration, creation, preservation, and/or enhancement will be specifically addressed in a detailed compensatory mitigation plan. Additionally, a drainage impact analysis of the facility is being performed as a part of the schematic design process. As a part of this analysis, overall project mitigation needs are identified. Detailed impact analyses of stream crossings and site specific mitigation design will be performed as a part of the final design process.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
D	Natural and Physical Environmental Issues	
D6	(Cont.)	(Cont.) Given the constraints of residential and commercial development, avoidance and minimization of impacts to the natural and human environment has been a balancing act throughout the corridor and alignment development process. See response to Comment D1 in this table regarding loss of habitat, wildlife, and local ecosystem.
D7	Commenter recommends mitigation of all impacts to aquatic resources should be considered when the assessment of mitigation efforts are finalized. Commenter also states the mitigation of these impacts be coordinated with Jamie Schubert with the TPWD Coastal Program.	As indicated in Segment G FEIS, Volume IV, Section 2 response to comment D8 the GPA is working with the USACE to avoid and minimize wetland impacts. See Section 4.26 (Mitigation Measures and Commitments), Volume II in the FEIS for mitigation commitments. Issuance of a Section 404 permit will not be sought until further design is complete to allow for a complete Section 404 permit package, including the mitigation plan, which will not occur until after issuance of a (Record of Decision) ROD. However, the public will be afforded an opportunity to comment on the issuance of the Section 404 permit. This opportunity is via the Secretary of the Army acting through the Chief of Engineers with the USACE. The USACE will post a notice and opportunity for public hearings on the issuance of Section 404 permits for the Grand Parkway for the discharge of dredged or fill material into waters of the United States at specified sites.
D8	The Harris County Flood Control District (HCFCD) stated in regards to the proposed bridge crossing in Harris County (Spring Creek), the HCFCD and the floodplain administrator for Harris County will not allow any adverse impact due to new bridges.	As indicated in Segment G FEIS, Volume IV, Section 2 response to comment D12 the proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations or ordinances. The Grand Parkway will be designed to comply with all appropriate HCFCD policies, criteria, and procedures.

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Table 2. Segment G FEIS Comments and Responses (Cont.)

Comment Category[1]	Comment	Response
E	Indirect and Cumulative Impacts	
E1	Commenter is concerned about impacts specific to the actual construction process.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment G8, the plans for avoiding impacts due to construction activities are summarized in the FEIS Volume II, Section 4.22 (Construction Impacts), which discusses fugitive dust, spill control, effects to water quality, and the use of BMPs.
F	Environmental Documentation	
F1	Commenter does not believe in the accuracy and validity of the environmental impacts projected to be associated with the Grand Parkway.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment A9 the EIS fully meets the requirements of NEPA and other related federal and state laws, rules, and regulations. In addition to being open to the public for review and comment, the methodologies and impact analyses used in these documents are approved by and the findings reviewed by all applicable federal, state, and local agencies and authorities who exercise jurisdictional authority or special expertise over a particular resource. For certain evaluations that were conducted, a worst case scenario was proposed. In these instances, the worst case included other projects, which were reasonably foreseeable.
F2	Commenter states, "I have reviewed the Segment G FEIS and agree with its findings."	Comment acknowledged.
G	General Comments	
G1	Commenter would like to be informed of the timeline for this project.	As indicated in Segment G FEIS Volume IV, Section 2 response to Comment B20, for up to date project status and construction schedule postings, please visit the Grand Parkway project website at http://www.grandpky.com/home. At this time, the earliest date for construction to begin is late 2010. A conservative estimate on construction time for Segment G would be two to four years; however, a more exact length of construction time will be established during the final design phase. It should also be noted that construction will only begin after all appropriate approvals are secured and ROW has been acquired.
G2	Commenter states this is a much needed project, build it as soon as possible.	Comment acknowledged.

Notes: [1] The "Comment Category" (e.g., "A") is described in bold in the gray rows and represents a topic used to divide the comments into logical groupings. Each Comment Category has a number of comments within it (e.g., comments A1 through A13) labeled in the far left column.
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