

ENVIRONMENTAL ASSESSMENT

ALMEDA ROAD

(From South MacGregor Way to Old Spanish Trail)

Harris County, Texas

CSJ No. 0912-72-072

PREPARED BY:

**U.S. DEPARTMENT OF TRANSPORTATION
THE FEDERAL HIGHWAY ADMINISTRATION
TEXAS DEPARTMENT OF TRANSPORTATION**

AND

THE CITY OF HOUSTON

September 2014

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ACRONYMS

AADT: average annual daily traffic	HEI: Health Effects Institute
ACHP: Advisory Council for Historic Preservation	H-GAC: Harris-Galveston Area Council
ADA: Americans with Disabilities Act	HHS: Health and Human Services
AOI: Area of Influence	IH: Interstate Highway
APE: Area of Potential Effect	IHW: Industrial Hazardous Waste
ASTM: American Society for Testing and Materials	IOP: Innocent Owner/Operator Program
BG: Block Group	IRIS: Integrated Risk Information System
BMPs: Best Management Practices	LEP: Limited English Proficiency
C&G: Curb-and-Gutter	LPST: Leaking Petroleum Storage Tank
CAAA: Clean Air Act Amendments	MBTA: Migratory Bird Treaty Act
CEQ: Council on Environmental Quality	MOA: Memorandum of Agreement
CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act	MOU: Memorandum of Understanding
CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System	MPH: Miles per Hour
CFR: Code of Federal Regulations	MPO: Metropolitan Planning Organization
CMAQ: Congestion Mitigation and Air Quality (CMAQ)	MS4: Municipal Separate Storm Sewer System
CMP: Congestion Management Process	MSATs: Mobile Source Air Toxics
CO: Carbon monoxide	NAC: Noise Abatement Criteria
CORRACTS: RCRA Corrective Action Sites	NATA: National Air Toxics Assessment
CT: Census Tract	NCHRP: National Cooperative Highway Research Program
CWA: Clean Water Act	NFRAP: No Further Remedial Action Planned
DNPL: Delisted National Priority List	NEPA: National Environmental Policy Act
EA: Environmental Assessment	NMFS: National Marine Fisheries Service
EIS: Environmental Impact Statement	NOI: Notice of Intent
EJ: Environmental Justice	NPL: National Priorities List
EO: Executive Order	NRCS: Natural Resources Conservation Service
EPA: United States Environmental Protection Agency	NRHP: National Register of Historic Places
ERNS: Emergency Response Notification System	NWI: National Wetlands Inventory
FEMA: Federal Emergency Management Agency	OST: Old Spanish Trail
FHWA: Federal Highway Administration	PALM: Potential Archeological Liabilities Map
FIRM: Federal Insurance Rate Map	PA-TU: First Amended Programmatic Agreement for Transportation Undertakings
FM: Farm-to-Market (road)	PM: particulate matter
FONSI: Finding of No Significant Impact	PS&E: Plans, Specifications and Estimates
FPPA: Farmland Protection Policy Act	PST: Petroleum Storage Tank
FTA: Federal Transit Authority	RCRA: Resource Conservation and Recovery Act
FWCA: Fish and Wildlife Coordination Act	ROW: right-of-way
GIS: Geographic Information System	RTHL: Recorded Texas Historical Landmarks
HCFCDD: Harris County Flood Control District	RTP: Regional Transportation Plan
HCPID: Harris County Public Infrastructure Department	SARA: Superfund Amendments and Reauthorization Act
	SHPO: State Historical Preservation Officer
	SOV: single occupancy vehicle
	SPL: State Superfund list
	STIP: Statewide Transportation Improvement Program

ACRONYMS (Continued)

STP-MM: Surface Transportation Program -
Metropolitan Mobility/Rehabilitation
SW3P: Storm Water Pollution Prevention Plan
TARL: Texas Archeological Research Library
TAQA: Transportation Air Quality Analysis
TCEQ: Texas Commission on Environmental
Quality
THC: Texas Historical Commission
TIP: Transportation Improvement Program
TMA: Transportation Management Area
TNM: Traffic Noise Model
TPDES: Texas Pollutant Discharge Elimination
System
TPWD: Texas Parks and Wildlife Department
TSD: Treatment, Storage, and Disposal
TSS: total suspended solids
TTD: Traffic & Transportation Division

TxDOT: Texas Department of Transportation
USACE: United States Army Corps of
Engineers
USC: United States Code
USDOT: United States Department of
Transportation
USFWS: United States Fish and Wildlife
Service
USGS: United States Geological Survey
UST: Underground Storage Tank
VA: Veterans Affairs
VCP: Voluntary Cleanup Program
VMT: vehicle miles traveled
VPD: vehicles per day

1.0 INTRODUCTION

This Environmental Assessment (EA) is prepared in accordance with Title 23 of the Code of Federal Regulations (23 CFR) §771.105, 23 CFR §771.119, and 40 CFR §1502, and provides sufficient information to allow the Federal Highway Administration (FHWA) to determine whether an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI) is appropriate. This EA has been prepared utilizing the Technical Advisory T6640.8A and the TxDOT Environmental Manual as guidance and addresses additional regulatory requirements, as applicable (see **Appendix A**).

The City of Houston, in cooperation with the Texas Department of Transportation (TxDOT), proposes to expand the existing capacity of Almeda Road from South MacGregor Way to Old Spanish Trail (OST), also known as US 90A, in Houston, Harris County, Texas. The total proposed project length is approximately 1.08 miles (see **Appendix B-1** for the **Project Vicinity and Location Map**).

All projects in the Houston-Galveston Area Council's (H-GAC's) 2013-2016 Transportation Improvement Program (TIP) that are proposed for federal or state funds are consistent with federal guidelines in Section 450 of Title 23, CFR and Section 613.200, Subpart B of Title 49. The proposed project is located within Harris County in the planning area of the H-GAC, which is its Metropolitan Planning Organization (MPO), and the Houston-Galveston Transportation Management Area (TMA). The project is included in the H-GAC's financially constrained 2035 Regional Transportation Plan (RTP) Update, which was found by FHWA/FTA to conform to the State Implementation Plan (SIP) on January 25, 2011. See **Appendix C** for **RTP/TIP Documentation**. The project is also included in the H-GAC's 2013-2016 TIP (as adopted April 27, 2012). The Statewide Transportation Improvement Program (STIP) and the 2013-2016 TIP, a part of the STIP, were approved by FHWA and FTA on November 1, 2012. The project is programmed as funding Category 7, Metropolitan Mobility/ Rehabilitation (STP-MM). The total estimated construction cost (as of 12/21/12 in the RTP) is \$12,749,374, which would be split as 80 percent federal funds and 20 percent local funds. The current estimated project let date is January 2015.

1.1 Land Use / Surrounding Area

The proposed project is located in a fully developed urban setting near downtown Houston, in Harris County, Texas. Land use in the vicinity of the project includes residential, commercial, institutional, public use, professional, light and heavy industrial, open, and undeveloped (see **Appendix B-2: Project Layout Map** and **B-3: Aerial Map**). Vegetation within the proposed project area is characterized as maintained urban landscape.

2.0 NEED FOR AND PURPOSE OF THE PROPOSED ACTION

2.1 Need

The need for the proposed project is based upon existing conditions of Almeda Road, including: (1) increased traffic congestion and reduced mobility due to substantially increased population; (2) lack of sufficient pedestrian and bicycle facilities along the project corridor; and (3) substantial structural deficiencies on Almeda Road.

Southeastern Harris County, including the proposed project area, is experiencing tremendous growth in population (see **Table 1**). Growth in population and employment creates demands on the existing local and regional transportation network. Continued growth and urbanization in the Houston-Galveston region, including near the proposed project, has resulted in the need for more efficient transportation systems to reduce existing congestion, accommodate future traffic demands and thus improve mobility. As traffic has increased in the region, Almeda Road, the north-south roadway closest to State Highway (SH) 288, has also experienced increased traffic.

Table 1 – Regional and Community Growth

Area	Year 1990	Year 2000	Year 2010	% Increase 2000-2010	Year 2030 (Projected)
City of Houston	1,630,553	1,954,848	2,257,412 ^a	15.5%	2,798,278
Harris County	2,818,199	3,400,578	4,100,000 ^b	20.6%	5,053,890

Sources: U.S. Census (2000), H-GAC (2010), Texas Water Development Board; accessed 2010 (2002 State Water Plan Population Projections, 2030)

a Per http://www.houstontx.gov/planning/Demographics/dem_links.htm (2010)

b 2009 Population; Per Harris County Management Services - Population Study - Budget - February 2010

Growth trends in population and employment indicate that the area would continue to experience increased travel demand and thus result in increased traffic. As a consequence, improved mobility has become an essential need both locally and regionally. The lack of adequate mobility can limit access to job opportunities. Inadequate mobility also results in increasing time spent moving people and goods from one point to another.

There is a need for improved pedestrian and bicycle accommodations. There are no shoulders on the roadway for bicycles, and the sidewalk along the west side of Almeda Road does not meet the requirements to accommodate bicycles. The sidewalk on the east side of Almeda Road is not continuous and is in poor condition (e.g., cracks, uneven surfaces, discontinuous).

Since its construction, local and regional changes have increased the traffic load on Almeda Road. The roadway was not designed to meet such demands and the growth of demand has contributed to surface damage that now also affects the underlying structure of the roadway. Lanes are rutted, potholed, broken, and cracked in various places. Successive pothole and other surface repair efforts have left a patchwork of uneven surfaces making it no longer prudent to continue spot repair projects. Lane striping is faded or obscured by pothole repair efforts, and reflectors are missing in some areas.

Thus, the needs of the proposed project include:

1. Reduced mobility and increased congestion on Almeda Road;
2. Lack of continuous sidewalks and lack of bicycle facilities along Almeda Road; and
3. Structural deficiencies on Almeda Road caused by increased traffic.

2.2 Purpose

A primary purpose of the proposed project is to increase capacity so that the roadway can meet current and future traffic demands, thus improving mobility and reducing congestion in the area. A benefit of this would be improved access to area destinations, such as the Texas Medical Center. A second purpose is to construct pedestrian and bicycle facilities. By connecting them to trails within Hermann Park, the area's pedestrian/bicycle network would be improved and expanded. A final purpose is to reconstruct the facility so that it meets current roadway design standards, eliminating the existing damage and creating a better facility.

The proposed project is not anticipated or intended to contribute to regional growth. The project occurs in a fully urbanized area that does not run through any substantially sized undeveloped land. The destinations to which Almeda Road provides access are the same as the destinations to which other major parallel facilities (SH 288, Cambridge Street) provide similar access.

2.3 Existing and Projected Traffic

According to H-GAC data, Almeda Road/FM 521 between South MacGregor Way and Holcombe Boulevard and between Holcombe Boulevard and OST has an existing 2011 annual average daily traffic (AADT) volume of approximately 12,654 and 15,815 vehicles per day (vpd), respectively. Based on City of Houston and TxDOT-approved traffic analyses, the average growth of these segments would be approximately 33.5 percent. The analyses also indicate that a six-lane design would have an approximately 15.6 percent greater amount of capacity than a four-lane design (see **Table 2** and **Table 3**).

Table 2 – Average Daily Traffic on Almeda Road (4-Lane No-Build Alternative)

Segment	2011	2035	% Change
MacGregor to Holcombe	12,654	34,420	172%
Holcombe to OST	15,815	30,888	95%

Table 3 – Average Daily Traffic on Almeda Road (6-Lane Build Alternative)

Segment	2011	2035	% Change
MacGregor to Holcombe	12,654	39,741	214%
Holcombe to OST	15,815	35,785	126%

2.4 Public Involvement

On January 31, 2013, the City of Houston and TxDOT conducted a public open-house meeting for the owners of property along Almeda Road and persons interested in the planned roadway improvements. The Public Meeting was held from 5:30 pm to 7:30 pm at the Robinson Jr. Community Center, located at 2020 Hermann Drive, Houston, Texas 77004. The purpose of the meeting was to present the proposed improvements and to gather public input. Members of the public were encouraged to visit information stations for information on project design and environmental constraints. Several engineers and environmental professionals were available at each station to provide information and answer questions.

The public was provided an opportunity to visit informally with City of Houston representatives to ask questions and make comments regarding the project. Provisions were made for Limited English Proficiency (LEP) populations in advertising for the meetings, meeting materials, and interpreters. Public notices were published in the *Houston Chronicle* in English on 12/28/2012 and 1/11/2013 and published in *La Voz* in Spanish on 12/30/2012 and 1/13/2013. Meeting notices sent to adjacent landowners were sent in English and bilingual comment forms were distributed at the Public Meeting.

Comments received indicated strong support for the project, although concerns regarding the following issues were raised: bicycle safety crossing Almeda Road and landscaping. The City responded that cyclists can get from Columbia Tap Trail to the park via the trails along the bayou and other alternate paths, and that a signalized crossing at Dixie Road (as desired by some commenters) is not warranted based on traffic counts. Consultation with the Parks Department is occurring in regards to maintaining the proposed landscaping. Further details of the public meeting are available from the City of Houston and TxDOT under a separate summary report.

The FHWA approved the January 2014 EA as “Satisfactory for Further Processing” on April 2, 2014. The City of Houston published a Notice Affording Opportunity for a Public Hearing (NAOPH) in English in the local/regional newspaper, *Houston Chronicle*, on August 4, 2014, and in Spanish in *La Voz* on August 10, 2014. The notice was also mailed to elected officials and adjacent property owners. The notice indicated that any interested citizen could request a public hearing to be held covering the social, economic and environmental effects of the proposed project by providing a written request to TxDOT Houston District’s Director of Project Development. Requests for a hearing were received from a City councilmember and a State Representative. TxDOT met with Representative Coleman on August 27, 2014. The City met with Councilmember Boykin on or about August 28, 2014. The Councilmember agreed to withdraw his request for a hearing after the City made the following public involvement commitments: the *City of Houston Public Works* and Engineering Department will hold a standard pre-construction meeting with the community, and CitizensNet, a City of Houston eNewsletter, will periodically inform the community about the project status through emails and/or website postings. TxDOT then contacted the Representatives office again on September 9, 2014 to discuss the commitments made to the councilmember by the City, and the Representative subsequently agreed to withdraw his request for a hearing.

3.0 DESCRIPTION OF FACILITY

3.1 Existing Facility

The existing facility is a four- to six-lane (two to three in each direction) roadway separated by a 33- to 76-foot wide depressed, grassy median. Almeda Road has three northbound lanes from approximately 390 feet south of Holcombe Boulevard to approximately 390 feet south of Dixie Drive (approximately 1,200 feet total) and three southbound lanes from approximately Lockett to 660 feet south of Dixie Drive (approximately 1,600 feet total). Travel lanes are typically 11 to 12 feet wide. Striped (i.e., dedicated) left-turn lanes exist on Almeda Road at Holcombe Boulevard and OST. Striped right-turn lanes exist at South MacGregor Way (northbound), Holcombe Boulevard (northbound and southbound), and Lockett

Street (southbound). Drainage is via curb and gutter (C&G) and open ditch (see **Appendix B-4: Site Photographs**), with C&G on one side of the road and open ditch on the other in some areas. The existing speed limit is 45 miles per hour (mph).

Within the project limits, a continuous 5- to 8-foot wide sidewalk exists on the west side of Almeda Road. A 4-foot wide sidewalk exists along much of the east side Almeda Road, but it is not continuous and is broken, cracked and uneven towards OST.

3.2 Proposed Facility

The proposed facility is presented in the **Project Layout Map (B-2)** and **Typical Sections (B-5)**. Where Almeda Road has only two lanes in a direction, the proposed project would involve the addition of one lane, thereby creating a facility with three lanes in each direction throughout the project limits. The center of Almeda Road is proposed to contain a 16-foot wide raised grassy median. All travel lanes would be 11 to 12 feet wide. The proposed project includes the addition of southbound left-turn lanes at Camden Drive, Hermann Park Court, and Payson Street and northbound and southbound left-turn lanes at Dixie Drive and Lockett Street. A new southbound left-turn lane is proposed on Holcombe Boulevard. It also includes a southbound right-turn lane at OST. All turn lanes would be 11 feet in width. Drainage would be via C&G and open ditch, with C&G on one side of the road and open ditch on the other in some areas. The speed limit would be/remain 45 mph.

The project is proposed to use grass swales along Almeda Road between the roadway and sidewalk and trail for conveyance and mitigation and focalpoints® for cleaning the storm runoff. These focalpoints® would consist of layers of filtration material that would remove suspended solids and some impurities from the runoff and are estimated to be 5 feet by 15 feet and would be typically landscaped with native plants that require low maintenance. The center medians would primarily be grassy with trees, although some medians would be strictly concrete.

In accordance with the U.S. DOT Policy Statement on Bicycle and Pedestrian Accommodations (signed on March 11, 2010), the City of Houston considered such accommodations. A 10-foot wide mixed-use trail is proposed on the west side of Almeda Road to accommodate bicyclists and pedestrians, and a 5-foot wide sidewalk is proposed on the east side. The trail, sidewalk, and their associated curb ramps and landings would be compliant Americans with Disabilities Act (ADA). Medians at the three signalized intersections (South MacGregor Way, Holcombe Boulevard and OST) would have a 6-foot median for pedestrian refuge.

3.3 Right-of-Way

The existing ROW width of Almeda Road (from South MacGregor Way to OST) varies from 120 to 168.8 feet. A total of 0.13 acre of additional ROW would be acquired, located at the northeast corner of Almeda Road and Holcombe Boulevard (along Holcombe Boulevard) and at the southwest corner of Almeda Road at OST (corner clip).

No relocations are anticipated as a result of the proposed project. However, if relocations are determined necessary, the relocations, in addition to ROW acquisition, would be conducted in accordance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* and *Title 49 Code of Federal Regulation (CFR) Part 24*, as amended.

4.0 ALTERNATIVES

Two alternatives were initially screened and evaluated for the proposed project.

- **Alternative #1:** Reconstruct the facility with two lanes each way (4 lanes total) with provisions for future widening to inside
- **Alternative #2:** Reconstruct the facility with two lanes each way (4 lanes total) with provisions for future widening to outside

These two initial build alternatives were eliminated from consideration because future traffic volumes exceed the capacity of a 4-lane facility. Two new alternatives, a Build Alternative, discussed above in **Section 3.2**, and a No-Build Alternative, described below, were then considered.

4.1.1 No-Build Alternative

The No-Build Alternative would result in no improvements being made. The existing Alameda Road would continue to function as a four- to six- lane roadway from South MacGregor Way to OST, and there would be no impacts from roadway construction. Normal routine maintenance would continue and all other pending, previously authorized actions would proceed as long as they do not require additional travel lanes. Costs associated with the No-Build Alternative would include routine maintenance and minor reconstruction activities on existing facilities. Typical maintenance activities under this alternative would include:

- Roadway inspections;
- Minor rehabilitations;
- Pavement edge repair;
- Seal coats and overlays; and
- Other activities such as striping, signing, and patchwork.

The No-Build Alternative is not consistent with H-GAC's 2035 RTP Update, which demonstrates the need for improved mobility. It fails to provide for efficient traffic flow, a necessary condition for reduced air pollution, as well as provide adequate access and connectivity for area residents and emergency vehicles, such as fire, police and ambulance services. The No-Build Alternative would not alleviate congestion on existing area roadways.

For the reasons stated above, the No-Build Alternative would not meet the proposed project's need and purpose, which is to improve mobility and reduce congestion in the immediate area and surrounding region, provide adequate pedestrian and bicycle facilities along Alameda Road, and address structural deficiencies on Alameda Road. However, it is retained as a basis for comparison with the alternative carried forward for detailed study as required by the Council on Environmental Quality (CEQ) regulations (40 CFR §1502.14(d)).

5.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS / CONSEQUENCES

5.1 Social and Economic Factors

Socioeconomic measures assess the social and economic conditions in a region. Such measures include population and housing statistics, tax revenues and availability of public services.

The U.S. Census Bureau provides population characteristics for various geographic levels, including counties, census tracts (CTs), blocks groups (BGs) and census blocks. Census tracts subdivide counties, block groups subdivide census tracts and census blocks subdivide block groups. The proposed project is within Census Tracts 3100 (BG 1), 3900 (BG 1), and 4001 (BGs 1 and 3). **Appendix B-6** depicts the locations of the project area's census tracts and block groups. Demographic characteristics of the proposed project area are presented below in **Table 4**.

Table 4 - Demographic Characteristics of the Proposed Project Area

Census Geographies ²	Total Population	Black/ African American (%)	American Indian/ Alaska Native (%)	Asian (%)	Native Hawaiian/ Pacific Islander (%)	Other ^a (%)	Hispanic or Latino (%)	Total Minority Races (%)
Harris County	4,092,459	18.4	0.2	6.1	0.1	1.4	40.8	67.0
Houston	2,099,451	23.1	0.2	5.9	0.0	1.3	43.8	74.4
CT 3100	3,356	16.9	0.1	14.1	0.1	2.1	11.7	45.0
BG 1	2,759	18.6	0.1	9.5	0.1	2.2	12.0	42.5
Block 1045	0	-	-	-	-	-	-	-
Block 1048	0	-	-	-	-	-	-	-
Block 1054	438	27.9	0.0	11.6	0.0	2.3	14.2	55.9
Block 1056	0	-	-	-	-	-	-	-
Block 1057	0	-	-	-	-	-	-	-
Block 1058	0	-	-	-	-	-	-	-
Block 1059	184	14.1	0.0	2.2	0.0	0.0	8.7	25.0
Block 1064	1,229	10.0	0.2	12.0	0.0	2.9	14.2	39.4
Block 1047	0	-	-	-	-	-	-	-
Block 1055	297	3.7	0.0	9.4	0.0	0.3	10.4	13.9
CT 3900	4,495	32.3	0.2	20.3	0.0	2.9	11.9	67.7
BG 1	1,943	33.5	0.2	14.6	0.1	3.3	14.0	65.6
Block 1006	3	0.0	0.0	0.0	0.0	0.0	33.3	33.3
Block 1011	58	44.8	0.0	3.4	0.0	12.1	22.4	82.8
Block 1017	0	-	-	-	-	-	-	-
Block 1018	0	-	-	-	-	-	-	-
Block 1019	0	-	-	-	-	-	-	-
Block 1020	0	-	-	-	-	-	-	-

Census Geographies ²	Total Population	Black/ African American (%)	American Indian/ Alaska Native (%)	Asian (%)	Native Hawaiian/ Pacific Islander (%)	Other ^a (%)	Hispanic or Latino (%)	Total Minority Races (%)
CT 4001	2,759	18.7	0.3	33.4	0.0	4.0	9.7	66.1
BG 1	25	0.0	0.0	48.0	0.0	4.0	28.0	80.0
Block 1002	0	-	-	-	-	-	-	-
Block 1003	0	-	-	-	-	-	-	-
Block 1015	0	-	-	-	-	-	-	-
Block 1040	0	-	-	-	-	-	-	-
Block 1041	0	-	-	-	-	-	-	-
BG 3	2,066	19.0	0.4	31.8	0.0	4.5	10.0	65.9
Block 3000	0	-	-	-	-	-	-	-

Source: Cubit Planning, Inc. (2010): 2010 Census Summary File 1, Table P1. Blocks included are those within a 150-foot buffer from the proposed roadway ROW.

^a Combines Census Table P8 categories 'Some other race alone' and 'Two or more races'

bold italic indicates a population reporting higher than 50% total minority, at the block level.

bold indicates a population reporting higher than 50% higher total minority, at the block group level or higher.

The demographic data indicates that the project area is sparsely populated; there are numerous blocks in which no population is reported. Block data indicate that minorities live in the project area. In **Table 4**, bold italic font indicates populations reporting more than 50 percent minority at the block level; bold font indicates populations reporting more than 50 percent minority at the BG level or higher. Based on the data, two blocks within the project area report a minority population: Block 1054 within CT 3100 and Block 1011 within CT 3900.

Table 5 presents the 2010 economic statistics for the population living within the proposed project area.

Table 5 – Household Income Data of the Proposed Project Area

Census Geographies	Total Households	% of Households with Annual Incomes			Median Household Income (\$)	Total Population for whom Poverty Status is Determined	Population with Income in the past 12 months below poverty level (%)
		Less than \$14,999	Between \$15,000 - \$19,999	Greater than \$20,000			
Harris County	1,391,103	11.9	5.5	82.6	52,675	3,983,054	17.3
Houston	769,867	23.8	6.5	69.7	44,124	2,060,551	21.5
CT 3100	1,559	8.3	0.6	91.1	63,785	2,868	10.3
BG 1	1,290	8.5	0	91.5	57,500	-	-
CT 3900	2,090	16.9	2.1	81.0	51,045	3,967	16.2
BG 1	682	13.9	3.2	82.9	51,591	-	-
CT 4001	1,573	19.6	3.7	76.7	37,165	2,585	18.1

Census Geographies	Total Households	% of Households with Annual Incomes			Median Household Income (\$)	Total Population for whom Poverty Status is Determined	Population with Income in the past 12 months below poverty level (%)
		Less than \$14,999	Between \$15,000 - \$19,999	Greater than \$20,000			
BG 1	25	40.0	0.0	60.0	42,917	-	-
BG 3	1,243	17.2	4.7	78.1	46,975	-	-

Source: Cubit Planning, Inc.: U.S. Census 2010 Tables B19001, B17001, B11001 and N19013.

The BG data show that the median household income in 2010 for all BGs is greater than the 2010 U.S. Department of Health and Human Services (HHS) poverty guideline of \$22,050 as well as the 2013 HHS poverty guideline of \$23,550. The information provided also indicates that median household incomes of the CTs of the project corridor range from \$37,165 to \$63,785, with CT 4001 (\$37,165) lower than the City of Houston (\$44,124).

Further discussion regarding impacts to minority and low-income populations is provided in **Section 5.1.2, Environmental Justice**.

5.1.1 Community Impacts

Community cohesion is a term that refers to an aggregate quality of a residential area. Cohesion is a social attribute that indicates a sense of community, common responsibility and social interaction within a limited geographic area. It is the degree to which residents have a sense of belonging to their neighborhood or community or a strong attachment to neighbors or groups over time.

The project is located in an urban area. Land use in the vicinity of the project includes residential, commercial, institutional, public use, professional, light industrial, open, and undeveloped land. Three apartment complexes are located off Alameda Road and one single-family residential subdivision lies to the east of the proposed project. The Veterans Affairs Medical Center is located on the west side of Alameda Road, just north of OST. The Texas Medical Center is the largest medical center in the world and the Center's Mid Campus is located along Alameda Road. The remainder of the project area is characterized by commercial and light industrial use.

Hermann Park, which is generally bounded by Main Street, Alameda Road, North MacGregor Way and Cambridge Street, has a mixed-use trail that runs along Brays Bayou, providing access to various parks and medical facilities in the area.

Various religious, educational, medical and recreational facilities are located within the local community:

Facility Type	Facility Name	Location	Distance from Proposed ROW
• School	UT School of Dentistry	7500 Cambridge Street	0.42 mile
• Park	Hermann Park	South MacGregor and Holcombe Boulevard	Adjacent
• Medical	VA Medical Center	2002 Holcombe Boulevard	Adjacent
• Medical	Victory Medical Center	2001 Hermann Drive	0.04 mile
• Religious	City of Refuge Church	3150 Yellowstone Boulevard	0.5 mile

Environmental Consequences of Implementing the No-Build Alternative

With the implementation of the No-Build Alternative, land use changes would occur as they would without the project, and there would be no displacements. The No-Build Alternative would not provide increased accessibility or provide a more efficient facility. The existing conditions would continue to deteriorate with increased congestion as future development in and around this area of Harris County continues.

Environmental Consequences of Implementing the Recommended Alternative

The proposed Almeda Road project would not split, isolate, or separate any adjacent neighborhoods, residences, or businesses. Since Almeda Road within the project limits has an existing median, the proposed project would not adversely affect access in the area. Driveway access points would not be changed, and no existing streets would be cut off by the project.

A reconstructed roadway surface would better serve the adjacent neighborhood and local community, as well as those traveling north-south through this region. Several other benefits to the community would occur as a result of the project. Pedestrian and bicycle access and the safety of residents would be improved with the addition of a sidewalk and a hike-and-bike trail along Almeda Road.

The proposed project would improve mobility and provide increased accessibility for this portion of Houston to the various religious, educational, medical, and recreational facilities in the area, potentially strengthening community cohesion. These facilities would remain accessible during construction of the proposed facility. Emergency public services would have a more efficient facility to use in the performance of their various duties because of less congested roads.

5.1.2 Environmental Justice

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

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

Disproportionately high and adverse human health or environmental effects are defined by FHWA as adverse effects that:

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

The identification of minority populations was based on the CEQ guidance document *Environmental Justice Guidance under the National Environmental Policy Act*. Based on this guidance, the manner by which minority populations should be identified is either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area (i.e., block) is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (i.e., block group) and who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; African American, not of Hispanic origin; or Hispanic. "Low-income" refers to a median household income at or below the DHHS poverty guidelines.

The minority populations are generally dominated by those of African American race and those of Hispanic ethnicity, followed by those of Asian race. No other general trends are observed in the data; each set of CT/BG/block data is different with respect to minority population. However, several observations can be made about the CTs and their corresponding data:

- CT 3100 Four of the 10 blocks within the project area report a population. Block 1054 contains the highest block level minority population at 55.9 percent. The BG and the CT report 42.5 and 45.0 percent minority populations, respectively.
- CT 3900 Only two blocks within the CT had recorded populations, Block 1006 with a 33.3 percent minority and Block 1011 with an 82.8 percent minority. The BG and the CT report 65.6 and 67.7 percent minority populations, respectively.
- CT 4001 All blocks within this CT reported no population. Both BGs within CT 4001 have high minority levels: BG 1 is 80.0 percent minority and BG 3 is 65.9 percent minority. The total minority level for CT 4001 is 66.1 percent.

Two blocks within the proposed project area have a predominant minority population (i.e., a minority population above 50 percent): CT 3100, BG 1, Block 1054 and CT 3900, BG 1, Block 1011. These are

indicated by bold print in **Table 4**. Block 1054 has a higher minority percentage (55.9%) than its respective BG (42.5 %); Block 1011 also has a higher minority percentage (82.8%) than its BG (65.6 %).

While the project area does not contain low-income populations, **Table 5** indicates that 10.3 to 18.1 percent of individuals in the CTs of the project corridor were living below the 2010 poverty guidelines, respectively. These percentages are lower than that of the City of Houston (21.5%).

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build Alternative, no new ROW would be acquired and the existing Almeda Road and the location area would remain as is; only routine maintenance activities would occur. The No-Build Alternative would not split, isolate or separate any distinct neighborhoods, ethnic groups or other specific groups, nor would it alter the social and economic character of the study area. Roadway conditions on Almeda Road would continue to degrade, causing a decrease in mobility and an increase in traffic congestion, noise, air pollution, fuel usage, and potentially accidents from vehicles seeking alternate routes through city streets. These are determined to be adverse effects to the Houston area. Although these adverse impacts would occur to minority and low-income populations, they would not be disproportionately high and adverse compared to the general population per EO 12898 regarding environmental justice.

Environmental Consequences of Implementing the Recommended Alternative

Although impacts (e.g., increased noise levels and air pollution impacts) to minority populations and low-income individuals would occur, they would not be disproportionately high and adverse compared to the general population. As shown in the **Project Layout Map (B-2)**, the project would require a minor amount of additional ROW and no displacements, and construction activities would not be isolated to areas with minority populations and low-income individuals.

The project would not split, isolate or separate any minority group or low-income populations. Based on this analysis, the proposed project would not cause disproportionately high adverse impacts on minority or low-income populations in accordance with the EO 12898 regarding environmental justice.

5.1.3 Limited English Proficiency

EO 13166, entitled *Improving Access to Services for Persons with Limited English Proficiency*, requires that federal agencies examine the services they provide, identify any need for services to those with limited English proficiency (LEP), and develop and implement a system by which LEP persons can meaningfully access those services.

The U.S. Department of Justice defines LEP individuals as those "who do not speak English as their primary language and who have a limited ability to read, write, speak, or understand English" (67 FR 41459). Data about LEP populations was gathered from the U.S. Census 2010 (see **Table 6**). Within area block groups, Census data record the presence of persons who describe their ability to speak English as less than "Very Well." The table below shows the percentages of adults who speak English less than "Very Well" by language category.

Table 6 – Percent of Adult Speakers Who Speak English Less than Very Well*

Census Geographies	Total Adult Population	Percent of Adult Speakers Who Speak English Less than Very Well			
		Spanish Language Speakers	Other Indo European Language Speakers	Asian and Pacific Island Language Speakers	Other Language Speakers
Texas	22,850,447	12.7%	0.5%	1.1%	0.1%
Harris County	3,690,373	17.8%	0.7%	2.2%	0.3%
Houston	1,919,517	21.0%	0.8%	2.2%	0.3%
CT 3100	2,924	2.3%	2.2%	2.1%	0.7%
BG 1	2,362	0.8%	1.0%	0.3%	0.0%
CT 3900	3,643	1.3%	0.0%	7.2%	0.0%
BG 1	1,415	0.0%	0.0%	4.6%	0.0%
CT 4001	2,675	4.8%	5.8%	7.0%	0.7%
BG 1	131	0.0%	0.0%	23.0%	0.0%
BG 3	2,050	6.3%	5.5%	3.2%	0.0%

Source: U.S. Census 2010 (Table B16004) as of February 13, 2013 for persons age 5 and older.

* The data on ability to speak English represent the Census respondent's own perception about his ability to speak English (United States Census 2010 Metadata).

Since LEP is partially defined as a limited ability to read and write English, literacy data were also consulted. Indirect literacy estimates for adults were calculated by the National Center for Education Statistics based on 2003 survey data for states and counties (the most recent survey data available). The percentage of adults who lack basic prose literacy skills for Harris County and Texas are 21 percent and 19 percent respectively.¹ While literacy estimates do not differentiate between low literate English speakers and low literate LEP populations, literacy data should be considered along with other LEP indicators in determining how to best provide access to LEP populations.

To determine the languages of the LEP populations, Census data were consulted for project area tracts. **Table 7** below details the top five languages spoken by the total adult population (LEP and non-LEP) for each tract.

Table 7 – Languages Spoken at Home

Census Geographies	Language 1	Language 2	Language 3	Language 4	Language 5
CT 3100	English 76.0%	Spanish 8.0%	Other Indo-European 8.6%	Asian & Pacific Islander 5.8%	Other 2.0%
CT 3900	English 67.5%	Spanish 8.9%	Asian & Pacific Islander 15.8%	Other Indo-European 5.3%	Other 2.5%

¹ See <http://nces.ed.gov/naal/estimates/Cautions.aspx> for general cautions about indirect literacy estimates.

Census Geographies	Language 1	Language 2	Language 3	Language 4	Language 5
CT 4001	English 55.4%	Spanish 20.4%	Asian & Pacific Islander 12.8%	Other Indo- European 10.2%	Other 1.1%

Source: U.S. Census 2010 (Table B16004) as of February 13, 2013.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not result in changes to the existing facility and would require no ROW; therefore, it would have no effect on LEP persons.

Environmental Consequences of Implementing the Recommended Alternative

Although the CTs contained notable percentages of Spanish, Other Indo-European and Asian & Pacific Islander speakers (**Table 7**), field visits to the project area revealed no signage in Spanish, Indo-European, or other Asian/Pacific Island languages. Bilingual (Spanish and English) notices and English fliers and meeting program were provided for the 2013 public meeting. Translators were made available upon request; no such requests were made. Bilingual notices were also published and sent to adjacent landowners and other stakeholders for the 2014 NAOPH. The City of Houston would continue to provide LEP populations meaningful access to proposed project plans, such as design schematics and recommended alternatives. Therefore, the requirement of EO 13166 would be satisfied.

5.1.4 Displacements

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would require no ROW and no displacements or relocations.

Environmental Consequences of Implementing the Recommended Alternative

There are currently no structures within the proposed ROW. No displacements or relocations are anticipated in association with the proposed project. Acquisition of and payment for additional needed ROW would be conducted in accordance with the *Uniform Relocation Assistance and Real Property Acquisitions Policies Act of 1970*, as amended, and all applicable TxDOT policies.

5.1.5 Detours

Environmental Consequences of Implementing the No-Build Alternative

Implementation of the No-Build Alternative would not require any traffic detours. The exception to this is when normal maintenance or repair work may occur and temporary detours may be implemented.

Environmental Consequences of Implementing the Recommended Alternative

If the Build Alternative were implemented, work on Almeda Road would be phased in such a manner that would allow at least one lane in each direction to remain open during construction. Access to businesses and residences would be maintained to the maximum extent possible at all times. It is not anticipated that detours would be necessary.

5.2 Natural and Biological Resources

5.2.1 Beneficial Landscape Practices

In accordance with the Executive Memorandum of August 10, 1995, all agencies shall comply with the National Environmental Policy Act (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 maximum 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.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not involve any additional landscaping (other than regular mowing) and would not require compliance with the Executive Memorandum on Beneficial Landscape Practices.

Environmental Consequences of Implementing the Recommended Alternative

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

5.2.2 Invasive Species

On February 3, 1999, the President issued EO 13112 to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not involve any additional landscaping and would not require compliance with EO 13112 on invasive species.

Environmental Consequences of Implementing the Recommended Alternative

In accordance with EO 13112 on invasive species, native plants would be used in the landscaping and in seed mixes where practicable.

5.2.3 Vegetation

The project area was surveyed for vegetation in accordance with the *Memorandum of Agreement between Texas Department of Transportation and Texas Parks and Wildlife Department for Finalization of 1998 Memorandum of Understanding, Concerning Habitat Descriptions and Mitigation* (TxDOT-TPWD MOA).

According to *The Vegetation Types of Texas*, the proposed action is in classification 46: Urban. Species within this type include numerous indigenous and non-native, as well as invasive species. Distribution of this vegetation type is primarily in major urban centers of Texas. The characteristics of this vegetation type are due to human disturbances such as commercial and residential development, fire suppression, and regular mowing. The species in the project area are consistent with this classification. Vegetation outside of the existing ROW is typically consistent with that within the ROW.

Vegetation within the existing and proposed ROW is comprised of regularly maintained herbaceous roadside vegetation with some ornamental shrubs and trees. Herbaceous species include Bermuda grass (*Cynodon dactylon*), Bahia grass (*Paspalum notatum*) and pink evening-primrose (*Oenothera speciosa*). Less frequently mowed vegetation within the central drainage ditch also includes Indian woodoats (*Chasmanthium latifolium*), curly dock (*Rumex crispus*), ivyleaf morning glory (*Ipomoea hederacea*), plains coreopsis (*Coreopsis tinctora*) and brown-eyed susan (*Rudbeckia hirta*). Ornamental shrubs and trees scattered along the maintained ROW consists primarily of live oak (*Quercus virginiana*) and water oak (*Quercus nigra*) with some crepe myrtle (*Lagerstroemia indica*), sweetgum (*Liquidambar styraciflua*), and sugarberry (*Celtis laevigata*). They range in height from approximately 10 to 30 feet (15-20 foot average varies by species) and have a diameter at breast height (dbh) range of 6 to 10 inches with an 8-10-inch average. Canopy cover within the existing mowed and maintained ROW is less than 5 percent.

Through the TxDOT- TPWD MOA, characterizations of habitat within the environmental documents must include consideration of unusual vegetation and special habitat features. Unusual vegetation features are defined in the MOA to include unmaintained vegetation, trees or shrubs along a fence line adjacent to a field (fencerow vegetation), riparian vegetation, trees unusually larger than others in the area, and unusual stands of vegetation. Special habitat features are defined in the MOA to include bottomland hardwoods, caves, cliffs and bluffs, native prairies, ponds, seeps or springs, snags, water bodies, wetlands, and bridges with bird or bat colonies.

There are no areas of unusual vegetation or special habitat features present within the project area. Vegetation along Almeda Road is mowed and maintained.

Environmental Consequences of Implementing the No-Build Alternative

If the No-Build Alternative were implemented, the existing facility would continue to be mowed and maintained (where applicable) at the current maintenance intervals. The No-Build Alternative would not result in any conversion of vegetated land to transportation use.

Environmental Consequences of Implementing the Recommended Alternative

As indicated in **Table 8**, implementation of the Build Alternative would impact up to a combined total of approximately 4.07 acres of permanent vegetation impacts and 5.32 acres of temporary vegetation impacts. Permanent impacts would result from the construction of the additional paved areas. It is expected that approximately 23 water oak trees located within the current median would be removed for construction activities and the additional lanes. They range in height from approximately 10 to 20 feet (15- to 20-foot average, varies by species) and have a dbh range of 6 to 10 inches with an 8- to 10-inch average. Canopy cover within the existing mowed and maintained ROW is less than 5 percent. Temporary impacts are anticipated since construction activities would require clearing of currently vegetated areas that would be re-vegetated. However, acreages of actual impacts may be less since the City of Houston would attempt to only clear the minimum area necessary to maintain construction areas.

Table 8: Estimated Vegetation Impacts

Habitat Type	Anticipated Impact Type & Estimated Acreage of Impact	
	Temporary	Permanent
Mowed and Maintained Existing ROW	5.28	3.98
Mowed and Maintained Proposed ROW	0.04	0.09
TOTAL:	5.32	4.07
Woody Vegetation (individual trees)		23 total

Note: At this time, it is assumed that the City of Houston would disturb all vegetation within the ROW, but during construction would attempt to only clear the minimum area necessary to maintain construction areas. Therefore, impacts presented are a conservative, maximum estimate.

The District practice for mitigation of impacts to woody vegetation consists of avoidance and minimization, where such can be safely implemented. In accordance with Provision (4)(A)(ii) of the TxDOT/TPWD Memorandum of Understanding (MOU), non-regulatory compensatory mitigation for vegetation and habitat impacts was evaluated. Habitats given consideration for non-regulatory mitigation during project planning include:

- (1) habitat for federal candidate species (impacted by the project) if mitigation would assist in the prevention of the listing of the species,
- (2) rare vegetation series (S1, S2, or S3) 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 provide habitat for 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 District chooses to consider.

None of these habitats were observed within the proposed project area.

The proposed project was evaluated against TPWD triggers for coordination with the agency. As indicated below, mature woody vegetation would be impacted by the project; therefore, coordination with TPWD is required. The City of Houston would attempt to only clear the minimum area and number of trees necessary to maintain construction areas and would plant new trees within the ROW upon completion of construction.

- Does the project involve more than 1.0 acre of new ROW within floodplains or creek drainages in rural or undeveloped urban areas? No
- Does the project require channel modifications to streams, rivers, or water bodies? No
- Does the project involve a channel re-alignment requiring the creation of new drainage ways or other excavation impacting more than 1.0 acre of mature woody vegetation? No
- Does the project require any excavation (scraping, clearing, or other surface disturbance) of the existing channel outside of TxDOT’s existing ROW, or of the channel inside the ROW which is not routinely maintained and exhibits native vegetation? No

- Might the project affect mature woody vegetation or dense mature brush, including any significant remnant native vegetation (e.g., undisturbed native prairie or bottomland hardwood, etc.)? Yes
- Is the project within range and in suitable habitat of any state or federally listed threatened or endangered species? No
- Does the project involve mitigation plans or otherwise involve proposals to redress project impacts on fish, wildlife, or plant resources? No
- Does the project have previous environmental clearance (i.e., three years have passed without major action(s) and/or TPWD review, but the project now meets any of the above listed criteria)? No
- Have three years passed since environmental clearance with major actions (i.e., the TPWD may have or may not have reviewed, but the project meets any of the above listed criteria)? No

5.2.4 Soils

Based on soil types described in the Natural Resources Conservation Service (NRCS) soil survey for Harris County (1976), the proposed project corridor (including the proposed detention basins) traverses three soil types. The soil types within the project corridor include Beaumont-Urban land complex (Bc), Lake Charles-Urban land complex (Lu), and Vamont-Urban land complex (Vn). **Table 9** lists the various soil types found within the proposed project area, a description of each soil type, and the hydric soil status.

Table 9 - Soil Types within Proposed Project Area

Soil Type	Description	Hydric Status
Beaumont-Urban land complex (Bc)	Nearly level soil in broad, irregularly shaped areas that average 500 acres. The slope ranges from 0 to 1%. This soil is somewhat poorly drained.	Hydric
Lake Charles-Urban land complex (Lu)	Nearly level complex in broad, irregular areas that range up to 1,800 acres in size. The slope ranges from 0 to 1%. This soil is somewhat poorly drained.	Hydric
Vamont-Urban land complex (Vn)	Nearly level, gently sloping areas to the low terraces and flood plains of major streams and drainage ways. The slope ranges from 0 to 4%. This soil is somewhat poorly drained.	Hydric

Source: NRCS (2007)

5.2.5 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) requires identification of proposed actions that would affect any farmland. Projects considered exempt under the FPPA include those that are developed, urbanized, or zoned for urban use. In addition, projects for which no additional ROW is required are exempt under the FPPA.

Environmental Consequences of Implementing the No-Build Alternative

Implementation of the No-Build Alternative would result in no ROW acquisition and no construction; therefore, the FPPA would not apply.

Environmental Consequences of Implementing the Build Alternative

The proposed project is in a developed, urban area and is, therefore, exempt from the requirements of the FPPA. No coordination with the NRCS is required.

5.2.6 Wildlife

Vegetation in the vicinity of the proposed project could and may support squirrel, rodents, other furbearing animals, and various species of songbird, spiders, insects, and reptiles. The proposed project is primarily adjacent to urban, commercial, public, institutional, and light industrial land uses; therefore, compensatory mitigation is not proposed for the impacts associated with the proposed project.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would require no additional ROW. Therefore, the existing Alameda Road facility would continue to have the impacts typically associated with a roadway (e.g., occasional road kill).

Environmental Consequences of Implementing the Recommended Alternative

Implementation of the proposed project is likely to have some temporary impacts on local wildlife individuals (as opposed to entire species), primarily during construction since animals could potentially be injured or killed by construction equipment. Some isolated impacts could result as individual animals are struck by vehicles in the additional lanes. Fragmentation of existing habitat is not anticipated. The project area is already bisected by Alameda Road. This habitat is not unique to the area nor does it provide habitat for any listed threatened or endangered species. No notable wildlife or tracks were observed during field reconnaissance activities.

5.2.7 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (MBTA) states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, or egg in part or in whole, without a federal permit issued in accordance with the Act's policies and regulations.

A cursory nest survey was conducted during initial environmental investigations in September of 2012. Field reconnaissance identified no nests or nesting habitat for migratory birds in trees within the proposed project limits.

Environmental Consequences of Implementing the No-Build Alternative

Implementation of the No-Build Alternative would result in no impacts to migratory birds, their nests, or their young.

Environmental Consequences of Implementing the Build Alternative

The migration patterns of these species would not be affected by this project. In accordance with the MBTA, measures such as additional surveys prior to construction to ensure active nests are not present would be taken prior to vegetation clearing and bridge and culvert reconstruction, which would avoid harm to these species. If nests, eggs or young are present, no work would occur in that area during the

nesting and breeding season (March 1 through August 31). Implementing the Build Alternative would have no effect on migratory birds, their nests, or their young.

5.2.8 Threatened and Endangered Species

The project's location is within the Bellaire, Texas USGS 7.5-minute topographic quadrangle map (N 29°42'00"-W 95°23'00") (B-7). The TPWD Harris County list identifies several threatened or endangered species and species of concern that may occur within Harris County. The listed status and anticipated effect to each species are summarized in **Table 10**. Note that species appearing on this list do not share the same probability of occurrence. Some species are migrants or wintering residents only, or may be historic or considered extirpated.

Table 10 - Federal and State Listed Threatened/Endangered Species in Harris County

Common Name <i>Scientific Name</i>	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
AMPHIBIANS						
Houston Toad <i>Bufo houstonensis</i>	E	E†	Endemic; sandy substrate, water in pools, ephemeral pools, stock tanks; breeds in spring especially after rains; burrows in soil of adjacent uplands when inactive; breeds February-June; associated with soils of the Sparta, Carrizo, Goliad, Queen City, Recklaw, Weches, and Willis geologic formations	No	No effect	No preferred habitat present.
BIRDS						
American Peregrine Falcon <i>Falco peregrinus anatum</i>	T	DM†	Year-round resident and local breeder in west Texas, nests in tall cliff eyries; also, migrant across state from more northern breeding areas in US and Canada, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	No	No impact	No stopovers (leading landscape edges such as lake shores, coastlines, and barrier islands) present.
Arctic Peregrine Falcon <i>Falco peregrinus tundrius</i>	SOC	DM†	Migrant throughout state from subspecies' far northern breeding range, winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands	No	No impact	No stopovers (leading landscape edges such as lake shores, coastlines, and barrier islands) present.
Bald Eagle <i>Haliaeetus leucocephalus</i>	T	DM†	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water; communally roosts, especially in winter; hunts live prey, scavenges, and pirates food from other birds	No	No impact	No suitable water bodies (rivers, lakes) present near the project area.
Black Rail <i>Laterallus jamaicensis</i>	SOC	*	Salt, brackish, and freshwater marshes, pond borders, wet meadows, and grassy swamps; nests in or along edge of marsh, sometimes on damp ground, but usually on mat of previous year's dead grasses; nest usually hidden in marsh grass or at base of Salicornia	No	No impact	No preferred habitat present.
Brown Pelican <i>Pelecanus occidentalis</i>	SOC	DM†	Largely coastal and near shore areas, where it roosts and nests on islands and spoil banks	No	No impact	Project is not located near coastline.

Common Name Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
Henslow's Sparrow (wintering) <i>Ammodramus henslowii</i>	SOC	*	Wintering individuals (not flocks) found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking	No	No impact	No preferred habitat present.
Mountain Plover <i>Charadrius montanus</i>	SOC	*	Breeding: nests on high plains or shortgrass prairie, on ground in shallow depression; nonbreeding: shortgrass plains and bare, dirt (plowed) fields; primarily insectivorous	No	No impact	No preferred habitat present.
Peregrine Falcon <i>Falco peregrinus</i>	T	DM†	both subspecies migrate across the state from more northern breeding areas in US and Canada to winter along coast and farther south; subspecies (F. p. anatum) is also a resident breeder in west Texas; the two subspecies' listing statuses differ, F.p. tundrius is no longer listed in Texas; but because the subspecies are not easily distinguishable at a distance, reference is generally made only to the species level	No	No impact	No stopovers (leading landscape edges such as lake shores, coastlines, and barrier islands) present.
Red-cockaded Woodpecker <i>Picoides borealis</i>	E	E†	Cavity nests in older pine (60+ years); forages in younger pine (30+ years); prefers longleaf, shortleaf, and loblolly	No	No effect	No preferred habitat present.
Snowy Plover <i>Charadrius alexandrinus</i>	SOC	*	Formerly an uncommon breeder in the Panhandle; potential migrant; winter along coast	No	No impact	No stopovers (leading landscape edges such as lake shores, coastlines, and barrier islands) present.
Southeastern Snowy Plover <i>Charadrius alexandrinus tenuirostris</i>	SOC	*	Wintering migrant along the Texas Gulf Coast beaches and bayside mud or salt flats	No	No impact	No preferred habitat present.
Sprague's Pipit <i>Anthus spragueii</i>	SOC	C	Only in Texas during migration and winter, mid- September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grasslands, uncommon to rare further west; sensitive to patch size and avoids edges	No	No impact	No preferred habitat present.
White-faced Ibis <i>Plegadis chihi</i>	T	*	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will attend brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats	No	No impact	No preferred habitat present.
White-tailed Hawk <i>Buteo albicaudatus</i>	T	*	Near coast on prairies, cordgrass flats, and scrub-live oak; further inland on prairies, mesquite and oak savannas, and mixed savanna-chaparral; breeding March-May	No	No impact	No preferred habitat present; project not located near coast.
Whooping Crane <i>Grus Americana</i>	E	E†	Potential migrant via plains throughout most of state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties	No	No impact	No preferred habitat present; no large wetland areas needed for food sources located within the project vicinity
Wood Stork <i>Mycteria Americana</i>	T	*	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags, sometimes in association with other wading birds (i.e. active heronries); breeds in Mexico and birds move into Gulf States in search of mud flats and other wetlands, even those associated with forested areas; formerly nested in Texas, but no breeding records since 1960	No	No impact	No preferred habitat present.

Common Name Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
FISHES						
American Eel <i>Anguilla rostrata</i>	SOC	*	Coastal waterways below reservoirs to gulf; spawns January to February in ocean, larva move to coastal waters, metamorphose, then females move into freshwater; most aquatic habitats with access to ocean, muddy bottoms, still waters, large streams, lakes; can travel overland in wet areas; males in brackish estuaries; diet varies widely, geographically, and seasonally	No	No impact	No waterways located within project vicinity
Creek Chubsucker <i>Erimyzon oblongus</i>	T	*	Tributaries of the Red, Sabine, Neches, Trinity, and San Jacinto rivers; small rivers and creeks of various types; seldom in impoundments; prefers headwaters, but seldom occurs in springs; young typically in headwater rivulets or marshes; spawns in river mouths or pools, riffles, lake outlets, upstream creeks	No	No impact	No waterways located within project vicinity
Smalltooth sawfish <i>Pristis pectinata</i>	E	E†	Different life history stages have different patterns of habitat use; young found very close to shore in muddy and sandy bottoms, seldom descending to depths greater than 32 ft (10 m); in sheltered bays, on shallow banks, and in estuaries or river mouths; adult sawfish are encountered in various habitat types (mangrove, reef, seagrass, and coral), in varying salinity regimes and temperatures, and at various water depths, feed on a variety of fish species and crustaceans	No	No impact	No waterways located within project vicinity
MAMMALS						
Louisiana Black Bear <i>Ursus americanus luteolus</i>	T	T†	Possible as transient; bottomland hardwoods and large tracts of inaccessible forested areas	No	No effect	No preferred habitat present.
Plains Spotted Skunk <i>Spilogale putoria interrupta</i>	SOC	*	Catholic; open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie	No	No impact	No preferred habitat present.
Rafinesque's Big-Eared Bat <i>Corynorhinus rafinesquii</i>	T	*	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures	No	No impact	No preferred habitat present.
Red Wolf <i>Canis rufus</i>	E	E†	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies	No	No effect	No preferred habitat present.
Southeastern Myotis Bat <i>Myotis austroriparius</i>	SOC	*	Roosts in cavity trees of bottomland hardwoods, concrete culverts, and abandoned man-made structures	No	No impact	No preferred habitat present.
MOLLUSKS						
Little Spectaclecase <i>Villosa lienosa</i>	SOC	*	Creeks, rivers, and reservoirs, sandy substrates in slight to moderate current, usually along the banks in slower currents; east Texas, Cypress through San Jacinto River basins	No	No impact	No water bodies located within project vicinity
Louisiana Pigtoe <i>Pleurobema riddellii</i>	T	*	Streams and moderate-size rivers, usually flowing water on substrates of mud, sand, and gravel; not generally known from impoundments; Sabine, Neches, and Trinity (historic) River basins	No	No impact	No water bodies located within project vicinity
Sandbank Pocketbook <i>Lampsilis satura</i>	T	*	Small to large rivers with moderate flows and swift current on gravel, gravel-sand, and sand bottoms; east Texas, Sulfur south through San Jacinto River basins; Neches River	No	No impact	No water bodies located within project vicinity

Common Name Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
Texas Pigtoe <i>Fusconaia askewi</i>	T	*	Rivers with mixed mud, sand, and fine gravel in protected areas associated with fallen trees or other structures; east Texas River basins, Sabine through Trinity rivers as well as San Jacinto River	No	No impact	No water bodies located within project vicinity
Wabash Pigtoe <i>Fusconaia flava</i>	SOC	*	Creeks to large rivers on mud, sand, and gravel from all habitats except deep shifting sands; found in moderate to swift current velocities; east Texas River basins, Red through San Jacinto River basins; elsewhere occurs in reservoirs and lakes with no flow	No	No impact	No water bodies located within project vicinity
REPTILES						
Alligator Snapping Turtle <i>Macrolemys temminckii</i>	T	*	Perennial water bodies; deep water of rivers, canals, lakes, and oxbows; also swamps, bayous, and ponds near deep running water; sometimes enters brackish coastal waters; usually in water with mud bottom and abundant aquatic vegetation; may migrate several miles along rivers; active March-October; breeds April-October	No	No impact	No water bodies located within project vicinity
Green Sea Turtle <i>Chelonia mydas</i>	T	T†	Gulf and bay system; shallow water seagrass beds, open water between feeding and nesting areas, barrier island beaches; adults are herbivorous feeding on sea grass and seaweed; juveniles are omnivorous feeding initially on marine invertebrates, then increasingly on sea grasses and seaweeds; nesting behavior extends from March to October, with peak activity in May and June	No	No effect	No water bodies located within project vicinity
Gulf Saltmarsh Snake <i>Nerodia clarkia</i>	SOC	*	Saline flats, coastal bays, and brackish river mouths	No	No impact	No water bodies located within project vicinity
Kemp's Ridley Sea Turtle <i>Lepidochelys kempii</i>	E	E†	Gulf and bay system, adults stay within the shallow waters of the Gulf of Mexico; feed primarily on crabs, but also snails, clams, other crustaceans and plants, juveniles feed on sargassum and its associated fauna; nests April through August	No	No effect	No water bodies located within project vicinity
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	E	E†	Gulf and bay systems, and widest ranging open water reptile; omnivorous, shows a preference for jellyfish; in the US portion of their western Atlantic nesting territories, nesting season ranges from March to August	No	No effect	No water bodies located within project vicinity
Loggerhead Sea Turtle <i>Caretta caretta</i>	T	T†	Gulf and bay system primarily for juveniles, adults are most pelagic of the sea turtles; omnivorous, shows a preference for mollusks, crustaceans, and coral; nests from April through November	No	No effect	No water bodies located within project vicinity
Smooth Green Snake <i>Liochlorophis vernalis</i>	T	*	Gulf Coastal Plain; mesic coastal shortgrass prairie vegetation; prefers dense vegetation	No	No impact	No preferred habitat present.
Texas Horned Lizard <i>Phrynosoma cornutum</i>	T	*	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive; breeds March-September	No	No impact	No preferred habitat present.

Common Name Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
Timber/Canebrake Rattlesnake <i>Crotalus horridus</i>	T	*	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto	No	No impact	No preferred habitat present.
VASCULAR PLANTS						
Coastal Gay-feather <i>Liatris bracteata</i>	SOC	*	Texas endemic; coastal prairie grasslands of various types, from salty prairie on low-lying somewhat saline clay loams to upland prairie on nonsaline clayey to sandy loams; flowering in fall	No	No impact	No preferred habitat present.
Florida ladies-tresses <i>Spiranthes brevilabris</i> var. <i>floridana</i>	SOC	*	Moist to wet, relatively open sites of pine-dominated landscapes, mesic pine uplands, open scrub pinelands with saw palmetto, Catahoula sandstone barrens, meadows, open grassy lawns, pitcher plant and seepage bogs, wet prairies, wet savannahs, and flatwoods. Delicate, nearly ephemeral, orchid with winter rosette. Flowers Apr-May	No	No impact	No preferred habitat present.
Giant Sharpstem Umbrella-sedge <i>Cyperus cephalanthus</i>	SOC	*	in Texas on saturated, fine sandy loam soils, along nearly level fringes of deep prairie depressions; also in depression area within coastal prairie remnant on heavy black clay; in Louisiana, most sites are coastal prairie on poorly drained sites, some on slightly elevated areas surrounded by standing shallow water, and on moderately drained sites; soils include very strongly acid to moderately alkaline silt loams and silty clay loams; flowering/fruitletting May-June, August-September, and possibly other times in response to rainfall	No	No impact	No preferred habitat or soils present.
Houston Daisy <i>Rayjacksonia aurea</i>	SOC	*	Texas endemic; on and around naturally barren or sparsely vegetated saline slick spots or pimple mounds on coastal prairies, usually on sandy to sandy loam soils, occasionally in pastures and on roadsides in similar soil types where mowing may mimic natural prairie disturbance regimes; flowering late September-November (-December)	No	No impact	No preferred habitat or soils present.
Neglected coneflower <i>Echinacea paradoxa</i> var. <i>neglecta</i>	SOC	*	Rocky prairies, glades, and crosstember open woodlands and savannas. Full sun.	No	No impact	No preferred habitat present.
Panicled indigobush <i>Amorpha paniculata</i>	SOC	*	A stout shrub, 3 m (9 ft) tall that grows in acid seep forests, peat bogs, wet floodplain forests, and seasonal wetlands on the edge of Saline Prairies in East Texas. It is distinguished from other <i>Amorpha</i> species by its fuzzy leaflets with prominent raised veins underneath, and the flower panicles, which are 8 to 16 inches long and slender, held above the foliage	No	No impact	No preferred habitat present.
Texas ladies'-tresses <i>Spiranthes brevilabris</i> var. <i>brevilabris</i>	SOC	*	Sandy soils in moist prairies, incl. blackland/Fleming prairies, calcareous prairie pockets surrounded by pines, pine-hardwood forest, open pinelands, wetland pine savannahs/flatwoods, and dry to moist fields, meadows, and roadsides. Delicate, nearly ephemeral orchid, producing winter rosettes, flowers Feb-Apr. Historically endemic to SE coastal plain	No	No impact	No preferred habitat present.

Common Name Scientific Name	State Status	Federal Status	Habitat Description	Habitat Present	Impact/Effect	Comments
Texas Meadow-rue <i>Thalictrum texanum</i>	SOC	*	Texas endemic; mostly found in woodlands and woodland margins on soils with a surface layer of sandy loam, but it also occurs on prairie pimple mounds; both on uplands and creek terraces, but perhaps most common on claypan savannas; soils are very moist during its active growing season; flowering/fruitleting (January-) February-May, withering by midsummer, foliage reappears in late fall (November) and may persist through the winter	No	No impact	No preferred habitat or soils present.
Texas Prairie Dawn <i>Hymenoxys texana</i>	E	E	Texas endemic; in poorly drained, sparsely vegetated areas (slick spots) at the base of mima mounds in open grassland or almost barren areas on slightly saline soils that are sticky when wet and powdery when dry; flowering late February-early April	No	No effect	No preferred habitat or soils present.
Texas Windmill Grass <i>Chloris texensis</i>	SOC	*	Texas endemic; sandy to sandy loam soils in relatively bare areas in coastal prairie grassland remnants, often on roadsides where regular mowing may mimic natural prairie fire regimes; flowering in fall	No	No impact	No preferred habitat or soils present.
Threeflower Broomweed <i>Thurovia triflora</i>	SOC	*	Texas endemic; near coast in sparse, low vegetation on a veneer of light colored silt or fine sand over saline clay along drier upper margins of ecotone between salty prairies and tidal flats; further inland associated with vegetated slick spots on prairie mima mounds; flowering September-November	No	No impact	No preferred habitat or soils present.

* These species occur on the State (TPWD) listing of threatened or endangered species; however, they are not federally listed at this time by the U.S. Fish and Wildlife Service (USFWS, 2013).

† These species occur on the State (TPWD) listing of threatened or endangered species; however, they are not listed to occur within this county by the Clear Lake office of the USFWS (2013).

E = endangered T = threatened H = historical occurrence I = introduced population C = candidate species

SOC = species of concern DM = delisted taxon, recovered, being monitored first five years

SAT = similarity of appearance to a threatened taxon D = delisted taxon PDL= proposed delisting

TPWD website listing by county viewed on 7/15/2013.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not require any construction work and, therefore, would have no effect on any federally- or state-listed threatened or endangered species.

Environmental Consequences of Implementing the Recommended Alternative

A check of the TPWD Texas Natural Diversity Database (TXNDD) “live” version was conducted on April 29, 2013. The TXNDD search found no element of occurrence record (EOR) for any listed threatened and/or endangered species within a 1.5-mile radius of the proposed project. An EOR is a spatial and tabular record of an area of land and/or water in which a species, natural community or other substantial feature of natural diversity is or was present. An EOR may be a single contiguous area or may be comprised of discrete patches or subpopulations.

There is no known flora or fauna in the area that would be classified as rare or unique. According to a review of the Texas Natural Heritage Program Information System, there are no significant natural plant communities or native prairie remnants that would be impacted by the proposed project. For a detailed description of surrounding habitat and vegetation, please see **Section 5.2.3, Vegetation**.

Field surveys and review of available records indicate that the proposed project would have no effect on any federally-listed threatened or endangered species and no impact on any state-listed species. Furthermore, the project would have no impact on Bald or Golden Eagles in compliance with the Bald and Golden Eagle Protection Act of 1940, as amended, as defined in **Appendix A**. Since the proposed project would have no effect on any federally-listed species, coordination with the USFWS is not required.

5.2.9 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended on October 11, 1996, requires all federal agencies whose actions would impact essential fish habitat (EFH) to consult with the National Marine Fisheries Service (NMFS) regarding potential adverse effects. This means that any project that receives federal funding must address potential impacts to EFH.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not require any activities within tidally influenced waters; therefore, there would be no impacts to EFH.

Environmental Consequences of Implementing the Recommended Alternative

There are no tidally influenced waters in the project area. Therefore, EFH would not be impacted and coordination with the NMFS is not required.

5.2.10 Water Resources

The subject property is underlain by Gulf Coast aquifers. The two principal fresh water aquifers are the Chicot and the Evangeline. The Chicot Aquifer is broken into two productive units, designated the Upper and Lower Chicot Aquifers. The Upper Chicot unit, comprised of the water-bearing sands in the Beaumont and Upper Lissie Formations, extends to a depth of approximately 250 feet below surface. The Lower Chicot unit, comprised of the water-bearing sands in the Lower Lissie and the Willis Sand of the Willis Formation, occurs within the approximate depth interval of 250 feet to 600 feet below ground surface. The aquifers are noted for their high sand-clay ratio and abundance of water. Use of the Chicot Aquifer in the Houston area is limited, other than as a water source for domestic or light industrial water supply uses.

The Evangeline Aquifer, corresponding to the Goliad Sand of the Willis and Fleming Formations, represents the principal subsurface water supply source for the City of Houston and surrounding communities. The aquifer is noted for its abundance of good quality ground water and is considered one of the most prolific aquifers in the Texas Coastal Plain. Individual sand beds are characteristically tens of feet thick. Public water supply wells completed within the Evangeline Aquifer in this area are typically screened within a depth interval of 600 feet to 2,400 feet below ground surface.

5.2.10.1 *Clean Water Act, Section 303(d) List*

The Texas Commission on Environmental Quality's (TCEQ) 2012 Texas Clean Water Act (CWA) Section 303(d) List (approved May 9, 2013) identifies impaired waters (i.e., water bodies that do not meet minimum standards in specific categories). If a project is less than 5 miles upstream of an impaired segment, coordination with TCEQ is required for total maximum daily loads (TMDLs).

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build Alternative, there would be no impacts to stream, channels, or wetlands and thus no impact to water quality or any water segment on the 303(d) list.

Environmental Consequences of Implementing the Recommended Alternative

Brays Bayou (Seg ID: 1007B) is the nearest listed receiving body for storm water drainage from the proposed project area. According to the 2012 Section 303(d) list, Brays Bayou is not listed as an impaired water body. The project area is not within 5 miles upstream of an impaired stream. Therefore, coordination with the TCEQ for total maximum daily loads would not be required.

No long-term water quality impacts are expected as a result of the proposed project. Subsurface water would not be required for this project; therefore, no adverse effects to groundwater are expected to occur. The proposed project is not expected to alter rainfall drainage patterns or contaminate or otherwise adversely affect the public water supply, water treatment facilities, or water distribution systems.

5.2.10.2 *Waters of the U.S. (Including Wetlands)*

The purpose of EO 11990, Protection of Wetlands (1977), is to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

In July 2011 and September 2012, qualified biologists and ecologists performed a wetland delineation of wetland areas and jurisdictional waters and a biological survey. Site photographs taken during the survey are included in **Appendix B-4**. The wetland delineation consisted of a review of available published historical information and the U.S. Geological Survey (USGS) topographic map (Bellaire Quadrant FEMA map #2995-423) and detailed site reconnaissance to evaluate the subject property for the presence or absence of jurisdictional waters and wetlands according to criteria set forth in the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region to the Corps of Engineers Wetland Delineation Manual – Technical Report Y-87-1*. The following activities were undertaken to perform the analysis: 1) site reconnaissance, evaluation and documentation of soil parameters, hydrology, and vegetation indicators; and 2) survey of jurisdictional waters, including wetlands, using GPS satellite equipment. Collection of data occurred under the following conditions to ensure optimum results: 1) use of at least 5 satellites; 2) a Position Dilution of Precision (PDOP) of 0.0 to 6.0; 3) a signal-to-noise ratio of less than 6.0; and 4) a satellite elevation mask of at least 15 degrees. In addition, data was collected using real time kinematics (RTK) by the use of the OmniStar satellite system.

Vegetation communities were evaluated and documented to delineate jurisdictional and upland boundaries. Vegetation observed during the survey is described in **Section 5.2.3, Vegetation** of this EA.

Plant and soil descriptions and classifications, as well as hydrologic conditions, from each of the sample areas were recorded on USACE routine data forms. Review of the USFWS National Wetland Inventory (NWI) Maps of the project area was also conducted to obtain information on current and historical wetlands within the project vicinity.

The project area contains one upland drainage ditch within the median of the roadway. An analysis of the USGS topographic map and field reconnaissance revealed no potential waters of the U.S. that would be impacted by the proposed project.

Environmental Consequences of Implementing the No-Build Alternative

Implementation of the No-Build Alternative would not have impacts on any Waters of the U.S., including wetlands.

Environmental Consequences of Implementing the Recommended Alternative

The proposed widening of Alameda Road would require culvert reconstruction and pavement widening. The project would not result in the placement of temporary or permanent dredge or fill material into potentially jurisdictional waters of the U.S., including wetlands or other special aquatic sites; therefore, a Section 404 permit would not be required. Since there are no wetlands present within the project area, EO 11990, Protection of Wetlands, does not apply.

5.2.10.3 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) was enacted to protect fish and wildlife when federal actions result in a modification of a natural stream body of water. If a modification to a natural stream or water body is expected, coordination with the USFWS is required.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not impound, divert or otherwise control or modify any of the water bodies. Coordination with the USFWS per the FWCA would not be required.

Environmental Consequences of Implementing the Recommended Alternative

The proposed project would not impound, divert or otherwise control or modify any of the water bodies. Coordination with the USFWS per the FWCA would not be required.

5.2.10.4 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 USC 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.

Environmental Consequences of Implementing the No-Build Alternative

Implementation of the No-Build Alternative would not have impacts on any present, proposed, or potential unit of the National Wild and Scenic River System.

Environmental Consequences of Implementing the Recommended Alternative

There are no water bodies within the proposed project area that are designated to be within the National Wild and Scenic River System. Therefore, the Build Alternative would have no impacts on present, proposed, or potential units of the National Wild and Scenic River System.

5.2.10.5 Significant Stream Segments

The Texas legislature may designate a river or stream segment of unique ecological value and thus a “Significant Stream Segment” following the recommendations of a regional water planning group. As per 16.051 (f) of the Texas Water Code, this designation solely means that a state agency or political subdivision of the State may not finance the actual construction of a reservoir in a specific river or stream segment designated by the legislature under this subsection. The following criteria are used when recommending a river or stream segment as being of unique ecological value: biological or hydrologic function, riparian conservation areas, high water quality/exceptional aquatic life/high aesthetic value, or threatened or endangered species/unique communities.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not involve construction of a reservoir in any water body designated as a Significant Stream Segment.

Environmental Consequences of Implementing the Recommended Alternative

In accordance with §16.051 (f) of the Texas Water Code, the Recommended Alternative would not involve construction of a reservoir in any water body designated as a Significant Stream Segment.

5.2.11 Permits

5.2.11.1 U.S. Army Corps of Engineers

Clean Water Act, Section 404

The USACE, under CWA authority, regulates fill within Waters of the U.S. through general and individual permits.

River and Harbors Act of 1899, Section 10

There are no navigable waterways within the proposed project area.

Environmental Consequences of Implementing the No-Build or Recommended Alternative

The No-Build Alternative would not involve the placement of fill in any waters of the U.S. (including wetlands) or the crossing of any navigable waterway. Therefore, a Section 404 permit from the USACE would not be required, and navigational clearance under the General Bridge Act of 1946 and Section 10 of the Rivers and Harbors Act of 1899 is not applicable.

Environmental Consequences of Implementing the Recommended Alternative

The Recommended Alternative would not involve the placement of fill in any waters of the U.S. (including wetlands) or the crossing of any navigable waterway. Therefore, a Section 404 permit from

the USACE would not be required. Navigational clearance under the General Bridge Act of 1946 and Section 10 of the Rivers and Harbors Act of 1899 is not applicable; coordination with the USACE for Section 10 would not be required.

5.2.11.2 U.S. Coast Guard

Environmental Consequences of Implementing the No-Build Alternative

There are no navigable waterways within the proposed project area. Navigational clearance under the General Bridge Act of 1946 / Section 9 of the Rivers and Harbors Act, administered by the U.S. Coast Guard (USCG), is not applicable.

Environmental Consequences of Implementing the Recommended Alternative

Since the proposed project does not involve work in or over a navigable water of the U.S., navigational clearance under the General Bridge Act of 1946 / Section 9 of the Rivers and Harbors Act does not apply. Coordination with the USCG would not be required for the Recommended Alternative.

5.2.11.3 Texas Commission on Environmental Quality

Clean Water Act, Section 401 Certification

The Clean Water Act (CWA) of 1977 (33 USC s/s 1251 et seq.), established the basic structure for regulating discharges of pollutants to Waters of the U.S. Pursuant to Section 401 of the CWA, a certification must be obtained from the state before any activity that may result in a pollution discharge into Waters of the U.S. can be permitted by a federal agency. The TCEQ issues 401 certifications for TxDOT activities.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would have no impacts on Waters of the U.S.; therefore, Section 401 certification is not applicable.

Environmental Consequences of Implementing the Recommended Alternative

The proposed project would not impact jurisdictional waters; therefore, Section 401 certification is not applicable.

TPDES, NOI, SW3P

The CWA Section 402 makes it unlawful to discharge storm water from construction sites to waters of the United States unless authorized by the Texas Pollutant Discharge Elimination System (TPDES) Permit No. TXR150000 for Storm Water Discharges Associated with Construction Activities. If more than 5 acres of ROW are disturbed at one time during construction, a Notice of Intent (NOI) must be filed with the TCEQ.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not result in the disturbance of any ROW; therefore, Section 402 is not applicable.

Environmental Consequences of Implementing the Recommended Alternative

Because the proposed project would disturb more than 5 acres (approximately 9.39 acre), the City of Houston is required to comply with the TPDES Permit No. TXR150000 for Storm Water Discharges Associated with Construction Activities. An NOI, stating that a Storm Water Pollution Prevention Plan (SW3P) would be developed and filed with the TCEQ in accordance with TxDOT policies, would be required. Pollution from storm water would be minimized through adherence to measures in the project's SW3P. Construction of the proposed action would include temporary erosion control measures to minimize impacts to water quality during construction as specified in the TxDOT manual *Storm Water Management and Guidelines for Construction Activities*. These measures may include the use of silt fencing, inlet protection barriers, hay bales, seeding or sodding of bare areas, or other suitable means of containment. Temporary erosion control structures would be built before construction begins (where appropriate) and maintained during construction. Vegetation would be cleared only as needed, and clearing may be phased, to maintain soil integrity and minimize exposure of an erosive surface. When construction is completed, disturbed areas would be restored and stabilized according to TxDOT specifications.

5.2.11.4 *Floodplains*

The City of Houston and Harris County are participants in the National Flood Insurance Program (NFIP). As a result of Tropical Storm Allison in June of 2001, the Federal Emergency Management Agency (FEMA) revised the 100-year floodplain for Houston and surrounding areas in 2006. This revision is entitled the *Tropical Storm Allison Recovery Project (TSARP)*. The revised Flood Insurance Rate Map (FIRM) number covering this project is 48201C0860L. The 100-year floodplains are depicted in the **Project Layout Map (B-2)**.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would have no impacts on floodplains.

Environmental Consequences of Implementing the Recommended Alternative

Approximately 5.6 acres of the Recommended Alternative ROW lie within the 100-year floodplain of Brays Bayou (**B-8**). The widening of Almeda Road would result in the addition of approximately 4.07 acre of pavement (impervious surface). Under existing conditions, storm water flows are handled via curb-and-gutter and shallow roadside drainage ditches along Almeda Road between South MacGregor Way and OST. Implementation of the proposed project would result in the addition of bioswale style drainage.

The hydraulic design practices for this project would be in accordance with current TxDOT design policy and standards. The project is proposed to use grass swales along the roadsides for conveyance and mitigation and focalpoints® for cleaning the storm runoff. These focalpoints® would consist of layers of filtration material that would remove suspended solids and some impurities from the runoff and are estimated to be 5 feet by 15 feet and would be typically landscaped with native plants that require low maintenance. The proposed project would not increase the base flood elevation to a level that would violate the applicable floodplain regulations or ordinances. All appropriate coordination with the local Floodplain Administrator would be performed prior to construction.

The proposed project would not include significant encroachment on the floodplain; therefore, 23 CFR 650.113 (only practicable alternative finding) does not apply.

5.2.11.5 Coastal Zone Management Plan

As of January 1997, the State of Texas has an approved Coastal Zone Management Plan.

Environmental Consequences of Implementing the No-Build or Recommended Alternative

The project area is not within the jurisdictional boundaries of the Texas Coastal Management Program; therefore, neither the proposed project nor the No-Build Alternative is subject to the guidelines of the plan. It is not expected that either alternative would have any direct adverse effect on any coastal natural resource areas. Coordination with the Texas General Land Office's Coastal Coordination Council is not required.

5.3 Cultural Resources

NEPA requires consideration of important historic, cultural, and natural aspects of our national heritage. Important aspects of our national heritage that may be present in the project corridor have been considered under Section 106 of the National Historic Preservation Act of 1966, as amended. This act requires federal agencies to "take into account" the "effect" that an undertaking would have on "historic properties." Historic properties are those included in or eligible for inclusion in the National Register of Historic Places (NRHP) and may include structures, buildings/districts, objects, cemeteries, and archeological sites. In accordance with the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties (36 CFR 800), federal agencies are required to locate, evaluate and assess the effects that the undertaking would have on such properties. These steps have been completed under terms of the First Amended Programmatic Agreement for Transportation Undertakings (PA-TU) between TxDOT, the State Historic Preservation Officer (SHPO), FHWA, and the ACHP. The identification of potential historic properties has been undertaken for structures, buildings/districts, objects, cemeteries, and archeological sites found within the project corridor.

5.3.1 Historic Resources

The area of potential effects (APE) for this project between South MacGregor and OST has been established as the proposed construction footprint and immediately surrounding area. A desktop review was conducted by qualified architectural historians within the APE after a literature review for the area. The desktop assessment identified no previously recorded extant historic-age structures, National Register-listed properties, Registered Texas Landmarks, or State Historical Landmarks within the APE. The project areas are comprised mostly of existing TxDOT ROW which has been heavily modified by prior multi-lane roadway construction. Standing structures visible in historic aerial photographs dating back as early as 1943 have been demolished and/or replaced since their date of construction.

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build alternative, no construction would occur within the existing or proposed ROW; therefore, there would be no effect on historic resources.

Environmental Consequences of Implementing the Build Alternative

The proposed project would involve reconstruction of the existing Almeda Road ROW. The project would acquire approximately 0.13 acre of new ROW but subsurface construction would not exceed the existing depth of the roadbed. There is little to no potential of encountering historic structures due to the previous disturbances including the construction of the road, utilities, and structures (past and present), as well as demolition and/or replacement of nearby buildings.

Although formal NRHP evaluations have not been performed, all proposed work would remain within 10 feet of the existing ROW and would only involve the extant roadway and re-delineating the positions of traffic lanes.

This desktop assessment identified no previously recorded historic-age structures, NRHP-listed properties, Registered Texas Landmarks (RTLs), or State Historical Markers within the architectural APE. Based on this assessment it is unlikely that there is a potential for historic-age structures to exist within the architectural APE. Therefore, a reconnaissance-level architectural history survey is not warranted for this project. The full letter report is included in **Appendix D: Agency Coordination**.

5.3.2 Archeological Resources

TxDOT's Preliminary Archeological Liability Map (PALM) covers Harris County and other counties in the Greater Houston area and is based on a combination of data including soil associations, landform types, cultural and natural resource distribution, and historic and modern land use data (see **B-9**). The PALM is a cultural resource management tool that predicts the likelihood of detecting deeply buried intact cultural resources in various topographic settings around Houston. The model also recommends the type of archaeological survey strategy that should be implemented for a given PALM unit, of which there are four major groupings. For PALM Unit 1, surface survey is recommended and deep reconnaissance is only recommended if deep impacts are anticipated. For PALM Unit 2, only surface survey is recommended. PALM Units 3 and 3a are similar and recommend no surface survey, although Map Unit 3 recommends deep reconnaissance if deep impacts are anticipated, while Map Unit 3a recommends deep reconnaissance only if severe impacts are anticipated. For PALM Unit 4, no survey is recommended. The entire project area is classified as PALM Unit 4.

Record searches at the Texas Archeological Research Laboratory (TARL) revealed no recorded sites within the project APE, which is the existing and proposed ROW of Almeda Road within the project limits. Research conducted with the THC Online Archaeological Site Atlas in January of 2013 showed no previously recorded archaeological sites, historic structures, historic markers, or cemeteries within the project APE. Two known archaeological sites are located within 1.6 kilometers (1 mile) of the project area. Both are historic house sites with glass and metal deposits within 1 meter (39 inches) depth. None are closer than 0.6 kilometers (0.35 mile) from the proposed project area.

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build Alternative, no construction would occur within the existing or proposed ROW; therefore, there would be no effect on archeological resources.

Environmental Consequences of Implementing the Build Alternative

The proposed project would involve reconstruction of the existing Alameda Road ROW and portions of Holcombe Boulevard at the Alameda Road intersection. The project would acquire minimal new ROW, and subsurface construction is not expected to exceed the existing depth of the roadbed. Therefore, there is little to no potential of encountering shallowly buried, intact, significant prehistoric or historic archaeological deposits due to the previous subsurface disturbances including the construction of the road, utilities, and structures (past and present). Although formal NRHP evaluations have not been performed, all proposed work (as planned) would only involve the extant roadway and re-delineating the positions of traffic lanes. These construction efforts pose no threat to prehistoric or historic age archeological deposits. As a result, an archaeological field survey of the property is not warranted for the project.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area would cease and TxDOT archeological staff would be contacted to initiate post-review discovery procedures under the provisions of the First Amended Programmatic Agreement among the FHWA, TxDOT, the Texas SHPO, and ACHP regarding the Implementation of Transportation Undertakings (PA-TU), and the MOU (43 TAC 2.24) between TxDOT and THC.

5.3.3 Section 4(f) Properties

Section 4(f) of the U.S. Department of Transportation Act of 1966 [49 USC 3039c] and 23 CFR 774 requires that the proposed use of any land from a significant publicly owned park or recreation area, wildlife refuge, or historic site that is listed in or is eligible for listing in the NRHP be given particular attention. Final action requiring the acquisition of such land must document that there are no feasible and prudent alternates to its use. Additionally, a full evaluation of measures to minimize harm to that resource must be made and documented.

Environmental Consequences of Implementing the No-Build Alternative

The No-Build Alternative would not require the use of, or ROW from, publicly owned land from historic sites of national, state or local significance.

Environmental Consequences of Implementing the Recommended Alternative

The proposed project would not require the use of, nor substantially impair the purposes of any publicly owned land from a public park, recreational area, wildlife and waterfowl refuge lands, or historic sites of national, state, or local significance, therefore, a U.S. Department of Transportation Act of 1966, Section 4(f) statement is not required. There are no publicly owned lands or Land and Water Conservation Fund Act funded properties in the project vicinity that would require protection under Section 4(f) or 6(f) of this Act. Hermann Park is located adjacent to the proposed project. However, no ROW would be required from the park and no impacts to the park would result from the project.

5.4 Air Quality Impacts

Transportation Conformity

This project is located in Harris County, which is part of the Houston-Galveston-Brazoria area that has been designated by EPA as a Marginal Nonattainment Area in accordance with the 2008 8-hour ozone standard; therefore, transportation conformity rules apply.

The project is included in the H-GAC's financially constrained 2035 RTP Update and the H-GAC's 2013-2016 TIP (as adopted April 27, 2012). Both the RTP and the TIP, as amended, were initially found to conform to the TCEQ SIP by FHWA on January 25, 2011 and November 1, 2012, respectively. All projects in the H-GAC 2013-2016 TIP that are proposed for federal or state funds were initiated in a manner consistent with federal guidelines in Section 450, of Title 23 CFR and Section 613.200, Subpart B, of Title 49 CFR. Energy, environment, air quality, cost, and mobility considerations are addressed in the programming of the TIP.

Carbon Monoxide (CO) Traffic Air Quality Analysis (TAQA)

Traffic data for the design year 2035 is 39,741 vehicles per day. A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an average annual daily traffic (AADT) below 140,000 (TxDOT Air Quality Guidelines, 2006, updated September 2011). The AADT projections for the project do not exceed 140,000 vehicles per day; therefore a Traffic Air Quality Analysis was not required.

5.4.1 Congestion Management Process (CMP)

The congestion management process (CMP) is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The project was developed from H-GAC's operational CMP, which meets all requirements of Title 23 CFR Section 500.109. The CMP was adopted by H-GAC on January 25, 2013.

The region commits to operational improvements and travel demand reduction strategies at two levels of implementation: program level and project level. Program level commitments are inventoried in the regional CMP, which was adopted by H-GAC; they are included in the financially constrained RTP, and future resources are reserved for their implementation.

Committed congestion reduction strategies and operational improvements within the study boundary will consist of signalization and intersection improvements. Individual projects are listed in **Table 11**. At the project's programming stage, travel demand reduction strategies and commitments would be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the single occupancy vehicle (SOV) facility implementation and project-specific elements.

Table 11- Congestion Management Process Strategies

Operational Improvements in the Travel Corridor		
Location	Type	Implementation Date
Alameda/SH 288	Alameda/SH 288 Guided Rapid Transit Line	2033
SH 288 from US 59 to Beltway 8	Build 4 toll lanes	2012
SH 288	South Freeway transit center	2012
IH 610 at SH 288	Emergency service connectors in Texas Medical Center	2013
Numerous Misc. Locations	Various Corridor Planning projects, Park and Ride Modifications, ITS Improvements, Transit Center Modifications, and Bus Fleet expansion/updates.	2017 through 2035
Holcombe at Main	Widen approaches to 3 lanes	2012
Main at Holcombe & Fannin	Pedestrian and transit improvements	2012
Herman Park Trail	Shared use trail around Herman Park Golf Course	2011

In an effort to reduce congestion and the need for SOV lanes in the region, TxDOT and H-GAC would continue to promote appropriate congestion reduction strategies through the Congestion Mitigation and Air Quality Improvement (CMAQ) program, the CMP, and the RTP. The congestion reduction strategies considered for this project would help alleviate congestion in the SOV study boundary, but would not eliminate it.

Therefore, the proposed project is justified. The CMP analysis for added SOV capacity projects in the TMA is on file and available for review at H-GAC.

5.4.2 Mobile Source Air Toxics (MSATs)

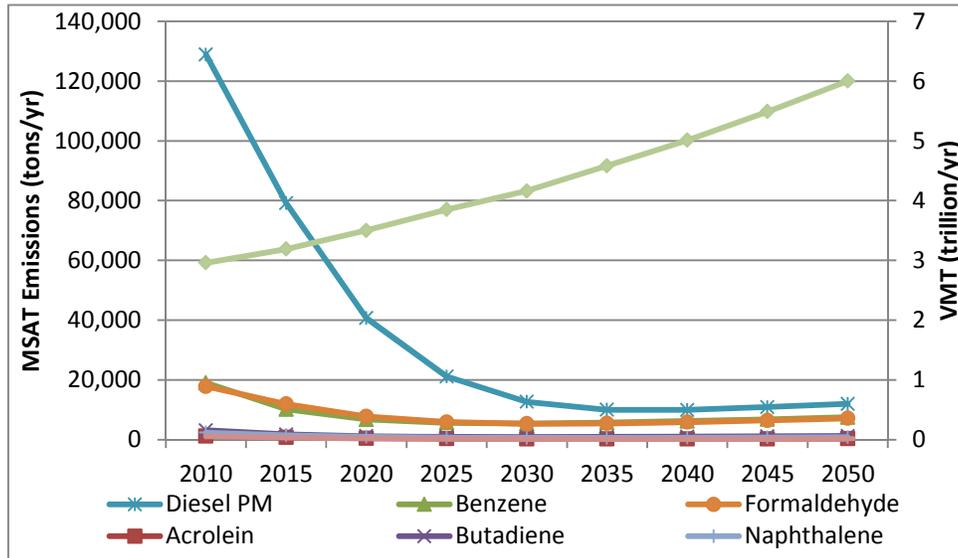
Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (<http://www.epa.gov/iris/>). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (<http://www.epa.gov/ttn/atw/nata1999/>). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA Mobile Source Air Toxics (MSAT) rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA

analysis using EPA’s MOVES2010b model, as shown in **Figure 1** and **Table 12**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 1 - Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA’s MOVES2010b Model



Source: Table 12 below.

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

Table 12 - Projected National MSAT Emission Trends 2010 – 2050 for Vehicles Operating on Roadways Using EPA’s MOVES2010b Model

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

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

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for

assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the National Environmental Policy Act (NEPA). The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

Project Specific MSAT Information

A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled, *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at:

http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf. For each alternative in this document, the amount of MSAT emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the roadway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b emissions model, emissions of all the priority MSAT decrease as speed increases. Also, regardless of the alternative chosen, emissions would likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

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

Incomplete or Unavailable Information for Project Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, <http://www.epa.gov/ncea/iris/index.html>). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's 2009 *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts- each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for a lifetime (i.e., 70-year) assessments, particularly because unsupported assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As

a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://pubs.heatheffects.org/getfile.php?u=395>) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also a lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework.

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

Conclusion

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

5.5 Traffic Noise

This analysis was accomplished in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Highway Traffic Noise (2011)*.

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB". Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis typically includes the following elements:

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

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

Table 13 – FHWA Noise Abatement Criteria

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

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

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one (1) dB(A) below the NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

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

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

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build Alternative, traffic noise would tend to increase with an associated increase in traffic.

Environmental Consequences of Implementing the Build Alternative

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 14** and **Project Layout Map (B-2)**) that represent the land use areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 14 - Traffic Noise Levels (dBA Leq)

Receiver	Type	NAC Category	NAC Level	Existing 2012	Predicted 2030	Change (+/-)	Noise Impact
R1	Park	C	67	60	64	+4	No
R2	Residential	B	67	67	69	+2	Yes
R3	Hospital	C	67	72	72	+/- 0	Yes
R4	Residence	B	67	67	69	+2	Yes
R5	Residence	B	67	67	69	+2	Yes
R6	Residence	B	67	67	69	+2	Yes
R7	Residence	B	67	66	68	+2	Yes
R8	Residence	B	67	67	69	+2	Yes
R9	Residence	B	67	66	69	+3	Yes

As indicated in **Table 14**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise barriers.

Before any abatement measure can be proposed for incorporation into the proposed project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50% of impacted, first row receivers by at least 5 dB(A); and to be "reasonable," it must not exceed the cost-effectiveness criterion of \$25,000 for each receiver that would benefit by a reduction of at least 5 dB(A) and the abatement measure must be able to reduce the noise level at least one impacted, first-row receiver by at least 7 dB(A).

Traffic Management: control devices could be used to reduce the speed of traffic; however, the minor benefit of one dB(A) per 5 mph reduction in speed does not outweigh the associated increase in

congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of vertical and/or horizontal alignments: any alteration of the alignment would displace existing residences, require additional right of way, and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations.

Noise barriers would not be feasible and reasonable for the following impacted receiver and, therefore, are not proposed for incorporation into the project:

R4: This receiver is a residence with a driveway facing the roadway. A continuous noise wall would restrict access to this residence. Gaps in a noise wall would satisfy access requirements, but the resulting non-continuous wall segments would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) or the noise reduction design goal of 7 dB(A).

R3: This receiver is a separate, individual hospital (Michael E. Debakey Veterans Affairs (VA) Medical Center) with an associated jogging trail. Noise barriers that would achieve the minimum feasible reduction of 5 dB(A) at this receiver would exceed the reasonable, cost-effectiveness criterion of \$25,000. Additionally, a noise barrier at this location would block pedestrian access to the hospital and associated jogging trail, in contradiction with one of the project's purposes.

Noise barriers would be feasible and reasonable for the following impacted receivers:

R2, R5 – R9: These receivers represent a total of 142 townhomes in two adjacent complexes (the Villas at Hermann Park and the Marquis Lofts at Hermann Park) separated by Hermann Park Court. Based on preliminary calculations, a noise barrier 992 feet in length and 8 feet in height, divided into two roughly 500-foot long segments by Hermann Park Court, would reduce noise levels by at least 7 dB(A) for at least 25 benefitted receivers and by at least 5 dB(A) for 56 benefitted receivers at a total cost of \$142,848 or approximately \$2,551 for each benefitted receiver. **Table 15** summarizes the details of the two proposed noise barrier segments adjacent to these townhomes between Dixie Drive and Camden Drive.

Table 15 – Preliminary Noise Barrier Data

Barrier	# Benefitted Receivers	Length (feet)	Height (feet)	Total Cost*	Cost per Benefitted Receiver
From Dixie Drive north to Hermann Park Court	26	490	8	\$70,560	\$2,714
From Hermann Park Court north to Camden Drive	30	502	8	\$72,288	\$2,410

*Based on estimated construction costs of \$18 per square foot.

Coordination with the owners of these two townhome complexes indicated that they object to construction of proposed noise barriers on the grounds that the structure would obstruct the view of their

residents and detract from their property values (see **Appendix E**). Therefore, noise barriers are not included in this project.

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

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

5.6 Hazardous Materials

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

5.6.1 Visual and Historical Observations

Site reconnaissance was conducted for the proposed elevated intersection project on August 30, 2011. No signs of staining, stressed vegetation (with the exception of drought-stressed plants), or other recognized environmental conditions were observed during site reconnaissance. Historical aerial photographs and site reconnaissance revealed no indications of any conditions which would pose an insurmountable environmental risk to the proposed project. Alameda Road (FM 521) and OST (US 90A) predate the 1944 aerial photograph. Prior to the establishment of interstate highways and other U.S. highways in the area, the two roads were significant transportation routes. At the project area, bordering land-uses ranged from mostly residential and larger tracts that were maintained, but mostly undeveloped. To the north was already well-developed with the golf course and residential subdivision(s). The St. Dominican Diocese Center and a small airstrip also were observed in the area. By 1953, The VA Center and the old Nabisco facility were present (Nabisco Bakery-circa 1948). Apartments and additional residential had developed in the area. A gasoline service station now was present on the northeast corner of Alameda Road and US 90. It is unclear when US 90 was called OST, but is also named after an earlier trail at the area; US 90 is anticipated to have become an alternate in the late 1960s or in the 1970s. By 1962, US 90A had been improved to a parkway. Brays Bayou was being engineered. The Dominican Sisters (6501 Alameda Road/6504) had expanded. Three commercial structures in the 6907 to 6935 (odd numbers

only) Alameda Road range had been established near the southern portion of the project area. Another gasoline service station was now present on the southeast corner of Alameda Road and OST. One of the structures currently occupied by Grocery Supply was now present to the east. The St. Anthony Hospital & Center now was present. Nabisco and the Dominican Sisters facilities continued to expand. By 1976, another gasoline service station was present on the southwest corner of Alameda Road and OST (may have been present in 1950s). By 1989, a major expansion had occurred at the VA Center. Apartment complexes had developed to the southeast. By 2010, the St. Anthony Hospital had been converted to mid-rise lofts. New low-rise lofts and apartments also now bordered the mid-rise loft. The Texas Medical Center purchased the old Nabisco Bakery (formerly 6803 Alameda Road) and renovated the facility for their use (commenced 2000-2001); and the facility has been renamed the John P. McGovern Campus (2450 Holcombe Blvd.). A strip center (2254-2280 Holcombe Road) had been established on the southwest corner of Alameda Road and Holcombe Boulevard and a small strip center also had developed near the northeast corner of Alameda Road and OST. No other significant observations were made.

5.6.2 Regulatory Records Review

Six regulatory listings were reported within the All Appropriate Inquiry – American Society for Testing Materials (AAI - ASTM) search range. More than one listing may be associated with a single regulatory facility. The databases that were searched and the corresponding search distances from the project alignment are listed below in **Table 16**.

Table 16 – Federal and State Environmental Record Sources

Database	Search Radius
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list (CERCLA and CERCLA NFRAP)	0.5-mile
Federal National Priority List (NPL and NPL Delisted)	1.0-mile
Federal Resource Conservation Recovery Act (RCRA) Corrective Actions (CORRACTS) and Treatment, Storage, and Disposal (TSD) facilities list	1.0-mile
Federal Resource Conservation and Recovery Information System (RCRIS) (RCRA Generators, Notifiers and Violations) list	0.125-mile
Federal Emergency Response Notification System (ERNS) list	0.25-mile
Federal Toxic Chemical Release Inventory System (TRIS) list	0.25-mile
State-equivalent CERCLIS	0.5-mile
State-equivalent NPL/State Superfund list (SPL)	1.0-mile
State landfill and/or solid waste disposal site list and Closed Landfill Inventory	1.0-mile
State registered Petroleum Storage Tank (PST) facilities	0.25-mile
State registered Leaking Petroleum Storage Tank (LPST) facilities	0.5-mile
State Spills (TxSpill) list	0.25-mile
Texas Voluntary Cleanup Program (TxVCP) and Innocent Owner/Operator Program (TxIOP) lists	0.5-mile
Brownfields	0.5-mile
Supplemental Databases:	
Federal and State IC/EC-AUL (Institutional Controls/Engineering Controls-Activity & Used Limitations)	Project Only
MSD (Municipal Setting Designation)	1.0-mile
Dry Cleaners	0.5-mile
TCEQ Industrial Hazardous Waste (IHW) lists	0.125-mile

Source: Project Team

Table 17 summarizes the regulatory facilities reported in the project area, while **Table 18** details facilities presented in the regulatory database search for the project alignment.

Table 17 – Regulatory Database Facilities Reported

Databases Searched	Distance Searched	# Mapped	# Not Mapped	Total
Federal - ASTM 1527-05/AAI Required				
National Priority List (NPL)	1.00	0	0	0
Delisted National Priority List (DNPL)	0.50	0	0	0
CERCLIS (CER)	0.50	2	0	2
CERCLIS NFRAP (CER NFRAP)	0.50	0	0	0
RCRA CORRACTS (RCRA COR)	1.00	1	0	1
RCRA non-CORRACTS TSD (RCRA TSD)	0.50	1	0	1
RCRA Generators (RCRA GEN)	0.25	5	0	5
Federal Brownfields (FED BWN)	0.50	0	0	0
Federal Institutional Control (FED IC)	0.50	0	0	0
Federal Engineering Control (FED EC)	0.50	0	0	0
ERNS List (ERNS)	0.25	1	0	1
State - ASTM 1527-05/AAI Required				
State/Tribal Equivalent NPL (ST NPL)	1.00	1	0	1
State/Tribal Equivalent CERCLIS (ST CER)	0.50	0	0	0
State/Tribal Disposal or Landfill (SWLF)	0.50	0	0	0
State/Tribal Leaking Storage Tank (LPST)	0.50	13	0	13
State/Tribal Storage Tank (PST)	0.25	9	0	9
State/Tribal Institutional Control (ST IC)	0.25	0	0	0
State/Tribal Engineering Control (ST EC)	0.50	0	0	0
State/Tribal Voluntary Cleanup (VCP)	0.50	5	0	5
State/Tribal Brownfield (ST BWN)	0.50	0	0	0
Non-ASTM/AAI Required Databases				
RCRA (RCRA)	0.25	2	0	2
Dry Cleaners (DRYC)	0.25	1	0	1
Industrial Hazardous Waste (IHW)	0.25	5	0	5
Total Sites Found		46	0	46

Source: Project Team

Table 18 – Regulatory Database Facilities Listed

Facility Name	Address	Facility Type (by heading)/Comments
CERCLIS		
VA Medical Center	2002 Holcombe Boulevard	RCRA ID No. TX0000605392 Not on NPL; Federal facility; Discovery complete: 1/17/1995; Preliminary Assessment complete: 11/14/2006
Aluminum Finishing Company	6006 Ardmore	RCRA ID No. TX0000606621 Not on NPL; Federal facility; Discovery complete: 7/7/2005; Preliminary Assessment complete: 7/13/2005
RCRA COR (CORRACT)		
Baylor College of Medicine	3325 Yellowstone Boulevard	RCRA ID No. TXD988070082 Conditionally exempt small quantity generator. Extensive list of lab wastes. Violations and enforcement actions listed.
RCRA TSD		
Baylor College of	2450 Holcombe	RCRA ID No. TXR000053322

Facility Name	Address	Facility Type (by heading)/Comments
Medicine/old Nabisco Bakery	Boulevard	Small quantity generator. Extensive list of wastes. No violation or corrective actions.
RCRA GEN		
Bon Ton Cleaners	6921 Alameda Road	RCRA ID No. TXR000070979 Conditionally-exempt small quantity generator. No listed violations. The facility is no longer active and the facility appears to now be occupied by M&M Grill.
OST Chevron Services	2802 Old Spanish Trail	RCRA ID No. TXR000000240 Small quantity generator. No listed violations.
University of Texas MD Anderson Introgen Laboratory	2250 Holcomb Boulevard, Ste 210	RCRA ID No. TXR000040527 Conditionally-exempt small quantity generator. No listed violations.
Baylor College of Medicine	2450 Holcombe Boulevard	RCRA ID No. TXR000053322 Small quantity generator. Extensive list of wastes. No listed violations.
Department of Veterans Affairs, VA Medical Center	2002 Holcombe Boulevard	RCRA ID No. TX5360310283 Small quantity generator. Extensive list of wastes. No listed violations.
ERNS		
Department of Veterans Affairs, VA Medical Center	2002 Holcombe Boulevard	NRC No. 235864 April 6, 1994; Gas cylinder/fitting not properly connected; ethylene oxide spilled into air; unknown quantity; no remedial action.
STATE NPL		
Aluminum Finishing Company	6006 Ardmore	RCRA ID No. RN100665082 Inactive as of 08/24/2007; Deleted, no further action, cleanup complete – final delist/transfer to VCP.
LPST		
Astrodome Medical Center Rents The property has been redeveloped with a small strip center	2803 Old Spanish Trail (NE corner of Alameda Road and OST)	LPST ID No. 114185 Final concurrence issued, case closed; discovered on 11/24/1998; no groundwater impacted, no apparent threats or impacts to receptors; 3 steel tanks (1 10,000-gal, 2 5,000-gal), gasoline, all removed from ground 10/27/1998.
Shell/former Chevron Fac. No 30107975	2802 Old Spanish Trail (SE corner of Alameda Road and OST)	LPST ID No. 114547 Final concurrence pending documentation of well plugging; discovered on 04/12/1998; groundwater impacted, no apparent threats or impacts to receptors; 4 tanks, all in use, (10,000-gal and 1,000-gal), installed 1/1/1974, fiberglass-reinforced plastic (FRP) (3 gasoline, 1 used oil).
Nabisco Brands	6803 Alameda Road now known as 2450 Holcombe Boulevard	LPST ID No. 106383 Final concurrence issued, case closed; discovered on 3/29/1993; minor soil contamination – does not require RAP; 2 steel tanks (30,000-gal) permanently filled-in-place 12/22/1992; 2 steel tanks (1,000-gal) removed from ground 12/30/1992; 1 steel tank (6,000-gal) removed from ground 12/30/1992.
Mobil/Exxon RAS No. 6-7451	2424 Old Spanish Trail (SW corner of Alameda Road and OST)	LPST ID No. 092183 Final concurrence issued, case closed; discovered on 8/3/1988; groundwater impacted, no apparent threats or impacts to receptors; 3 FRP tanks, in use; 1 8,000-gal gasoline, 1 10,000-gal gasoline, 1 12,000-gal gasoline; 1 FRP tank removed, 1 6,000-gal used oil removed 6/4/1998.

Facility Name	Address	Facility Type (by heading)/Comments
Exxon RAS No. 6-7520	6021 Alameda Road	LPST ID No. 112570 Two LPST incidents were referenced to the location. Final concurrence issued, case closed; discovered on 6/27/1990; no groundwater impacted, no apparent threats or impacts to receptors; 5 tanks, all removed from ground 07/30/1987; 1 3,000-gal steel gasoline, 2 6,000-gal steel gasoline, 1 8,000-gal steel gasoline, 1 550-gal steel used oil. LPST ID No. 100417 Final concurrence issued, case closed; discovered on 9/7/1990; groundwater impacted, no apparent threats or impacts to receptors
Southwest Forklift	7100 Grand Boulevard	LPST ID No. 115609 Final concurrence pending documentation of well plugging.
Former Atkins Service Station	NW Corner Hermann Drive and Alameda Road	LPST ID No. 116609 Final concurrence issued, case closed; discovered on 7/12/2005; groundwater impacted, no apparent threats or impacts to receptors.
Labco Inc. Lastec Plastic	2921-2951 Corder Road	LPST ID No. 111239 Final concurrence issued, case closed; discovered 6/19/1996; no groundwater impacted, no apparent threats or impacts to receptors.
Grocers Supply Company, Inc.	3131 E. Holcombe Boulevard	LPST ID No. 106606 Final concurrence issued, case closed; discovered on 5/7/1993; minor soil contamination – does not require rap; 8 steel tanks, all removed from ground (3 10,000-gal diesel, 1 6,000-gal diesel, 2 12,000-gal diesel, 2 3,000-gal gasoline); all removed between 5/5/1993 – 5/18/1993.
Stop- N-Go No. 2359	3161 Old Spanish Trail	LPST ID No. 113762 Final concurrence issued, case closed; discovered on 11/5/1998; groundwater impacted, no apparent threats or impacts to receptors; 2 steel tanks, all removed from ground (2 10,000-gal gasoline); all removed on 2/9/1999.
Camco Inc.	7030 Ardmore Street	LPST ID No. 093408 Final concurrence issued, case closed; discovered on 07/18/1989; soil contamination only, requires full site assessment and RAP; 3 steel tanks, all removed from ground (1 8,000-gal gasoline and 1 550-gal gasoline removed 7/31/1989; 1 8,000-gal gasoline removed 8/1/2001.
Camco Inc.	7010 Ardmore Street	LPST No. 092657 Final concurrence issued, case closed; discovered on 07/18/1989; soil contamination only, requires full site assessment and RAP; 3 steel tanks, all removed from ground (1 8,000-gal gasoline and 1 550-gal gasoline removed 7/31/1989; 1 8,000-gal gasoline removed 8/1/2001. <u>The two listings appear to refer to the same tanks and appear to have two addresses, thus the two LPST listings.</u>
PST		
Astrodome Medical Center Rents	2803 Old Spanish Trail	Facility ID No. 67640 3 steel tanks, all removed from ground on 10/27/1998 (1 10,000-gal gasoline, 2 5,000-gal gasoline).
Med Center Shell	2802 Old Spanish Trail	Facility ID No. 29221 4 FRP tanks in use (3 10,000-gal gas and 1 1,000-gal used oil).
Nabisco Brands	6803 Alameda Road	Facility ID No. 39965 2 steel tanks (30,000 gal) permanently filled-in-place 12/22/1992; 2 steel tanks (1,000 gal) removed from ground 12/30/1992; 1 steel tank (6,000 gal) removed from ground 12/30/1992.

Facility Name	Address	Facility Type (by heading)/Comments
PARD South Central Division	6520 Alameda Road	Facility ID No. 64086 3 FRP tanks; in use; 1 1,000-gal gasoline, 1 1,000-gal diesel, 1 550-gal used oil.
Mobil/Med Center Exxon RAS No. 6-7451	2424 Old Spanish Trail	Facility ID No. 26773 3 FRP tanks, in use; 1 8,000-gal gasoline, 1 10,000-gal gasoline, 1 12,000-gal gasoline; 1 FRP tank removed, 1 1,000-gal used oil removed 06/4/1998.
Exxon RAS No. 6-7520	6021 Alameda Road	Facility ID No. 0026701 5 tanks, all removed from ground 07/30/1987; 1 3,000-gal steel gasoline, 2 6,000-gal steel gasoline, 1 8,000-gal steel gasoline, 1 550-gal steel used oil.
Alameda Shell	6019 Alameda Road	Facility ID No. 0070434 2 FRP tanks, in use; 1 12,000-gal gasoline, 1 20,000-gal gasoline.
Department of Veterans Affairs, VA Medical Center	2002 Holcombe Boulevard	Facility ID No. 0003548 4 steel tanks, in use (4 35,000-gal diesel), 5 FRP tanks, in use (2 12,000-gal diesel, 1 6,000-gal diesel, 1 2,500-gal diesel, 1 2,000-gal diesel); 2 steel tanks, removed from ground (1 10,000-gal diesel, 1 1,000-gal diesel), removed on 10/17/1991, 2 FRP tanks, removed from ground (2 2,000-gal diesel), pulled from ground 10/17/1991 and 6/14/1997.
Mrs. Baird's OST Warehouse	7000 Grand Boulevard	Facility ID No. 0030673 1 steel tank, removed from ground (1 8,000-gal gasoline), pulled from ground 05/10/1990.
VCP		
ISBA-Houston (Batteries)	3014 Old Spanish Trail	VCP ID No. 2326 Status is under investigation as of 06/10/2010; site contamination is heavy metals in soils.
Southwest Forklift	7100 Grand Boulevard	VCP ID No. 1489 Status is completed as of 07/9/2002 and certified 1/13/2003; site contamination was VOCs, TPH, PAH in soils.
Riverside Kitchen and Bath	6006 Ardmore	VCP ID No. 815 Status is terminated as of 07/28/1998; no site contamination or affected media info.
Riverside Kitchen and Bath	6006 Ardmore	VCP ID No. 1956 Status is under investigation as of 08/9/2006; site contamination is heavy metals in soils.
WCP Ardmore	7030 Ardmore Street	VCP ID No. 1848 Status is under investigation as of 08/04/2005; site contamination is SVOCs and Chlorinated solvents in soils and groundwater.
RCRA		
Nabisco Biscuit Company	6803 Alameda Road	RCRA ID No. TXD490019502 Not a generator, no violations, numerous waste products.
Exxon RAS No. 6-7451	2424 Old Spanish Trail	RCRA ID No. TXD988030532 Not a generator, no violations, waste products: benzene and ignitable waste.

Facility Name	Address	Facility Type (by heading)/Comments
Drycleaners		
Laredo Cleaners	2270 Holcombe Boulevard	TCEQ Reg. No. RN103960951 Status is active, site type is drop station
Industrial Hazardous Waste		
Nabisco Biscuit Company	6803 Almeda Road	RCRA ID No. TXD490019502 Status is inactive, numerous listed waste.
Exxon RAS No. 6-7451	2424 Old Spanish Trail	RCRA EPA No. TXD988030532 Status is inactive, unreported waste products.
University of Texas MD Anderson Introgen Laboratory	2250 Holcomb Boulevard, Ste. 210	RCRA ID No. TXR000040527 Status is closure request, waste products are bulk flammable liquids, ignitable, laboratory waste, maintenance activity products, non-halogenated spent solvents, out-of-date and off specification products.
Baylor College of Medicine Research and Diagnostics Laboratory	2450 Holcombe Boulevard	RCRA ID No. TXR000053322 Status is active, numerous listed wastes.
Department of Veterans Affairs, VA Medical Center	2002 Holcombe Boulevard	RCRA ID No. TX5360310283 Status is active, numerous listed wastes.

Source: Project Team

Of the above-mentioned regulatory facilities, the following four facilities were identified as potential sources of concern to the project:

- Bon Ton Cleaners (6921 Almeda Road). The facility is no longer active. The facility was not reported to have discovered environmental conditions. As long as excavations associated with the project are not proposed to groundwater, the former regulatory facility is not a source of environmental concern to the project. The potential for environmental concern from the former facility to the project appears to be low.
- Small strip style retail center (listed as Astrodome Medical Center Rents) / former gasoline service station (formerly 2803 OST). The gas station has been demolished and redeveloped with the above-mentioned use and adjoins the project area. Based on the listed information, the facility did not appear to be significantly affected by hydrocarbons for the LPST event, but was an older closure (1998). *Based on the provided project alignment, the facility represents the greatest potential to encounter possible hydrocarbon-affected soil.* Groundwater contamination was not indicated. The potential for environmental concern from the former facility to the project appears to be low to moderate. The potential for any environmental condition to be a concern to construction workers is low, but special handling practices of the soil may be necessary if the soil is discovered to be hydrocarbon-affected.
- Med Center Shell/former Chevron Fac. No 30107975 (2802 OST). The facility is active. A gas station has been associated with the property since the late 1940s or early 1950s. If the project activities do not encroach on the property, the potential to encounter hydrocarbon-affect soils appears to be low. Additionally, as long as excavations associated with the project are not

proposed to groundwater, the regulatory facility is not a source of environmental concern to the project. The potential for environmental concern from the facility to the project appears to be low.

- Mobil/Exxon RAS No. 6-7451 (2424 OST). The facility is active. The facility appears to date back to 1974. If the project activities do not encroach on the property, the potential to encounter hydrocarbon-affect soils appears to be low. Additionally, as long as excavations associated with the project are not proposed to groundwater, the regulatory facility is not a source of environmental concern to the project. The potential for environmental concern from the facility to the project appears low.

During the site reconnaissance it was determined that at this time, no evidence of recognized environmental conditions was identified on, adjoining, or adjacent to the proposed project. Nevertheless, during any construction activity there exist some potential to encounter contaminated soil or water. As indicated earlier, any unanticipated hazardous materials and/or petroleum contamination encountered during construction, per TxDOT Standard Specifications, would be handled according to applicable federal and state regulations.

Maps and other support data are provided in **Exhibit B-10: Hazardous Materials Support Data**.

5.7 Construction Impacts

Environmental Consequences of Implementing the No-Build Alternative

Under the No-Build Alternative, no new ROW would be acquired and no construction, other than scheduled maintenance activities, would occur. Therefore, there would be no construction impacts such as traffic disruption, increased noise, temporary air impacts, or potential spills or encounters of hazardous materials.

Environmental Consequences of Implementing the Build Alternative

The construction impacts due to the improvements to Almeda Road would include clearing and grading the surface, preparing a new roadbed, paving the roadway, and re-vegetating and restoring the ROW. Temporary disruption of typical traffic flow along Almeda Road may occur during construction of the proposed project; however, at least one lane of traffic in each direction would be provided in order to facilitate traffic movement during construction. All traffic control would conform to Part VI (*Traffic Control for Street and Highway Construction and Maintenance Operations*) of the *Texas Manual of Uniform Traffic Control Devices*.

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. No potential receivers would be expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions would be included in the plans and specifications that require the Contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

During the construction phase of this project, temporary increases in air pollutant emissions may occur from construction activities. The primary construction-related emissions are particulate matter (fugitive dust) from site preparation. These emissions are temporary in nature (only occurring during actual construction); it is not possible to reasonably estimate impacts from these emissions due to limitations of the existing models. However, the potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.

The construction activity phase of this project may generate a temporary increase in MSAT emissions from construction activities, equipment and related vehicles. The primary MSAT construction related emissions are particulate matter from site preparation and diesel particulate matter from diesel powered construction equipment and vehicles. The Texas Emissions Reduction Plan (TERP) includes incentive programs to encourage the development of multi-pollutant approaches to ensure that the air in Texas is both safe to breathe and meets minimum federal standards. TxDOT encourages construction contractors to utilize this program to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: <http://www.tceq.state.tx.us/implementation/air/terp/>.

However, considering the temporary and transient nature of construction-related emissions, as well as the mitigation actions to be utilized, it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

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

5.8 Visual Impacts

Environmental Consequences of Implementing the No-Build Alternative

No construction activities would occur under the No-Build Alternative. Therefore, there would be no visual impacts.

Environmental Consequences of Implementing the Build Alternative

The proposed improvements to Almeda Road would not have an effect on the visual resources within the project area. The proposed project does not require construction at a new location and no trees are expected to be removed. The landscaping that would be implemented along the sidewalks and the raised center median would be consistent with landscaping in the surrounding area. The majority of the project would widen the existing facility without adding a new structural component to the landscape, with the exception of safety signs, traffic light fixtures and other roadway appurtenances.

6.0 INDIRECT IMPACTS

The CEQ defines indirect impacts as those “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Population growth and constructed development are the primary triggers for indirect impacts related to highway improvement projects. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR Section 1508.8). For example, if a bypass or a relief route is constructed around a town, development may occur in the bypass area in the form of restaurants, gas stations, and other commercial establishments. Land development, in turn, results in the transformation of primary uses within the study area to residential and commercial land use. Increased development can alter the landscape, increase impervious cover, modify species composition of any remaining habitats, and introduce fertilizers and anthropogenics into the biotic system. Indirect impacts differ from the direct impacts associated with the construction and operation of the proposed project and are caused by another action or actions that have an established relationship or connection to the proposed project. These induced actions are those that would not or could not occur except for the implementation of the proposed project.

According to TxDOT’s September 2010 *Guidance on Preparing Indirect and Cumulative Impact Analyses* (TxDOT’s September 2010 Guidance), which is adapted from the National Cooperative Highway Research Program (NCHRP) *Report 466, Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects (NCHRP Report 466)*, there are three general categories of indirect effects (which are described in more detail in **Step 5** of the **Indirect Impacts** chapter of this EA):

- Category 1 - Encroachment-Alteration Effects
- Category 2 - Access-Alteration Effects
- Category 3 - Effects Related to Project-Influenced Development (Induced Growth-Related Effects)

For transportation projects, Category 1 impacts include project impacts such as fragmentation of habitat by a roadway or dispersal of pollutants onto adjacent lands. Indirect impacts from Categories 2 and 3 are typically encountered outside of the project ROW, and may result from actions taken by other parties, such as private land developers not directly associated with the project. Indirect impacts are therefore subject to some level of conjecture as to the extent of changes which might be expected in the project corridor, with and without the project in place. There are various guidance documents published by FHWA and others on this subject, including the *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process* (FHWA, 2003). The CEQ regulation cited above states that the NEPA document must identify all the indirect impacts that are known, and make a good faith effort to explain the impacts that are not known but which are “reasonably foreseeable.” CEQ has issued guidance that further explains “reasonably foreseeable” as events that must be “probable,” even though there is some uncertainty about them (*Forty Most Asked Questions Concerning CEQ’s NEPA Regulations, 46 FR 18031, 1981*).

The stepwise process presented in TxDOT's September 2010 Guidance includes the following seven steps to assess indirect impacts:

- 1) Scoping
- 2) Identify the Study Area's Goals and Trends
- 3) Inventory the Study Area's Notable Features
- 4) Identify Impact-Causing Activities of Proposed Action and Alternatives
- 5) Identify Potentially Substantial Indirect Effects for Analysis
- 6) Analyze Indirect Effects and Evaluate Results
- 7) Assess Consequences and Consider/Develop Mitigation

These seven steps have been followed regarding the proposed roadway widening/extension project and are outlined below.

6.1 Step 1: Scoping

The initial step in this analysis examines the attributes of the proposed project and the surrounding area to focus the analytical approach and identify an appropriate area for analysis of indirect impacts. The immediate project area is urban in nature, particularly given the amount of development surrounding this area. It is not anticipated to undergo notable development.

Almeda Road is currently a four- to six-lane (two to three in each direction) roadway located southwest of downtown Houston, Texas. The length of the proposed project is approximately 1.08 miles. The existing four-lane sections of Almeda Road from OST to Lockett Street and from Dixie Drive to South MacGregor Way would be widened to contain three 11- to 12-foot wide travel lanes in each direction with a typical 16-foot raised median. The west side of Almeda Road is proposed to have a mixed-use trail, and the east side is proposed to have a sidewalk.

As mentioned in **Section 2.0** of the EA (**NEED FOR AND PURPOSE OF THE PROPOSED PROJECT**), the need for and purpose of the project includes providing capacity, correcting structural deficiencies, and bringing Almeda Road up to modern roadway design and construction standards in order to address existing deficiencies caused by traffic exceeding the roadway's design limits. This would be accomplished by adding a travel lane in each direction (increasing capacity), and rebuilding the roadway to current design standards. In addition, the roadway serves several medical facilities associated with the Texas Medical Center, which would have improved access. The most probable types of indirect impacts would be the conversion of land that is currently undeveloped land to a range of uses such as residential, commercial and light industrial and indirect impacts associated with additional traffic, such as increased pollutant runoff.

The Area of Influence (AOI) was generally established as property boundary lines and roadways located at least 500 feet from the proposed project's ROW. The City of Houston has indicated that impacts from the proposed project beyond the designated AOI would be minimal and likely be overshadowed by development resulting from other transportation projects. Thus, an AOI of approximately 317 acres (0.49

square miles) has been established, as shown in the **Indirect Impacts Analysis – AOI Map. (Appendix F)** According to the City of Houston’s officials, the AOI selected is appropriate for analysis.

Indirect impacts from the proposed project would be analyzed until 2035, because 2035 is the horizon year of H-GAC’s RTP. Projects currently on the plan have been fully evaluated based on projections for 2035, and performance of the proposed improvements beyond that time cannot yet be reasonably evaluated.

6.2 Step 2: Identify the Study Area’s Directions and Goals

The Indirect Impacts Analysis has been developed in part based on the existing conditions of the AOI, reasonable projections of future land uses in the AOI, as well as the City of Houston’s 2009 Major Thoroughfare and Freeway Plan and H-GAC’s Capital Improvement Plan – Fiscal Year 2009-10 thru 2013-14.

The focus of this step is assembling information regarding general trends and goals within the study area. The trends and goals in question are independent of the proposed transportation project and typically concern social, economic, ecological, and/or growth-related issues. Empirical evidence indicates that transportation investments result in land use changes only in the presence of other factors. These factors include, but are not limited to, supportive local land use policies, local development incentives, availability of developable land, and a good investment climate. Therefore, an understanding of community goals, combined with a thorough knowledge of demographic, economic, social and ecological trends, is essential to understanding the dynamics of project-influenced changes in development location.

The H-GAC 2035 RTP Update defines transportation systems and services in the area containing the boundaries of the AOI. The RTP addresses regional transportation needs that are identified through forecasting current and future travel demand, developing and evaluating system alternatives and selecting those options which best meet the mobility needs of the region. The proposed facility is included in this plan.

The City of Houston and Harris County do not have zoning regulations or comprehensive plans. However, the City of Houston’s Code of Ordinances (Chapter 33, Article III - Comprehensive Planning and Zoning) states a finding that “The continued growth and development of the city will require the establishment of a comprehensive planning process to guide the future development and redevelopment of the city.” Land use in those portions of the AOI would be difficult to enforce. Furthermore, development is confidently predictable only when a subdivision plat or building permit is applied for. As this represents current plans, not future plans, professional judgment and coordination with the City of Houston and Harris County is required to speculate on future land use trends in these jurisdictions.

The proposed roadway project does not conflict with the expectations, desires and goals of the communities in the region. Alameda Road is shown as planned for widening as having sufficient ROW in Houston’s 2009 MTFP. Similarly, it is designated as an existing and future thoroughfare in the Harris County Thoroughfare System. Furthermore, the project is strongly desired by the City of Houston.

The proposed project would also be in compliance with the applicable County and City policies, regulations and ordinances, such as those regarding tree preservation/protection and SW3P and storm water detention requirements. These policies can be found at the following websites:

HCPID-AED: <http://www.eng.hctx.net/spec/index2011.htm>
http://hcpid.org/permits/docs/SWQ_manual_residential_devel.pdf

Houston: <http://library.municode.com/index.aspx?clientId=10123&stateId=43&stateName=Texas>

These municipalities have ordinances and policies for tree preservation and protection. For example, the HCPID-AED's Specification Item 501 specifies that "Trees located a clear distance of 3-feet from proposed face of curb are to be preserved unless field conditions determine otherwise" and gives procedures on how to protect (e.g., with fencing) such trees. Details regarding the protection of trees (including replacement of trees) by the City of Houston is addressed in its Code of Ordinances, Chapter 33 (Planning and Development), Article VI (Protection of Certain Trees).

Storm water quality and detention is also addressed by the Cities and the County through various policies and ordinances. The HCPID Permit Office has a SWQ (storm water quality) policy document titled *Storm Water Quality Document for New Development/Redevelopment Projects (Single Family Residential Development, Commercial Development, Road Projects, Flood Control Projects)*. The City of Houston's Code of Ordinances, Chapter 47 (Waters and Sewers), Article XII, covers storm water discharge requirements, such as submittals of Notices of Intent, Notices of Termination, and implementation of SW3P to satisfy the requirements of a TPDES permit. Houston's SW3P Standard Details shows what an SW3P should include, and the DCM provides information about detention requirements (e.g., Harris County must approve detention ponds proposed in their jurisdiction).

6.2.1 Goals

This section presents information about Harris County's and the City of Houston's goals and policies, typically obtained from their respective comprehensive plans, when available, and through correspondence with City and County Officials.

6.2.1.1 Harris County

The proposed project is located in Precinct One of Harris County. The Harris County Road and Bridge Department is responsible for road and bridge construction and maintenance in the unincorporated areas of Precinct One. Inter-local agreements with the City of Houston allows Precinct One to maintain certain thoroughfares within the Houston city limits. As indicated on the precinct's website (http://www.hctx.net/comm_lee/MissionSt.htm), "The primary charge of all commissioners is to maintain the administration and operations of parks, and road & bridge projects. To this end, the daily Mission Statement of Harris County Precinct One is to efficiently and effectively develop, maintain and enhance precinct parks, and road & bridge programs with the added component and provisions of community county-services/referrals and educational-recreational programming within the boundaries of Precinct One. In addition to Precinct One's primary charge, the precinct's mission also includes the provision of

activities, transportation and services for senior citizens and youth, including a division dedicated to delivery of social services and referrals on behalf of the indigent populations of the county.”

The mission of the HCPID-AED, as reported in their *Capital Improvement Plan*, is “to execute the planning, study, design and construction of various buildings, roads, bridges, traffic signals, drainage improvements, parks, and other architectural and maintenance projects in accordance with certain design standards and contract documents. The proposed project is included in the County’s list of CIP Road Projects FY 2009-10 – FY 2013-14.

HCPID-AED’s policies with respect to transportation projects are addressed through their 2011 Revised Specifications. These are numerous (over 150) and can be viewed and downloaded on their website: <http://www.eng.hctx.net/spec/index2011.htm>. Specifications address items such as roadway excavation, paving, shaft drilling, pile driving and re-vegetation. The County follows all applicable state, federal, and local requirements in its construction projects.

6.2.1.2 City of Houston

The City has developed numerous plans to guide it through the many issues facing a large metropolitan area. These plans address community well-being and services, infrastructure and public facility improvements, airport systems, land annexation, drainage improvements, transportation and mobility, and development/redevelopment. A few of these plans which are relevant to the project’s indirect impacts are discussed below.

- *Strategic Plan: 2008-2012* - The Traffic Operations Division (TOD) exists to facilitate safe and efficient mobility on the city streets. The goals and objectives of the Strategic Plan are to develop new and sustainable resources and increase organizational readiness in order to achieve its mission.

The division’s mission, visions, and goals are also presented in this plan:

“*MISSION:* The Traffic & Transportation Division exists to facilitate safe and efficient mobility on the city’s streets. Its mission is encapsulated by the mission statement: “*We Serve to Keep Houston Moving!*”

“*VISION:* We will deliver premier transportation management services to the City of Houston by successfully integrating people, plans, and projects to:

- Reduce Traffic Congestion on City Streets
- Improve Traffic Safety Throughout the City
- Develop New and Sustainable Resources
- Increase Organizational Readiness“

In this plan, the City recognizes that “Traffic congestion and traffic safety are different sides of the same coin; they are perpetually linked in the pursuit of improving Houston’s transportation system. Multiple studies indicate that they are both causes of one another and effects of one another. In other words, the level of traffic congestion both causes and is caused by the level of

traffic safety, and vice versa.” Effectively addressing these challenges is the focus of the Strategic Plan.

The City’s overall goal may be inferred through this single statement:

“...facilitating safe and efficient mobility throughout the City is one of the essential ingredients necessary to promote the increased level of public health and safety, improved quality of life, and continued economic vitality that all Houstonians desire.”

Houston’s regional partners have envisioned big changes for Houston’s transportation landscape. Focused development patterns; multimodal transportation options; increased connectivity between homes, jobs, activities, and services; and infrastructure sustainability are goals that have been adopted by various partner agencies throughout the region. Two main operational goals of the TTD are:

<u>Operational Goal</u>	<u>Year 1 Objectives</u>	<u>Year 2 Objectives</u>	<u>Year 3+ Objectives</u>
1 - Reduce Traffic Congestion on City Streets	Identify critical success factors, performance measures, and resource requirements for affecting on-going improvement	Establish service level benchmarks from which to gauge future performance	To be determined (based on Year 1 & 2 outcomes)
2 - Improve Traffic Safety Throughout the City			

Major milestones established in the *Strategic Plan* include:

- Mobility Response Team
 - Transportation Impact Analysis / Access Management Program
 - City Mobility Plan
 - Houston Transportation Center Enterprise Fund
 - Traffic Operations University
 - American Public Works Association Accreditation
- *2012 Major Thoroughfare and Freeway Plan (MTFP)* - The City identifies sections of roadways (either thoroughfares or major collectors) that are in need of expansion, either by lengthening or widening. The MTFP identifies ROW needs and proposes roadway alignments within the city limits and the extraterritorial jurisdiction (ETJ). The plan, updated annually, serves as notice to the public for developing land adjacent to the identified roads. The 2012 MTFP indicates that Almeda Road is to be widened by the addition of one lane in each direction, with a 16-foot raised median, a 10-foot mixed-use trail, and a sidewalk.
 - *City Mobility Plan* – By mandate, the TTD is to design and implement the Houston City Mobility Plan. City Mobility Planning (CMP) is an important initiative to analyze local mobility and to enhance growth of the Greater Houston Region. Community values and priorities identified through HGAC's Envision Houston Region and Blueprint Houston's citizens conference processes would serve as the basis. It would become the primary tool for evaluating the City’s transportation system infrastructure. The City’s intent is to use this tool to evaluate individual projects for their mobility benefits and downstream impact. As a tool, it would enable conceptual

layout of transportation improvements on up-to-date population and land use data as well as the modeling of development impacts.

6.2.2 Trends

On a regional scale, the H-GAC *2035 Regional Growth Forecast* reports that by 2035 the Houston-Galveston region would be home to 8.8 million people and would support over 4 million jobs, an increase of 3.5 million people and 1.5 million jobs. Of the eight Houston-Galveston TMA counties (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller), Harris County would remain a major attractor and is expected to have the largest population growth, followed by Fort Bend and Montgomery Counties. Brazoria and Galveston Counties follow in this list, and the less densely populated Chambers, Liberty and Waller Counties are projected to have the least growth. Harris County's population is approximately 4,100,000 in 2010 (per the Harris County Management Services - Population Study dated February 2010) and is projected to hit 5,840,000 in 2035 (H-GAC *2035 Regional Growth Forecast*, released August 2006).

The AOI lies partially within a region known as the Texas Medical Center within the City of Houston and has an overall population of approximately 11,000. The Texas Medical Center is characterized as an urban professional center with high density residential development. The Texas Medical Center regional economy has become more diverse; featuring services, recreation, and medical tourism.

At the city level, Houston encompasses approximately 617 square miles and has a 2010 population of 2,257,412. It experienced a population increase of 15.5 percent between 2000 and 2010. According to the U.S. Bureau of Labor Statistics, the Houston area added 42,400 private-sector jobs between November 2007 and November 2008 and registered the nation's largest gain in private sector employment among the nation's cities. In April of 2008, the job growth rate was 2.8% and the unemployment rate in the city was 3.8 percent. However, with the recent economic slump, unemployment rates have risen nationally. In March 2010, the unemployment rate for the Houston - Sugar Land - Baytown Metropolitan Statistical Area (MSA) rate was 8.5 percent (compared with a 9.9% national rate). Factors such as these are what continually draw new residents to this area (and the outlying cities). The population of Houston is projected to reach 2,798,278 by 2030.

As reported in the *Strategic Plan: 2008-2012*, Houstonians are feeling the impact of traffic congestion. The 2005 Urban Mobility Report by the Texas Transportation Institute (TTI) indicates that annual delay and its associated costs increased significantly between 2000 and 2003. Over the same time period, the growth in demand for drivable arterials outpaced the growth in the supply of available arterials by 230 percent. The disparity between thoroughfare demand and thoroughfare supply is not likely to narrow in the foreseeable future, because (1) Houston's metropolitan population is expected to increase by 64 percent by the year 2025, and (2) constructing new arterials in Houston costs between \$1.4 million and \$3.3 million per lane-mile. Therefore, reversing the trend of increasing congestion in Houston would require a mixture of alternative solutions.

In the Houston area, thoroughfares saw a sharp increase in daily vehicle-miles traveled, from 3.8 per lane-mile in 1990 to 5.3 just 15 years later. Although fuel consumption and congestion cost have risen steadily since the early '90s, Houston is holding steady with other major urban areas, with a travel time index and annual delay per peak traveler comparable to the average. Houston is ranked as the top transportation consumer in the nation, with 20.9 percent of household spending in 2003 going to transportation-related expenses (national average is 19.1%).

Public transportation service, a long overlooked and underused strategy in Houston, saved all area peak travelers an average of \$44 in 2005, and operational strategies (including thoroughfare signal coordination & access management) saved the average Houston area peak traveler approximately \$110. These savings are markedly less than that for cities such as Atlanta and San Francisco, which move approximately the same volume of peak period travelers as Houston. Continued focus on operational and public transportation strategies would save Houstonian's more time and money in the long run in addition to related benefits (e.g., improved safety, higher property values, and better quality of life).

The proposed project area and AOI is primarily urban in nature with nearly complete development. Based on historical aerial photograph review (TelALL™), the AOI has not experienced substantial development in the past 15 years; the most noticeable difference is the addition of the Villas at Hermann Park and the Marquis Lofts at Hermann Park townhome complexes between Dixie Drive and MacGregor Drive. The VA Hospital at the intersection of Alameda Road and OST was constructed between 1978 and 1989. Most of the remaining adjacent land uses were developed by 1962.

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

This step involves conducting an inventory of notable environmental features, including socioeconomic, to identify specific environmental issues by which to assess the project. The indirect impact-causing activities of the proposed action are then detailed where possible. The outcome is identification of potentially significant indirect impacts for further analysis (it should be noted that indirect impacts to a resource might occur even in the absence of direct impacts). Qualitative and quantitative techniques (where and when available), including analysis of Geographic Information System (GIS) data, are then employed in subsequent steps to estimate the magnitude of the potentially significant effects.

The primary objective of Step 3 is to inventory the base-line environmental conditions of the project area by following three sub-steps:

- Inventory Ecosystem Conditions,
- Inventory Socioeconomic Conditions, and
- Inventory Notable Features.

While the first two of these are generally conducted as part of establishing the existing conditions for analysis of direct effects, the third sub-step is unique to the indirect impacts analysis and involves assessment of "features" listed below (brief descriptions are also provided):

- *Sensitive Species and Habitats* - ecologically valuable species and habitat, and/or those that are vulnerable to impacts. State- and Federally-listed threatened and endangered species and their habitats are included. The TxDOT-TPWD MOA outlines a list of unique and unusual landscape features that have been identified as special habitat features which warrant special consideration.
- *Valued Environmental Components* - characteristics or attributes of the environment that society seeks to use, protect, or enhance (i.e., they are important to the community).
- *Relative Uniqueness, Recovery Time, and Unusual Landscape Features* - measure the value of specific landscape elements according to several factors. Relative uniqueness refers to how many comparable examples of the element exist at different levels of scale. Recovery time refers to how long it would take to replace the landscape element if it were disturbed or destroyed. Unusual landscape features are those that occur once, or only a few times, across a landscape. These features are valuable, and may represent particular activity centers. A list of unique and unusual landscape features identified as special habitat features and those warranting special consideration are included in the TxDOT-TPWD MOA.
- *Vulnerable Elements of the Population* - may include the elderly, children, persons with disabilities, minority groups, or low-income groups. These populations may be more susceptible to environmental conditions, more dependent on non-vehicular forms of transportation, or underrepresented in the decision-making process. These factors may also lead to these populations being less able to bear impacts and recover from them than the general population.

Perspective and setting play a considerable role in defining notable resources within any specific study area. A feature that is notable to one group may not be notable to another. Identifying notable features is important in determining what indirect impacts may be notably substantial. Notable features are generally more vulnerable or more highly valued, and less able to bear impacts. The absence of notable features does not indicate an absence of indirect impacts; it simply means that those impacts are less likely to be substantial.

The notable features within the AOI include (and are discussed further below):

- the Michael E. DeBakey VA Medical Center; and
- Hermann Park.

Michael E. DeBakey VA Medical Center

A military hospital has been located at the corner of OST and Almeda Road since 1946. Originally proposed as a Naval hospital in 1944 and opened in 1946, the facility was transferred to the Veteran's Administration (VA) in 1949. The United States Veterans Administration Hospital operated as a teaching hospital affiliated with Baylor University, serving as a major source of medical services for veterans and medical training for medical students in the south. The current building was constructed from 1986-1991; the original building north of the current facility was demolished upon completion of construction in 1991. The facility was officially named the Michael E. DeBakey VA Medical Center in 2003. The Medical Center annually serves approximately 130,000 veterans from around the country, with the capacity to house 578 veterans at any time. Nearly 2,000 medical students train at the Medical Center

every year. A Research and Development Program produces new medical knowledge, procedures, and devices for the benefit of patients at the Medical Center and nationwide. The Medical Center also serves the community at large in a variety of ways, including providing emergency response services during hurricanes and other emergency events.

Hermann Park

Hermann Park is located on 445 acres donated to the City of Houston by Mr. George H. Hermann in 1914. The park contains numerous attractions of high public value, including the Houston Zoo, the Houston Museum of Natural Science, Hermann Park Golf Course, and the Miller Outdoor Theater. The park receives over 6 million visitors per year. The portion of Hermann Park located along Almeda Road consists of an 80-acre plot separated from the rest of the park by Brays Bayou. This area, identified as “Bayou Parkland”, has been developed with a picnic area, jogging trails, and other fitness-related amenities, but would remain largely undeveloped to serve as urban habitat. The Hermann Park Conservancy is now working to restore the Bayou Parkland. Restoration efforts mainly consist of removal of overgrown and invasive vegetation, and reestablishment of native vegetation by volunteers. The new Bill Coats Memorial Bike Bridge now connects Bayou Parkland both to the rest of Hermann Park and to a new bike trail along Brays Bayou, creating a network of approximately 40 miles of jogging and bicycle trails.

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

Impact-causing activities include all of the activities involved in a project, from clearing to maintenance of vegetation once the project is finished. These activities are typically relevant to encroachment-alteration effects and access-alteration effects. There are 10 general categories of impact-causing activities identified in *NCHRP Report 466*. These are listed below, with examples of each:

- Modification of regime – alteration of habitat, flora, hydrology, etc.
- Land transformation and construction – construction methods, design features, ancillary elements (i.e. parking lots, transit shelters, etc.)
- Resource extraction – excavation, dredging
- Processing – storage of construction materials
- Land alteration – erosion control, landscaping, fill
- Resource renewal activities – revegetation, remediation activities
- Changes in traffic – traffic patterns on project and adjoining facilities
- Waste Emplacement – landfill, waste discharge
- Chemical treatment – fertilization, herbicide application, deicing
- Access alteration – changes in access, circulation patterns, travel times to major attractors

The proposed project would include widening the existing four-lane sections of Almeda Road from OST to Lockett and from Dixie Drive to South MacGregor Way to contain three 12-foot travel lanes in each direction with a 16-foot raised median, 10-foot mixed-use trail and a sidewalk. Impact-causing activities are described in **Table 19** by type.

Table 19 – Impact-Causing Activities

Type of Activity	Project-Specific Activity	Relevant Details
Changes in Traffic Patterns and Access Alteration	Addition of Travel Lanes to an Existing Roadway	<p>From OST to Lockett and from Dixie Drive to South MacGregor Way, the project would result in the addition of two travel lanes and a 16-ft raised median in existing and new ROW (new ROW would primarily be small corner cuts). The added capacity is expected to reduce congestion and improve mobility in the area.</p> <p>The raised median would affect access to neighboring properties by requiring some motorists to U-turn in left-turn bays to reach their destination.</p> <p>Traffic control and construction sequencing is done during the Plans, Specifications and Estimates (PS&E) process; however, it is anticipated that the existing Almeda Road would remain open during construction. Access to properties along Almeda Road would be maintained at all times.</p>
Modification of Regime	Alteration of Ground Cover	<p>As presented in Table 11 in Section 5.2.3, Vegetation, the construction of the additional paved areas (and reconstruction) would permanently disturb ground cover consisting of mowed and maintained grasses within the existing ROW of Almeda Road. The road widening and mixed use trail and sidewalk construction would permanently impact 4.07 acres of mowed and maintained grasses.</p> <p>The length of temporary disturbance is ~24 months. BMPs would be in place to control erosion. When construction is complete, ground cover within ROW would be established with placement of topsoil and permanent seeding with a mix of selected native grasses.</p>
Resource Renewal	Re-vegetation	<p>Approximately 3.94 acres of temporarily disturbed vegetation would be reestablished following construction.</p>
Land Transformation and Construction	Expanded Transportation Facility	<p>The existing urban segment of Almeda Road would be expanded to six lanes with a 16-foot raised median. The proposed lanes would result in the addition of approximately 4.07 acres (177,289 sq. ft.) of new pavement within the proposed Almeda Road ROW, including proposed sidewalk and trail pavement. The new travel lanes would be 12 ft. wide. Drainage would be via curb-and-gutter.</p> <p>A 5-ft wide, approximately 5,500-ft-long pedestrian sidewalk is proposed for the east side of Almeda Road. A 10-foot wide mixed use trail is proposed for the west side of Almeda Road.</p>
Land Alteration	Constructing Raised Median	<p>The 16-foot wide raised median would be built between existing lanes of Almeda Road traffic. Approximately 1.3 acre (58,357 sq. ft.) of land would be occupied by the median. The existing roadside drainage ditch within the grassy median would be replaced with a bioswale area designed to absorb roadside runoff and release in at a controlled rate.</p>
Processing	Staging and Movement of Construction Equipment	<p>The project would likely result in localized negative impacts to air quality from temporary emission increases and dust created by construction activities.</p> <p>Storage of materials would likely occur in open space within the existing road ROW; such decisions have not been made to date. Construction is anticipated to result in temporary increases in sedimentation and turbidity, which would be minimized through the incorporation of appropriate BMPs for erosion control, post-construction TSS control, and sedimentation control. In addition, a SW3P would be implemented by the Contractor to prevent, minimize, and control the spill of hazardous materials in staging areas.</p>
Chemical Treatment	Use of Chemicals	<p>Use of fertilizer is anticipated during the seeding procedure. None of the slopes which would be revegetated are steeper than 3:1 in grade, therefore no chemical binders would be needed. Periodic applications of herbicide may occur during the maintenance phase of the project; however, this is unknown at this time.</p>

ft. = feet/foot

6.5 Step 5: Identify Potentially Substantial Indirect Effects for Analysis

The objective of this step, which is essentially a screening step, is to compare the list of project impact-causing actions with the goals and notable features to explore potential cause-effect relationships and establish which effects are potentially substantial and merit subsequent detailed analysis (or conversely, which effects are not potentially substantial and require no further assessment). Identification of effects was conducted using site reconnaissance where possible, cartographic review (GIS mapping and aerials), and qualitative inference.

The context of the AOI and the intensity of the impact should be considered when determining if an impact may be substantial. Each type of indirect effect should be considered for relevance to the project. As previously indicated, there are three types of indirect effects; each is discussed further below and they are summarized in **Table 20** under **Step 6**.

- **Category 1 - Encroachment-Alteration Effects** are those that alter the behavior and functioning of the physical (including biological and chemical) environment. These are related to project design features, but are separated from the project by time and/or distance. An example is subsequent increased levels of impacts to wildlife due to increased levels of animal/vehicle collisions or disruptions of wildlife travel corridors.
- **Category 2 - Access-Alteration Effects** are also known as Project-Influenced Effects (i.e., the Land Use Effect). Changes in traffic, access, and mobility can result in changes in land use. Highway projects may promote development, or influence an increase in the rate of development. These effects are Access-Alteration Effects, and are often referred to as “induced growth”. An example would be development made possible by the access provided by a new-location roadway.
- **Category 3 - Effects Related to Project-Influenced Development, or Induced Growth-Related Effects**, are those effects that are attributable to the induced growth itself. Category 3 effects are created by a third party. For example, if a new development is an indirect result of a highway project, the removal of vegetation associated with that development is an effect related to project-influenced development. Category 3 effects occur only if Category 2 effects occur.

Encroachment-Alteration Effects

These effects may occur in two categories: ecological effects and socioeconomic effects. They are project design-related because they alter the behavior and functioning of the physical environment. These effects are linked to the impact-causing activities identified in **Step 4**.

Ecological Effects

The land to be impacted within the project area is primarily mowed and maintained roadway medians. It does not contain notable wildlife habitat and is not utilized by any listed threatened or endangered species. Wildlife diversity within Hermann Park and elsewhere within the AOI would not be affected. No wildlife tracks were observed during field reconnaissance activities. Therefore, degradation of habitat and habitat fragmentation are not expected.

While water flow patterns would be affected, no adverse impacts are anticipated to the receiving waterway (HCFCD Unit D100-00-00, Brays Bayou). The proposed project is expected to improve drainage given current drainage standards and requirements. Any water quality impacts would be temporary and minimized by the implementation of BMPs and a SW3P.

The project would likely result in some localized negative impacts to air quality from temporary emission (including MSAT) increases related to construction activities, and the additional lanes would result in a greater volume of traffic. However, this would be offset by the reduction in congestion and vehicle miles traveled. No change in attainment status is anticipated within the AOI as the result of the project. In order for the region to achieve ozone attainment, a variety of point, non-point, and mobile source emission reduction strategies must be implemented for the entire H-GAC area as outlined in the SIP. Furthermore, because of terrain and climatic conditions, dispersion, the process of formulating pollutants, and the movement of traffic throughout the area, it is anticipated that any negative indirect impacts would be slow in developing and would resemble long-term cumulative effects of redistribution.

Based on the information above, the proposed project is not anticipated to have substantial ecological encroachment-alteration effects.

Socioeconomic Effects

The proposed project is located in a generally urban area that is largely surrounded by development. Although there would be no displacements resulting from the project, it would result in access changes and changes in travel patterns, which are discussed further below.

Alameda Road would remain open during construction. Access to properties along Alameda Road would be maintained at all times. After construction, the proposed project would result in the addition of two travel lanes, a continuous improved sidewalk, a hike and bike trail, a 16-foot wide raised median, and turning bays between South MacGregor Way and OST. The added capacity is expected to improve mobility and reduce congestion in the area. Some motorists may have to make a U-turn to access locations near N. MacGregor Way which no longer have direct access. Since substantial indirect effects on access to adjacent properties and area public services are not anticipated, this issue does not warrant further evaluation.

Access-Alteration Effects (or, Induced Growth Effects)

These effects pertain to changes in how people move through and within an area, and can dictate where homes and businesses are constructed. The initial step is to identify and map those areas where natural, governmental, or other constraints would make future changes in land use unlikely. This step sets aside areas within the Indirect Impacts AOI that would be unsuitable or unlikely for future development or redevelopment activities, and includes the following areas: areas within the 100-year floodplain; public parks; parcels owned and/or used for major utilities (e.g., electric substations or pump stations); and existing public facilities (e.g., road ROW, schools, churches).

The **Indirect Impacts Analysis – AOI Map (Appendix F)** shows areas that are currently developed, are within a 100-year floodplain, and are identified as waters/wetlands based on the USFWS's National Wetlands Inventory (NWI) mapped features. These areas would be less likely to be developed (or re-developed) and therefore unlikely to experience induced growth effects. The 376-acre AOI contains approximately 369 acres of existing development, including existing roadway ROW and Hermann Park. Therefore, the remaining area, approximately 7 acres, is judged potentially suitable for development to residential use, multi-use buildings (retail, office and service commercial properties), institutional properties, larger commercial properties, and industrial uses. It is noted that waters, floodplains, and wetland areas could be built upon, but the assumption is that development would typically occur on locations with the fewest obstacles if a developer has a choice (due to permitting requirements and engineering challenges).

Land use changes are difficult to accurately predict or quantify, as they would be dependent on individual landowners' desires, economic conditions, and other factors. As previously mentioned, Harris County and the City of Houston view the project as being a critical link in the region's transportation network, which would improve mobility and safety in the areas. The City of Houston's City Councilman for this area has indicated that the proposed project would relieve congestion (mostly in the peak hours), improve area mobility, and improve roadway safety in the Texas Medical Center. In addition, with current drainage standards the project would improve drainage in the area. The projects listed are consistent with the City's development plans.

Both the Michael E. DeBakey VA Medical Center and the Bayou Parklands portion of Hermann Park are not anticipated to undergo development for residential, commercial, or industrial land uses. Although the Texas Medical Center identifies locations within its properties near Almeda Road where development could occur, no specific projects have been proposed. Proposed development at the Bayou Parklands consists of landscaping for urban habitat improvement and expansion of fitness related amenities. The proposed Almeda Road project would complement (but not induce) these improvements, particularly with the proposed multi-use trail, which would link Bayou Parkland with other trails in the area. The proposed multi-use trail would also link to walking/jogging trails located on the VA Medical Center property, connecting them to approximately 40 miles of existing and proposed multi-use trails in the local area.

Improvements based on the proposed project would make the area more attractive and development on the available 7 acres is a possibility, but no specific development plans exist currently. The Almeda Road project is not anticipated to induce land development; therefore, the indirect effect of land use changes (conversion) would not be further analyzed.

Effects Related to Induced Growth

These effects are similar to encroachment-alteration effects, but occur as a result of induced growth. This category of indirect impacts can only be considered once induced growth has been studied to some degree. There are numerous ways that induced growth, should it occur, could affect the environment, including the ecological and the socioeconomic environment. Such impacts could be similar to (but not limited to) many of those listed in **Table 19** in **Step 4**.

Most land which could have been impacted by induced development is currently developed lands, most of which are residential, commercial, and institutional uses. Harris County and the City of Houston have no future land use plans or zoning. Approximately 7 acres of potentially developable land is located within the AOI. Although a mix of uses including residential are possible on these 7 acres, no specific development plans have been identified at this time. Therefore, no effects related to induced growth are anticipated.

6.6 Step 6: Analyze Indirect Effects and Evaluate Results

Substantial indirect encroachment-alteration effects were not identified in **Step 5**. The City of Houston, Harris County, and local landowners have indicated that the proposed project would not induce development due to the improved mobility and new access. While there is some developable land to evaluate, induced development is not anticipated at the time of this analysis, and no effects related to induced growth are anticipated. Therefore, no analysis of indirect effects is necessary.

Based on the analyses performed in Steps 1 through 6, direct and indirect impacts on Land Use (conversion of land), Water Quality, Wetlands and Vegetation were not determined to be substantial; therefore, none of these resources are evaluated further in the cumulative impacts analysis. Although direct and indirect impacts on Air Quality were not determined to be substantial, this issue is evaluated further in the cumulative impacts analysis since the proposed project is located within an EPA-designated Marginal Nonattainment Area.

6.7 Step 7: Assess Consequences and Consider/Develop Mitigation (When Appropriate)

As stated in the TxDOT's September 2010 Guidance, mitigation should be considered for indirect impacts that:

- Conflict with study area goals;
- Could worsen the condition of a sensitive or vulnerable notable feature;
- Could delay or interfere with planned improvement of a notable feature;
- Could eliminate a valued or unique notable feature, or could render that notable feature ordinary; or
- Are inconsistent with an applicable law.

The Transportation Research Board notes that "it is suggested that mitigation responsibility for indirect impacts of proposed transportation projects be based on the distinction between indirect impacts that are within the control of the project agency and those that are outside the control of that agency, to the extent that such distinction is consistent with federal and state laws.... 'Induced growth and effects related to induced growth' are generally 'outside the control' of the project agency (the exception being to avoid or minimize impacts through change in access location, where practicable)." It is outside the responsibility and capability of the City of Houston, Harris County, or TxDOT to mitigate against indirect impacts that are land development oriented unless the proposed project would specifically interfere with the ability to develop land. This project is not anticipated to result in indirect impacts. Based on the absence of anticipated indirect impacts and criteria presented above, mitigation for indirect impacts is not warranted or recommended for this project.

7.0 CUMULATIVE IMPACTS

CEQ regulations (40 C.F.R. § 1508.7) define cumulative effects as:

“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” (40 CFR 1508.7)

The purpose of cumulative effects analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. This approach allows the decision maker to evaluate the incremental impacts of the proposed Build Alternative in light of the overall health and abundance of selected resources. The evaluation process for each resource considered may be expressed in shorthand form as follows:

$$\frac{\text{BASELINE CONDITION}}{\text{(Historic and Current)}} + \frac{\text{FUTURE EFFECTS}}{\text{(Foreseeable Projects)}} + \frac{\text{PROJECT IMPACTS}}{\text{(Direct and Indirect)}} = \text{CUMULATIVE EFFECTS}$$

The eight-step approach as described in TxDOT’s September 2010 Guidance was utilized to assess the potential cumulative impacts of the past, present, and reasonably foreseeable actions to the resources in the project area. These eight steps are:

1. Identify the resources to consider in the analysis.
2. Define the Study Area for each resource.
3. Describe the current health and historical context for each resource.
4. Identify direct and/or the indirect impacts that may contribute to a cumulative impact.
5. Identify other reasonably foreseeable actions that may affect resources.
6. Assess potential cumulative impacts to each resource.
7. Report the results.
8. Assess and discuss mitigation issues for all adverse impacts.

The goal of the cumulative effects analysis is to determine whether the proposed action’s direct and indirect impacts, considered with other reasonably foreseeable actions, would result in substantial degradation of a resource that would not result from the proposed action considered alone. TxDOT’s September 2010 Guidance states: “If a project would not cause direct or indirect impacts on a resource, it would not contribute to a cumulative effect on the resource.” It also states, “The cumulative effect analysis should focus only on: 1) those resources substantially impacted by the project; and 2) resources currently in poor or declining health or at risk even if project impacts are relatively small.”

The focus of the analysis is to qualify the magnitude of impact to the overall health of a resource from the sum of current and future actions, and to determine if such impacts are related to the proposed project. The health of a resource refers to characteristics of its general overall condition, stability, or vitality, and

how these characteristics may change over time. Trends toward better or worsening health of a resource are of similar importance to existing conditions and are carefully analyzed. Laws, regulations, policies, or other actions affect these trends, and they would be reviewed to determine if they are likely to increase or decrease the level of stress on each resource.

Per TxDOT’s September 2010 Guidance, only those indirect effects which may be substantial need to be studied in further detail. **Table 20** provides a recap of direct and indirect impacts to each, whether it was carried forward to a cumulative effects analysis, and a rationale for this decision. In many cases, the rationale is supported by the direct impacts analysis.

Table 20: Summary of Environmental Resources

Resource / Issue	Summary of Direct and Indirect Impacts		In Analysis?	Rationale for Decisions
	Direct	Indirect		
Socioeconomic Issues				
Environmental Justice (including LEP)	No disproportionately high and adverse impacts to EJ/LEP populations.	No indirect adverse impacts anticipated.	No	All residents would experience similar benefits. No displacements anticipated.
Land Use	Conversion of undeveloped herbaceous area to transportation facility	No land use conversion planned. ~7 acres of undeveloped land (in 4 areas) are available within the AOI, but not proposed for development at this time.	No	Impacts are not anticipated and no further analysis warranted.
Natural Resources				
Waters of the U.S. (including Wetlands)	The Alameda Road project would not impact waters of the U.S., including wetlands.	No development of properties including jurisdictional wetlands/waters of the U.S. anticipated.	No	Impacts are not anticipated and no further analysis warranted.
Vegetation	Removal of approximately 4.07 acres of vegetation, consisting of mowed and maintained areas.	No development of up to approximately 7 acres of maintained landscaped vegetation anticipated.	No	Impacts are not anticipated and no further analysis warranted.
Wildlife	Project area is primarily mowed and maintained grass, with some landscaping trees and shrubs. No wildlife impact anticipated.	Area is considered urbanized.	No	Area does not contain unique habitat.
Threatened and Endangered Species	No anticipated direct impacts to State species or effects to Federal species.	No anticipated indirect impacts to State species or effects to Federal species.	No	Area does not contain unique habitat or habitat desired by the listed species.
Essential Fish Habitat	No direct impacts; no tidally influenced waters.	No indirect impacts; no tidally influenced waters.	No	No tidally influenced waters.
Cultural Resources				
Historic Properties	No direct impacts.	No anticipated indirect impacts.	No	Resources administered through legislation.

Resource / Issue	Summary of Direct and Indirect Impacts		In Analysis?	Rationale for Decisions
	Direct	Indirect		
Archaeological	No direct impacts.	No anticipated indirect impacts.	No	Tribal coordination and coordination with THC conducted. Concurrence of no impact received for FEIS. TxDOT would initiate coordination due to design change and additional ROW.
Section 4(f)	No direct impacts.	No anticipated indirect impacts.	No	Resources administered through legislation.
Prime/Unique Farmland	No direct impacts.	No anticipated indirect impacts.	No	No prime/unique farmland.
Other Resources/Issues				
Water Quality	<ul style="list-style-type: none"> Replacement of open ditch with bioswale area. Temporary increase in sedimentation and turbidity in these waters. Permanent increase in storm water runoff due to the increase in the amount of impervious surface (4.07 acres) within the ROW would occur.	No development of properties including jurisdictional wetlands/ waters of the U.S. anticipated. No additional impervious surfaces anticipated.	No	Impacts are not anticipated and no further analysis warranted.
Noise	Two noise receivers representing one hospital and 142 townhomes in the project area would be impacted.	No anticipated indirect impacts.	No	Noise mitigation has been found to be reasonable and feasible at townhomes along Almeda Road. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.
Floodplains	No direct impacts.	No indirect impacts.	No	Would not impact.
Coastal Zones	No direct impacts.	No indirect impacts	No	Project / AOI / Almeda Road not located within the Coastal Zone limits.
Air Quality	Primarily those associated with the increased capacity, accessibility and the resulting projected increases in VMT.	No anticipated indirect impacts.	Yes	Because the project's potential direct impacts on air quality and MSATs are projected to be offset by federal fuel and vehicle control programs or state and federal regulatory programs, negative impacts on air quality are not anticipated. However, further analysis has been performed as project area is located within an EPA-designated Marginal Nonattainment Area.
Hazardous Materials	No anticipated direct impacts.	No anticipated indirect impacts.	No	Not a resource.

As discussed in this EA document, impacts for this project are not considered substantial or notable; hence, further detailed analysis is not warranted for most Resources/Issues. Further detailed analysis has been performed for Air Quality since the project area is located within the Houston-Galveston-Brazoria area, which has been designated by EPA as a Marginal Nonattainment Area in accordance with the 2008 8-hour ozone standard.

Cumulative effects for air quality were evaluated using the following factors: the historical context, current condition and trend, future transportation, land use and zoning plans, and the pertinent regulations

and standards associated with air quality. Implicit in the approach to predicting the future conditions are several key assumptions:

1. All reasonably foreseeable actions would be completed as currently planned.
2. The relationships between the resources, ecosystems, and human communities that have been identified from historical experience would continue into the future.
3. The sponsors of government and private projects would comply with relevant federal, state, and local laws designed to protect air quality. Regulatory agencies would perform their duties in accordance with legal requirements and internal guidelines.

The underlying principal of a cumulative impacts analysis is that impacts from conceivably completely unrelated projects may join with the impacts of the proposed project to cause long-term effects for or against the identified resource/issue. Therefore, the proper focus of a cumulative impacts analysis is the “net effects” on each resource that remain after full compliance with the regulatory requirements of the proposed project are satisfactorily addressed at all levels. However, this does not require a full knowledge of any effect that may develop over time, but is limited to the inclusion of reasonably foreseeable effects. Projects that are candidates for causing reasonably foreseeable effects include local or regional transportation projects (i.e., associated with the cities’ or counties’ thoroughfare plans or H-GAC’s 2035 RTP Update), locally-funded transportation projects, and commercial and residential land use change and development.

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

The Indirect Impacts **Step 1** evaluation identified one (1) resource/issue that warranted more detailed evaluation and discussion: Air Quality.

7.2 Step 2: Define the Study Area for Each Affected Resource

For the purpose of assessing cumulative impacts, **Step 2** identifies the geographic extent of the resource study area (RSA) and the temporal RSA.

Air Quality

Evaluating Air Quality in relation to cumulative impacts requires looking at three distinct RSAs, as described below (**Appendix F: Air Quality RSA Map**):

- **Ozone** – The RSA for evaluating the ozone (O₃) NAAQS was designated as the Houston-Galveston-Brazoria 8-hour O₃ nonattainment area, which includes: Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties.
- **Carbon Monoxide** – The RSA for carbon monoxide (CO) was based on the ROW line, which represents the locations with the highest potential for CO concentrations. However, the nature of the proposed project does not warrant a TAQA. Therefore, CO levels resulting from this project would not be expected to exceed the NAAQS for CO and negatively impact air quality in this area.
- **Mobile Source Air Toxics (MSATs)** – The RSA for MSATs is the boundaries of Harris County. Unlike the other resources evaluated, air quality impacts from MSATs have been evaluated qualitatively in this proposed project by TxDOT and FHWA. MSATs are regulated by EPA on a

national basis through requirements for fuels and vehicle technology. The MSAT analysis qualitatively evaluated emission changes based upon the proposed project and national trends.

General Note

The following sources were used to analyze the potential for cumulative impacts:

- Demographic forecasts and the 2035 RTP Update (which represents the furthest extent of transportation and land use planning efforts) identify future population trends.
- Interviews/correspondence with local officials and others identified in the Introduction of this chapter were conducted for information on current conditions, expected development, and traffic information.

Statutes, regulations, and ordinances, discussed throughout this EA, have been designed by federal, state, and local governments to ensure the sustainability of resources by requiring project sponsors to avoid, minimize, and mitigate for the environmental effects of their actions.

Although it would be ideal to identify all past, present, and reasonably foreseeable activities so their potential effects could be taken into consideration in combination with those from the proposed project, site specific details regarding such actions (i.e., type, location, magnitude, and scale) are not always comprehensively available. Therefore, potential effects from other actions were estimated based on available information from general development plans and trends. Effects have been quantitatively determined where possible, and qualitatively determined if not. It was found that many of the potential effects to the resources/issues considered in this cumulative impact analysis are not specifically attributable to the proposed project but are related to the indirect and cumulative impacts of urbanization and associated infrastructure.

Temporal

The temporal RSA in this cumulative impact analysis was defined and spans from 1944 to 2035. This timeframe was determined by the general start of when, based on aerial photography and research on various property developments, new development visibly began in the AOI; therefore, when notable impacts to resources began. The latter date was established as 2035 because, by this time, the proposed project (should it be approved) would be complete and operational and because this timeframe is consistent with other regional planning efforts/projections including land use plans and traffic forecasts (i.e., it is the horizon year of the current RTP Update).

7.3 Step 3: Define the Current Health and Historical Context for Each Affected Resource

Patterns or activities that have contributed to the current condition of the resources/issues considered in this cumulative impact analysis would not differ greatly with the proposed project because growth and development is taking place independently, and to varying degrees, currently occurring and expected to continue.

Air Quality

Current Health

The EPA establishes limits on atmospheric pollutant concentrations through enactment of the NAAQS for six principal, or criteria, pollutants. The EPA designated eight counties in the Houston-Galveston-Brazoria area as nonattainment for O₃. The region is currently in attainment for all other criteria pollutants. Although there have been year-to-year fluctuations, the O₃ trend continues to show improvement. The trend of improving air quality in the region is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies, and H-GAC regional clean air initiatives.

Historical Context

On July 18, 1997, the final 1997 8-hour O₃ standard was published in the Federal Register. The O₃ standard became effective on September 16, 1997. Final designations were published in the Federal Register on April 30, 2004, and became effective on June 15, 2004. The Houston-Galveston-Brazoria (HGB) area was designated moderate nonattainment. Counties affected under this status are Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller.

On September 18, 2008, the EPA granted the governor's request to voluntarily reclassify the HGB ozone nonattainment area from a moderate to a severe nonattainment area for the 1997 ozone standard. The effective date of this reclassification was October 31, 2008. The EPA set April 15, 2010, as the date for the state to submit a revised SIP addressing the severe ozone nonattainment requirements. The HGB area's new attainment date for the 1997 ozone standard was as expeditiously as practicable, but no later than June 15, 2019.

On March 27, 2008, the EPA lowered the primary and secondary 8-hour ozone NAAQS to 0.075 parts per million (ppm) ([73 FR 16436](#)). The eight counties of the HGB area was designated nonattainment and classified Marginal under the 2008 8-hour ozone NAAQS, effective July 20, 2012. The attainment deadline for the HGB Marginal Nonattainment Area is December 31, 2015.

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

A cumulative impacts analysis must look at the impacts of the proposed action in combination with the impacts of other past, present, or reasonably foreseeable actions within an RSA. Identification of the direct and indirect impacts of the proposed action, in collaboration with City Officials, also assists in determining the project's contribution to the cumulative impact on the resource. Because the project would potentially affect air quality (a resource generally in good health, but in poor health for O₃), this resource/issue is carried through the analysis for cumulative impacts. Additional information on the direct and indirect impacts for air quality is discussed in previous sections of this EA.

Air Quality

Direct Impacts

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

Indirect Impacts

Indirect impacts on air quality and MSATs resulting from project’s increased accessibility or capacity to the area are not anticipated. Any increased air pollutant or MSAT emissions resulting from the potential development of the area must meet regulatory emissions limits established by the TCEQ and EPA and, therefore, are not expected to result in any degradation of air quality or MSAT levels.

7.5 Step 5: Identify Other Reasonably Foreseeable Future Effects

Reasonably foreseeable actions are those that are likely to occur, or are probable, rather than those that are merely possible. Several sources were reviewed or utilized to identify reasonably foreseeable development plans within the project vicinity. In addition, use of GIS mapping was essential in evaluating and estimating potential impacts.

Air Quality

Reasonably foreseeable actions that could potentially affect air quality within the RSAs include transportation projects and development projects. These actions and their anticipated impacts are also summarized in **Table 21**. It is noted that developers often do not release plans for developments until the projects become public (i.e., platted). No other known specific, “reasonably foreseeable” plans or platted developments for projects such as industrial developments, retail/commercial centers, or residential subdivisions were identified for this analysis. However, currently unreleased plans may exist.

Table 21- Reasonably Foreseeable Actions

Project Name	Project Sponsor	Summary Description	Air Quality Impacts
Cambridge Street from Old Spanish Trail to Holly Hall Street	TxDOT-HOU	Reconstruct two lanes in each direction.	Transportation projects would result in localized increases in air pollutants/MSAT emissions from moving lanes closer to receptors and increasing capacity of the regional network, which could also contribute to the capacities measured on the widened section of Almeda Road and new traffic on the extension. Less congestion along these roads would result in fewer cars traveling at lower speeds or in idling conditions for shorter periods of time during peak periods, resulting in less fuel combustion and lower idling emissions. Emissions must meet regulatory emissions limits established by the TCEQ and EPA as well as
SH 288 (from US 59 to IH 610)	TxDOT-HOU	Construct four toll lanes with interchange at IH 610	
Lockett Road/Ringess Road intersection	Tx Medical Center	Realignment of intersection to improve connectivity and reduce congestion in Texas Medical Center Mid Campus	
Lauderdale Road from Cambridge Street to Lockett Road	Tx Medical Center	Extend existing Lauderdale Road from existing terminus at Cambridge Street east to Lockett Road.	
Potential Medical Center development	Tx Medical Center	Potential future development area west of Almeda Road bound by Old Spanish Trail to the south, Cambridge Street to	

	the west, and Holcombe Blvd to the north. No specific projects currently under development.	obtain appropriate authorization from the TCEQ and therefore are not expected to result in any degradation of air quality or MSAT levels. No change in attainment status is expected.
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Sources: H-GAC 2035 RTP Update; H-GAC 2013-2016 TIP; Harris County Flood Control District (HCFCD) Environmental Services Department; City of Houston, Public Works & Engineering Department (COH-PWED); Tx Medical Center 2009 Mid and South Campus Conceptual Development Plan; and interviews with landowners.

Increased development and urbanization can result in increased air pollutant or MSAT emissions resulting from these actions. These must meet regulatory emissions limits established by the TCEQ and EPA and, therefore, are not expected to result in any degradation of air quality or MSAT levels. Reasonably foreseeable actions that could impact air quality within the RSA are those transportation projects listed in **Table 21**.

7.6 Step 6: Identify and Assess Cumulative Impacts

The goal of this analysis was to generate a quantitative assessment of cumulative effects. However, quantitative data was not always available, and some data was cost ineffective and/or cost prohibitive to acquire. In some cases where quantitative data was available, its incomplete nature precluded its use. When these conditions prevailed, qualitative assessment was applied. In addition to gathering information from the 2035 H-GAC RTP Update and the 2013-2016 TIP, review of municipal websites (e.g., City of Houston, Texas Medical Center, and Harris County) were conducted to obtain information about present and foreseeable actions and associated impacts. The extent of probable impact from various projects was primarily determined using topographic maps and TelALL™ and Google™ earth aerial photograph review, in conjunction with GIS overlays for mapping and measuring impacts. The severity of the impacts was then evaluated by comparing the impacts to the health and trend of the affected resources while considering the local goals for the area.

In conducting the cumulative impacts analysis, the following assumptions were made:

- The reasonably foreseeable actions identified in **Table 21** would be constructed in their entirety, as indicated in the applicable reference (RTP Update, TIP, thoroughfare maps, etc.) and within the temporal boundaries established (i.e., by 2035).
- The project would have no influence on the construction of other developments within the RSAs (i.e., the reasonably foreseeable projects are independent of the proposed Almeda Road project).
- There are likely to be many more projects in the geographic RSAs that occur within the temporal RSA that this analysis cannot include.
- Past actions have contributed to the current condition, and current actions will ultimately contribute to cumulative effects (and that those current actions have already been given proper analysis).

The potential cumulative impacts regarding air quality, as a result of the proposed project and in conjunction with the reasonably foreseeable projects listed, are discussed below.

Air Quality

Any increased air pollutant or MSAT emissions resulting from increased capacity, accessibility and development are projected to be more than offset by emissions reductions from EPA's new fuel and vehicle standards or addressed by EPA's and TCEQ's regulatory emissions limits programs. Projected traffic volumes are expected to result in minimal impacts on air quality; improved mobility and circulation may benefit air quality. Increases in urbanization would likely have a negative impact on air quality. However, planned transportation improvements in the project area as listed in a conforming RTP and TIP, coupled with EPA's vehicle and fuel regulations, and fleet turnover, are anticipated to have a cumulatively beneficial impact on air quality.

7.7 Step 7: Report the Results

Any cumulative impacts on the resources analyzed are a result of the steady urbanization of the area. The past and reasonably foreseeable effects in the area have impacted and would continue to impact the resources considered in this study as a result of prosperous economic growth and development patterns adopted by Houston and the Texas Medical Center.

Some beneficial cumulative impacts to the entire RSA (including individual home owners) may include the addition of infrastructure improvements constructed to support the increased development and commerce associated with land development in the RSA. The proposed project would ensure that mobility in the RSA is sustained.

Air Quality

All projects in H-GAC's 2013-2016 TIP that are proposed for federal or state funds are consistent with federal guidelines in Section 450 of Title 23, CFR and Section 613.200, Subpart B of Title 49. The proposed project is located within Harris County in the planning area of the H-GAC, which is its MPO, and the Houston-Galveston TMA. The proposed project is covered in the 2013-2016 TIP, as amended, in Chapter 3 (Highway Project Listing), under CSJ 0912-72-072 (see **Appendix C: RTP and TIP Documentation**). The total estimated construction cost (as of 12/21/12 in the RTP) is \$12,749,374, which would be split as 80 percent federal funds and 20 percent local funds.

The proposed project is consistent with the H-GAC's financially constrained 2035 RTP Update (see **Appendix C**). The 2035 RTP Update and the FY 2013-2013 TIP were found to conform to the TCEQ SIP by FHWA and the FTA on January 25, 2011 and November 1, 2012, respectively.

When combined, planned transportation improvements, revised EPA fuel and vehicle regulations, and fleet turnover are anticipated to have a cumulatively beneficial impact on air quality. Based on this analysis, the project would have no notable contribution to cumulative impacts on air quality.

7.8 Step 8: Assess and Discuss Mitigation Issues for All Adverse Impacts

NEPA regulations in Title 23 CFR 771.105(d) call for the consideration of mitigation for all adverse impacts. Mitigation should be considered for any impact disclosed in the environmental document, whether direct, indirect, or cumulative. Consideration of potential mitigation measures, as specified in 40 CFR 1508.20, for this project included:

- Avoiding the impact altogether by not taking a certain action or parts of an action;

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

The mitigation of development impacts to the area considered for this study would generally rest with the agencies authorized to implement such controls. This authority rests with the municipal governments and to a lesser extent, the county governments. H-GAC will continue its efforts to work with these agencies in the planning process to identify transportation challenges and explore and develop appropriate mitigation strategies. Examples include programs and projects to improve availability of, and accessibility to, alternate transportation options including discounted transit fares and tolls, HOV discounts on toll roads and managed lanes, better accessibility to regional transportation systems, and community-level congestion management. The responsibility of transportation providers such as TxDOT, local and regional transit agencies, and the local governments would be to implement a transportation system to complement the land use or development controls implemented.

However, neither H-GAC, TxDOT nor any other agency or municipality can force or implement any plan or strategy upon another municipality. Alternative growth scenarios are presented as suggested alternatives the municipalities could incorporate into their land use policies to improve regional transportation and environmental issues. These scenarios are provided by H-GAC as an educational guide for the cities and municipalities that comprise the Houston-Galveston Metropolitan Area.

Nevertheless, H-GAC has no power to control regional growth and land development and the unshared cost of implementation of a full sustainable land use plan is substantial.

Air Quality

A variety of federal, state, and local regulatory controls as well as local plans and projects have had a beneficial impact on regional air quality. The CAA, as amended, provides the framework for federal, state, tribal, and local rules and regulations to protect air quality. The CAA required the EPA to establish NAAQS for pollutants considered harmful to public health and the environment. In Texas, the TCEQ has the legal authority to implement, maintain, and enforce the NAAQS. The TCEQ establishes the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general comprehensive plan. Authorization in the Texas Clean Air Act (TCAA) allows the TCEQ to do the following: collect information and develop an inventory of emissions; conduct research and investigations; prescribe monitoring requirements; institute enforcement; formulate rules to control and reduce emissions; establish air quality control regions; encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and to establish and operate a system of permits for construction or modification of facilities. Local governments having some of the same powers as the TCEQ can make recommendations to the commission concerning any action of the TCEQ that may affect their territorial jurisdiction, and can execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town

may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA or the rules or orders of the TCEQ.

The CAA also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies to reduce emissions, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the non-attainment areas. These regulatory controls, as well as other local transportation and development initiatives implemented throughout the HGB area by local governments and other entities provide the framework for growth throughout the area consistent with air quality goals. As part of this framework, all major transportation projects, including the proposed project, are evaluated at the regional level by the H-GAC for conformity with the SIP.

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

8.0 RECOMMENDATION OF THE RECOMMENDED ALTERNATIVE

The recommended alternative and the rationale for its recommendation are provided in this chapter. The rationale is followed by a list of the mitigation and monitoring which would be necessary with the implementation of the recommended alternative.

8.1 Identification and Rationale for the Recommended Alternative

8.1.1 Recommended Alternative

The City of Houston and TxDOT recommend the Build Alternative: *Reconstruct Almeda Road from South MacGregor Way to Old Spanish Trail as a 6-Lane Raised-Median Divided Facility* as the Recommended Alternative.

8.2 Support Rationale and Impacts Summary

If constructed, the Build Alternative would fulfill the public need to improve mobility and reduce congestion, provide sufficient pedestrian and bicycle facilities along Almeda Road, and correct substantial structural problems. **Table 22** compares the alternatives' ability to satisfy the objectives of the proposed project.

Under the Build Alternative, two travel lanes would be added to the majority of the facility, which would increase capacity, reduce congestion, and improve mobility (both locally and regionally). This alternative would include raised medians with dedicated turn-lanes at intersections, a multi-use trail, and a sidewalk, thereby improving mobility and adding to the pedestrian/bicycle capacity of the facility. The

improvements would also improve the traffic operations on Alameda Road. The proposed project would be compatible with other proposed and on-going Texas Medical Center projects. In addition, the project would provide transportation improvements consistent with regional goals presented in the 2035 RTP Update and the 2013-2016 TIP. Achievement of these project objectives addresses public comments provided during project development.

The No-Build Alternative would not fulfill the public’s transportation needs between OST and South MacGregor Way. Traffic congestion would continue to worsen as traffic volumes increase on Alameda Road. As growth continues in the surrounding area, Alameda Road would continue to experience congestion, increases in traffic delays, and an overall inconvenience to the traveling public. There is also the likelihood that accidents would increase proportionally along the corridor, since it does not have the standard shoulders for a facility of this type.

The **Summary and Comparison of Alternatives (Table 22)** presents a summary and comparison of the effects of the No-Build and proposed Build Alternatives on the human and natural environments.

Table 22: Summary and Comparison of Alternatives’ Impacts

Resource / Issue	No-Build Alternative	Build Alternative
Right-of-Way	No ROW required	Approximately 0.13 acre of new ROW would be required.
Socioeconomic	The project would not result in any disproportionate effects to environmental justice populations.	No displacements would be required. The project would not result in any disproportionate effects to environmental justice populations. The project would eliminate cut-through traffic.
Land Use	Conversion of undeveloped lands for residential, commercial and light industrial development would continue (is dependent upon other factors).	Conversion of undeveloped lands for commercial and residential development is anticipated to continue, at same rate as with No-Build Alternative. No induced development is anticipated.
Prime Farmlands	No impact	The project would not impact “prime farmland” soils. The farmland conversion impact rating is less than 160 and no further consideration is warranted.
Vegetation	No impact	A total of approximately 4.07 acres of vegetation would be permanently impacted.
Threatened & Endangered Species	No impact/effect.	Project area does not contain preferred habitat for any state- or federally-listed species. No listed species were observed during site reconnaissance. The project is anticipated to have no effect/impact on federally-/state-listed species, respectively.
Historic Resources	No impact	No impact - There are no historic-age structures or historic resources within the proposed project APE.
Archeological	No impact	No impact - A search of the THC Texas Archaeological Atlas Online and a review of the Handbook of Texas History Online indicates that there are no previously recorded resources within the APE. Project area is previously disturbed and within PALM Unit 4, for which no survey is recommended.

Resource / Issue	No-Build Alternative	Build Alternative
Section 4(f)	No impact	No impact.
Water Quality	No impact	No adverse impacts to groundwater or long-term impacts to area surface water quality are expected to occur. In order to minimize impacts to surface water quality, appropriate BMPs would be implemented.
Floodplains	No impact	The hydraulic design of the project would be in accordance with the current TxDOT and FHWA policy standards. Roadway design would be such as to prevent inundation at recurrence interval of at least 100 years.
Waters of the U.S. (Including Wetlands)	No impact	The project would not result in impacts to waters of the U.S., including wetlands.
Air Quality	Future congestion would continue to present localized and regional air quality issues	Included in the 2013-2016 TIP and 2035 RTP Update, which have been found to conform to the SIP.
Noise	No impact; traffic noise would tend to increase with an associated increase in traffic.	The final decision to construct noise barriers would not be made until completion of the proposed project design, utility evaluation, and polling of adjacent property owners.
Hazardous Materials	No known impact	During any construction activity, there exists the potential to encounter contaminated soil or groundwater. Four sites were identified to be a potential problem to the project; however, as long as excavations associated with the project are not proposed to groundwater, three of these facilities are not of environmental concern to the project. The small strip style retail center / former gasoline service station represents the greatest potential to encounter possible hydrocarbon-affected soil. The potential for any environmental condition to be a concern to construction workers is low, but special handling practices of the soil may be necessary if the soil is discovered to be hydrocarbon-affected.
Construction Impacts	No impact	At least one travel lane in each direction would be kept open at all time during construction. All construction-related impacts would be temporary and not pose any long-term effects.
Indirect Impacts	No Impact	No notable indirect impacts anticipated.
Cumulative Effects	No Impact	Project would not contribute to cumulative effects.

8.2.1 Mitigation and Monitoring Commitments

The Alameda Road project would be phased in such a manner that would allow at least one lane in each direction to remain open during construction. Access to businesses and residences would be maintained to the maximum extent possible at all times. It is not anticipated that detours would be necessary. All traffic control would conform to Part VI (*Traffic Control for Street and Highway Construction and Maintenance Operations*) of the *Texas Manual of Uniform Traffic Control Devices*.

Under the Build Alternative, a SW3P would be implemented. It would include temporary erosion and sedimentation control items (i.e., BMPs) to be used as directed by the Engineer in response to changing

field conditions and by the Contractor for construction activities within state ROW. Since the project is not within 5 miles upstream of an impaired water, coordination with TCEQ is not required for TMDLs.

Per the CWA Section 402, HCPID-AED and TxDOT are required to comply with the TPDES Permit No. TXR150000 for Storm Water Discharges Associated with Construction Activities. An NOI, stating that a SW3P would be developed and filed with the TCEQ, would be required. Pollution from storm water would be minimized through adherence to measures in the project's SW3P.

The project would have no impacts on waters of the U.S. (including wetlands); therefore, no CWA Section 404 permit would be required.

The project would comply with the applicable Municipal Separate Storm Sewer System (MS4) requirements.

Construction activities would occur above groundwater resources, and all potable and non-potable water would be brought to the site by the contractor.

All appropriate coordination with the local Floodplain Administrator would be performed prior to construction.

Landscaping would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices. Native plant species would be used in the landscaping and in the seed mixes where practicable (per EO 13112).

During construction, clearing of vegetation throughout the project corridor would be avoided or minimized, where possible, for the construction of the proposed project.

In accordance with the MBTA, measures such as additional surveys prior to construction to ensure active nests are not present would be taken prior to vegetation clearing and bridge and culvert reconstruction, which would avoid harm to these species. No vegetation containing nests, eggs, or young would be removed should they occur on the project site during the nesting and breeding season (March 1 through August 31).

Construction may temporarily degrade air quality through dust and exhaust gases associated with construction equipment. Measures to control dust and air pollutants would be considered and incorporated into the final design and construction specifications and would include the following measures:

- Fugitive dust would be controlled by sprinkling water on construction haul roads and work areas when this becomes a problem.

- Air pollutant emissions in construction equipment exhaust would be minimized by performing maintenance on equipment engines as necessary and shutting off idling equipment where possible.

Construction would normally occur during daylight hours when occasional loud noises are more tolerable. None of the receivers is expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

For this project, a traffic noise barrier was determined to be both feasible and reasonable for Receiver 2, and is proposed for incorporation in the project.

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

If unanticipated evidence of archaeological deposits is encountered during construction, work in the immediate area would cease and TxDOT archaeological staff would be contacted to initiate accidental discovery procedures under the provisions of the First Amended PA-TU between FHWA, TxDOT, THC, and ACHP.

Impacts from borrow and fill areas would be assessed, mitigated, and monitored as appropriate once these locations and impacts are identified.

9.0 RECOMMENDATION FOR ALTERNATIVE SELECTION AND FOR A FONSI

Based upon using a systematic interdisciplinary approach and summarizing the results of related studies, relevant documents, technical reports, coordination with resource and regulatory agencies, and public involvement, the City of Houston and TxDOT recommend implementation of the Build Alternative: *Reconstruct Almeda Road from South MacGregor Way to Old Spanish Trail as a 6-Lane Raised-Median Divided Facility*. TxDOT requests that FHWA find that implementing the Build Alternative would not be a major federal action significantly affecting the quality of the human environment and thus issue a Finding of No Significant Impact (FONSI) for this project.

Appendix A
Applicable Regulatory Requirements

Applicable Regulatory Requirements and Agency Coordination

The following Executive orders, Memoranda of Understanding (MOUs), and regulations directly influence the design, operational, and environmental decisions that must be made concerning the proposed improvements:

- **Archeological Resources Protection Act (ARPA) of 1966:** This Act establishes as federal policy the protection of the historic properties or places and their values in cooperation with other nations and with state and local governments. It establishes a program of grants-in-aid to state governments for historic preservation activities. Subsequent amendments designated the State Historic Preservation Officer or the Tribal Historic Preservation Officer (SHPO) or the Tribal Historic Preservation Officer (THPO) as the individual responsible for administer programs in the states or reservations. The Act also creates the Advisory Council on Historic Preservation (ACHP).
- **Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. 668-668c):** This act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." This definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.
- **Clean Air Act (CAA) of 1970, as amended (42 USC §§7401-7626):** This act is the comprehensive federal law that regulates air emissions from area, stationary, and mobile sources. This law authorizes the U.S. Environmental Protection Agency to establish National Ambient Air Quality Standards to protect public health and the environment.
- **Clean Water Act (CWA) of 1972:** This act is an amendment to the Federal Pollution Control Act of 1972. It sets the basic structure for regulating discharges of pollutants to Waters of the U.S. Section 401 of the CWA requires that an applicant for a federal permit provide a State certification that any discharges from the facility would comply with the Act, including water quality standard requirements. Section 402 of the CWA established the National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The State of Texas is regulated under the TCEQ's Texas Pollutant Discharge Elimination System (TPDES). Section 404 of the CWA regulates the discharge of fill material into Waters of the U.S., including wetlands. The act authorizes the issuance of permits for such discharges as long as the proposed activity complies with environmental requirements specified in Section 404(b)(1) of the Act.
- **Coastal Coordination Act of 1991 (15 CFR §§ 923.31-34 and 31 Texas Administrative Code 501.3):** This act established the Coastal Coordination Council (CCC) to develop policy and oversee implementation of the Texas Coastal Management Program (TCMP). TCMP rules state that actions that may adversely affect coastal natural resource areas must comply with the goals and policies of TCMP. TCMP rules authorize CCC to review actions for consistency (consistency determination) with the goals and policies.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** This Act providers Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency release of pollutants and contaminations into the environment. Through the Act, the Environmental Protection Agency (EPA) was given

power to seek out those parties responsible for any release and assure their cooperation in the cleanup.

- **Endangered Species Act (ESA) of 1973, as amended (16 USC §§1531-1543):** This law provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found.
- **Executive Memorandum on Environmentally and Economically Beneficial Landscape Practices:** This memorandum requires agencies to (where cost effective and to the extent practicable) use beneficial landscaping practice such as regionally native plants for landscaping and designing and to use or promote construction practices that minimize adverse affects on natural habitat.
- **Executive Order 11988 on Floodplains:** This order requires agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.
- **Executive Order 11990 on Protection of Wetlands:** This order requires agencies to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.
- **Executive Order 12898 on Environmental Justice:** This order requires federal agencies to address environmental justice in minority and low-income populations.
- **Executive Order 13112 on Invasive Species:** This order requires federal agencies to prevent the introduction of invasive species and provide for their control and then minimize the economic, ecological, and human health effects that invasive species cause.
- **Executive Order 13166 on Limited English Proficiency:** This order sets a framework to improve access to federally conducted and federally assisted programs and activities for persons, who as a result of national origin, are limited in their English proficiency.
- **Farmland Protection Policy Act (FPPA – 7 CFR Part 658):** This Act minimizes the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses and to assure the federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland.
- **Fish and Wildlife Coordination Act (FWCA – 16 USC §661-667e):** This law was enacted to protect fish and wildlife when federal actions result in a modification of a natural stream body of water. If a modification to a natural stream or water body is expected, coordination with the U.S. Fish and Wildlife Service (USFWS) is required.
- **National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347 et seq., P.L. 91-190, January 1, 1970, as amended July and August 1975 and September 1982):** This Act requires federal agencies to integrate environmental values into their decision-making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. The Act also provided for the establishment of a Council on Environmental Quality.
- **National Historic Preservation Act of 1966:** This Act and its implementing regulations (Section 106) have been complied with for this project. The required consultation with the Texas State Historic Preservation Officer (SHPO) occurred according to the stipulations of the Programmatic Agreement among the Texas Historical Commission (THC), the FHWA, TxDOT, and the Advisory Council on Historic Preservation (ACHP). The proposed project also has been coordinated with appropriate federally-recognized Native American Tribes. In the event that archeological materials are discovered during construction, construction in the immediate area

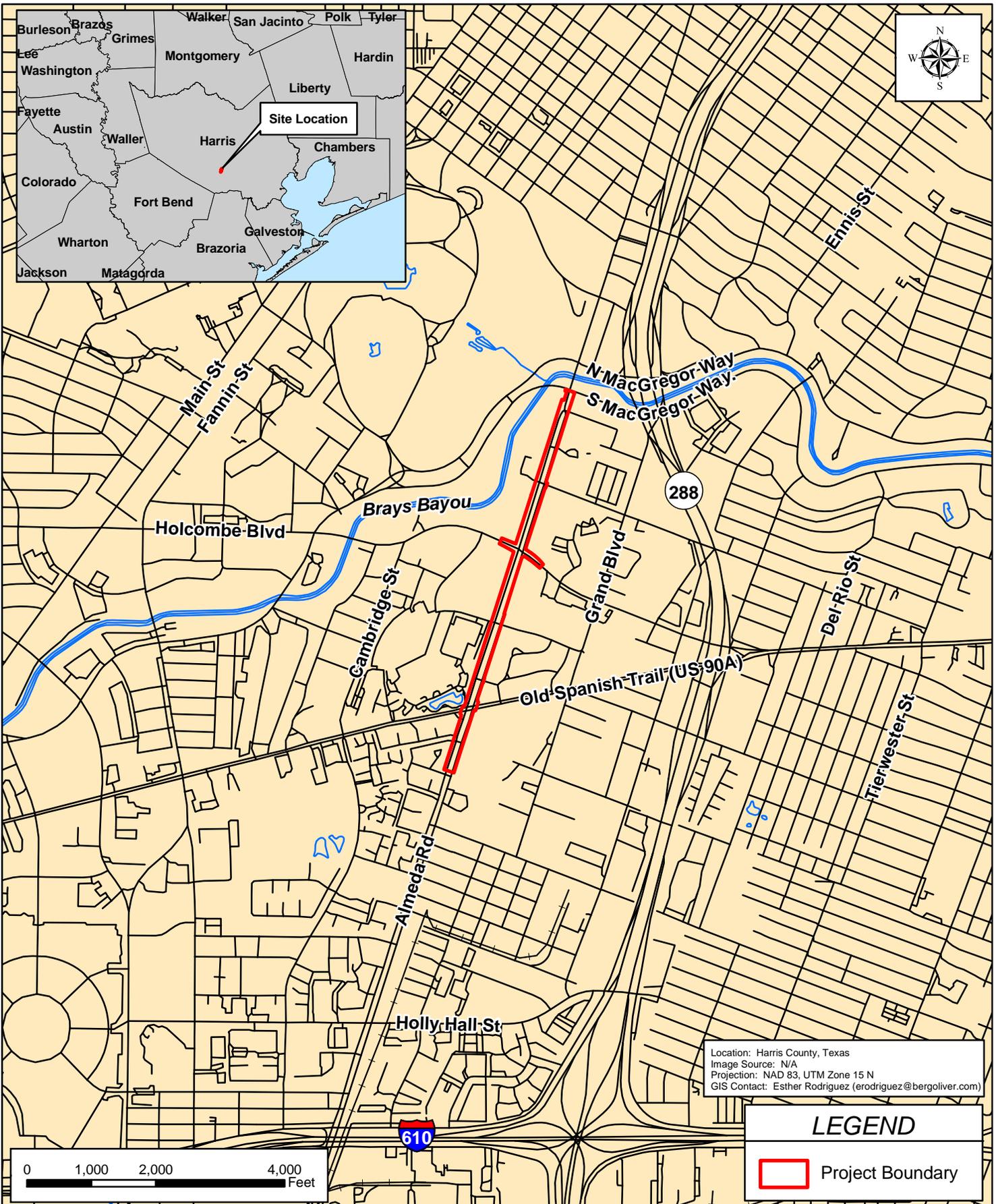
shall cease, and the SHPO would be contacted to initiate accidental discovery procedures in accordance of the terms of the Programmatic Agreement among the THC, FHWA, and TxDOT

- **Native American Graves Protection and Repatriations Act (NAGPRA) Regulations, Final Rule, 1996:** This Act of 1990 sets forth rules for international excavation and removal of Native American cultural items, including human remains and funerary objects, and for inadvertent discovery of such items. The final rule establishes definitions and procedures for lineal descendants, Indian tribes, Native Hawaiian organizations, museums, and federal agencies to carry out the Native American Graves Protection and Repatriations Act of 1990.
- **Only practicable alternative finding (23 CFR 650.113):** A proposed action which includes a significant encroachment [on floodplains] shall not be approved unless the FHWA finds that the proposed significant encroachment is the only practicable alternative.
- **Pollution Prevention Act (P2) of 1990:** This Act focused industry government, and public attention on reducing the amount of pollution through cost-effective changes in production operation, and raw material use.
- **Protection of Children from Environmental Health Risks and Safety Risks – (Executive Order 13045):** This order requires each federal agency to make it a high priority to identify and assess environmental health risks and safety risk that may disproportionately affect children. It also requires agencies to ensure that policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.
- **Resource Conservation and Recovery Act (RCRA) (42 USC §6901 et seq.):** This Act gives the EPA the authority to control hazardous waste from the “cradle-to-grave.” This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. RCRA also set forth a framework for the management of non-hazardous wastes.
- **Superfund Amendments and Reauthorization Act (SARA) of 1986:** This Act reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Title III of SARA also authorized the Emergency Planning and Community Right-to-Know Act (EPCRA).
- **Texas Commission of Environmental Quality (TCEQ) Memorandum of Understanding (MOU):** TxDOT must submit environmental documents to the TCEQ for review: if a project encroaches upon or is within five miles upstream of threatened or impaired waters; if a project is located in the recharge zone or contributing zone of the Edwards Aquifer; or if a project requires an individual CWA Section 401 certification. TxDOT must implement best management practices at the discharge points to water bodies to minimize impacts to threatened or impaired waters.
- **Texas Parks and Wildlife Department (TPWD) MOU:** TxDOT provides TPWD with pertinent information regarding potential effects to natural resources and measures to minimize and/or compensate for unavoidable losses of sensitive habitats. TxDOT must coordinate with TPWD to assist with the decision making process.
- **Tier I TPDES Construction General Permit:** The authority for this program has been delegated from the EPA to TCEQ. The system controls what can be discharged into Waters of the U.S. Construction activities or facilities with discharges that may affect surface or groundwater quality require TPDES permitting.
- **TPWD Memorandum of Agreement (MOA):** Procedures and methodologies for habitat characterizations and impact descriptions, and criteria for compensatory mitigation are identified in this MOA.

- **Uniform Relocation Assistance and Real Property Acquisitions Policies Act (49 CFR Part 24) and Advisory Circular 150-5100-17:** This title and related advisory circular establishes a uniform policy for the fair and equitable treatment of persons displaced as a direct result of programs or proposals undertaken by a federal agency or with federal financial assistance.

Appendix B

Exhibits



Location: Harris County, Texas
 Image Source: N/A
 Projection: NAD 83, UTM Zone 15 N
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

Project Boundary

PROJECT VICINITY AND LOCATION MAP

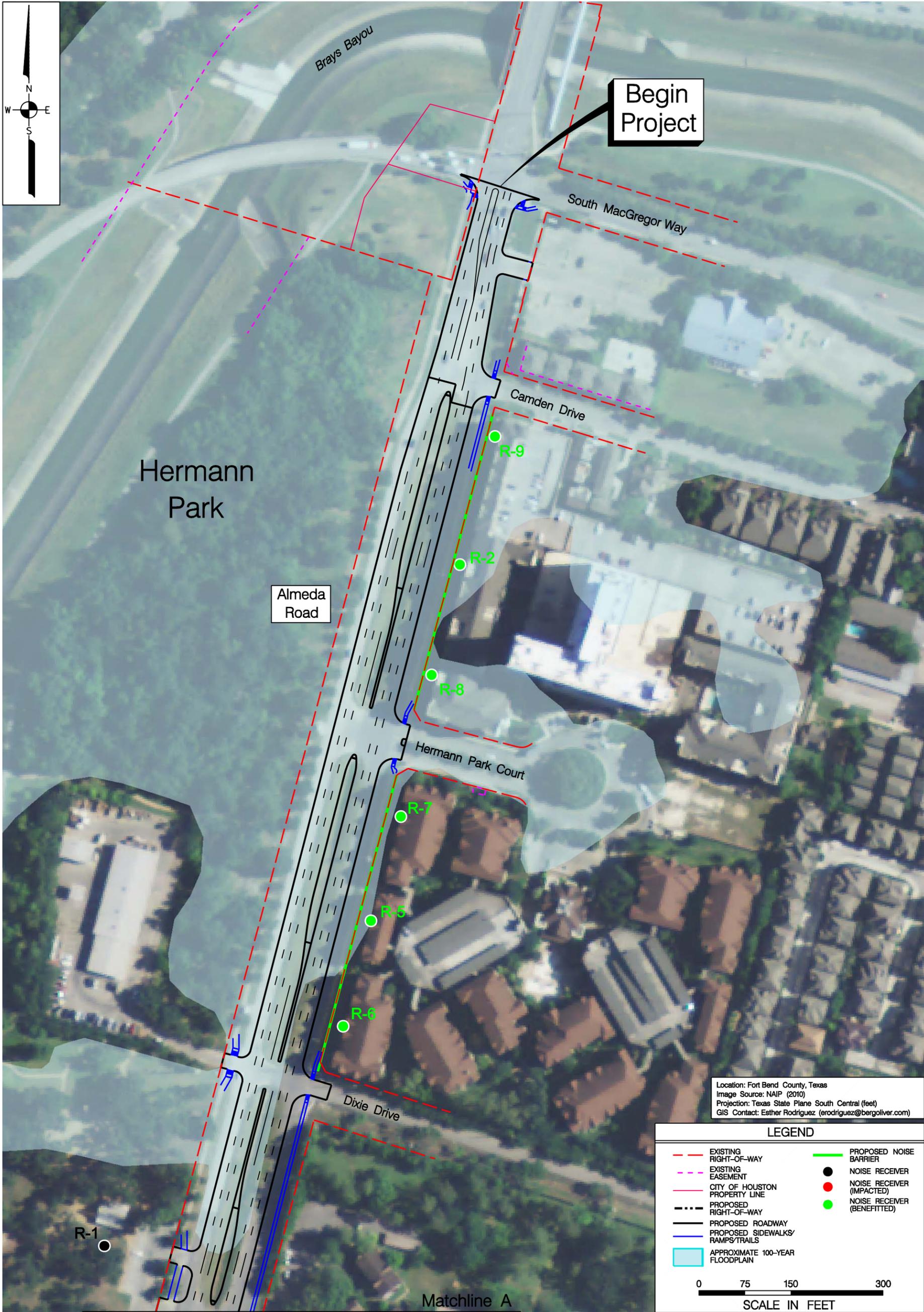
Exhibit B-1

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (obo City of Houston)
 Location: Alameda Rd. from S. MacGregor to OST
Harris County, Texas

REVISIONS
Sept. 19, 2012 by MER
Jan. 11, 2013 by MER

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 14701 ST. MARY'S LANE, SUITE 400
 HOUSTON, TEXAS 77079 PHONE (281)589-0898 <http://www.bergoliver.com>





Location: Fort Bend County, Texas
 Image Source: NAIP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- CITY OF HOUSTON PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED ROADWAY
- PROPOSED SIDEWALKS/RAMPS/TRAILS
- APPROXIMATE 100-YEAR FLOODPLAIN
- PROPOSED NOISE BARRIER
- NOISE RECEIVER
- NOISE RECEIVER (IMPACTED)
- NOISE RECEIVER (BENEFITTED)

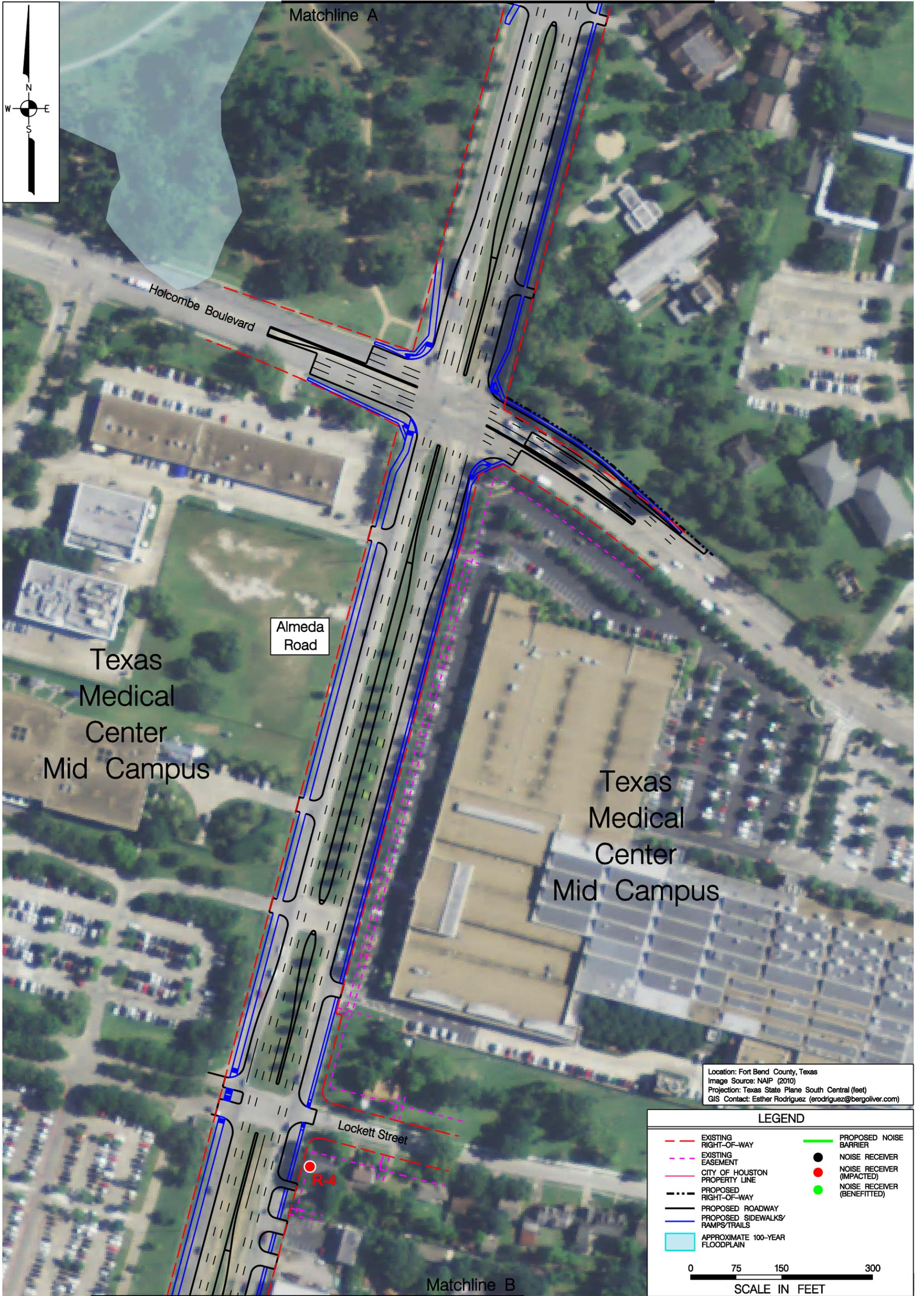


PROJECT LAYOUT MAP

Exhibit B-2

PROJECT #:	7314 - CSJ: 0912-72-072
FOR:	Walter P. Moore (α/b City of Houston)
LOCATION:	Alameda Road From South MacGregor Way to Old Spanish Trail Harris County, Texas

REVISIONS:
October 4, 2011 by M. E. Rodriguez
September 13, 2012 by M. E. Rodriguez
October 18, 2012 by M. E. Rodriguez
January 8, 2013 by M. E. Rodriguez
February 28, 2013 by M. E. Rodriguez
April 18, 2013 by M. E. Rodriguez
October 16, 2013 by M. E. Rodriguez



Location: Fort Bend County, Texas
 Image Source: NAIP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND			
	EXISTING RIGHT-OF-WAY		PROPOSED NOISE BARRIER
	EXISTING EASEMENT		NOISE RECEIVER (IMPACTED)
	CITY OF HOUSTON PROPERTY LINE		NOISE RECEIVER (IMPACTED)
	PROPOSED RIGHT-OF-WAY		NOISE RECEIVER (BENEFITTED)
	PROPOSED ROADWAY		
	PROPOSED SIDEWALKS/RAMPS/TRAILS		
	APPROXIMATE 100-YEAR FLOODPLAIN		

0 75 150 300
SCALE IN FEET

PROJECT LAYOUT MAP

Exhibit B-2

PROJECT #:	7314 – CSJ: 0912-72-072
FOR:	Walter P. Moore (o/b City of Houston)
LOCATION:	Alameda Road From South MacGregor Way to Old Spanish Trail Harris County, Texas

REVISIONS:
October 4, 2011 by M. E. Rodriguez
September 13, 2012 by M. E. Rodriguez
October 18, 2012 by M. E. Rodriguez
January 8, 2013 by M. E. Rodriguez
February 28, 2013 by M. E. Rodriguez
April 18, 2013 by M. E. Rodriguez
July 24, 2013 by M. E. Rodriguez
August 30, 2013 by M. E. Rodriguez



Location: Fort Bend County, Texas
 Image Source: NAIP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

 EXISTING RIGHT-OF-WAY	 PROPOSED NOISE BARRIER
 EXISTING EASEMENT	 NOISE RECEIVER
 CITY OF HOUSTON PROPERTY LINE	 NOISE RECEIVER (IMPACTED)
 PROPOSED RIGHT-OF-WAY	 NOISE RECEIVER (BENEFITTED)
 PROPOSED ROADWAY	
 PROPOSED SIDEWALKS/RAMPS/TRAILS	
 APPROXIMATE 100-YEAR FLOODPLAIN	

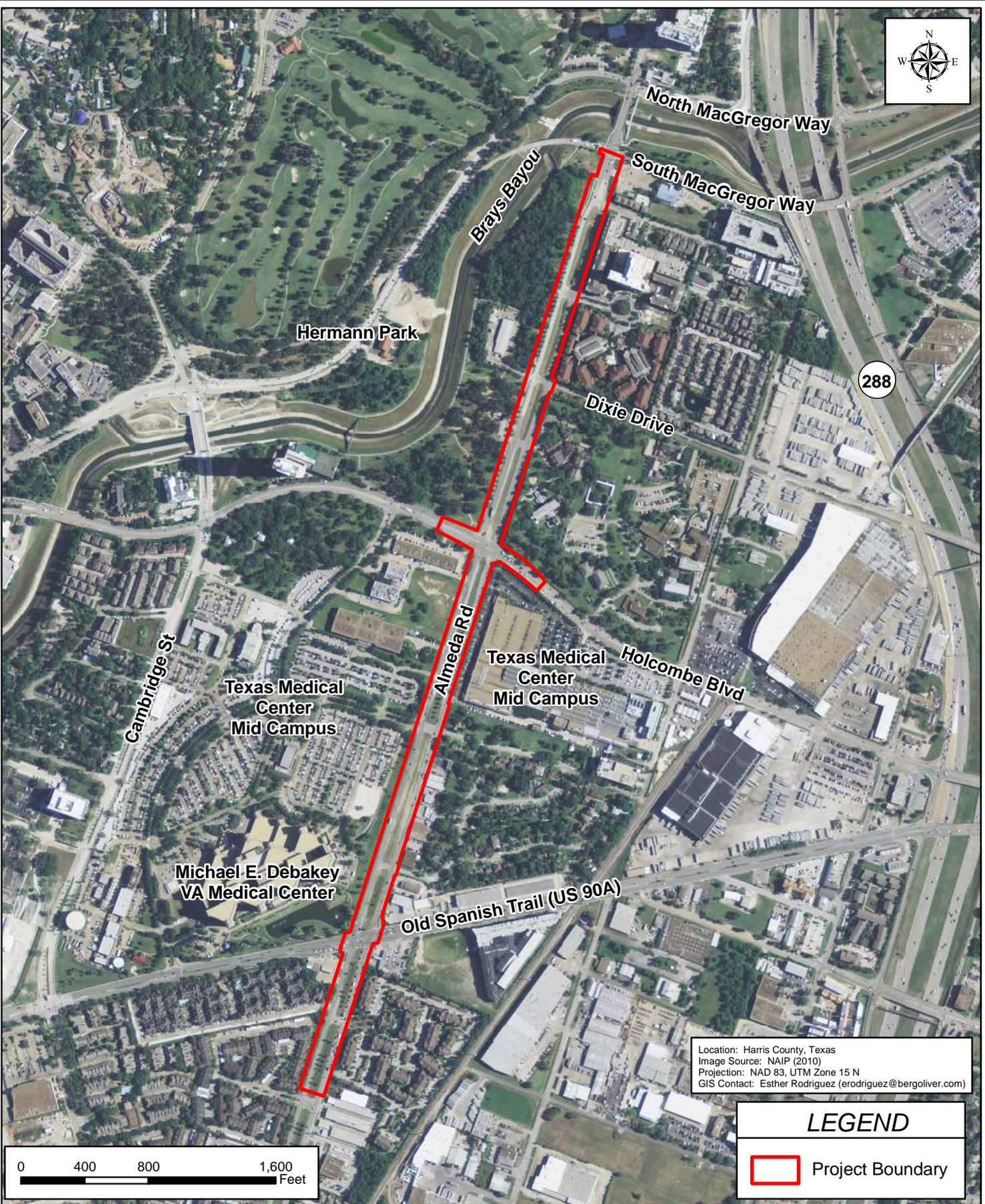
0 75 150 300
 SCALE IN FEET

PROJECT LAYOUT MAP

Exhibit B-2

PROJECT #:	7314 – CSJ: 0912-72-072
FOR:	Walter P. Moore (o/b City of Houston)
LOCATION:	Alameda Road From South MacGregor Way to Old Spanish Trail Harris County, Texas

REVISIONS:
October 4, 2011 by M. E. Rodriguez
September 13, 2012 by M. E. Rodriguez
October 18, 2012 by M. E. Rodriguez
January 8, 2013 by M. E. Rodriguez
February 28, 2013 by M. E. Rodriguez
April 18, 2013 by M. E. Rodriguez



Location: Harris County, Texas
 Image Source: NAIP (2010)
 Projection: NAD 83, UTM Zone 15 N
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

 Project Boundary



AERIAL MAP

Exhibit B-3

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (o/b City of Houston)
 Location: Alameda Rd. from S. MacGregor to OST
 Harris County, Texas

REVISIONS	
Sept. 17, 2012	by MER
Jan. 11, 2013	by MER
March 1, 2013	by MER

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Site Photographs



View of Almeda Road facing North.



View of broken culvert within center median of Almeda Road.



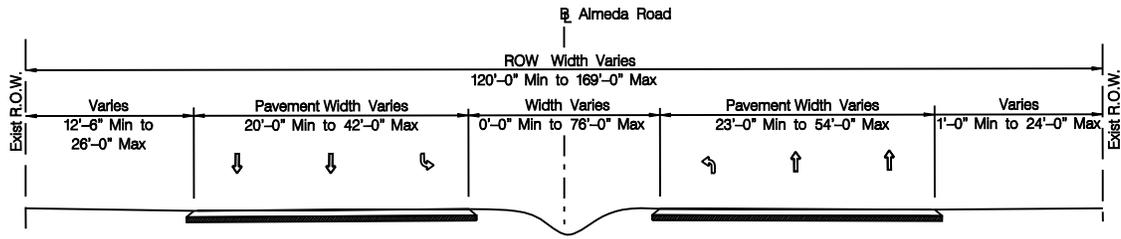
View of center median of Almeda Road facing North.



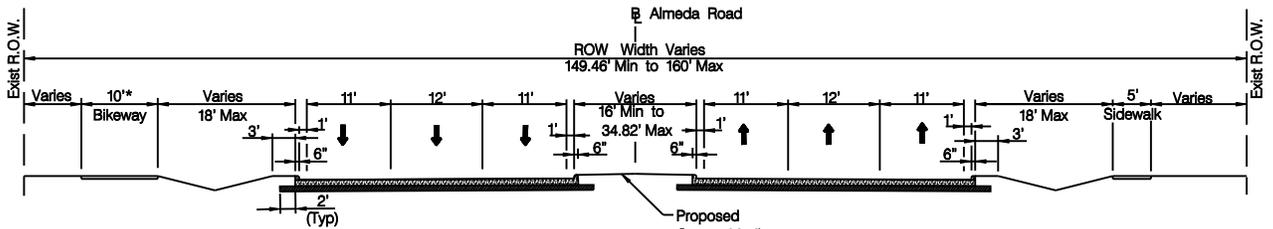
View of Almeda Road facing North.



View of Almeda Road facing North.

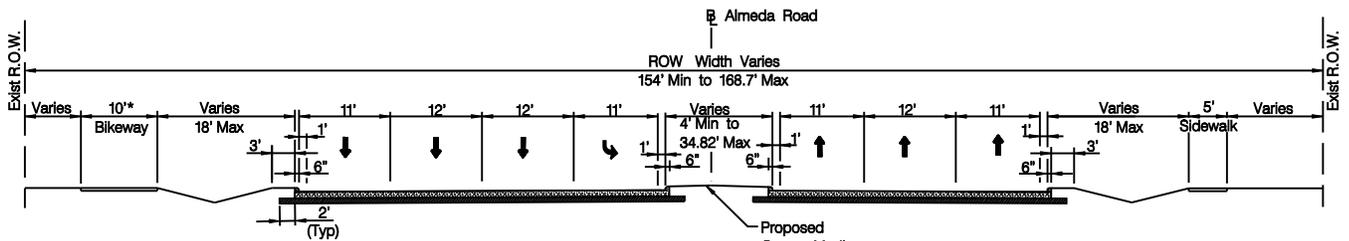


EXISTING ALMEDA ROAD TYPICAL SECTION



* Existing Bikeway begins at S. MacGregor Way and ends at Holcombe Boulevard.

PROPOSED ALMEDA ROAD TYPICAL SECTION



* Existing Bikeway begins at S. MacGregor Way and ends at Holcombe Boulevard.

PROPOSED ALMEDA ROAD TYPICAL SECTION
With Left Turn Lane

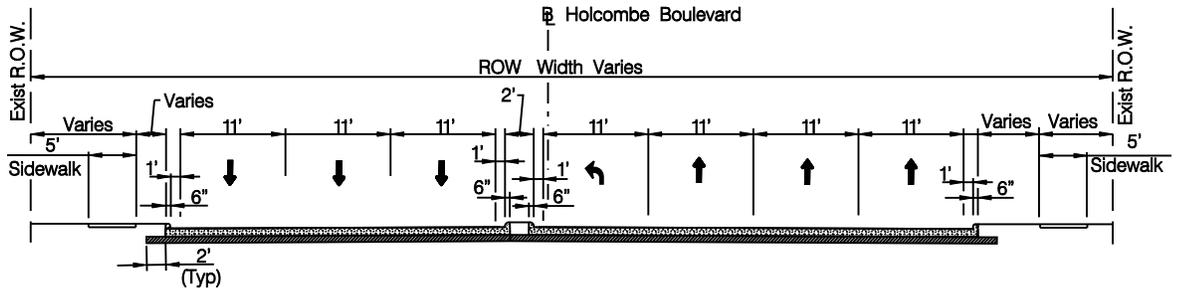
NOT TO SCALE

TYPICAL SECTIONS

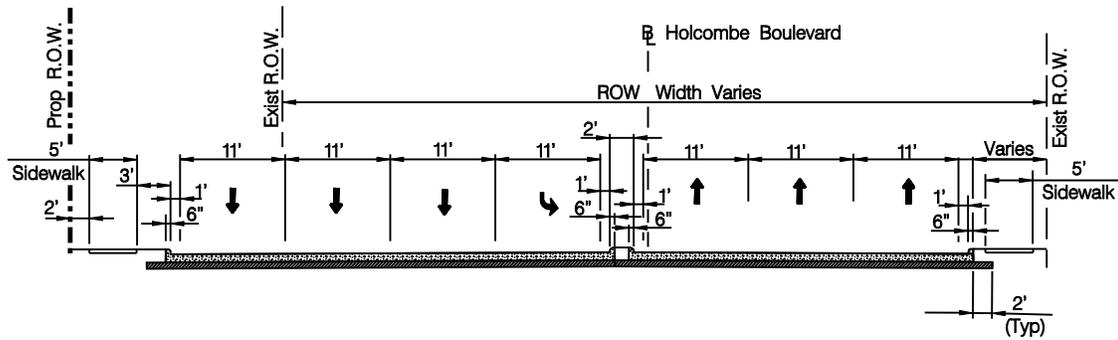
Exhibit B-5

PROJECT #:	7314 - CSJ: 0912-72-072
FOR:	Walter P. Moore (o/b City of Houston)
LOCATION:	Alameda Road From South MacGregor Way to Old Spanish Trail Harris County, Texas

REVISIONS:
Feb. 14, 2013 by M. E. Rodriguez



PROPOSED HOLCOMBE BOULEVARD TYPICAL SECTION
West of Alameda Road



PROPOSED HOLCOMBE BOULEVARD TYPICAL SECTION
East of Alameda Road

NOT TO SCALE

TYPICAL SECTIONS

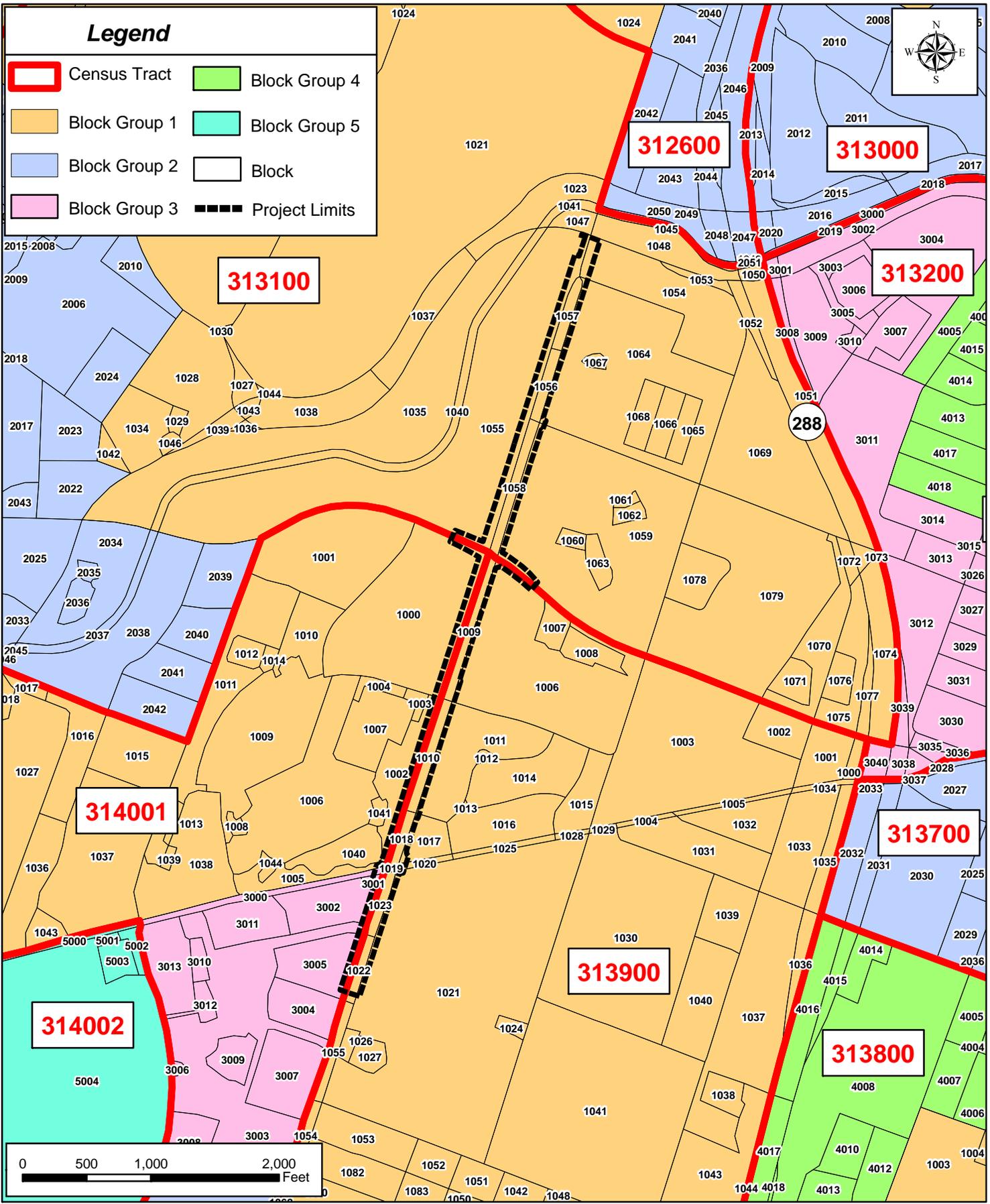
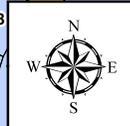
Exhibit B-5

PROJECT #: 7314 - CSJ: 0912-72-072
 FOR: Walter P. Moore (o/b City of Houston)
 LOCATION: Alameda Road
 From South MacGregor Way to Old Spanish Trail
 Harris County, Texas

REVISIONS:
Feb. 14, 2013 by M. E. Rodriguez

Legend

- Census Tract
- Block Group 4
- Block Group 1
- Block Group 5
- Block Group 2
- Block
- Block Group 3
- Project Limits



2010 CENSUS MAP

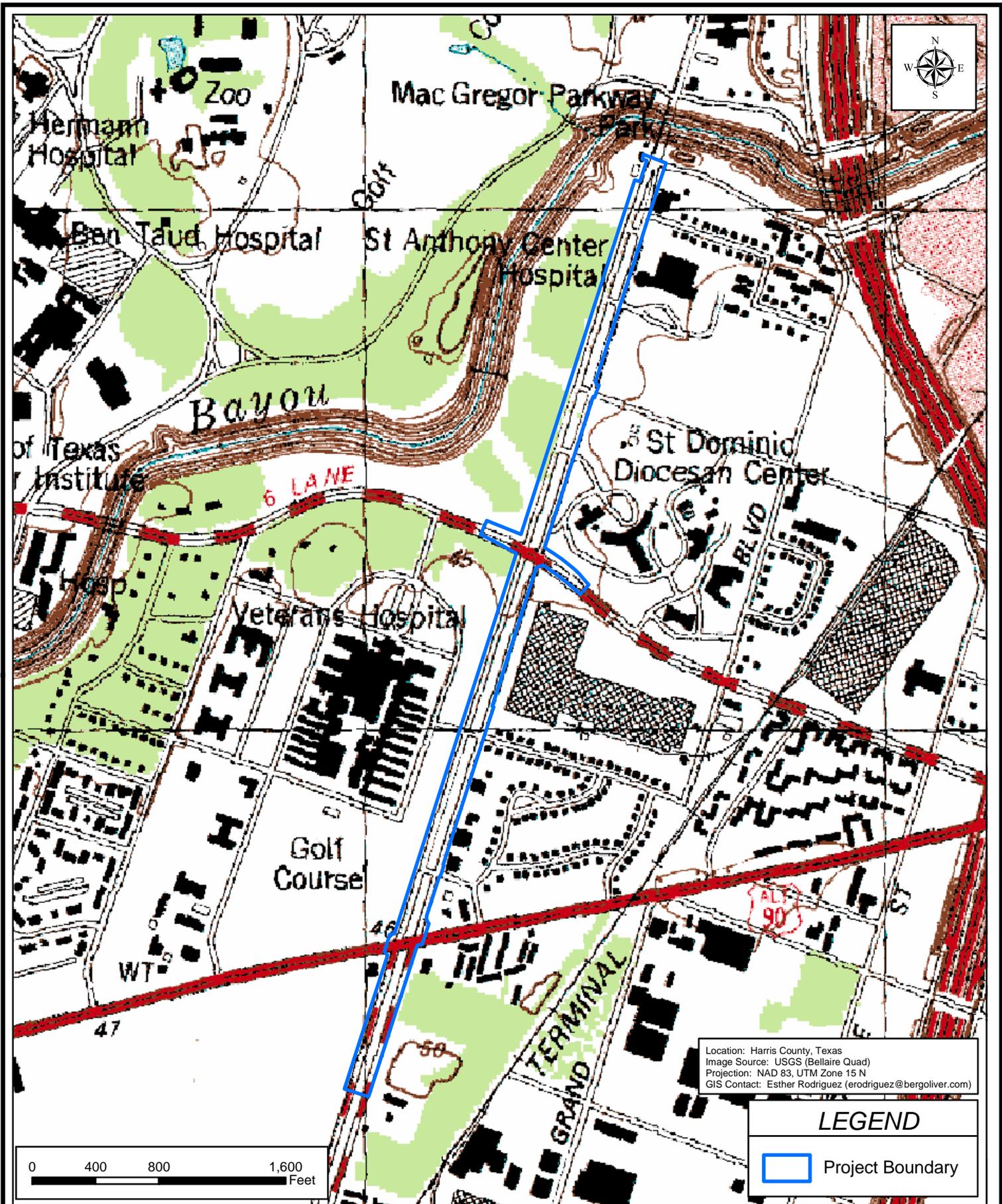
Exhibit B-6

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (o/b City of Houston)
 Location: Almeda Rd. from S. MacGregor to OST
 Harris County, Texas

REVISIONS	
Feb. 25, 2013	by MDE

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 HOUSTON, TEXAS 77079 PHONE (281)589-0898 <http://www.bergoliver.com>





Location: Harris County, Texas
 Image Source: USGS (Bellaire Quad)
 Projection: NAD 83, UTM Zone 15 N
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

Project Boundary



TOPOGRAPHIC MAP

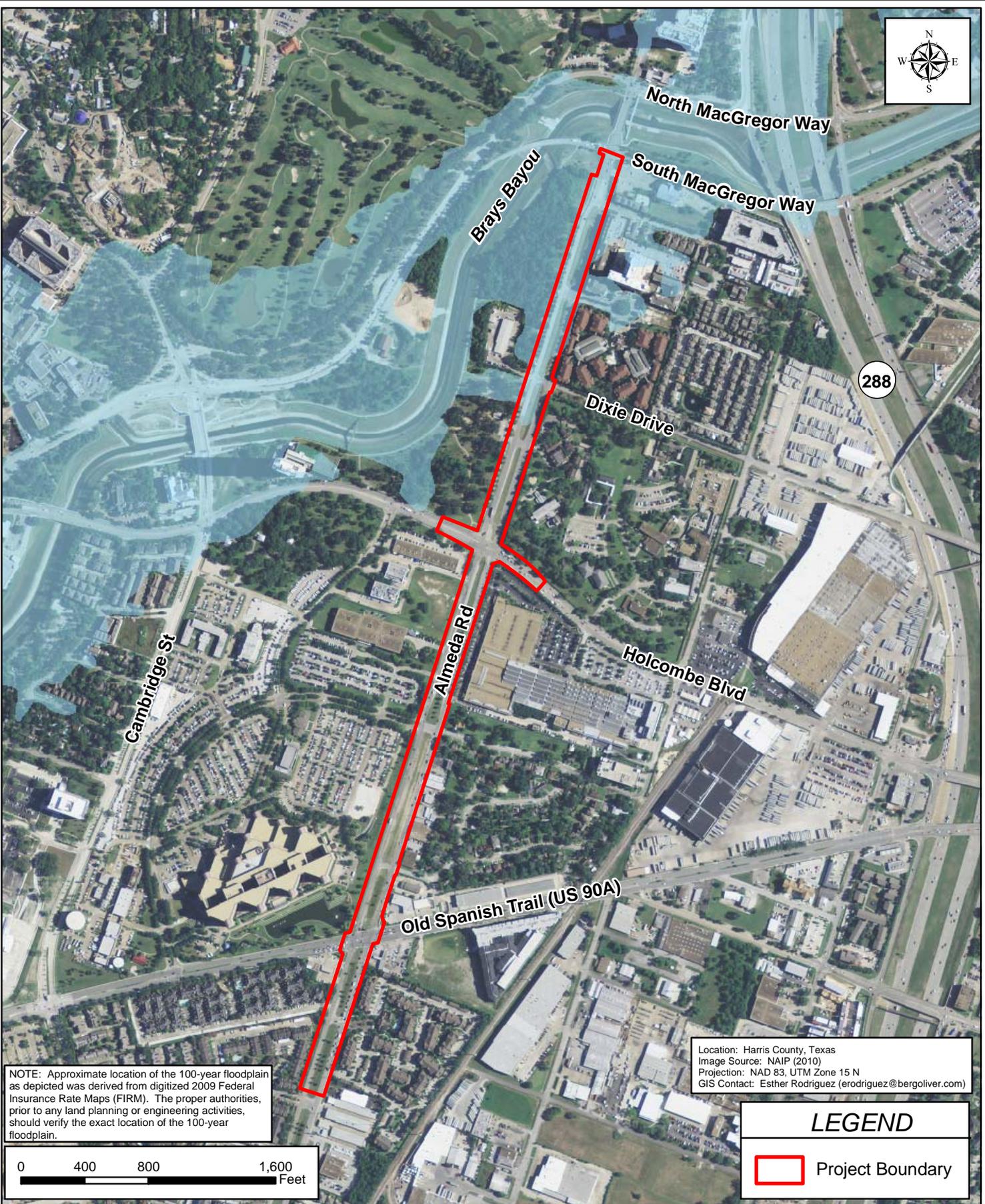
Exhibit B-7

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (o/b City of Houston)
 Location: Almeda Rd. from S. MacGregor to OST
 Harris County, Texas

REVISIONS	
Sept. 17, 2012	by MER
Jan. 11, 2013	by MER

BERG•OLIVER ASSOCIATES, INC.
 ENVIRONMENTAL SCIENCE, ENGINEERING
 & LAND USE CONSULTANTS
 14701 ST. MARY'S LANE, SUITE 400
 HOUSTON, TEXAS 77079 PHONE (281)589-0898 <http://www.bergoliver.com>





NOTE: Approximate location of the 100-year floodplain as depicted was derived from digitized 2009 Federal Insurance Rate Maps (FIRM). The proper authorities, prior to any land planning or engineering activities, should verify the exact location of the 100-year floodplain.

Location: Harris County, Texas
 Image Source: NAIP (2010)
 Projection: NAD 83, UTM Zone 15 N
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

 Project Boundary



FEMA FLOODPLAIN MAP

Exhibit B-8

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (o/b City of Houston)
 Location: Alameda Rd. from S. MacGregor to OST
 Harris County, Texas

REVISIONS	
Sept. 17, 2012	by MER
Jan. 11, 2013	by MER

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Potential Archeological Liability Map (PALM)

- 0 - Water. No survey recommended.
- 1 - Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 2 - Surface Survey Recommended, No Deep Reconnaissance Recommended.
- 2a - Surface Survey of Mounds Only; No Deep Reconnaissance Recommended.
- 3 - No Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 3a - No Surface Survey Recommended, Deep Reconnaissance Recommended only if Severe Deep Impacts are Anticipated.
- 4 - No Survey Recommended.

Alameda Road: MacGregor to O.S.T.
CSJ 0912-72-072

Exhibit B-9





★ Target Site

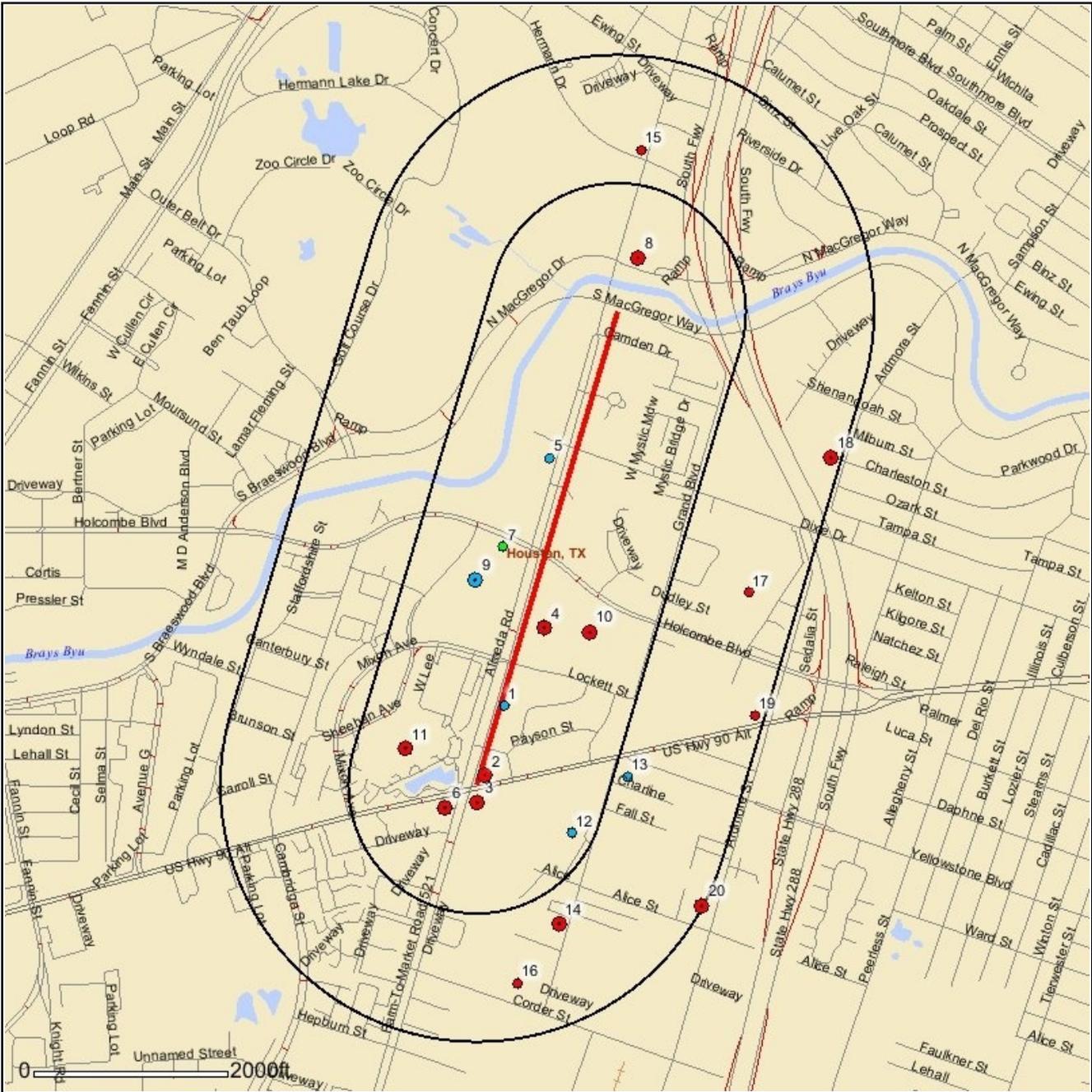
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
RCRA COR, RCRA TSD, CER, LPST, NPL, ST NPL, SWLF			
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
RCRA GEN, ST & FED BWN, ST & FED EC, ST & FED IC, DNPL, CER NFRAP, PST, VCP, ST CER			
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
ERNS, IHW, RCRA, DRYC, AIRS			

Limited Access Hwy	Railroad
Primary Highway	County
Secondary Highway	State
Roads	Urban Area
Ramps	Water Bodies

One inch = 0.24 miles

Banks Environmental Data
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 Austin, Texas 78701
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 FAX 512-478-1433
 banks@banksinfo.com
 www.banksinfo.com
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★ Target Site

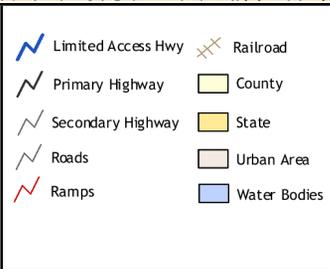
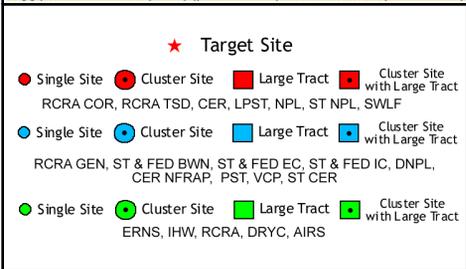
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
RCRA COR, RCRA TSD, CER, LPST, NPL, ST NPL, SWLF			
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
RCRA GEN, ST & FED BWN, ST & FED EC, ST & FED IC, DNPL, CER NFRAP, PST, VCP, ST CER			
● Single Site	● Cluster Site	■ Large Tract	■ Cluster Site with Large Tract
ERNS, IHW, RCRA, DRYC, AIRS			

Limited Access Hwy	Railroad
Primary Highway	County
Secondary Highway	State
Roads	Urban Area
Ramps	Water Bodies

One inch = 0.33 miles

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One inch = 0.5 miles

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Appendix C
RTP/TIP Documentation

Harris County Projects in the 2035 RTP Update - 'US 290/SH 288' Conformity

MPOID Fiscal Yr Status Sponsor	CSJ # CIP ID	Street From Limit To Limit	Project Description	Total Project Cost Conformity Year Length Lanes*
7535 2012 TIP CITY OF HOUSTON	N-000697	AIRLINE DR N MAIN ST IH 610 N	REHABILITATION OF A MULTI-LANE UNDIVIDED ROADWAY WITH CURBS, SIDEWALKS, STREET LIGHTING & UNDERGROUND UTILITIES. OVERLAY FROM N. MAIN TO CAVALCADE.	\$11,421,842 N/A 1 (4, 4), (0, 0)
14656 2013 TIP AIRLINE IMPROVEMENT DISTRICT	0912-00-424	AIRLINE IMPROVEMENT DISTRICT VA VA	AIRLINE IMPROVEMENT DISTRICT BICYCLE/PEDESTRIAN IMPROVEMENTS	\$3,821,138 N/A 0.001 (0, 0), (0, 0)
11467 2020 RTP METRO	4.6	AIRPORT BLVD AT BROADWAY ST	CONVERSION/RELOCATION OF HOBBY TRANSIT CENTER WITH LIGHT RAIL TRANSIT	\$3,000,000 2025 0.001 (0, 0), (0, 0)
10052 2014 TIP CITY OF HOUSTON	N-000751	ALABAMA ST W WESLAYAN ST SHEPHERD DR S	ENGR & ROW ACQ OF EXISTING RDWY W/ CONCRETE PAVING, CURBS, SIDEWALKS, STREET LIGHTING & UNDERGROUND UTILITIES AS NEEDED	\$5,106,000 N/A 2 (4, 4), (0, 0)
11007 2014 TIP UPTOWN HOUSTON DISTRICT	UPT-9	ALABAMA ST W SAGE ST IH 610	RECONFIGURE AND RECONSTRUCT ROADWAY INCLUDING PAVEMENT, SIGNALIZATION AND SIDEWALK IMPROVEMENTS	\$8,100,000 N/A 0.9 (4, 4), (0, 0)
10770 [2011] Let MIDTOWN MANAGEMENT DISTRICT	0912-70-008	ALABAMA ST/GRAY ST (SMITH TO MAIN) (MILAM TO CHENEVERT)	MIDTOWN LIVABLE COMMUNITIES INITIATIVE (PHASE II)	\$2,762,764 N/A 0.001 (0, 0), (0, 0)
7737 [2011] Let HARRIS COUNTY	HCTRA	ALDINE MAIL ROUTE RD SWEENEY RD REEVESTON RD	WIDEN BRIDGE OVER HARDY TOLL ROAD	\$17,000,000 2014 0.75 (2, 4), (0, 0)
10097 [2012] Let HARRIS COUNTY	B10501	ALDINE MAIL ROUTE RD AIRLINE DR ALDINE WESTFIELD RD	CONSTRUCT 4-LANE CONCRETE BLVD SECTION W/CURB & GUTTER AND STORM SEWERS	\$10,100,000 2014 2.25 (2, 4), (0, 0)
10099 2023 RTP HARRIS COUNTY		ALDINE MAIL ROUTE RD US 59 HOMESTEAD RD	CONSTRUCT 4-LANE CONCRETE W/ STORM SEWERS	\$1,118,604 2025 0.7 (0, 4), (0, 0)
5004 [2011] Let CITY OF HOUSTON	N-000577	ALDINE WESTFIELD RD LITTLE YORK TIDWELL	WIDEN TO 4-LANE DIVIDED	\$9,118,496 2014 1.59 (2, 4), (0, 0)
11038 2020 RTP CITY OF PASADENA		ALLEN GENOA RD FAIRMONT PKWY GENOA-RED BLUFF	DESIGN, ACQUIRE ROW & WIDEN TO 4-LANE DIVIDED ROADWAY INCLUDING DRAINAGE AND SIGNALS AT FAIRMONT PARKWAY	\$13,471,291 2025 1.93 (2, 4), (0, 0)
13518 2013 TIP CITY OF HOUSTON	0912-72-072 N-000806	ALMEDA RD MACGREGOR WY OLD SPANISH TRAIL	RECONSTRUCT AND WIDEN TO 6-LANES INCLUDING 10FT SHARED PATHWAY FROM HOLCOMBE TO OLD SPANISH TRAIL, SIDEWALKS, STORM DRAINAGE WITH GREEN INFRASTRUCTURE.	\$12,749,374 2017 0.95 (4, 6), (0, 0)

* (Existing, Proposed) Main Lanes then Frontage Roads.

Sorted by: Street, CSJ Number, then MPOID

Amendment # 30

Modify existing TIP projects (schedule, scope and funding) at sponsor request and to encumber Prop 12 V2 funds in FY 2013

Action	Project Details						Proposed Changes	
	MPOID	CSJ	Fiscal Year	Sponsor	Description	Funding	Change	Comments
Modify	14712	0188-03-022	2013	BRAZORIA COUNTY	Facility: SH 36 From: 200' N OF CR 467/HOGG RANCH RD To: SH 35 Description: GRADE SEPARATION OVER NEW SH 35, OVERLAY AND RESTRIPE PAVEMENT FROM 2 TO 4-LANES	Federal: \$144,030 State: \$36,009 Local: \$7,707,000 Categories: 3-PTF, 1-PREV-M	Delay project to FY 2014.	
Modify	14258	0188-04-050	2013	BRAZORIA COUNTY	Facility: SH 36 From: SH 35 To: 2000' S OF SH 35 Description: GRADE SEPARATION OVER NEW SH 35, OVERLAY AND RESTRIPE PAVEMENT FROM 2 TO 4-LANES	Federal: \$0 State: \$0 Local: \$4,264,300 Categories: 3-PTF	Delay project to FY 2014.	
Modify	14178	3158-01-031	2013	CITY OF CONROE	Facility: FM 3083 From: AT UPRR To: Description: CONSTRUCT GRADE SEPARATION (DOT# 448 431H)	Federal: \$0 State: \$12,499,650 Local: \$2,700,000 Categories: 3-PROP-12, 3-LOCAL CONT	Delay project to FY 2014 and modify funding as follows: Federal: \$0 State: \$10,800,000 Local: \$2,700,000 Categories: 3-TMF	Swap Prop-12 V2 funds with Texas Mobility Funds (TMF) Category 2-funds from US 290 (CSJ-0050-060-81, Segment 9) . Reprogramming necessary to ensure Prop-12 V2 funds encumbered by August 2013.
Modify	13518	0912-72-072	2013	CITY OF HOUSTON	Facility: ALMEDA RD From: MACGREGOR WY N To: OLD SPANISH TRAIL Description: RECONSTRUCT AND WIDEN TO 6 LANES INCLUDING 10FT SHARED PATHWAY FROM HOLCOMBE TO OLD SPANISH TRAIL, SIDEWALKS, STORM DRAINAGE WITH GREEN INFRASTRUCTURE.	Federal: \$8,160,904 State: \$0 Local: \$2,040,227 Categories: 10-MISC	Delay project to FY 2015.	
Modify	9713	0912-71-627	2013	CITY OF HOUSTON	Facility: CITY OF HOUSTON From: VA To: VA Description: CITY OF HOUSTON RCTSS PROGRAM: IMPROVE TRAFFIC CONTROL DEVICES	Federal: \$3,346,842 State: \$0 Local: \$846,983 Categories: 5-CMAQ, 10-MISC, 3-LOCAL CONT	Delay project to FY 2014.	

Appendix D
Agency Coordination

Archeological Coordination



Mr. Cole Konopka
 Berg Oliver Associates, Inc.
 14701 St. Mary's Lane, Suite 400
 Houston, Texas 77079

February 26, 2013

Re: Archaeological Assessment of the Proposed Almeda Road Reconstruction Project in Harris County, Texas (CSJ No. 0912-72-072)

Dear Mr. Konopka,

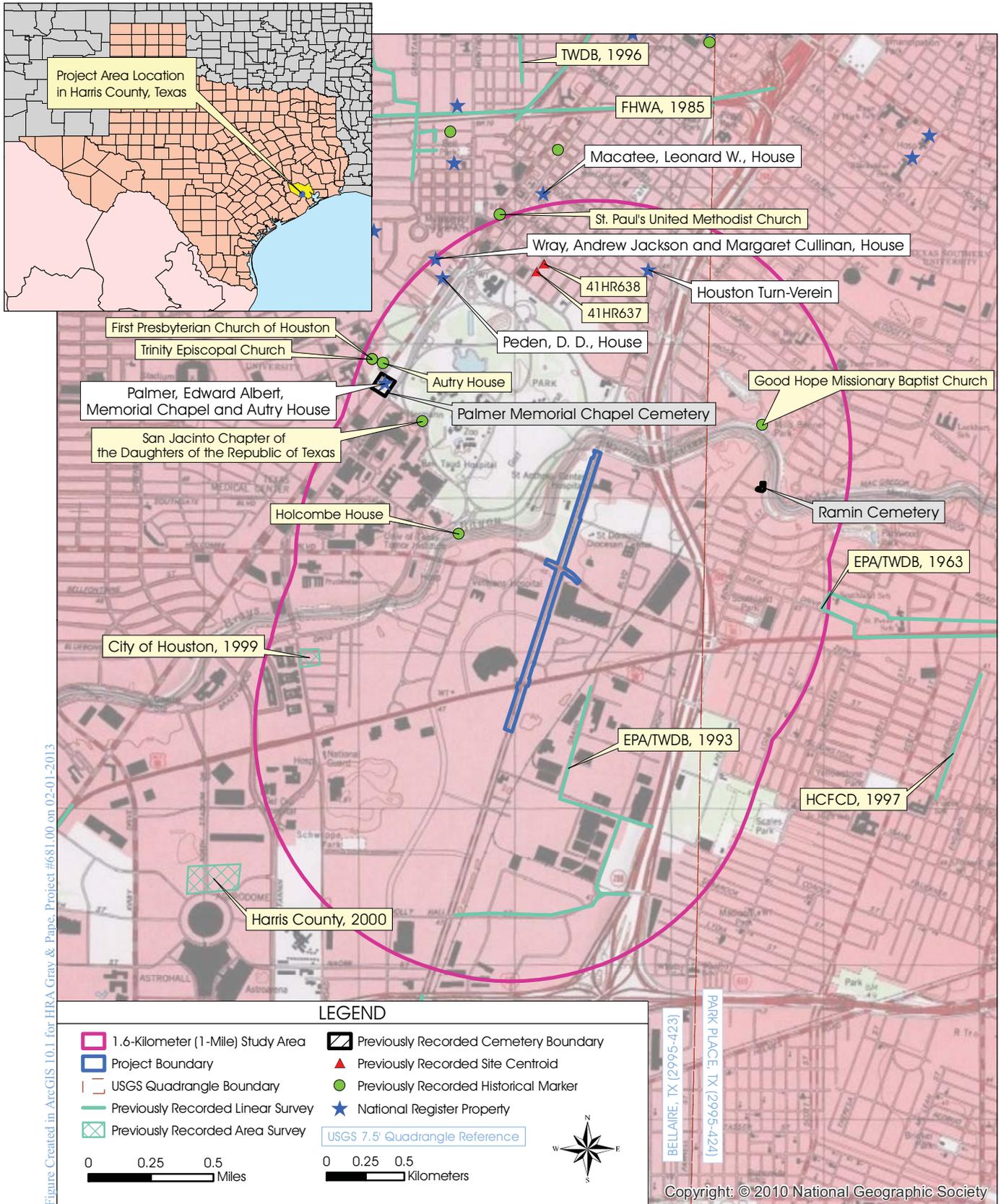
HRA Gray & Pape, LLC, (HRA Gray & Pape) of Houston, Texas was contracted by Berg Oliver Associates, Inc. to conduct an assessment of the effect that the above-referenced project would have on archaeological sites in Harris County, Texas. Research activities, including a site file research and a review of available historic maps and aerial photographs, were initiated on January 21, 2013. This letter documents the results of these activities, along with our assessment regarding the potential for site identification within the project area.

Based on conversations with Berg Oliver Associates, Inc., the Texas Department of Transportation (TxDOT) will be the Lead Agency for this project. Therefore, HRA Gray & Pape has provided archaeological services that meet standards and requirements set forth by Section 106 of the National Historic Preservation Act (NHPA) and the Antiquities Code of Texas. A TxDOT archeologist will evaluate the potential for the proposed project to affect archeological historic properties or State Archeological Landmarks in the archaeological Area of Potential Effects (APE). Section 106 review and consultation will proceed in accordance with the Programmatic Agreement (PA) among TxDOT, the Texas Historic Commission (THC), the Federal Highway Administration (FHWA), and the Advisory Council on Historic Preservation, as well as the Memorandum of Understanding (MOU) between THC and TxDOT. To assist with TxDOT's review, a Project Coordination Request (PCR) form is provided in Appendix A of this document.

PROJECT AREA DESCRIPTION

The project area is located on the *Bellaire* (2995-423) 7.5-minute United States Geological Survey (USGS) topographic quadrangle map (Figure 1). The proposed project includes approximately 2,199 linear meters (7,215.7 linear feet) along Farm-to-Market (FM) 521/Almeda Road proposed for reconstruction from South MacGregor Drive to 353.7 meters (1,160 feet) south of Old Spanish Trail. Work will also take place along Holcombe Boulevard (Blvd) around the Almeda Road intersection. Brays Bayou is located just north of the project area.

Cincinnati Ohio 1318 Main St. Cincinnati, OH 45202 513.287.7700 f 513.287.7703	Missoula Montana 125 Bank St. Fifth Floor Missoula, MT 59802 406.721.1958 f 406.721.1964	Houston Texas 1428 West Alabama St. Houston, TX 77006 713.541.0473 f 713.541.0479	Richmond Virginia 100 West Franklin St. Suite 102 Richmond, VA 23220 804.644.0656 f 804.643.8119	Seattle Washington 1904 Third Ave. Suite 240 Seattle, WA 98101 206.343.0226 f 206.343.0249	Portland Oregon 909 N. Beech St. Suite B Portland, OR 97227 503.247.1319 f 503.284.1161	Providence Rhode Island 60 Valley St. Suite 103 Providence, RI 02909 401.273.9900 f 401.273.9944
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Project Area Location in Harris County, Texas

Figure 1

It is the understanding of HRA Gray & Pape that most of the reconstruction activities will take place within the existing right-of-way (ROW). The exception is approximately 0.08 hectares (0.2 acres) of proposed new ROW consisting of an additional 6.7 to 8.2 meters (22 to 27 feet) of width that will be added along approximately 150 meters (490 feet) length of the north side of Holcombe Blvd, east of Almeda (see Appendix B, Sheet 2 of 3). Currently, FM 521/Almeda Road consists of 4 lanes of traffic. In an effort to maximize capacity the project will increase the number of lanes to 6. Drainages will also be updated. The archaeological APE is defined as the project construction footprint. The depth of the APE is considered to be the depth of the roadbed or approximately 1 meter (3 feet) (see Appendix C).

The project is located on an existing road. The land to either side of the road is appears to be under a mix of public and private ownership including the City of Houston and the Houston Medical Center. It is unclear how much subsurface disturbance, has occurred within these parcels however it is presumed to contain overhead and buried utilities common along the roadside and in proximity to heavily developed areas.

PHYSIOGRAPHY AND GEOMORPHOLOGY OF THE REGION

The Texas Coastal Plain makes up part of the larger Gulf Coastal Plain, a low level to gently sloping region extending from Florida to Mexico. The Texas Coastal Plain reaches as far north as the Ouachita uplift in Oklahoma, and as far west as the Balcones escarpment in central Texas. The basic geomorphological characteristics of the Texas coast and associated inland areas, which includes Harris County, resulted from depositional conditions influenced by the combined action of sea level changes from glacial advance in the northern portions of the continent, and subsequent downcutting and variations in the sediment load capacity of the region's rivers. Locally, Harris County is underlain by relatively recent sedimentary rocks and unconsolidated sediments ranging in age from the Miocene to Holocene (Abbott 2001; Van Siclen 1991).

Although older geologic units have been identified in the region (Abbott 2001; Barnes 1982; Van Siclen 1991), units relevant to the study of long-term human occupation in modern-day Harris County include the Beaumont Formation, generally believed to predate human occupation in the region, the so-called "Deweyville Terraces", stratigraphically positioned between the Beaumont and Recent deposits. Quaternary Beaumont Formation underlies the project area (Barnes 1982). These deposits are made up of clay, silt, and sand. This includes stream channel, point bar, natural levee, back swamp, and mud flat deposits (Barnes 1982). Gilgae, a succession of microbasins and microknolls in generally level areas or microvalleys and microridges parallel to the slope are common microfeatures.

The date of deposition for the Deweyville Terraces is not known. However, Abbott (2001:16) among others believes the north-south oriented terraces aggraded during the Late Pleistocene from overbank deposition of rivers and streams prior to the beginning of the Holocene. Abbott suggests that aggradation ended by approximately 20,000 years before present (B.P.) (Abbott 2001:106). However, meanders of rivers cut valleys through these terraces regularly during the Holocene and then abandoned them. This process leaves large, flat, open, and well drained areas favored for campsites. While all depositional facies other than channels have the potential to preserve archeological sites, behaviorally, human activity favors well drained, sandy channel-proximal localities over floodbasin muds (Abbott 2001:126). Overlaying these deposits may be relatively thick or thin Holocene deposits, laid down in the Harris County area by alluvial or eolian factors, or potentially, marshy environments.

Topographic relief is the result of downcutting of sediments from fluvial action associated with the many rivers, bayous, and creeks within and around Harris County. Major drainages include the Brazos River to the west, the Colorado River to the north, and San Jacinto River to the east. Creeks and bayous that border or dissect Harris County include Spring and Cypress creeks to the north, Cedar Bayou to the east, Buffalo Bayou in central Harris County, and Clear Creek, Brays Bayou, and Keegans Bayou to the south.

SOILS

A review of the *Harris County Soil Survey* (Wheeler 1976) revealed that the project area is classified as Urban Land, because the soils have been extremely altered and obscured that they cannot be classified into a soil unit. The Urban Land mapping unit is composed of extensively built-up areas where 75- 100% of the area is covered by structures or is disturbed by cutting, filling, or grading. Smaller areas within the Urban Land unit include only moderately altered areas where buildings and other structures cover 40-60% of the area. In addition to these built up areas, there are very small sections of the area where the natural soil has been covered up by fill material likely exceeding 2.4 meters (8 feet) in thickness (Wheeler 1976).

These urban areas are very unlikely to contain near surface intact prehistoric archaeological deposits due to the previous extensive alteration of natural landforms and the overall landscape. The exceptions to this include historic sites where additional development capped the initial historic deposit, preserving it *in situ* and deeply preserved archaeological deposits that are located below disturbed depths.

PREHISTORIC OVERVIEW

Aten (1983) and Story et al. (1990) have aptly described the cultural context of the upper coastal region. This information is merged with the archeological data here to give a complete picture of life on the Upper Texas Coast. Along the Upper Texas Coast, the Paleo-Indian period begins around 12,000 B.P. and ends near 9,000 B.P. (Aten 1983; Story et al. 1990). This period is poorly represented in the archeological evidence for the region (Aten 1983) and no sites for this period have been verified. Isolated artifacts include Clovis, Angostura, Scottsbluff, Meserve, Plainview, and Golondrina point types (Aten 1983). Sites from this stage would be either buried by alluvium or found in upland sites.

The Transitional Archaic period begins about 9,000 B.P. and ends around 7,500 B.P. (Aten 1983; Story et al. 1990). This stage is also poorly represented in the archeological work in the area but isolated finds of Bell/Calf Creek, Early-Side Notched, and Early Expanding Stemmed dart points are attributed to this time period. The Archaic stage is thought to include a shift towards a diet more geared towards plant processing but still includes hunting. Plant processing technology seen during the entire Archaic period includes stone-lined hearths and baking pits as well as milling tools (Story et al. 1990). Groups began to travel over less of the landscape and population density seems to have risen.

Beginning at 7,500 B.P. and spanning 2,500 years (Aten 1983), the Early Archaic period in this region has not been well documented. The sites may have been destroyed or deeply buried (Aten 1983; Story et al. 1990). *In situ* Early Archaic remains have been found at the Addicks Reservoir as well as other localities in the area (Story et al. 1990). Points from this period include Bell, Carrollton, Trinity, Wells, and Early Stemmed. It is possible that the Carrollton, Trinity, and Wells points continued to be used into the middle Archaic (Patterson 1996).

The Middle Archaic period (5,000 to 3,000 B.P.) reveals the earliest surviving shell middens (Aten 1983). These middens often contain remains of shellfish, such as oysters and estuarine clams, faunal material from terrestrial and aquatic vertebrates, and the earliest known human burials in the region (Aten 1983). Characteristic projectile points include Bulverde, Williams, Lange, and Pedernales types.

The Late Archaic lasted from 3,000 to 2,000 B.P. and shows evidence for population increase (Aten 1983). By 2,500 B.P., the climate in this area was essentially like the modern climate. Ground stone artifacts made from materials from southwestern Arkansas and found in context with human burials in cemeteries such as the Ernest Witte Site indicate the possibility of trade (Hall 1981). Projectile points differ from earlier periods in that they are corner-notched or expanding-stemmed forms, such as the Kent, Ellis, and Pontchartrain types. Other types can be found, such as the un-notched Pamillas. These types are thought to precede the Gary type, which can be found into the Late Prehistoric (Story et al. 1990). During the Late Archaic, more utilitarian biface tools are prevalent as well as are bone tools. Late Archaic assemblages are very similar to the early part of the Late Prehistoric stage (Aten 1983).

The transition from the Late Archaic stage to the Late Prehistoric is indicated by the introduction of ceramics into the assemblage (Aten 1983). Cultural shifts during the Late Prehistoric include the possible adoption of a more sedentary lifestyle and major technological changes, such as sandy paste ceramics and late in the stage, the bow and arrow (Story et al. 1990). The cultural tradition during the Late Prehistoric along the Upper Gulf Coast has been designated as Woodland. Story et al. (1990) has suggested the use of the term Mossy Grove Tradition to define cultural patterns of the region. The Trinity River seems to be a dividing line in this tradition with cultures east of the river being more similar to those in Louisiana than to those, west of Galveston Bay. The eastern tradition also seems to have begun earlier than that in the west, beginning about 2,000 B.P. and lasting 600 years (Aten 1983; Story et al. 1990).

Story et al. (1990) splits the Mossy Grove Tradition into five distinct time intervals on the coast, while noting that only two are found inland. Aten (1983) defined these intervals for the area between the Brazos River and Galveston Bay as the Clear Lake (1,850 to 1,525 B.P.), Mayes Island (1,525 to 1,300 B.P.), Turtle Bay (1,300 to 950 B.P.), Round Lake (950 to 600 B.P.), and Old River (600 to 250 B.P.) periods based on ceramic styles. Only the Round Lake period is recognized by Aten for the West Bay-Brazos Delta due to the low artifact class diversity compared to areas east of Galveston Bay as well as a time discrepancy in which equivalent periods are later in time than those to the east (Aten 1983).

Early ceramics from this area are similar to Tchefuncte period wares found near Sabine Lake and into Louisiana and include sandy paste varieties such as Mandeville Plain, Goose Creek Plain (Anahuac variety), and Tchefuncte Plain (Aten 1983; Story et al. 1990). These early sites appear similar to pre-ceramic sites due to the low number of ceramic sherds found. The appearance of sandy paste and sand-tempering occurs about 1,900 B.P. with the O'Neal Plain (variety Conway) being a good example (Aten 1983). Rocker-stamped decorations, a distinctive marker for this period, are uncommon in the West Bay-Brazos Delta, as are incised wares (Aten 1983).

The Mayes Island period brought about the introduction of the bow and arrow, which was probably used along with the atlatl until the historic period (Aten 1983; Story et al. 1990). The arrow points during this period included both notched and expanding-stemmed forms (Aten 1983; Story et al. 1990).

Ceramic indicators for the Turtle Bay period include Goose Creek red-filmed along with other decorated ceramics, all of which are rare in the West Bay-Brazos Delta area. At the beginning of the Round Lake

period, the earliest use of grog or large crushed ceramic particles as tempering agents is seen. Typical varieties include Baytown Plain (variety San Jacinto) and San Jacinto Incised. Along with these types, a reduction in Goose Creek types is seen. Aten (1983) describes this period as having an increase in population due to the larger number of sites in more specialized locations.

During the Old River period, a resurgence of Goose Creek ceramics is seen as the Baytown types decrease in popularity. Contact with Europeans begins near the end of this period, but visible changes in material culture are not seen until about A.D. 1750 along with a rapid decline in population (Story et al. 1990).

BRIEF HISTORY OF HARRIS COUNTY

Harris County was formed as Harrisburg County on December 22, 1836. The county was renamed Harris in December 1839 to honor John Richardson Harris, an early pioneer who had established Harrisburgh in 1826, the first town site in the county. Harrisburgh was established at the confluence of Buffalo Bayou and Brays Bayou and by the 1830s had become the major port of entry for the region and a transportation hub. Roads ran northwest to the Brazos communities of San Felipe and Washington, east to the ferry landing that crossed the San Jacinto, and west paralleling Brays Bayou to the Oyster Creek Community near present day Stafford in Fort Bend County (Henson 2012).

Under Mexican rule the area surrounding Harrisburg (as it came to be spelled by 1832) was known as the San Jacinto District. The district stretched east from Lynchburg on the San Jacinto River west to the location of present day Richmond, and from Clear Creek in the south to Spring Creek in the north. Harrisburg County encompassed this same territory with the addition of Galveston Island. The modern boundaries of Harris County were established in 1838 (Henson 2012).

The lands that would become Harris County comprised the southeastern border of Austin's Colony. In July of 1824, 29 titles were granted to lands in future Harris County, with an additional 23 grants made between 1828 and 1833. These original grants concentrated mainly on the watercourses of the region. The early settlers in the region were mostly from the southern United States who brought with them their African slaves. In the 1840s large numbers of German and French immigrants settled in Harris County. The Hispanic presence in the region was relatively sparse prior to an influx of immigrants following the Mexican Revolution reflecting the ephemeral nature of Spanish and Mexican colonization (Henson 2012).

ARCHIVAL RESEARCH RESULTS

A review of the literature available on the Texas Archeological Sites Atlas, an online resource maintained by the THC resulted in the identification of 2 known archaeological sites, 4 National Register-listed historic properties, 5 Historical Markers, and approximately 21 neighborhood surveys within 1.6 kilometers (1 mile) of the project area. None of these locations are located within the immediate vicinity of the project area.

The 2 known archaeological sites are located northwest of the project area. Site 41HR637 is described as a historic 2 story house build circa 1929 for T.C. Spencer. This structure was used as a family home from 1929- 61, as a domicile rental from 1961- 71, and for commercial use from 1971- 84. This site consisted of the standing structure, broken bottle glass, a flattened metal can, and cement concretion. It was described as not having potential as a State Archaeological Landmark (SAL) or for the National Register

of Historic Places (NRHP) (Wheat 1990a). Site 41HR638 is described as a historic 3 story house. This structure was used as a family home from 1929-56, as a rental property from 1956-61, and for commercial use from 1961-84. This site consisted of the standing structure, glass, and metal (Wheat 1990b). The potential for this site as a SAL or for the NRHP is unknown.

The 4 National Register-listed properties, 5 Historical Markers, and 21 neighborhood surveys are primarily house sites where prominent Houstonians resided. Other contributors include the sites of buildings that are uniquely crafted and most notably represent a period of style and design. Also included in these are religious houses of worship, a hospital, and a zoological garden. None of these properties are located within or immediately adjacent to the project area.

Two cemeteries are located north of the project area. One cemetery (Palmer Memorial Chapel) is located northwest of the subject area, west of Almeda Road, on South Main Street just west of Hermann Park (see Figure 1). This cemetery is a Type 2 cemetery and had been identified with European and Protestant heritages. Gravestones have been noted to have English writings (THC 2012a). The second cemetery (Ramin) is located northeast of the project area, west of Almeda Road, west of Brays Bayou on Ardmore on the north side of South MacGregor Way (see Figure 1). The Ramin cemetery, also known as the Adams-Campbell Cemetery, is a Type 2 cemetery with unmarked graves. No identifiable information regarding the graves, such as cultural or religious heritages, was available due to the cemetery's conditions (THC 2012b). The cemeteries are situated a sufficient distance away from the project to avoid potential project impacts.

REVIEW OF HISTORIC MAPS AND AERIAL PHOTOGRAPHY OF THE PROJECT AREAS

Historical topographic maps dating back to 1915 and 1967, along with historic aerials maps dating back to 1943 and 1952, were reviewed for the presence of historic structures that may still be present alongside FM 521/Almeda Road from south of Brays Bayou to south of Old Spanish Trail. The 1915 map shows the presence of at least 9 structures adjacent to or near the east side of what is now FM 521/Almeda Road. This 1915 topographic map also shows that the current project's location was once the site of a rail line for the GH and SA Railroad. This railroad does not appear on the 1943 aerial map and no longer appears on the 1967 topographic map. The pre-channelized route of Brays Bayou can be seen on the 1921 topographic map. The channelized bayou is apparent on the 1943 aerial. The 1943 aerial shows the presence of some structures on the east of FM 521/Almeda Road. On the 1952 aerial, more structures are shown to the east of FM 521/Almeda Road with the addition of structures (specifically the Veterans Hospital) on the west side of FM 521/Almeda Road. The 1967 topographic map and the 2011 aerial map show numerous additional structures on both sides of FM 521/Almeda Road.

A review of historic aerial images shows that what appear to be private residences present near the road in 1943 were either demolished or replaced by 1953 and replaced again by 1978. That pattern of demolition and replacement appears to have continued to the present as nearly all the structures visible in 1943 are gone. The exceptions are a few residences that are located along Lockett Street, which branches to the east from Almeda Road between Holcombe Blvd and Old Spanish Trail.

PREVIOUS CULTURAL RESOURCE INVESTIGATIONS

In October 1963, a linear survey was performed for the Environmental Protection Agency (EPA) and the Texas Water Development Board (TWDB). This survey area is located east of the proposed project area. Another linear survey for the EPA/TWDB survey took place east and south of the southern end of the proposed project area in October 1993. An area survey was performed by Moore Archeological Consulting, Inc. on August 2, 1999 for the City of Houston. This survey took involved a limited subsurface survey investigation of Fire Station No. 33. This area was occupied in the late 1840s by German immigrants (Meyers and Moore 2005).

TxDOT's Houston-Potential Archaeological Liability Map (PALM)

The Texas Department of Transportation's Houston-PALM (Abbott 2001) covers Harris County and other counties in the greater Houston area. These maps are based on a combination of data, including soil associates, landform types, cultural and natural resource distribution, and historic and modern land use data. The Houston-PALM is a cultural resource management tool that predicts the likelihood of detecting intact prehistoric cultural resources in various topographic settings around Houston and its vicinity. The model recommends the type of archaeological survey strategy that should be implemented for a given PALM Unit, of which there are 4 major groupings. For Houston-PALM Unit 1, surface survey is recommended and deep reconnaissance is only recommended if deep impacts are anticipated. For PALM Unit 2, only surface survey is recommended. PALM Units 3 and 3a are similar and recommend no surface survey, although Map Unit 3 recommends deep reconnaissance if deep impacts are anticipated, while Map Unit 3a recommends deep reconnaissance only if severe impacts are anticipated. For PALM Unit 4, no survey is recommended.

The entire project area is classified as PALM Unit 4 - No survey recommended (see Appendix D attached to the end of this document).

RECOMMENDATIONS FOR ADDITIONAL WORK

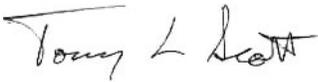
The proposed project will involve reconstruction of the existing FM 521/Almeda Road ROW and portions of Holcombe Blvd at the Almeda intersection. As currently understood acquisition of new ROW will be minimal, and subsurface construction will either not exceed the existing depth of the roadbed or will be in otherwise previously disturbed areas. Based on this information, there is little to no potential of encountering shallowly buried, intact, significant prehistoric or historic archaeological deposits due to the previous subsurface disturbances including the construction of the road, utilities, and structures (past and present). As a result, HRA Gray & Pape is of the opinion that an archaeological field survey of the property is not warranted. Although historic-age structures may be present on adjacent properties to the road, and formal NRHP evaluations have not been performed, all proposed work (as planned) will remain within the existing ROW and will only involve the extant roadway and re-delineating the positions of traffic lanes. These construction efforts pose no threat to historic-age structures. As a result, HRA Gray & Pape is of the opinion that an archaeological survey is not warranted for the current project.

Should project plans change to include the acquisition of new ROW or require deeper impacts beyond the depth of the existing road bed, these recommendations should be reviewed and revised as appropriate.

As always, concurrence by a reviewer with TxDOT should be obtained for the recommendations outlined in this letter prior to project initiation. If fieldwork is required on publicly owned land in the state of Texas, investigation must be permitted through and comply with regulations outlined in the Antiquities Code of Texas (Section 191.092 of the Code). Projects funded, permitted, or approved by Federal agencies must comply with guidelines and requirements set forth in Section 106 of the National Historic Preservation Act of 1966, as amended.

A letter regarding architectural history assessment for this project has also been filed; additional architectural history survey is not recommended. If you have any questions or comments, or are in need of additional information, please do not hesitate to contact me at (713) 541-0473.

Sincerely,

A handwritten signature in black ink that reads "Tony L. Scott". The signature is written in a cursive style with a horizontal line above the first name.

Tony Scott
Principal Investigator
HRA Gray & Pape

Enc.
Cc:

HRAGP #681.00

REFERENCES

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Appendix A: Project Coordination Request Form

*Texas Department of Transportation
Environmental Affairs Division*

**Standards of Uniformity for
Technical Documents**

**Project Coordination Request for
Archeological Studies**

Project Coordination Request for Archeological Studies

Instructions for Project Coordination Request for Archeological Studies, Part 1.

The District completes Part 1 for submission to ENV. This Standard of Uniformity (SOU) will be reviewed by ENV’s Archeological Studies (ARCH) staff; ARCH will return it to the District if the information is not sufficient to initiate work or coordination. The District will then address any information insufficiencies. Once any additional issues have been addressed, the District will resubmit this form for appropriate action. Part 2 includes additional information required for field projects. ARCH staff will notify districts when Part 2 must be completed.

Note: Part 1 includes information that is minimally required to properly facilitate the review process. Whenever possible, please submit all relevant documentation at one time. The District may submit a project coordination request with incomplete information, but ARCH staff may not be able to initiate work without complete information.

District/County Houston/Harris

Highway 1) Almeda Road, 2) Holcombe Blvd.

CSJ #0912-72-072

Contractor HRA Gray & Pape, LLC Submittal Date 02/19/13

PART 1: Information Required to Process Archeological Resources Coordination and Consultation <i>[To be completed with all appropriate documentation attached by District personnel. Quality Control must be performed by District personnel if completed by a consultant]</i>		Comments*
1	District provided: <input checked="" type="checkbox"/> An active CSJ (or equivalent if the project is not a construction project) against which environmental work can be charged.	#0912-72-072
2	District indicated the targeted: <input checked="" type="checkbox"/> Environmental ready-to-let (RTL) date <input type="checkbox"/> Letter of Authority (LOA) date	August 2014
3	District provided: <input checked="" type="checkbox"/> A map of the project area on a USGS 7.5' quadrangle or equivalent if a 7.5' quadrangle is unavailable.	Refer to Figure 1 of the attached letter.
4	District provided a project description that explicitly identifies: <input checked="" type="checkbox"/> the project limits, width, and acreage; <input checked="" type="checkbox"/> the maximum depth of impacts from the project, referring to project plans or to typical impacts for this class of project. Note: the presence of any of the following project elements would affect the depth of impacts, so please consider their possible presence when	See Appendices B and C.

Project Coordination Request for Archeological Studies

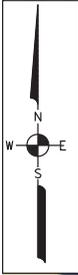
	determining impacts: culvert replacements or construction; bridge-class culvert replacements, bridge replacements, or bridge approach work; storm sewer installations; and utility relocations associated with the project.	
5	<p>District provided a project description that explicitly:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> notes whether the project includes any new right-of-way, easements (temporary or permanent), utility relocations, or project-specific locations; <input checked="" type="checkbox"/> describes the location of any such features; and <input checked="" type="checkbox"/> quantifies their area. 	Addition of 0.08 hectares (0.2) acres of proposed new ROW along north side of Holcombe Blvd. See Appendix B, Sheet 2 of 3.
6	<p>When available, the district supplied:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> clearly reproducible layouts, showing the existing and proposed right-of-way boundaries, easements, utility relocations and project-specific locations; <input type="checkbox"/> clearly reproducible profiles; <input checked="" type="checkbox"/> clearly reproducible typical sections; and <input type="checkbox"/> photographs of the project area, illustrating disturbances of other factors that might affect a decision to survey all or part of the project area. 	See Appendices B and C.
	<p>PART 2: Information Required for Some Field Investigations <i>[This part to be completed upon request of ARCH staff. To be completed with all appropriate documentation attached by District personnel. Quality Control must be performed by District personnel if completed by a consultant]</i></p>	
7	<p>District provided:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Right of entry forms, signed by the owners of parcels from which new right-of-way or easements shall be acquired. <input type="checkbox"/> Deed of gift form, signed by the same parcel owners, transferring ownership of any recovered artifacts from the private property owner to the State. NOTE: this criterion may be waived for survey-level investigations but is required for all test excavations and data recovery projects. 	N/A

Signature of QC Officer _____

Printed Name _____ **Date** _____

ENV Staff Reviewer Signature _____ **Date** _____

Appendix B: Project Plans



Location: Fort Bend County, Texas
 Image Source: N/AIP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergalliver.com)

LEGEND

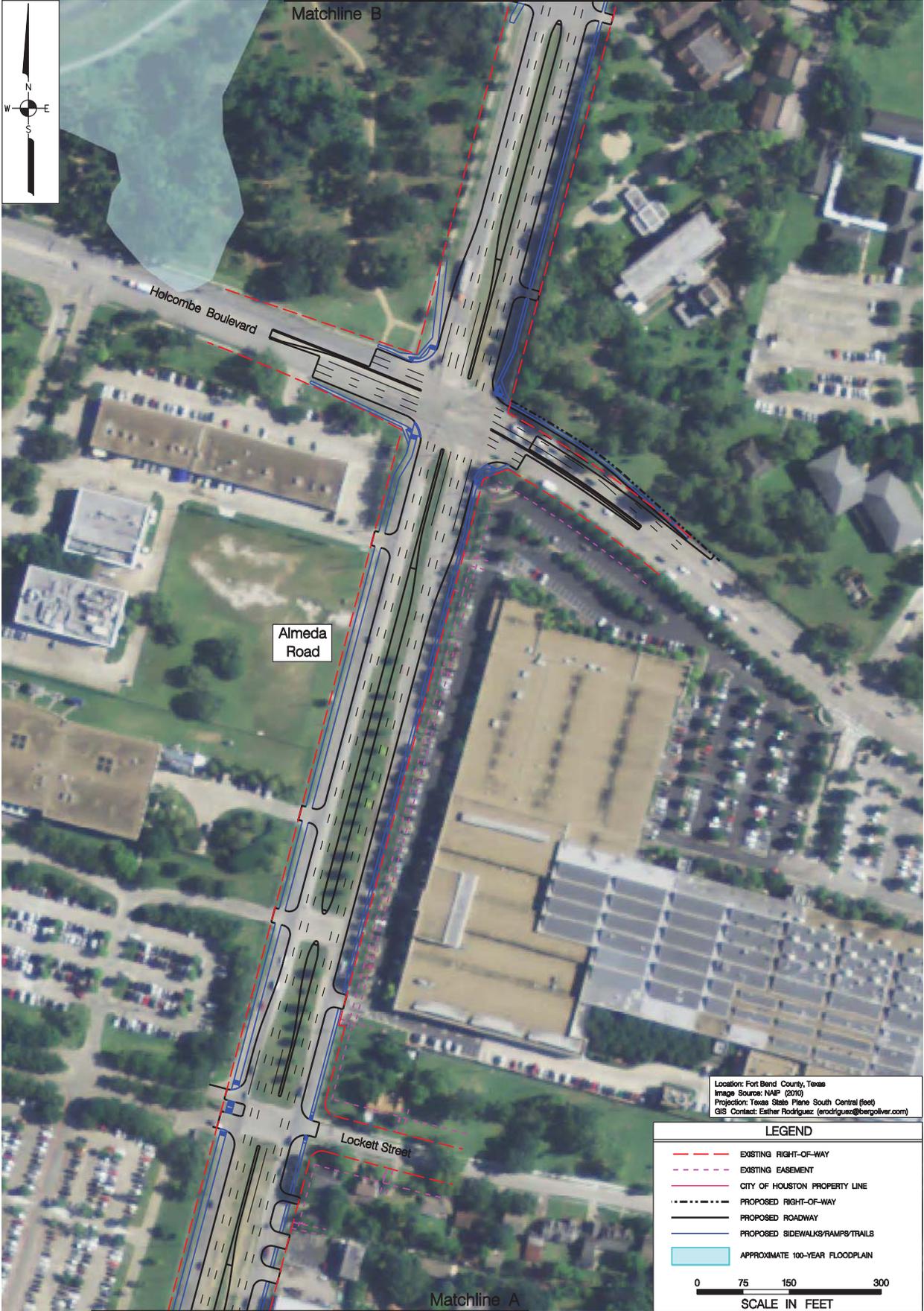
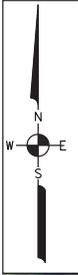
- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- CITY OF HOUSTON PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED ROADWAY
- PROPOSED SIDEWALKS/RAMP&TRAILS
- APPROXIMATE 100-YEAR FLOODPLAIN



PROJECT LAYOUT MAP

PROJECT #:	7314 - CSJ: 0912-72-072
FOR:	Walter P. Moore (c/b City of Houston)
LOCATION:	Alameda Road From Old Spanish Trail to South MacGregor Way Harris County, Texas

REVISIONS:
October 4, 2011 by M. E. Rodriguez
September 15, 2012 by M. E. Rodriguez
October 18, 2012 by M. E. Rodriguez
January 8, 2013 by M. E. Rodriguez



Location: Fort Bend County, Texas
 Image Source: NMAP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergolive.com)

LEGEND

- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- CITY OF HOUSTON PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED ROADWAY
- PROPOSED SIDEWALKS/RAMPS/TRAILS
- APPROXIMATE 100-YEAR FLOODPLAIN

0 75 150 300
 SCALE IN FEET

PROJECT LAYOUT MAP

PROJECT #:	7314 - CSJ: 0812-72-072
FOR:	Walter P. Moore (c/b City of Houston)
LOCATION:	Alameda Road From Old Spanish Trail to South MacGregor Way Harris County, Texas

REVISIONS:
October 4, 2011 by M. E. Rodriguez
September 15, 2012 by M. E. Rodriguez
October 18, 2012 by M. E. Rodriguez
January 8, 2013 by M. E. Rodriguez



Location: Fort Bend County, Texas
 Image Source: N/AIP (2010)
 Projection: Texas State Plane South Central (feet)
 GIS Contact: Esther Rodriguez (erodriguez@bergalliver.com)

LEGEND

- EXISTING RIGHT-OF-WAY
- EXISTING EASEMENT
- CITY OF HOUSTON PROPERTY LINE
- PROPOSED RIGHT-OF-WAY
- PROPOSED ROADWAY
- PROPOSED SIDEWALKS/RAMP&TRAILS
- APPROXIMATE 100-YEAR FLOODPLAIN

0 75 150 300
 SCALE IN FEET

PROJECT LAYOUT MAP

<p>PROJECT #: 7314 - CSJ: 0912-72-072</p> <p>FOR: Walter P. Moore (c/b City of Houston)</p> <p>LOCATION: Alameda Road From Old Spanish Trail to South MacGregor Way Harris County, Texas</p>	<p>REVISIONS:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">October 4, 2011 by M. E. Rodriguez</td> </tr> <tr> <td style="font-size: small;">September 15, 2012 by M. E. Rodriguez</td> </tr> <tr> <td style="font-size: small;">October 18, 2012 by M. E. Rodriguez</td> </tr> <tr> <td style="font-size: small;">January 8, 2013 by M. E. Rodriguez</td> </tr> </table>	October 4, 2011 by M. E. Rodriguez	September 15, 2012 by M. E. Rodriguez	October 18, 2012 by M. E. Rodriguez	January 8, 2013 by M. E. Rodriguez	<p>SHEET 3 OF 3</p>
October 4, 2011 by M. E. Rodriguez						
September 15, 2012 by M. E. Rodriguez						
October 18, 2012 by M. E. Rodriguez						
January 8, 2013 by M. E. Rodriguez						

Appendix C: Typical Sections

NOTE

The location of existing underground utilities are shown in an approximate way. The utility owner should be contacted for exact locations. The City of Houston Department of Public Works and Engineering has provided the utility location information for the City of Houston. The utility owner should determine the exact location of all existing utilities before commencing work. The utility owner should be contacted for exact locations. The utility owner should determine the exact location of all existing utilities before commencing work.

CAUTION - UNDERGROUND UTILITIES

Locations of existing underground utilities are shown in an approximate way. The utility owner should be contacted for exact locations. The City of Houston Department of Public Works and Engineering has provided the utility location information for the City of Houston. The utility owner should determine the exact location of all existing utilities before commencing work. The utility owner should be contacted for exact locations. The utility owner should determine the exact location of all existing utilities before commencing work.

- New Center Road Energy pole is existing on site, at 714-961-8307 (100' on to the north of the existing pole location).
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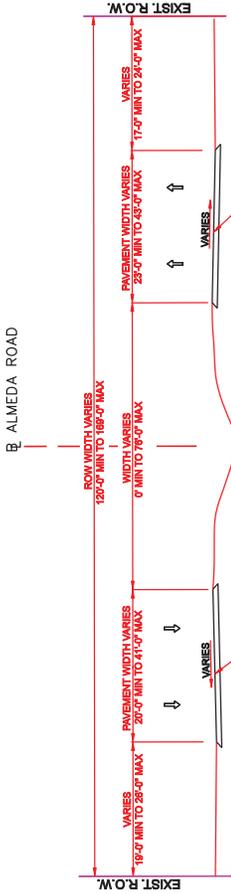
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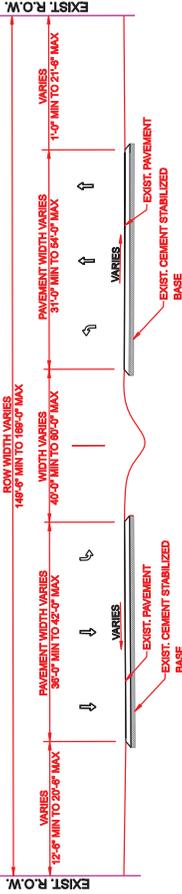
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*LANE WIDTH VARIES



EXIST. TYPICAL SECTION
N.T.S.



EXIST. TYPICAL SECTION
N.T.S.

NO.	DATE	REVISIONS	APP.

NO. 10. ADVANCE FOR LINES TO BE TURNED OFF OF ROAD. CALL CONTRACTOR AT 713-201-2222.

AT LEAST 48 HOURS BEFORE LOCATING A UTILITY, CALL OR CONTACT THE UTILITY TO DETERMINE THE EXACT LOCATION. CALL THE UTILITY AT THE NUMBER LISTED IN THE LISTING.

DATE: _____

CABLE COMPANY
TRISTITHA SILVAPE
 Walter P. Moore and
 Associates, Inc.
 15000 Katy Road, Suite 100
 Houston, Texas 77058
 281-461-1111
 281-461-1112
 281-461-1113
 281-461-1114
 281-461-1115
 281-461-1116
 281-461-1117
 281-461-1118
 281-461-1119
 281-461-1120
 281-461-1121
 281-461-1122
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 281-461-1193
 281-461-1194
 281-461-1195
 281-461-1196
 281-461-1197
 281-461-1198
 281-461-1199
 281-461-1200

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING
ALMEDA ROAD FROM
OLD SPANISH TRAIL TO 8
MACGREGOR WAY
EXISTING TYPICAL SECTIONS

WBS NUMBER	N-0000000-0001-3
DRAWING SCALE	AS NOTED
DATE	CITY OF HOUSTON, TX
DESIGNED BY	MICHELLE RANDSON, P.E.
CHECKED BY	WALTER P. MOORE, P.E.
DATE	11/11/2011

Appendix D: PALM



Potential Archeological Liability Map (PALM)

- 0 - Water. No survey recommended.
- 1 - Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 2 - Surface Survey Recommended, No Deep Reconnaissance Recommended.
- 2a - Surface Survey of Mounds Only; No Deep Reconnaissance Recommended.
- 3 - No Surface Survey Recommended, Deep Reconnaissance Recommended if Deep Impacts are Anticipated.
- 3a - No Surface Survey Recommended, Deep Reconnaissance Recommended only if Severe Deep Impacts are Anticipated.
- 4 - No Survey Recommended.

Alameda Road: MacGregor to O.S.T.
CSJ 0912-72-072



Historic Coordination

Standards of Uniformity for Historical Studies – Project Coordination Request

District/County Houston/Harris Highway Alameda Rd CSJ 0912-72.012
 Contractor _____ Submittal Date _____

SECTION 3: ENV HIST DETERMINATIONS	
ADDITIONAL ACTIONS REQUIRED BY THE DISTRICT.	
SOU TO BE RESUBMITTED WITH REQUESTED INFORMATION	
[DO NOT WRITE on this page; for ENV HIST STAFF ONLY]	
1	Project information is insufficient to determine level of Historic Resource Review and Consultation (see attached comments indicating why information is insufficient). Yes <input type="checkbox"/>
2	Project information is sufficient to recommend that a Reconnaissance Survey be performed.** ENV HIST staff will consult with the District to specify survey needs and to develop a scope of work and a timeline for receiving contract deliverables. <input type="checkbox"/>
3	Project information is sufficient to recommend that an Intensive Survey be performed.** ENV HIST staff will consult with the District to specify survey needs and develop a scope of work and a timeline for receiving contract deliverables. <input type="checkbox"/>
ADDITIONAL COMMENTS:	

** All work must meet appropriate Standards of Uniformity. Please consult with ENV HIST if District requires assistance through an ENV Scientific Services Contract.

SECTION 4: ENV HIST CERTIFICATION	
[TO BE FILLED OUT BY ENV HIST STAFF. TO BE INCLUDED WITH DISTRICT'S SUBMISSION TO THE REC]	
ENV HIST staff determined that the project information is sufficient to record Section 106 actions on HIST screen in ETS. The appropriate NEPA language was submitted to the District and recorded in ETS.	
ENV HIST Reviewer Name: <u>Suzanne Mauer</u>	Date: <u>1/23/13</u>



Mr. Tim Kroeker
 Berg Oliver Associates, Inc.
 14701 St. Mary's Lane, Suite 400
 Houston, Texas 77079

September 15, 2011

Re: Architectural History Assessment of the Proposed Almeda Road Reconstruction Project in Harris County, Texas (CSJ No. 0912-72-072)

Dear Mr. Kroeker,

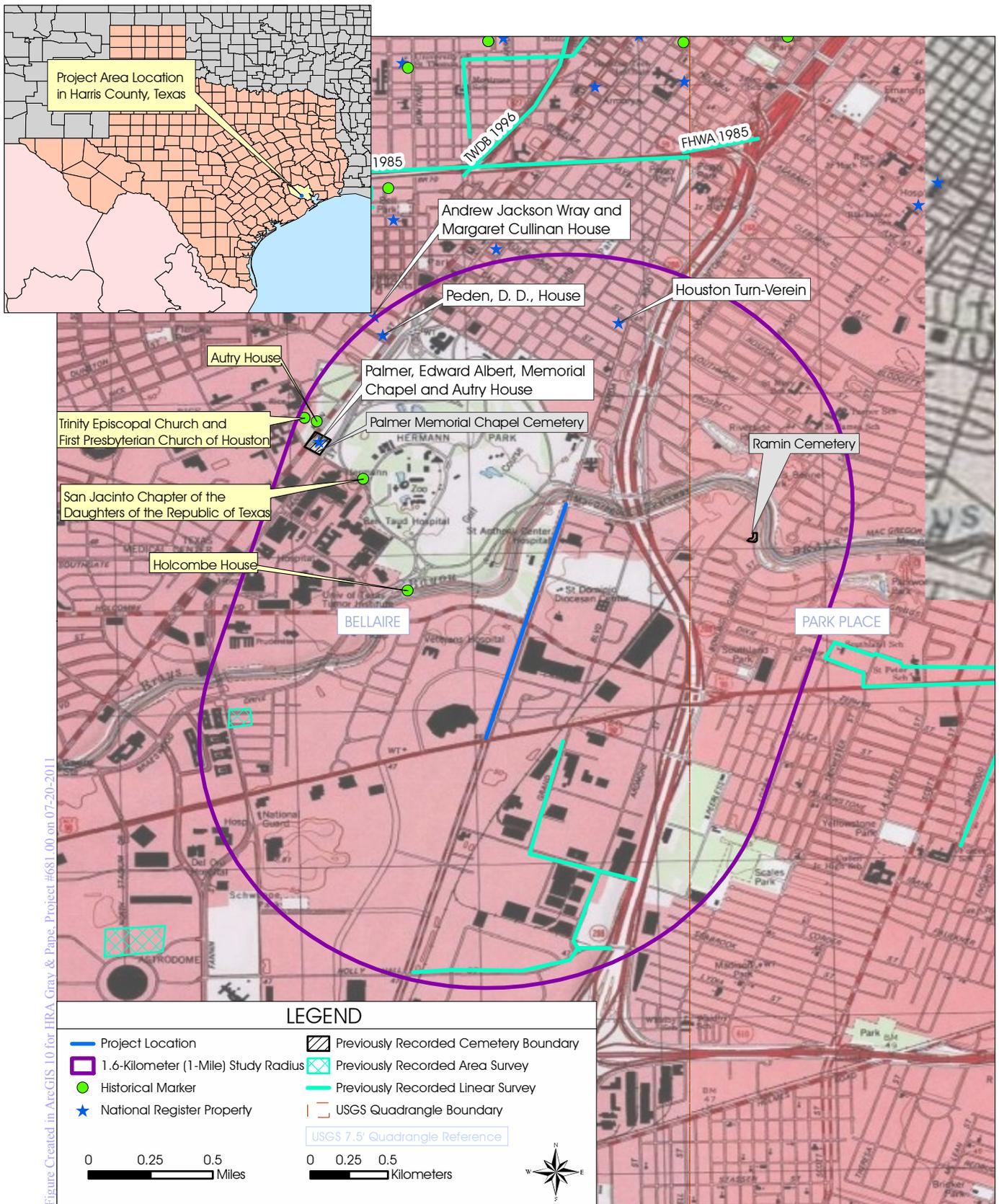
On July 14, 2011, Berg Oliver Associates, Inc. contracted HRA Gray & Pape, LLC, (HRA Gray & Pape) of Houston, Texas to conduct historic properties research for the above-referenced project in Harris County, Texas. Reconstruction between South McGregor and Old Spanish Trail is planned along FM 521/Almeda Road. This letter documents the results of these activities, along with our assessment regarding the potential for additional historical resource identification within the project area and recommendations concerning the need for an architectural history field survey.

Based on recent conversation with Berg Oliver Associates, Inc., the Texas Department of Transportation (TxDOT) will be the Lead Agency for this project. Therefore, HRA Gray & Pape has provided archaeological services that meet standards and requirements set forth by Section 106 of the National Historic Preservation Act (NHPA) and the Antiquities Code of Texas. A TxDOT reviewer will evaluate the potential for the proposed acquisition area of potential effect (APE) to contain non-archeological historic properties. Section 106 review and consultation will proceed in accordance with the Programmatic Agreement (PA) among TxDOT, the Texas Historic Commission (THC), the Federal Highway Administration (FHWA), and the Advisory Council on Historic Preservation, as well as the Memorandum of Understanding (MOU) between THC and TxDOT.

DESCRIPTION OF THE PROJECT AREA

The project area is located on the Bellaire (2995-423) 7.5-minute United States Geological Survey (USGS) topographic quadrangle map (Figure 1). The proposed project includes approximately 1,557 linear meters (5,107 linear feet) along Farm-to-Market (FM) 521/Almeda Road proposed for reconstruction between South MacGregor and Old Spanish Trail within existing right-of-way (ROW). Brays Bayou is located just north of the project area. Although detailed project plans are not yet available, it is the understanding of HRA Gray & Pape that reconstruction activities will take place within the existing roadway. Currently, FM 521/Almeda Road consists of 4 lanes of traffic. In an effort to maximize capacity the project will increase the number of lanes to 6. Drainages will also be updated.

Cincinnati Ohio	Missoula Montana	Houston Texas	Richmond Virginia	Seattle Washington	Portland Oregon	Providence Rhode Island
1318 Main St. Cincinnati, OH 45202 513.287.7700 f 513.287.7703	125 Bank St. Fifth Floor Missoula, MT 59802 406.721.1958 f 406.721.1964	1428 West Alabama St. Houston, TX 77006 713.541.0473 f 713.541.0479	100 West Franklin St. Suite 102 Richmond, VA 23220 804.644.0656 f 804.643.8119	1904 Third Ave. Suite 240 Seattle, WA 98101 206.343.0226 f 206.343.0249	909 N. Beech St. Suite B Portland, OR 97227 503.247.1319 f 503.284.1161	60 Valley St. Suite 103 Providence, RI 02909 401.273.9900 f 401.273.9944



Project Area Location in Harris County, Texas

Figure 1

All proposed construction will take place within existing TxDOT right of way, therefore the architectural Area of Potential Effects (APE) is defined as the project construction footprint and immediately surrounding area.

The project is located on an existing road. The land to either side of the road is appears to be under a mix of public and private ownership including the City of Houston and the Houston Medical Center. It is unclear how much subsurface disturbance, has occurred within these parcels however they are presumed to have been altered by landscape modification, grading, and drainage measures.

BRIEF HISTORY OF HARRIS COUNTY

Harris County was formed as Harrisburg County on December 22, 1836. The county was renamed Harris in December 1839 to honor John Richardson Harris, an early pioneer who had established Harrisburgh in 1826, the first town site in the county. Harrisburgh was established at the confluence of Buffalo Bayou and Brays Bayou and, by the 1830s, had become the major port of entry for the region and a transportation hub. Roads ran northwest to the Brazos communities of San Felipe and Washington, east to the ferry landing that crossed the San Jacinto, and west paralleling Brays Bayou to the Oyster Creek Community near present day Stafford in Fort Bend County (Henson 2009).

Under Mexican rule, the area surrounding Harrisburg (as it came to be spelled by 1832) was known as the San Jacinto District. The district stretched from Lynchburg on the San Jacinto River to the location of present day Richmond, and from Clear Creek in the south to Spring Creek in the north. Harrisburg County encompassed this same territory with the addition of Galveston Island. The modern boundaries of Harris County were established in 1838 (Henson 2009).

The lands that would become Harris County comprised the southeastern border of Austin's Colony. In July 1824, 29 titles were granted to lands in future Harris County, with an additional 23 grants made between 1828 and 1833. These original grants concentrated mainly on the watercourses of the region. The early settlers in the region were mostly from the southern United States and brought with them their African-descended slaves. During the 1840s, large numbers of German and French immigrants settled in Harris County. The Hispanic presence in the region was relatively sparse prior to an influx of immigrants following the Mexican Revolution, reflecting the ephemeral nature of Spanish and Mexican colonization (Henson 2009).

ARCHIVAL RESEARCH RESULTS

A review of the literature available on the Texas Archeological Sites Atlas, an online resource maintained by the Texas Historical Commission (THC) resulted in the identification of 2 known archaeological sites, 4 National Register-listed historic properties, 4 Historical Markers, and approximately 21 neighborhood surveys within 1.6 kilometers (1 mile) of the project area. None of these locations are located within the immediate vicinity of the project area.

The 2 known archaeological sites are located northwest of the project area. Site 41HR637 is described as a historic 2 story house build circa 1929 for T.C. Spencer. This structure was used as a family home from 1929- 61, as a domicile rental from 1961- 71, and for commercial use from 1971- 84. This site consisted of the standing structure, broken bottle glass, a flattened metal can, and cement concretion. It was described as not having potential as a State Archaeological Landmark (SAL) or for the National Register

of Historic Places (NRHP) (Wheat 1990a). Site 41HR638 is described as a historic 3 story house. This structure was used as a family home from 1929-56, as a rental property from 1956-61, and for commercial use from 1961-84. This site consisted of the standing structure, glass, and metal (Wheat 1990b). The potential for this site as a SAL or for the NRHP is unknown.

The 4 National Register-listed properties, 4 Historical Markers, and 21 neighborhood surveys are primarily house sites where prominent Houstonians resided. Other contributors include the sites of buildings that are uniquely crafted and most notably represent a period of style and design. Also included in these are religious houses of worship, a hospital, and a zoological garden. None of these properties are located within or immediately adjacent to the project area.

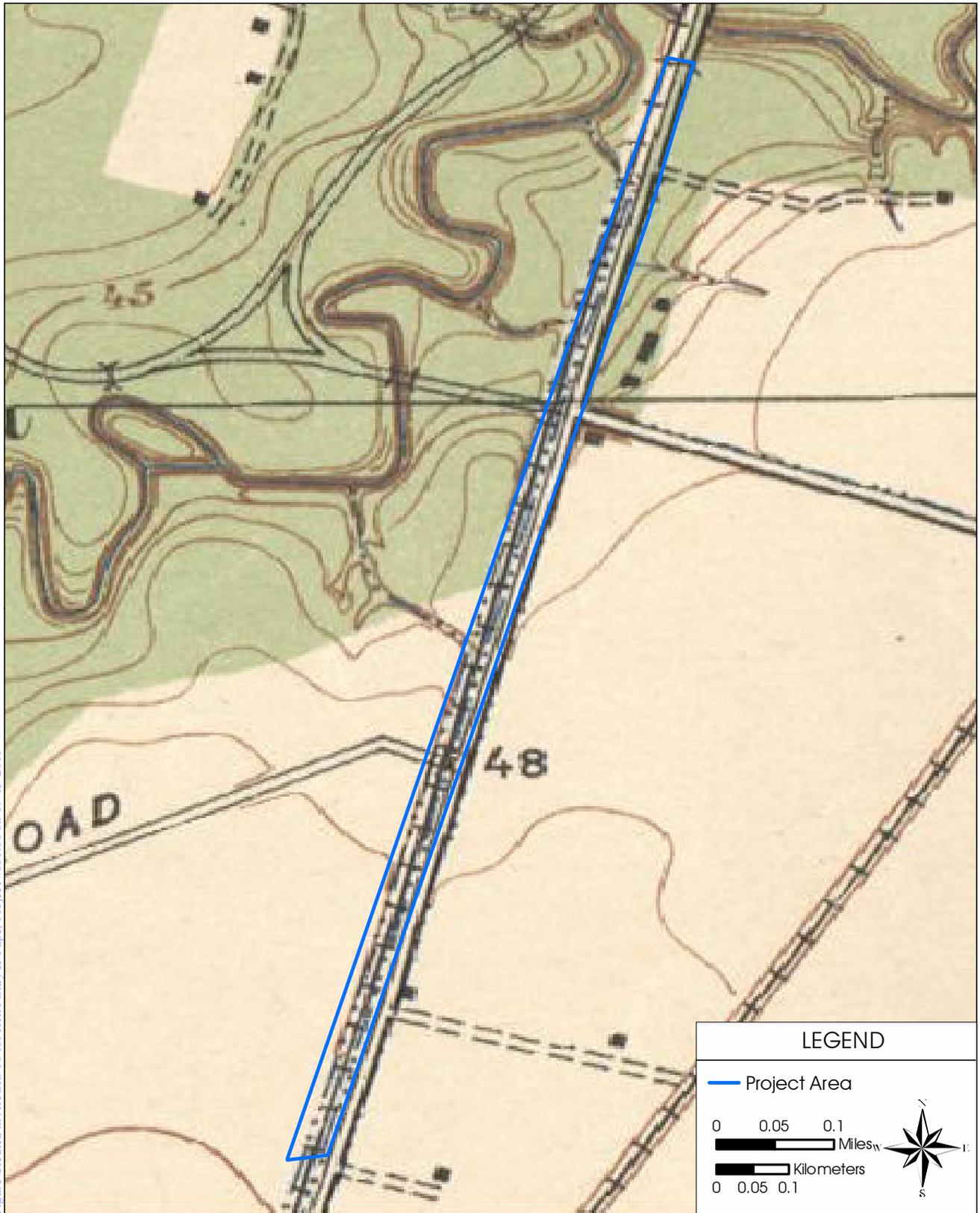
Two cemeteries are located north of the project area. One cemetery (Palmer Memorial Chapel) is located northwest of the subject area, west of Almeda Road, on South Main Street just west of Hermann Park (see Figure 1). This cemetery is a Type 2 cemetery and had been identified with European and Protestant heritages. Gravestones have been noted to have English writings (THC 2011a). The second cemetery (Ramin) is located northeast of the project area, west of Almeda Road, west of Brays Bayou on Ardmore on the north side of South MacGregor Way (see Figure 1). The Ramin cemetery, also known as the Adams-Campbell Cemetery, is a Type 2 cemetery with unmarked graves. No identifiable information regarding the graves, such as cultural or religious heritages, was available due to the cemetery's conditions (THC 2011b). The cemeteries are situated a sufficient distance away from the project to avoid potential project impacts.

REVIEW OF HISTORIC MAPS AND AERIAL PHOTOGRAPHY OF THE PROJECT AREAS

Historical topographic maps dating back to 1915 and 1967, along with historic aerials maps dating back to 1943 and 1952, were reviewed for the presence of historic structures that may still be present alongside FM 521/Almeda Road between South MacGregor and Old Spanish Trail. The 1915 map shows the presence of at least 9 structures adjacent to or near the east side of what is now FM 521/Almeda Road. This 1915 topographic map also shows that the current project's location was once the site of a rail line for the GH and SA Railroad (Figure 2). This railroad does not appear on the 1943 aerial map and no longer appears on the 1967 topographic map (Figure 3). The pre-channelized route of Brays Bayou can be seen on the 1915 topographic map. The channelized bayou is apparent on the 1943 aerial. The 1943 aerial shows the presence of some structures on the east of FM 521/Almeda Road but nothing located within the APE (Figure 4). On the 1952 aerial, more structures are shown to the east of FM 521/Almeda Road with the addition of structures (specifically the Veterans Hospital) on the west side of FM 521/Almeda Road. The 1967 topographic map and the 2011 aerial map show numerous additional structures on both sides of FM 521/Almeda Road (Figure 5).

A review of historic aerial images shows that what appear to be private residences present near the road in 1943 were either demolished or replaced by 1953 and replaced again by 1978. That pattern of demolition and replacement appears to have continued to the present as nearly all the structures visible in 1943 are gone. The exceptions are a few residences that are located along Lockett Street, which branches to the east from Almeda Road between Holcombe Boulevard and Old Spanish Trail.

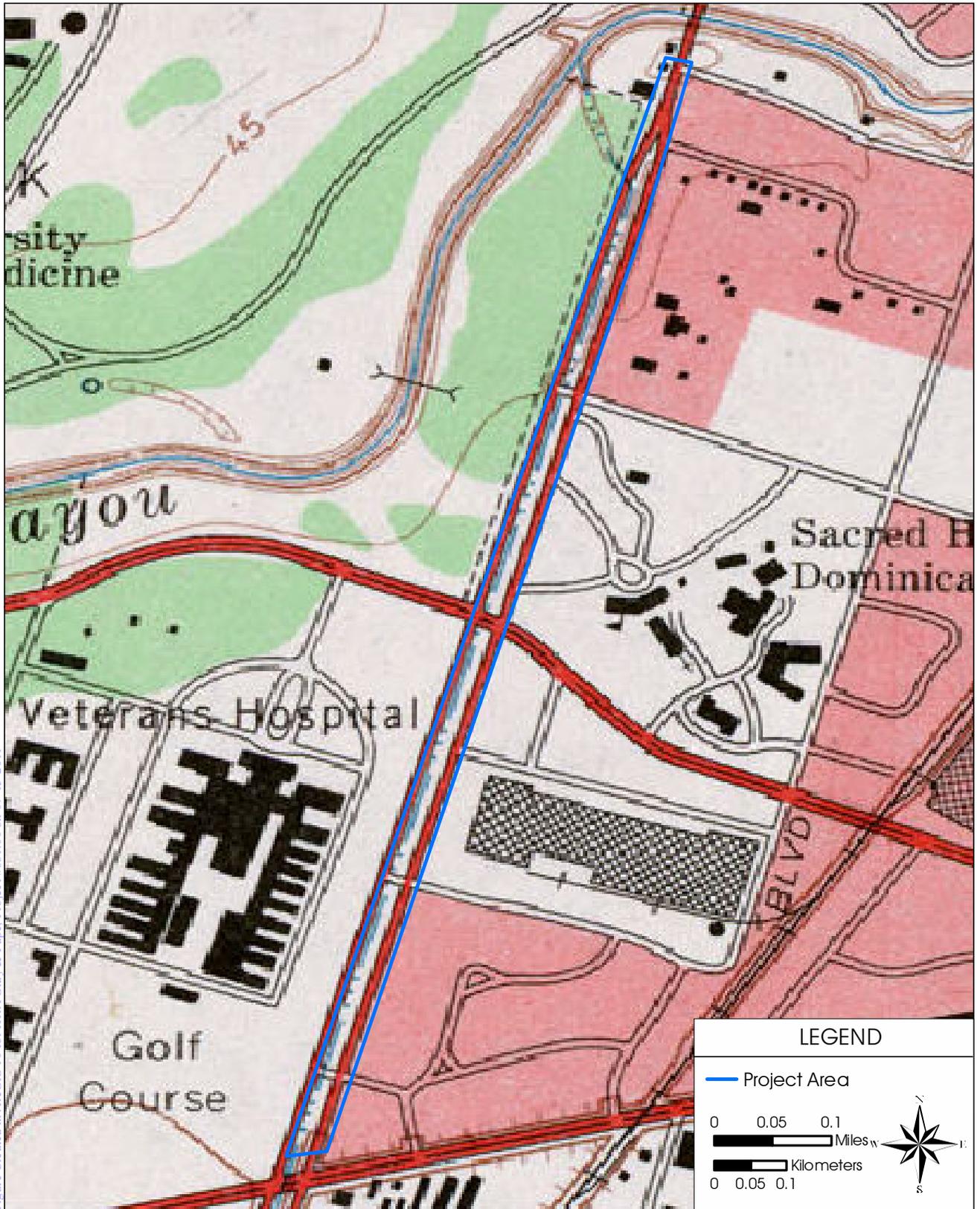
Figure Created in ArcGIS 10 for HRA Gray & Pape, Project #681.00 on 09-15-2011



Project Area Location on the 1915 Bellaire 7.5-Minute
Topographic Quadrangle

Figure 2

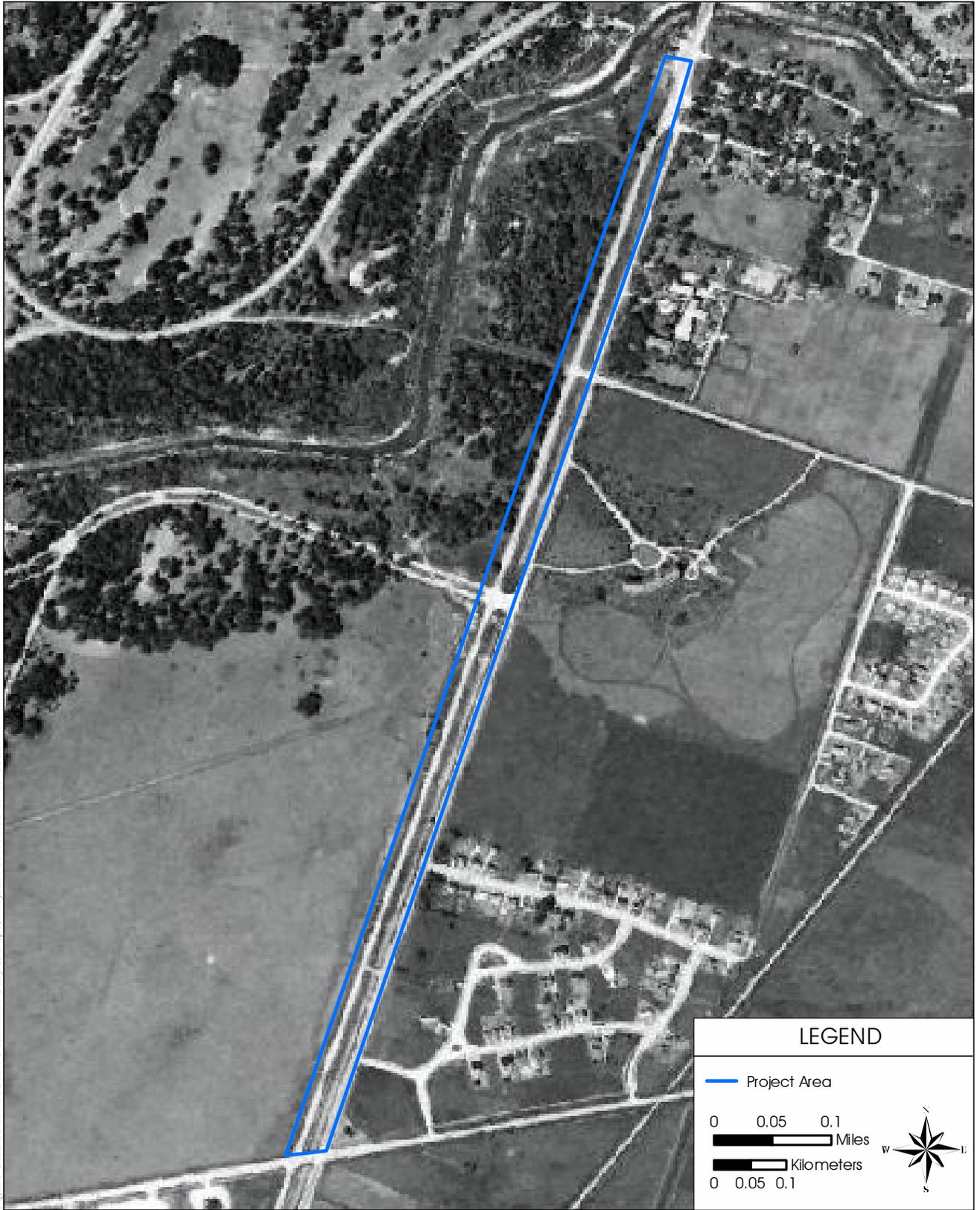
Figure Created in ArcGIS 10 for HRA Gray & Pape, Project #681.00 on 09-15-2011



Project Area Location on the 1967 Bellaire 7.5-Minute Topographic Quadrangle

Figure 3

Figure Created in ArcGIS 10 for HRA Gray & Pape, Project #681.00 on 09-15-2011



Project Area Location on an Aerial Image, Circa 1943

Figure Created in ArcGIS 10 for HRA Gray & Pape, Project #681.00 on 09-15-2011



Project Area Location on a Modern Aerial Image

RESULTS AND RECOMMENDATIONS

This desktop assessment identified no previously recorded extant historic-age structures, National Register-listed properties, Registered Texas Landmarks, or State Historical Markers within the APE. Furthermore, the project areas are comprised entirely of existing TxDOT right-of-way which has been heavily modified by prior multilane highway construction. Based on the results of archival research outlined in this letter, a review of recent and historic aerial photography and topographic maps, it is highly unlikely that an architectural field survey would be appropriate for the project. HRA Gray & Pape recommends that an architectural field survey not be required within the project APE and immediately adjacent areas due to previous disturbance and the presence supporting infrastructure within and adjacent to the project areas. As always, concurrence by a reviewer with TxDOT should be obtained for the recommendations outlined in this letter prior to project initiation. Projects funded, permitted, or approved by Federal agencies must comply with guidelines and requirements set forth in Section 106 of the National Historic Preservation Act of 1966, as amended.

A letter regarding archeological assessment for this project has also been filed; additional archeological survey is not recommended. If you have any questions or comments regarding the methods or results associated with our research, or are in need of additional information, please contact me at (713) 541-0473 or via email at tscott@hragp.com.

Sincerely,



Tony Scott
Principal Investigator
HRA Gray & Pape

Enc.
Cc:

HRAGP #681.00

REFERENCES

Henson, Margaret Swett

- 2009 Handbook of Texas Online, s.v. "Harris County"
<http://www.tshaonline.org/handbook/online/articles/HH/hch7.html>
[Accessed Nov 11, 2009].

Meyers, Allen D. and Roger G. Moore

- 2005 Limited Archeological Survey Investigation for the Fire Station No. 33 Project, City of Houston, Harris County, Texas.

Texas Historical Commission

- 2011a HR-C306 Palmer Memorial Chapel. Texas Historical Commission Online Archaeological Sites Atlas [Accessed July 20, 2011].

- 2011b HR-C090 Ramin. Texas Historical Commission Online Archaeological Sites Atlas [Accessed July 20, 2011].

Wheat, Patricia

- 1990a 41HR637. Texas Site Survey Form. Texas Historical Commission Online Archaeological Sites Atlas [Accessed July 19, 2011].

- 1990b 41HR638. Texas Site Survey Form. Texas Historical Commission Online Archaeological Sites Atlas [Accessed July 19, 2011].

Appendix E
Noise Barrier Coordination



July 25, 2014

via electronic mail
tsilva@walterpmoore.com

Mr. Thusitha Silva
Principal
WALTER P MOORE
1301 McKinney, Suite 1100
Houston, Texas 77010

RE: Villas at Hermann Park Apartments - 6301 Almeda Road

Dear Thusitha:

Per our telephone conversation of yesterday, UCM/FSDC Hermann Park, L.P. opposes any plans to construction a sound wall in the right of way adjoining Villas at Hermann Park Apartments located at 6301 Almeda Road, Houston, Texas. A sound wall in that location would damage us economically by reducing the visibility of our property to the street which is currently an important marketing source for our apartment complex. We also believe that a sound wall will increase the incidence of crime at our property also attributable to the reduction in visibility from the street.

In our opinion, the proposed improvements to Almeda Road simply bring this section of the road to the same level that is seen south of Old Spanish Trail. There are a number of apartment complexes in that section of Almeda Road that are not burdened by a sound wall along their frontage and it would be an undue burden to our property if we were not treated in a like manner.

Please call me at 512-377-4400 x101 if you would like to discuss this in further detail.

Sincerely,

UCM/FSDC-Hermann Park, L.P.

By: UCM/FSDC-Hermann Park GP, LLC, its General Partner

A handwritten signature in blue ink, appearing to read "Steven D. Eller", is written over a horizontal line.

Steven D. Eller
Vice President



AN INVESTMENT MANAGEMENT COMPANY

Marcellus Mosley II
CWS Capital Partners LLC
9606 N Mo Pac Expy, Ste. 500
Austin, TX 78759

Thusitha Silva
Walter P Moore
1301 McKinney, Ste. 1100
Houston, TX 77010

August 8, 2014

Dear Mr. Silva,

Re: Noise Barrier Almeda Road

This letter is in reference to the proposed concrete noise barrier to be placed along Almeda Road parallel to our property, Marquis Lofts at Hermann Park, 1 Hermann Park Ct, Houston, TX 77021. We object to the construction of the wall at this location on the grounds that the structure will obstruct the view of our residents and detract from the value of our property. Furthermore, we strongly believe the benefit received from a slight reduction in traffic noise is outweighed by the potential loss of demand for apartment units on the first level should the wall be installed.

If you require any additional information or clarification on our position, please feel free to contact me.

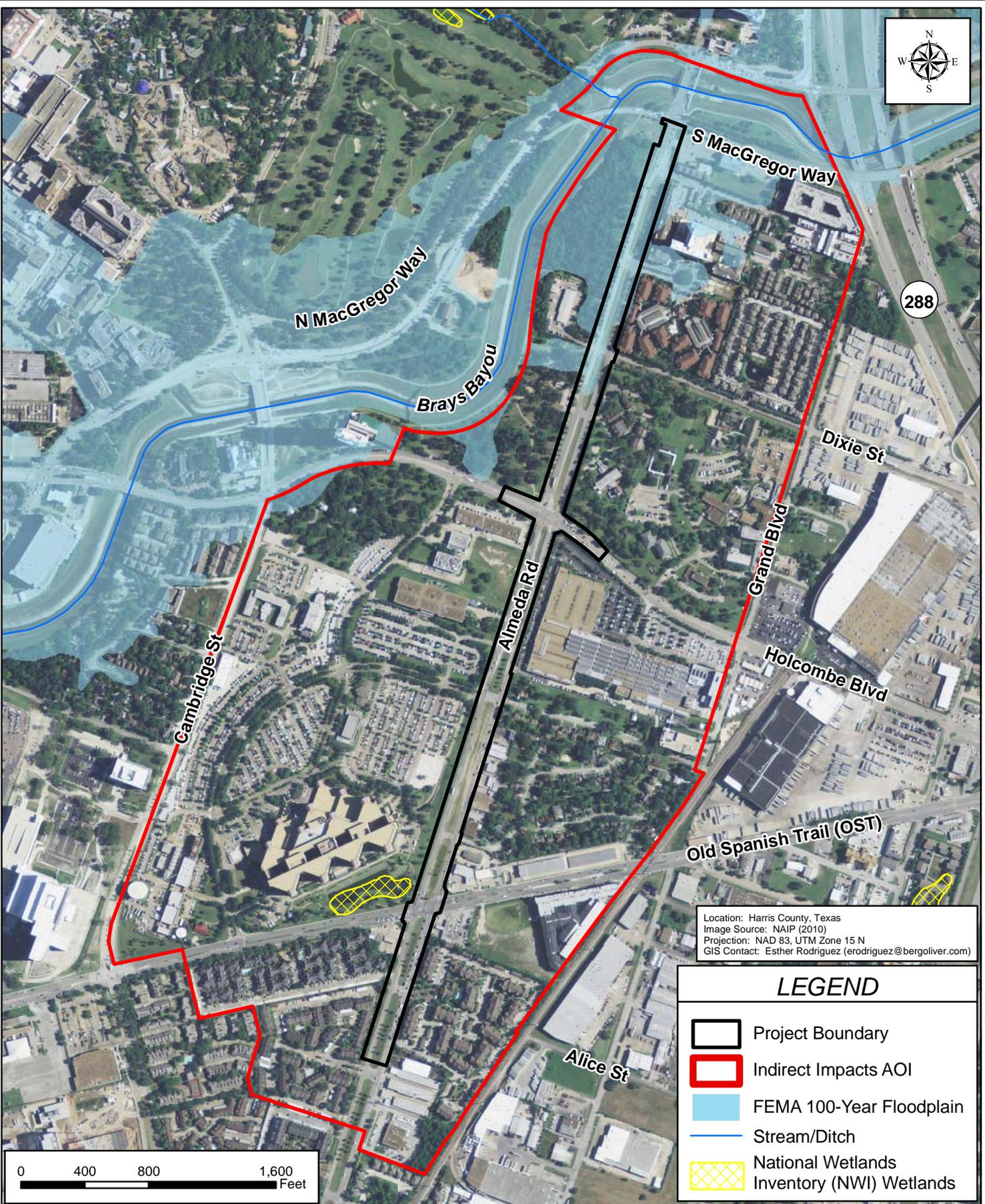
A handwritten signature in black ink, appearing to read "M Mosley II", with a stylized flourish at the end.

Sincerely,

Marcellus Mosley II

Appendix F

Indirect and Cumulative Impacts Analyses Maps



Location: Harris County, Texas
 Image Source: NAIP (2010)
 Projection: NAD 83, UTM Zone 15 N
 GIS Contact: Esther Rodriguez (erodriguez@bergoliver.com)

LEGEND

- Project Boundary
- Indirect Impacts AOI
- FEMA 100-Year Floodplain
- Stream/Ditch
- National Wetlands Inventory (NWI) Wetlands

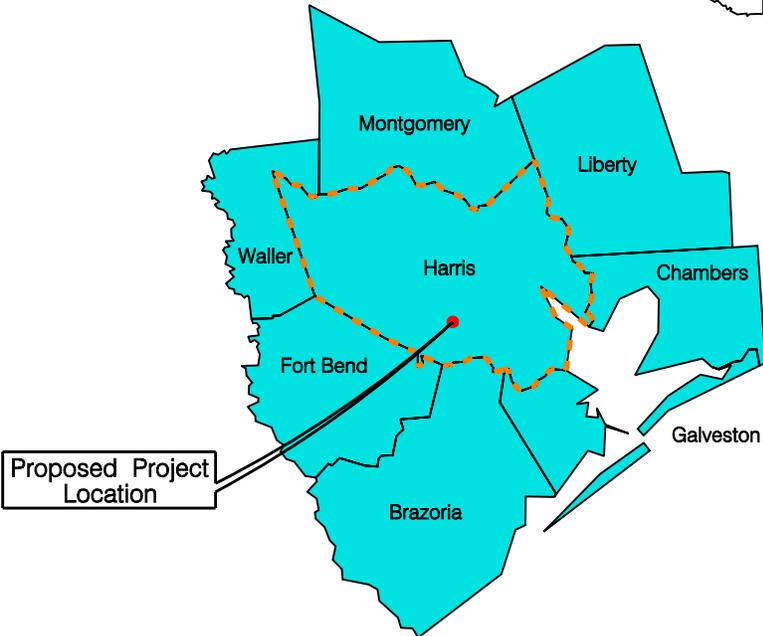
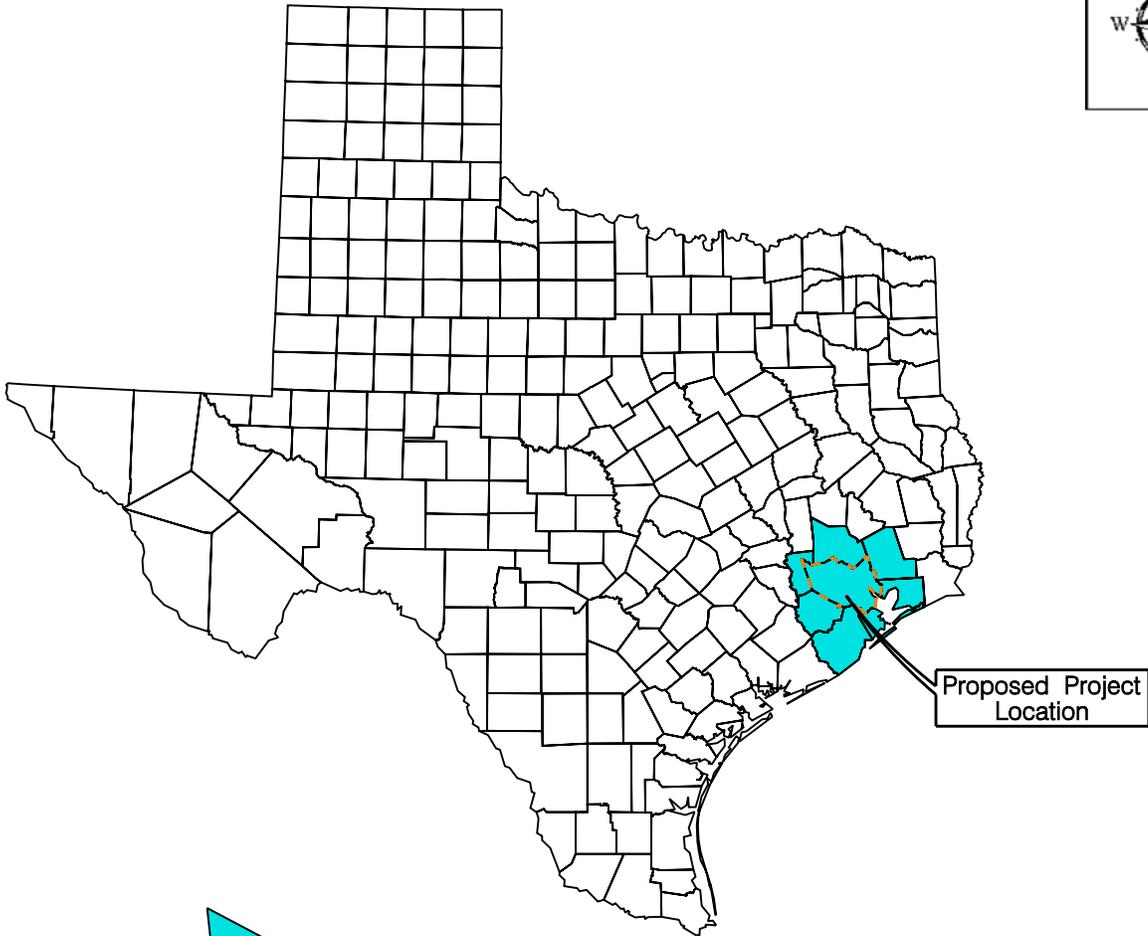
INDIRECT IMPACTS AOI

Project #: 7314 - CSJ: 0912-72-072
 For: Walter P. Moore (o/b City of Houston)
 Location: Alameda Rd. from S. MacGregor to OST
 Harris County, Texas

REVISIONS	
Dec. 12, 2012	by MER

BERG•OLIVER ASSOCIATES, INC.
 ENVIRONMENTAL SCIENCE, ENGINEERING
 & LAND USE CONSULTANTS
 14701 ST. MARY'S LANE, SUITE 400
 HOUSTON, TEXAS 77079 PHONE (281)589-0898 <http://www.bergoliver.com>





LEGEND

- - - - - MOBILE SOURCE AIR TOXICS (MSAT) RSA
 OZONE RSA

NOT TO SCALE

**AIR QUALITY RSA
OZONE AND MOBILE SOURCE AIR TOXICS (MSATs)**

PROJECT #: 7314 – CSJ: 0912-72-072

FOR: Walter P. Moore (o/b City of Houston)

LOCATION: Almeda Rd. from S. MacGregor to OST
Harris County, Texas

REVISIONS:
Jan. 24, 2014 by M. E. Rodriguez

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