

**CATEGORICAL EXCLUSION
ENVIRONMENTAL REPORT**

BUFFALO SPEEDWAY

*from Willowbend Blvd to south of Holmes Road
Harris County, Texas*

CSJ: 0912-72-311

**US DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

TEXAS DEPARTMENT OF TRANSPORTATION

CITY OF HOUSTON

January 2015

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CATEGORICAL EXCLUSION ENVIRONMENTAL REPORT

BUFFALO SPEEDWAY

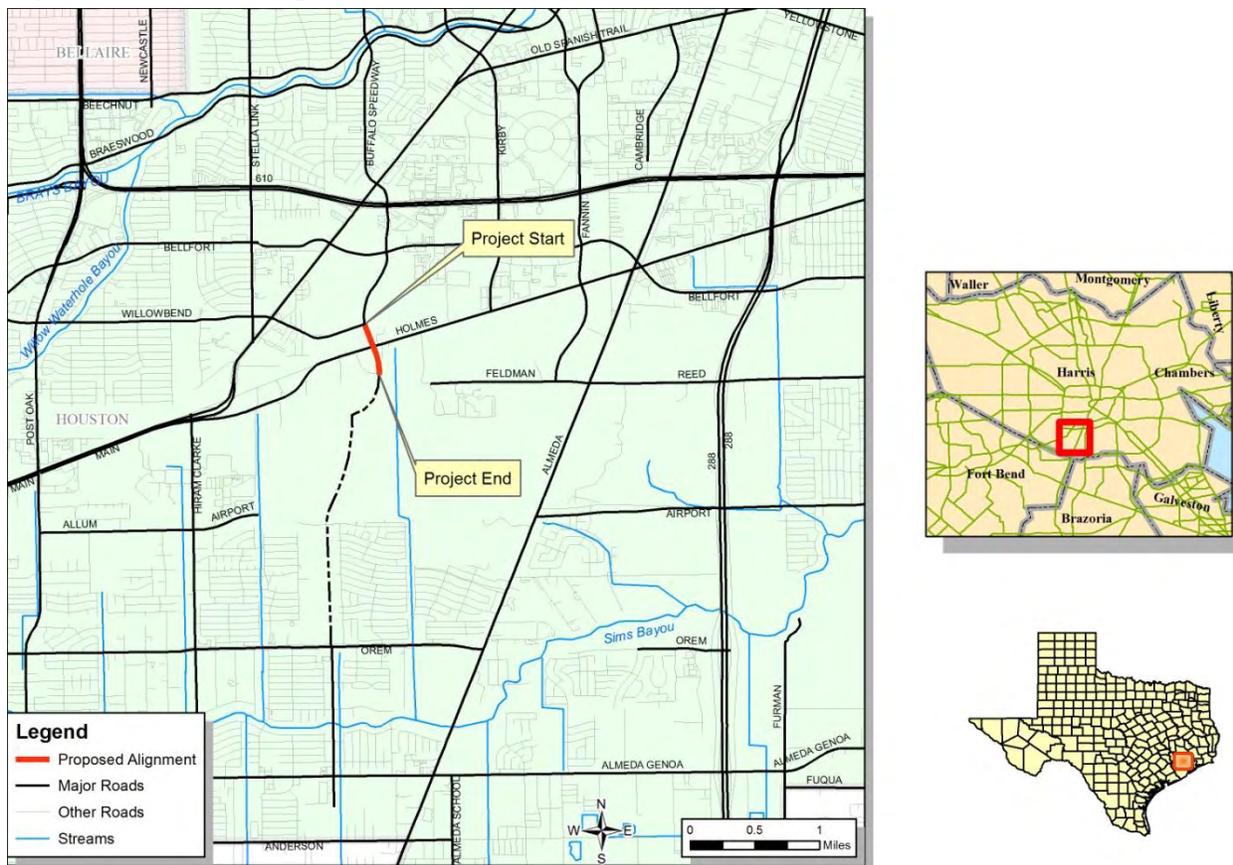
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1 Need for and Purpose of the Proposed Action

The City of Houston proposes to extend Buffalo Speedway as a 4-lane boulevard roadway from its current terminus at Willowbend Boulevard to a point 1,200 feet south of Holmes Road, bridging over the Union Pacific Railroad and Holmes Road. The total length of the project is 2,200 feet, or 0.42 mile. Figure 1 shows the location of the proposed project.

The estimated cost of the proposed action is \$6.25 million. The project would be built by the City of Houston Department of Public Works & Engineering with partial funding provided by the Federal Highway Administration of the U.S. Department of Transportation. The Texas Department of Transportation (TxDOT) would administer the federal funds for this project. Federal funds would cover 80 percent of the project cost, and the City of Houston would fund the remaining 20 percent. Construction would begin in 2016. The proposed project is in the 2015–

Figure 1: Vicinity Map of Project Corridor



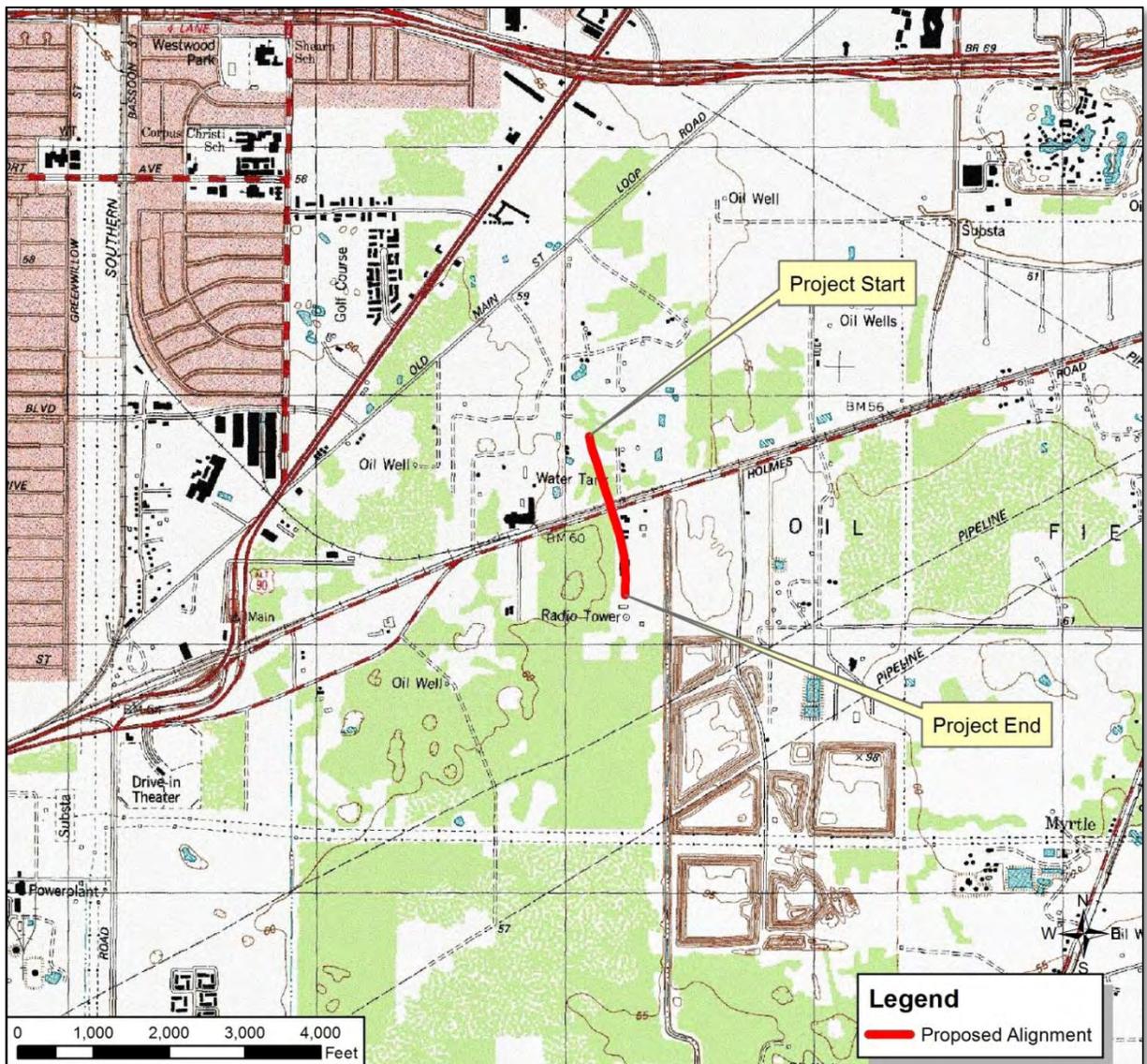
2018 Transportation Improvement Program¹ (TIP) and the 2035 Regional Transportation Plan Update² by the Houston–Galveston Area Council (Appendix E). The 2015-2018 TIP is pending approval by the U.S. Department of Transportation.

Figure 2 is a topographic map of the project area.

1.1 Need for the Proposed Action

The Buffalo Lakes area is a large tract of land between South Main Street, West Bellfort Road, Kirby Drive and Holmes Road that is currently under development as a mixed-use community of residential, office and retail land uses. The land north of West Bellfort Road is already developed with residential and commercial uses. Two major thoroughfares (Willowbend Boulevard and Buffalo Speedway) enter the Buffalo Lakes area, but neither crosses the area completely. Therefore, motorists entering or leaving Buffalo Lakes must enter and exit the community from the

Figure 2: Topographic Map of Project Area



Source: U.S. Geological Survey 7½' topographic map for Bellaire, Texas, 1984.

north or the west, sometimes requiring circuitous routes to make their trips.

Table 1: Forecast Traffic Volume in 2035

<i>Segment</i>	<i>Traffic Volume (vehicles per day)</i>
Buffalo Speedway from Willowbend Boulevard to South Terminus	22,100

Source: City of Houston.

Traffic on Buffalo Speedway north of the proposed project is currently 2,770 vehicles per day,³ which on the 4-lane roadway is Level of Service A. (Traffic congestion is measured on a 6-point Level of Service (LOS) scale, where LOS A is completely free-flowing traffic and LOS F is stop-and-go congestion.) Without the connection to Holmes Road, traffic on Buffalo Speedway north of the proposed project is expected to increase to 20,900 vehicles per day in 2035. This traffic would flow at Level of Service C, which is an acceptable level of congestion. A future segment of Buffalo Speedway, currently in final design and under construction starting in 2015, will extend from the southern terminus of this project to West Airport Boulevard. If Buffalo Speedway were connected to Holmes Road and this future segment of Buffalo Speedway, traffic is estimated to increase from 20,900 to 22,100 vehicles per day in 2035 (Table 1), indicating that there is latent demand to use Buffalo Speedway to get to Holmes Road and areas south of Holmes Road.

1.2 Objectives of the Project

The objectives of the proposed project are:

- To provide a through route connecting West Bellfort Road to Holmes Road and a future segment of Buffalo Speedway from south of Holmes Road to West Airport Boulevard, planned for construction starting in 2015; and
- To provide access to lands along the project route north and south of Holmes Road.

1.3 Planning Process

The proposed project is comprised of parts of two previous projects: extension of Buffalo Speedway from West Bellfort Road to Holmes Road, and extension of Buffalo Speedway from Holmes Road to Airport Boulevard. Buffalo Speedway was built from West Bellfort Road to Willowbend Boulevard in 2011, but the segment from Willowbend to Holmes Road was not built because an agreement could not be reached between the City of Houston and the Union Pacific Railroad for the proposed at-grade rail crossing. The extension of Buffalo Speedway from south of Holmes Road to Airport Boulevard, which will include a connector road to Holmes Road, is in final design and will be under construction starting in 2015.

In 2012, the City of Houston modified its plans for the Union Pacific Railroad crossing of Buffalo Speedway and designed a bridge over the railroad and Holmes Road. This Environmental Report considers the likely environmental consequences of this project.

1.4 Related Studies and Relevant Documents

A Phase 1 Environmental Site Assessment was done for extending Buffalo Speedway from Holmes Road to West Airport Boulevard in 2011. This Environmental Report includes an update of this Phase 1 Environmental Site Assessment for this segment of that project.

1.5 Regulatory Requirements

This Environmental Report considers the social, economic and environmental impacts of the proposed project. Section 2 describes the proposed action and considers alternative actions. Section 3 presents the environment potentially affected by the project. Section 4 describes the likely

environmental consequences of the proposed action. Section 5 describes the public involvement process. Section 6 presents the conclusions and recommendations of this assessment.

This Environmental Report was prepared to determine whether this action qualifies for a Categorical Exclusion from the requirement under the National Environmental Policy Act of 1969 to prepare an Environmental Impact Statement or an Environmental Assessment for a major federal action that may significantly affect the environment. The federal action is the provision of reimbursable federal funds to build the proposed project. This document satisfies the Federal Highway Administration's regulatory requirement for complying with the National Environmental Policy Act in Section 771 of Title 23, Code of Federal Regulations, and complies with TxDOT planning policy.

2 Description of the Proposed Action

This section describes the proposed action, and presents alternative actions that were considered in developing the proposed action.

2.1 Design Requirements

The proposed action should meet the following design requirements:

- Have a design speed of 35 miles per hour;
- Be compatible with the current Buffalo Speedway design north and south of the project;
- Increase access to adjacent properties;
- Ensure vehicle and pedestrian safety;
- Maintain current drainage conditions; and
- Comply with the highway design standards of TxDOT and the American Association of State Highway Transportation Officials.

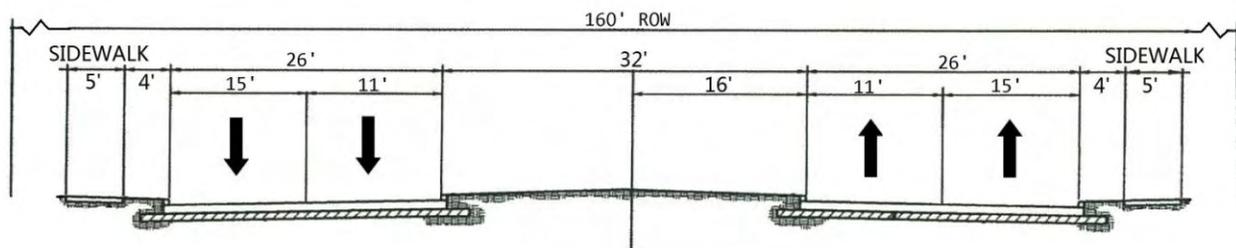
The project must meet requirements of all laws, regulations, environmental permits and agreements and should minimize potential social and environmental impacts from construction and operation.

2.2 The Proposed Action

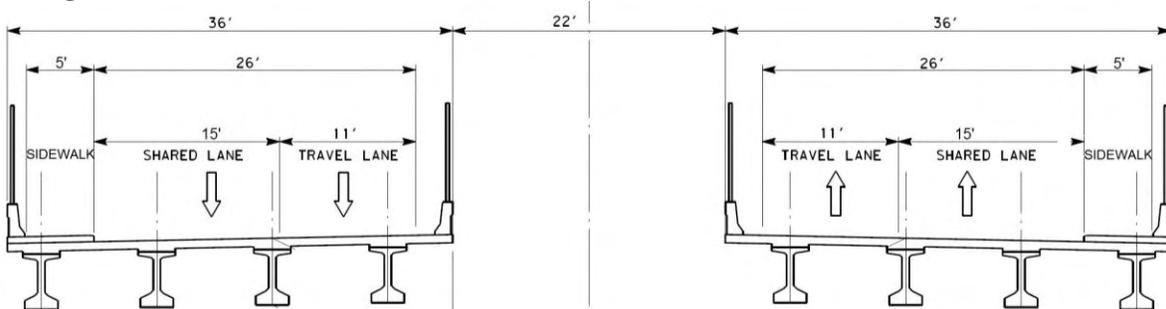
The proposed action would extend Buffalo Speedway as a 4-lane divided roadway in a 160-foot-wide right-of-way, from Willowbend Boulevard southward, rising above grade starting 80 feet south of Willowbend on fill with retaining walls, continuing on a 1,150-foot long, 4-lane bridge starting 500 feet south of Willowbend, reaching 32 feet above grade. The bridge would begin to decrease elevation over Holmes Road, returning to grade level 1,080 feet south of Holmes Road. Cross-section views of the proposed action, showing the proposed roadway at grade and on the bridge, are shown in Figure 3. Appendix A has a plan view of the proposed action.

Figure 3: Typical Cross-Section Views of the Proposed Action

a. At Grade



b. Bridge



The proposed action would not provide direct access to Holmes Road, but a 2-lane, two-way connector road that is currently pending construction will have been built at grade from Buffalo Speedway just south of the southern terminus of the proposed project to Holmes Road, 360 feet west of the proposed crossing.

The proposed action meets the project objectives. It provides access to lands north and south of Holmes Road and a means to relieve expected traffic congestion.

2.3 Right-of-Way and Displacements

The proposed action would be built on 8.8 acres of land. The City of Houston already owns the right-of-way for the proposed Buffalo Speedway. Therefore, the City of Houston would not need to acquire right-of-way to build the proposed action.

The land along the proposed rights-of-way includes undeveloped land and abandoned industrial facilities. The proposed action would not displace homes or businesses.

2.4 Alternative Actions Considered

There are several alternative ways for the proposed extension of Buffalo Speedway to cross the Union Pacific Railroad and Holmes Road:

- Cross the Union Pacific Railroad and Holmes Road at grade, with a crossing gate at the railroad and a signalized intersection at Holmes Road.
- Cross the Union Pacific Railroad and Holmes Road in an underpass, with a new railroad bridge and a roadway bridge for Holmes Road over the underpass.

Crossing the Union Pacific Railroad at grade is infeasible, since the Union Pacific Railroad has indicated in meetings with the City of Houston (Appendix B) that it will not agree to a grade crossing for Buffalo Speedway.

Crossing the Union Pacific Railroad via underpass is unreasonable, since it would be very expensive to build. The cost to build an underpass, with a new railroad bridge and roadway bridge over it, is estimated at \$30 million, about five times the cost of building a bridge over the railroad and Holmes Road.

Alternatives that change the roadway alignment north of the Union Pacific Railroad are unreasonable since the City of Houston already owns the right-of-way north of the Union Pacific Railroad and alternatives that abandon this alignment would require new right-of-way. This would be a substantial new expense to the City of Houston that would cause substantial disruption to the environment.

2.5 Other Relevant Actions

The City of Houston extended Buffalo Speedway from West Bellfort Road to Willowbend Boulevard in June 2011. Currently, the segment of Buffalo Speedway south of this project to West Airport Boulevard is programmed for construction in 2015. This project is the next planned segment in the proposed extension of Buffalo Speedway south to West Airport Boulevard.

In addition, Houston plans to reconstruct Holmes Road from Main Street to Kirby Drive as a 4-lane divided roadway, starting in 2016.

3 Affected Environment

This section describes the environment that could be affected by the proposed action. Impacts of the proposed action are presented in Section 4, Environmental Consequences.

3.1 Lakes, Rivers and Streams

The proposed project alignment does not cross a stream. The northern part of the project, north of the Union Pacific Railroad, is in the Brays Bayou watershed. Brays Bayou is about two miles north of the northern terminus of the proposed project. The southern part of the project, south of the Union Pacific Railroad, is in the Sims Bayou watershed. Sims Bayou is 2½ miles south of the southern terminus of the proposed project, and there is a drainage ditch about 500 feet east of the proposed Buffalo Speedway alignment that drains southward to Sims Bayou. Both Sims Bayou and Brays Bayou flow east and northeast to Buffalo Bayou, which flows into the San Jacinto River, which flows into Galveston Bay. Streams near the project corridor are shown in Figure 2.

According to the Texas Commission on Environmental Quality’s 303(d) report⁴ of impaired streams, both Brays Bayou above tidal (Segment 1007B) and Sims Bayou (Segment 1007D) have impaired water quality that is not suitable for fishing and swimming, due to high levels of fecal coliform bacteria. These bacteria originate from animal feces or untreated sewage that enters the streams. Both streams are within five miles downstream of the proposed project.

3.2 Soils

The proposed project is wholly within an area mapped by the U.S. Natural Resources Conservation Service⁵ as Beaumont clay loam. Beaumont clay loam is a deep, somewhat poorly drained soil on upland prairies, with very slow permeability and internal drainage. Beaumont clay loam is a prime farmland soil. It is also a hydric soil when exposed to frequent saturation.

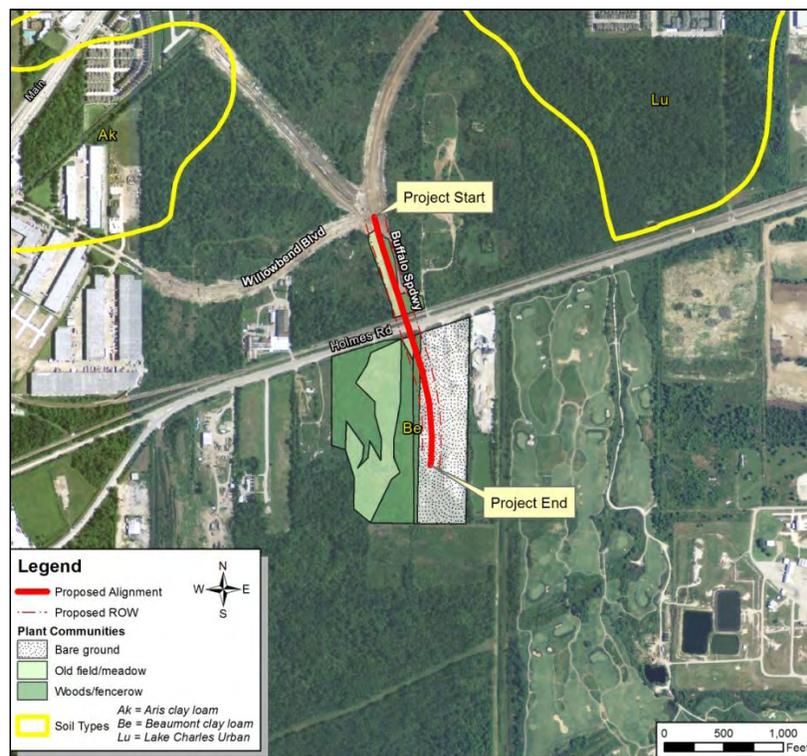
Figure 4 is a map of the project area showing soil types.

3.3 Plant Communities

The proposed project is in the Northern Humid Gulf Coastal Prairies ecological region,⁶ and *The Vegetation Types of Texas*⁷ shows that the main vegetation type is Urban (46). The project area has vacant and urban industrial tracts of land, with fragmented woodlots and grassy areas interspersed with industrial sites and developed land.

Figure 4 shows plant communities in the project area.

Figure 4: Soil Types and Plant Communities



Source: U.S. Natural Resources Conservation Service, 1976.

The project corridor north of Holmes Road has been cleared of trees and is best characterized as an old-field plant community. Common species are Bermuda grass (*Cynodon dactylon*), annual marsh elder (*Iva annua*) and rattlebush (*Sesbania drummondii*). Giant reed (*Phragmites australis*) forms monospecific stands over part of the proposed right-of-way. Also present are sunflower (*Helianthus annuus*), goldenrod (*Solidago canadensis*) and snapdragon (*Gerardia tenuifolia*).

South of Holmes Road, the right-of-way crosses a field dominated by common panic-grass (*Panicum capillare*) with small black willow trees (*Salix nigra*) and goldenrod, then a fencerow dominated by macartney rose (*Rosa bracteata*) and sugarberry trees (*Celtis laevigata*), then a former industrial site covered with gravel and concrete paving.

The project would clear about four trees with diameters larger than three inches. These are Chinese tallow (*Sapium sebiferum*) and sugarberry trees that are about 25 feet tall.

Wetlands are not present in the proposed project right-of-way.

3.4 Wildlife

The project area is home to mammals and birds typical of grassland and woodland areas in east coastal Texas. Bird species seen in the project corridor include crows (*Corvus brachyrhynchos*), house sparrows (*Passer domesticus*) and mockingbirds (*Mimus polyglottos*). Mammal species likely to be in the project corridor include white-tailed deer (*Odocoileus leucocephalus*), opossum (*Didelphis virginiana*), nine-banded armadillos (*Dasyus novemcinctus*) and raccoons (*Procyon lotor*).

3.5 Air Quality

The proposed action is in Harris County, which is part of the Houston-Galveston-Brazoria air quality region. This 8-county region meets national ambient air quality standards for sulfur oxides, nitrogen oxides, particulate matter (greater than 10 microns in size), carbon monoxide and lead, but exceeds the 8-hour standard for ozone, a powerful oxidizer that harms the human respiratory system. The U.S. Environmental Protection Agency has designated the Houston-Galveston-Brazoria region as in marginal non-attainment for ozone, effective July 20, 2012. The major contributors to air pollution in the Houston-Galveston region are industries and motor vehicles; each contributes about half the region's total emissions of ozone precursor pollutants.

3.6 Land Use

Most of the project corridor was in industrial use from the 1920s to the 1990s. Since 2000, many of the industrial structures were abandoned, possibly in anticipation of re-development for commercial and residential uses. Figure 5 shows land use in the project area. The Buffalo Lakes development on the north side of Holmes Road, including the proposed segment of Buffalo Speedway north of Holmes Road, is being developed as residential, commercial retail and office land. South of Holmes Road, industrial uses still exist east and west of the project corridor. A golf course was built on a former landfill east of the proposed Buffalo Speedway corridor.

The project corridor is wholly within the City of Houston, which does not have a zoning ordinance to control land use in this area.

3.7 Aesthetics

The project corridor does not have exceptional scenic resources. Photographs of the project corridor are presented in Appendix C.

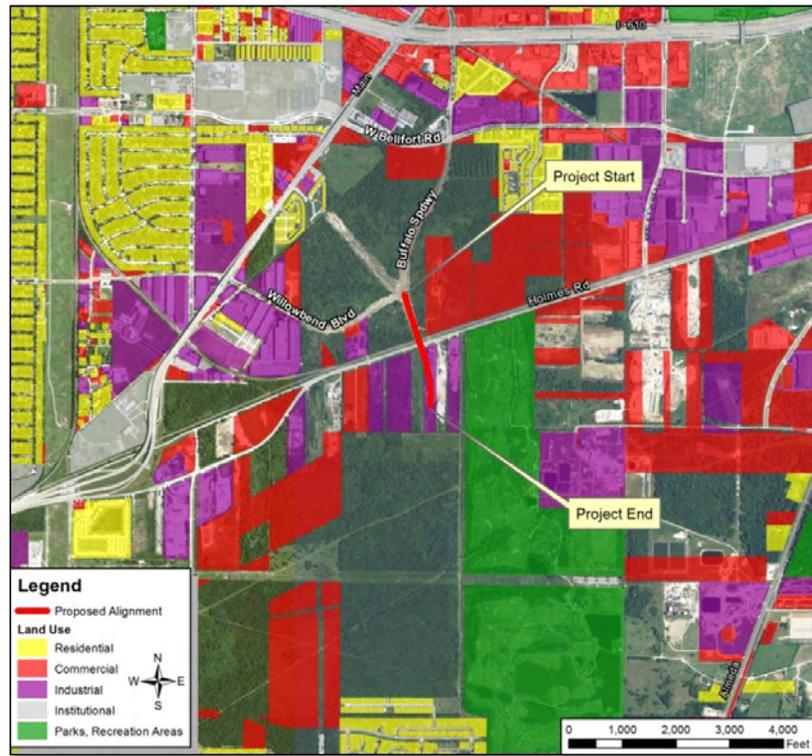
3.8 Socioeconomic Conditions

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. This section discusses the population, racial proportions and economic status of neighborhoods along proposed Buffalo Speedway.

The U.S. Census Bureau provides population characteristics for various geographic levels, including counties, census tracts, block groups and census blocks. Census tracts subdivide counties, block groups subdivide census tracts and blocks subdivide block groups. Figure 6 shows the census tracts, block groups and census blocks near the project corridor.

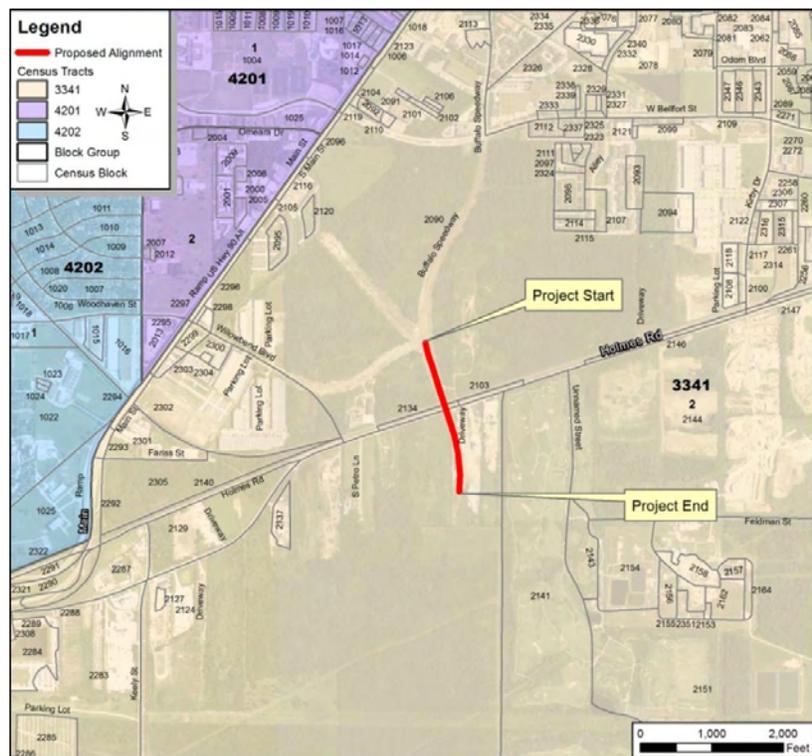
In 2010, the population of Census Blocks 2090, 2103, 2124 and 2134 of Census Tract 3341, which include the project corridor, was 1,887 residents. The 2000 population of the same geographical area in the 2000 Census was 1,458 residents; the population of this area grew by 29 percent in those ten years. Table 2 presents the population, racial and ethnic proportions of the blocks and block groups of the project corridor

Figure 5: Land Use



Source: Houston-Galveston Area Council, 2013.

Figure 6: 2010 Census Tracts, Block Groups and Blocks



Source: U.S. Census Bureau, 2010 Census.

Table 2: Population, Racial and Ethnic Characteristics, 2010 Census

<i>Geography</i>	<i>Total Population</i>	<i>Race</i>					<i>Ethnicity</i>	
		<i>White</i>	<i>Black</i>	<i>American Indian</i>	<i>Asian, Pacific Islander</i>	<i>Other or More than One</i>	<i>Hispanic</i>	
Census Tract 3341	9,914	2,196	5,729	53	673	1,263	2,599	
Block Group 2	6,286	1,539	3,250	31	655	811	1,550	
Block 2090	982	359	272	3	1	82	141	
Block 2103	0	0	0	0	0	0	0	
Block 2124	905	219	450	11	9	216	429	
Block 2134	0	0	0	0	0	0	0	
City of Houston	2,099,451	1,060,491	498,466	14,997	127,531	397,966	919,668	

Source: U.S. Census Bureau, 2010 Census.

in 2010, along with statistics for Houston.

The racial composition of the project corridor is predominantly African-American. The proportion of blacks in the four census blocks along the proposed alignment of Buffalo Speedway is 38 percent, 52 percent in Block Group 2 and 58 percent in Census Tract 3341. These are higher percentages of blacks than for Houston (24%). The proportion of whites in the four census blocks is 31 percent, 24 percent in Block Group 2 and 22 percent in Census Tract 3341, all of which are lower percentages than for Houston (51%). The racial composition Census Block 2090, north of Holmes Road has a higher percentage of whites (37%) and a slightly lower percentage of blacks (28%) than does Census Block 2124, south of Holmes Road (24% and 50%, respectively).

Thirty percent of the residents of the four project census blocks consider themselves Hispanic, regardless of race. This is a slightly higher percentage than the block group (25%), of the census tract (26%) and Houston (23%).

Economic data are available from the 2007-2011 5-year American Community Survey of the U.S. Census Bureau (Table 3) at the block group level and above. The residents of the project census tract have a 12-month median household income of \$44,954, virtually the same as for the city of Houston (\$44,124). Almost 13 percent of families in Census Tract 3341 are below the poverty limit set by the U.S. Department of Health and Human Services (\$23,850 for a family of four in 2014), as compared to 18 percent for Houston.

The dominant language of the project corridor is English. The 2007-2011 American Community Survey shows that 15 percent of residents in Census Tract 3341 that are over five years old speak English less than “very well,” as compared to almost 25 percent for Houston. The most common language spoken other than English is Spanish.

Table 3: Economic and Language Characteristics, 2007-2011 American Community Survey

<i>Category</i>	<i>Tract 3341, Block Group 2</i>	<i>Tract 3341</i>	<i>City of Houston</i>
Median household income	\$43,049	\$44,954	\$44,124
Number of families	1,118	2,269	474,649
Percentage of families below poverty level income	12%	13%	18%
Population over 5 years old	4,116	8,554	2,089,090
Over 5 years and speak English less than “very well”	13%	15%	25%

Source: U.S. Census Bureau, 2007-2011 American Community Survey.

4 Environmental Consequences

This section describes the potential impacts the proposed action would have on the natural and human environment.

4.1 Water Quality

Motor vehicles deposit pollutants on roads through automobile exhaust emissions and deposition of oils, fuels, wastes, metal scrapings and brake linings during travel and while braking. Storm water runoff carries vehicle pollutants, including suspended solids, heavy metals, nutrients and hydrocarbons, into streams. Suspended solids increase turbidity, transport other pollutants adhered to particle surfaces, and reduce runoff storage capacity in ponds and lakes. Heavy metals are toxic to many aquatic organisms and can accumulate in fish tissues, thus posing potential health risks to humans. Nutrients stimulate the growth of algae and aquatic plants, which die and degrade water quality by depleting oxygen levels below the level needed by fish. Biochemical oxygen-demanding pollutants are organic substances that break down by chemical or biological processes and deplete oxygen. Some hydrocarbons can pose risks to human health if drinking water or fish become contaminated with them.⁸

The amount of water pollution from highways depends on the volume of traffic and the area of pavement. The proposed action would add pavement area and thus increase the load of highway pollutants to Brays Bayou and Sims Bayou. However, other sources contribute much more pollution to these streams. Runoff from residential lawns and commercial parking lots are greater sources of pollutants. The minor increase in pollution loads from the proposed project would not affect water quality.

Pollution from storm water would be minimized during construction through adherence to measures in the project's *Storm Water Pollution Prevention Plan*, which would be prepared before construction. The TxDOT manual *Storm Water Management Guidelines for Construction Activities* would be employed. The following best management practices would be used to reduce pollutant loads to streams:

- Erosion would be reduced by using silt fences around construction areas and temporary vegetation on slopes.
- Sedimentation would be minimized by using silt fences and sand bag berms downstream of construction areas.
- After construction, unpaved areas would be planted with vegetative filter strips to control suspended solids.

Construction operators for the proposed project would handle fuel, hydraulic fluid, paint and possibly other hazardous substances, and generate small quantities of liquid wastes. The construction contractor would use measures to prevent spills of hazardous materials in the construction staging area. The contractor would handle and dispose of hazardous materials so as not to degrade water quality, in compliance with Texas and federal laws.

The Texas 2012 list of impaired stream segments⁹ under Section 303(d) of the Clean Water Act shows that the proposed project does not cross a threatened or impaired stream segment but is within five miles upstream of impaired stream. Both Sims Bayou and Brays Bayou, which are within five miles downstream of the project corridor, are impaired by high counts of fecal coliform bacteria. Coordination with the Texas Commission on Environmental Quality is required for total maximum daily loads.

Because the project would disturb more than five acres, the City of Houston would comply with the General Permit for Construction for the Texas Pollutant Discharge Elimination System, administered by the Texas Commission on Environmental Quality. Houston would file a Notice of Intent to comply with the General Permit, stating that the Houston would have a *Storm Water Pollution Prevention Plan* in place during the construction of this project.

4.1.1 Floodplains

The 100-year floodplain is the area with one percent chance of inundation by floods each year on average. The proposed project corridor does not cross a stream and is fully above the 100-year floodplain¹⁰ (Figure 7).

The hydraulic design of the proposed project would be in accordance with current TxDOT and Federal Highway Administration design standards. The proposed project would not increase the base flood elevations to a level that would violate floodplain regulations. The proposed project would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing severe damage to the roadway, stream or properties. The proposed project would not change the extent of either the 100-year floodplain or the frequency or severity of flooding.

4.1.2 Coastal Management

The proposed project is not within the boundary of the Texas Coastal Management Program. The proposed action will not have a direct or significant adverse effect on coastal natural resource areas, as identified in the applicable policies.

4.2 Farmland

The proposed project right-of-way is vacant and industrial land; there is no farmland in the project right-of-way.

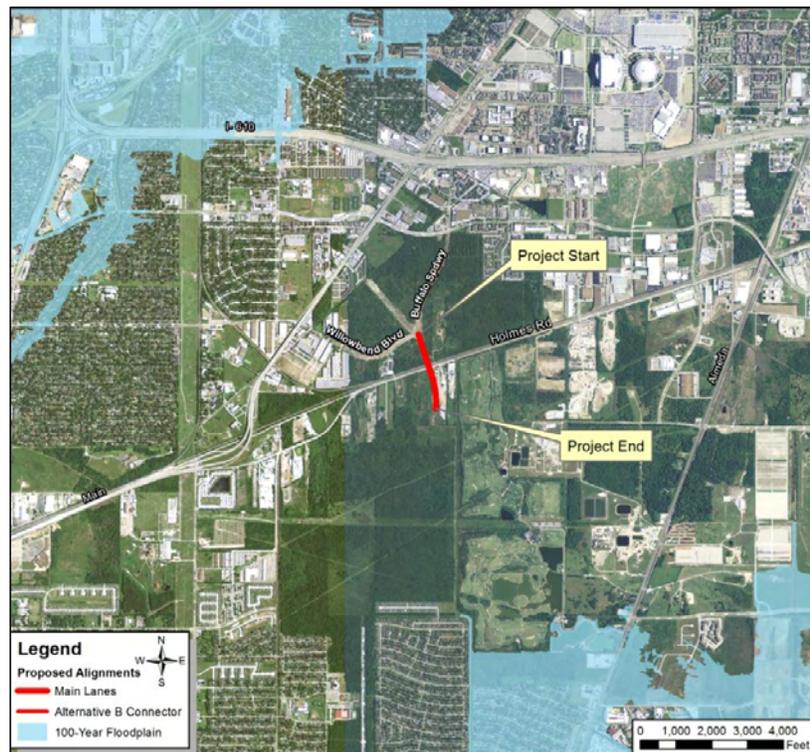
4.3 Plant Communities

The proposed action would remove 1.77 acres of early successional woods and 1.80 acres of old fields and grasslands (Table 4). It would not affect wetlands.

The proposed action would require clearing of fencerow trees with diameters of up to 12 inches and heights up to 25 feet.

The loss of these wooded plant communities due to the proposed project would be a minor impact to the region,

Figure 7: Floodplains



Source: Federal Emergency Management Agency, No. 48201 C 0870L, June 18, 2007.

since these woods are very common, developing on abandoned land about 20 years after abandonment. The project would not cause a substantial reduction of wooded area in the region. Likewise, old fields and grasslands are very common in the region and the loss from this project would not be a substantial reduction of grassland area in the region.

Table 4: Plant Communities in Proposed Right-of-Way

Description	Tree Diameter Range (inches)	Affected Area (acres)
Early Successional Woods	2-12	1.77
Old Fields and Grasslands	--	1.80

Field surveys of vegetation (Figure 8) show that most of the proposed project right-of-way north of the Union Pacific Railroad and Holmes Road is old field. South of Holmes Road, the route crosses a meadow and a wooded fencerow, and then extends into a gravel-covered former industrial area.

A memorandum of agreement between TxDOT and TPWD requires that these special habitats be considered for compensatory mitigation:

- Habitat for Federal candidate species;
- Rare vegetation series;
- Unusual or special habitat features;
- Bottomland hardwood, native prairie, and riparian areas; and
- Locally important habitat.

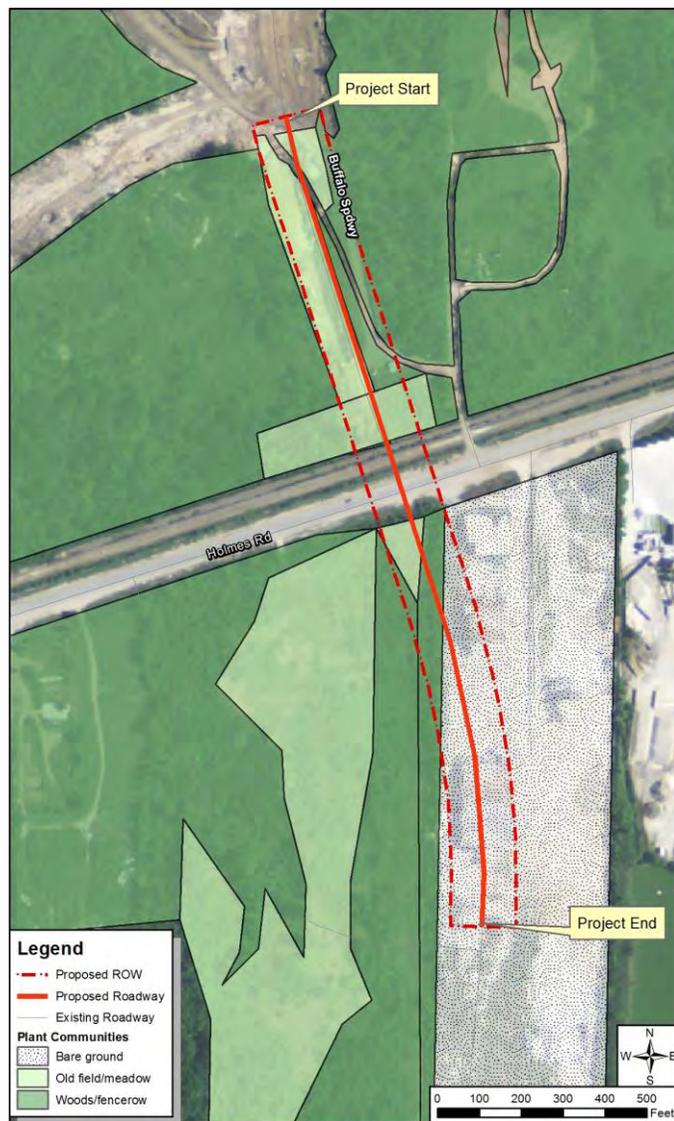
The proposed action would not result in the loss of these special habitats.

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 re-seeded according to the TxDOT specification *Seeding for Erosion Control*. Mowing, seeding, herbicide use and mechanical brush control would be conducted according to TxDOT's *Standards of Vegetation Management*.

4.3.1 Wetlands

The proposed action would not affect wetlands.

Figure 8: Vegetation in the Project Area



Source: Quadrant Consultants Inc.

4.3.2 Invasive Species

In compliance with Executive Order 13112 on Invasive Species, the City of Houston would take steps to prevent the introduction of invasive species, control inadvertent introductions and minimize economic, ecological and human health impacts. Native plant species would be used in the landscaping and in the seed mixes where practical. Soil disturbance would be minimized so that invasive species would not establish in the right-of-way. Construction equipment would be washed before they are brought to the project area to prevent seeds or propagules of invasive species that may be carried in the mud on construction equipment from being inadvertently introduced to the area.

4.4 Wildlife

The loss of plant communities by the proposed project, described in the previous section, would also affect wildlife. The proposed action would remove 1.77 acres of woods and 1.80 acres of grassland and old field, which provide habitat for wildlife. Habitat loss would likely cause a proportional reduction in wildlife populations. However, the affected plant communities and the affected wildlife species are common and found throughout the region, and therefore the project would result in minor impacts to wildlife.

4.4.1 Endangered Species

Endangered species are plant and animal species that are in imminent danger of extinction; threatened species are likely to become endangered soon. The U.S. Fish & Wildlife Service and the Texas Parks & Wildlife Department keep lists of endangered species, threatened species and candidate species for these categories; the Texas list also includes species and habitats of concern. Table 5 is a list of endangered and threatened species and species and habitats of concern in Harris County.

Table 5: Endangered Species of Harris County

Common Name	Scientific Name	State Status ^a	Federal Status ^a	Habitat Description	Habitat Present?	Project Effect?
Amphibians						
Houston toad	<i>Bufo houstonensis</i>	E	E†	Sandy soil, breeds in ephemeral pools	No	No
Birds						
American peregrine falcon	<i>Falco peregrinus anatum</i>	T	DM†	Potential migrant, nests in west Texas	No	No
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	SOC	DM†	Potential migrant	No	No
Bald eagle	<i>Haliaeetus leucocephalus</i>	T	DM	Near water areas, in tall trees	No	No
Black rail	<i>Laterallus jamaicensis</i>	SOC		Freshwater marshes and grassy swamps	No	No
Brown pelican	<i>Pelecanus occidentalis</i>	E	DM†	Island near coastal areas	No	No
Henslow's sparrow (wintering)	<i>Ammodramus henslowii</i>	SOC		Weedy fields, fields with bunch grass, vines, and brambles, needs bare ground	No	No
Mountain plover	<i>Charadrius montanus</i>	SOC		Short grass plains and bare dirt (plowed fields)	No	No
Red-cockaded woodpecker	<i>Picoides borealis</i>	E	E†	Nest in 60+ year old pines, forages in 30+ year old pines	No	No
Snowy plover	<i>Charadrius alexandrinus</i>	SOC		Coastal winter migrant	No	No
Southeastern snowy plover	<i>Charadrius alexandrinus tenuirostris</i>	SOC		Winter migrant on Texas coast beaches, bayside mud or salt flats	No	No

Common Name	Scientific Name	State Status ^a	Federal Status ^a	Habitat Description	Habitat Present?	Project Effect?
Sprague's pipit	<i>Anthus spragueii</i>	SOC	C†	Migrant, upland prairie, coastal grasslands	No	No
White-faced ibis	<i>Plegadis chihi</i>	T	†	Freshwater marshes, but some brackish or salt marshes	No	No
White-tailed hawk	<i>Buteo albicaudatus</i>	T		Coastal prairies	No	No
Whooping crane	<i>Grus americana</i>	E	E†	Winters in Aransas NWR	No	No
Wood stork	<i>Mycteria americana</i>	T	E†	Prairie ponds and flooded pastures	No	No
Fishes						
American eel	<i>Anguilla rostrata</i>	SOC		Coastal waterways below reservoirs to gulf	No	No
Creek chubsucker	<i>Erimyzon oblongus</i>	T		Variety of small rivers and creeks, prefers headwaters	No	No
Smalltooth sawfish	<i>Pristis pectinata</i>	E	E†	Various water depths	No	No
Mammals						
Louisiana black bear	<i>Ursus americanus luteolus</i>	T	T†	Bottomland hardwoods; large, undisturbed forest areas	No	No
Plains spotted skunk	<i>Spilogale putorius interrupta</i>	SOC	†	Wooded, brushy areas and tall-grass prairie	No	No
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	T	†	Cavity trees in hardwood forest, concrete culverts, abandoned buildings	No	No
Red wolf	<i>Canis rufus</i>	E	E†	Extirpated, brushy, forested areas, coastal prairies	No	No
Southeastern myotis bat	<i>Myotis austroriparius</i>	SOC		Cavity trees in hardwood forest, concrete culverts, abandoned buildings	No	No
Mollusks						
Little spectacle-case	<i>Villosa lienosa</i>	SOC		Creeks, rivers, and reservoirs, sandy substrates, slight to moderate currents, along banks in slower currents	No	No
Louisiana pigtoe	<i>Pleurobema riddellii</i>	T		Streams and moderate-sized rivers, mud, sand and gravel	No	No
Sandbank pocketbook	<i>Lampsilis satura</i>	T		Rivers with moderate to swift flows, gravel-sand and sand	No	No
Texas pigtoe	<i>Fusconaia askewi</i>	T		Rivers with mixed mud, sand and fine gravel in protected areas	No	No
Wabash pigtoe	<i>Fusconaia flava</i>	SOC		Creeks to rivers, mud, sand, and gravel, moderate to swift currents	No	No
Reptiles						
Alligator snapping turtle	<i>Macrochelys temminckii</i>	T		Deep water of rivers and canals	No	No
Green sea turtle	<i>Chelonia mydas</i>	T	T†	Gulf and bay system	No	No
Gulf salt marsh snake	<i>Nerodia clarkii</i>	SOC		Saline flats, coastal bays, and brackish river mouths	No	No
Kemp's Ridley sea turtle	<i>Lepidochelys kempii</i>	E	E†	Gulf and bay system	No	No
Leatherback sea turtle	<i>Dermochelys coriacea</i>	E	E†	Gulf and bay system	No	No
Loggerhead sea turtle	<i>Caretta caretta</i>	T	T†	Gulf and bay system	No	No
Smooth green snake	<i>Liochlorophis vernalis</i>	T		Gulf coastal prairies, prefers dense vegetation	No	No
Texas horned lizard	<i>Phrynosoma cornutum</i>	T	†	Open, semi-arid regions, with bunch grass	No	No
Timber or canebrake rattlesnake	<i>Crotalus horridus</i>	T		Swamps and floodplains of hardwood and upland pine	No	No
Plants						
Coastal gay-feather	<i>Liatris bracteata</i>	SOC		Coastal prairie grasslands	No	No

Common Name	Scientific Name	State Status ^a	Federal Status ^a	Habitat Description	Habitat Present?	Project Effect?
Florida ladies-tresses	<i>Spiranthes brevilabris</i> var. <i>floridana</i>	SOC		Moist to wet, open sites, pine-dominated uplands, open scrub pine-lands with saw palmetto	No	No
Giant sharpstem umbrella-sedge	<i>Cyperus cephalanthus</i>	SOC		Deep prairie depressions on saturated, fine sandy loam soils or on heavy black clay	No	No
Houston daisy	<i>Rayjacksonia aurea</i>	SOC		Barren, sparsely vegetated saline slicks, pimple mounds, on sandy to sandy loam	No	No
Neglected coneflower	<i>Echinacea paradoxa</i> var. <i>neglecta</i>	SOC		Rocky prairies, glades and cross-timber open woodlands and savannas, full sun	No	No
Panicled indogobush	<i>Amorpha paniculata</i>	SOC		Acid seep forests, peat bogs, wet floodplain forests and seasonal wetlands on the edge of saline prairies	No	No
Texas ladies-tresses	<i>Spiranthes brevilabris</i> var. <i>brevilabris</i>	SOC		Sandy soils in moist prairies	No	No
Texas meadow-rue	<i>Thalictrum texanum</i>	SOC		Woodland margins on sandy loam, on pimple mounds, clay pan savannas	No	No
Texas prairie dawn	<i>Hymenoxys texana</i>	E	E	Poorly drained areas in open grasslands; pimple mounds	No	No
Texas windmill-grass	<i>Chloris texensis</i>	SOC		Sandy to sandy loam soils in bare areas	No	No
Threeflower broomweed	<i>Thurovia triflora</i>	SOC		Low vegetation, on light colored silt or fine sand over saline clay	No	No

Source: U.S. Fish & Wildlife Service and Texas Parks & Wildlife Department.

^a 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; AD = proposed delisting; SAT = similarity of appearance to a threatened taxon.

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

The project area is in the potential range of the endangered Texas prairie-dawn (*Hymenoxys texana*) and Texas windmill-grass (*Chloris texensis*), a species of concern in Texas. A qualified biologist performed a field survey of the proposed right-of-way on September 18, 2013, and did not find the characteristic habitat for Texas prairie-dawn: sandy “mima mounds” that are completely unshaded and have good drainage. Therefore, Texas prairie-dawn is very unlikely to be present in the project right-of-way. Texas windmill-grass was not found during the field survey. It is very unlikely to occur in the project lands.

The Texas Parks & Wildlife Department was contacted on October 3, 2013, about the potential for endangered species or critical habitat in the proposed right-of-way of this project. The agency responded with a letter that is reproduced in Appendix B, indicating that the Department’s Wildlife Habitat Assessment Program does not anticipate significant impacts to rare, threatened or endangered species, or other fish and wildlife resources. In addition, the Texas Parks & Wildlife Department’s Natural Diversity Database (January 28, 2008 version) was consulted on October 2, 2013, for any records of endangered and rare species and habitats in the Bellaire quadrangle, which includes the area within 1½ miles of the project corridor. The project corridor is at least 1½ miles from any recorded site of an endangered, threatened or rare species in the Natural Diversity Database.

Henslow’s sparrow is a species of concern on the Texas list. It is found in grasslands, especially “large, flat fields with no woody plants, and with tall, dense grass, a dense litter layer, and standing dead vegetation.”¹¹ Although there is grassland habitat in the project corridor south of

Holmes Road, the fields are not large, woody plants are present and there is little or no litter layer or standing dead vegetation. Therefore, the project corridor does not contain Henslow's sparrow habitat, and the project would not have an impact on the Henslow's sparrow.

Therefore, the project would have no effect on endangered, threatened or candidate species on the federal list, and it would not have an impact on endangered or threatened species, or species or habitats of concern, on the Texas list.

4.4.2 Migratory Birds

The City of Houston would avoid harming migratory birds by clearing trees outside the nesting season (March through August), unless the area to be cleared during the nesting season is specifically surveyed to confirm the absence of nesting birds. If migratory birds or their nests were encountered in the right-of-way during project construction, any harm to migratory birds would be avoided.

4.4.3 Essential Fish Habitat

The Manguson-Stevens Fishery Conservation and Management Act, as amended on October 11, 1996, directs that all Federal agencies, whose actions would affect essential fish habitat, must consult with the National Marine Fisheries Service regarding potential adverse effects. The only essential fish habitat in the Houston area is tidal waters. Since tidal waters are not in the proposed project area, the proposed action would not affect essential fish habitat.

4.5 Air Quality

Since the proposed project is in the Houston-Galveston-Brazoria air quality region, which is in marginal non-attainment of the national 8-hour ozone standard, transportation conformity rules apply.

All projects in the Houston-Galveston Area Council's *2013-2016 Transportation Improvement Program*¹² (TIP) that are proposed for federal or state funds are consistent with federal guidelines in Section 450 of Title 23, Code of Federal Regulations and Section 613.200, Subpart B of Title 49. The TIP considers energy, environment, air quality, cost and mobility. The U.S. Department of Transportation (Federal Highway Administration and Federal Transit Administration) found the *2035 Regional Transportation Plan Update*¹³ (RTP) to conform to the State Implementation Plan on January 25, 2011, and the 2013-2016 TIP to conform to the State Implementation Plan on November 1, 2012.

The proposed project is not listed in the 2013-2016 TIP, but it is listed in the 2015-2018 TIP, which has been approved by the Transportation Planning Council and published by the Houston-Galveston Area Council. It is anticipated that the U.S. Department of Transportation will approve this TIP shortly. In addition, the 2035 RTP lists this project. Until it is listed in an approved TIP, the Federal Highway Administration will not make a decision on this project. Excerpts from the 2015-2018 TIP and the 2035 RTP, showing the proposed project, are in Appendix E of this document.

The average annual traffic volume on the project corridor is projected to be up to 22,100 vehicles per day in 2035, the design year for the project. A previous TxDOT modeling study demonstrated that it is unlikely that the carbon monoxide standard would ever be exceeded when traffic volume falls below 140,000 vehicles per day. The traffic volume is not projected to exceed 140,000 vehicles per day; therefore, a traffic air quality analysis is not required.

4.5.1 Congestion Management Process

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 people and goods to levels that meet state and local needs. The proposed project was developed from the Houston–Galveston Area Council’s operational CMP, which meets all requirements in Section 500.109 of Title 23 of the *Code of Federal Regulations*. The CMP was instituted by the Houston–Galveston Area Council in 2009 and revised in 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; they are included in the financially constrained RTP, and future resources are reserved for their implementation. The CMP element of the plan carries an inventory of all project commitments (including those resulting from major investment studies) that details type of strategy, implementing responsibilities, schedules and expected costs. At the project’s programming stage, travel demand reduction strategies and commitments will be added to the regional TIP or included in construction plans. The regional TIP programs these projects at appropriate times for single-occupancy vehicle (SOV) facility implementation and project-specific elements. Committed congestion reduction strategies and operational improvements near the project corridor are listed in Table 6.

To reduce congestion and the need for SOV lanes in the region, TxDOT and the Houston–Galveston Area Council will continue to promote appropriate congestion reduction strategies through the Congestion Mitigation Air Quality (CMAQ) program, the CMP and the RTP. The congestion reduction strategies considered for this project would help alleviate congestion in the project corridor, but would not eliminate it. The congestion mitigation analysis for added SOV capacity projects in the Houston-Galveston area is on file and available for review at the Houston-Galveston Area Council, 3555 Timmons Drive, Houston, Texas.

4.5.2 Mobile Source Air Toxic Pollutants

Controlling toxic air emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxic pollutants, 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*,¹⁴ and identified 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (<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 (<http://www.epa.gov/ttn/atw/nata1999/>). These are acrolein, benzene, 1,3-butadiene, diesel particu-

Table 6: Congestion Mitigation Measures near Project Corridor

<i>Location</i>	<i>Congestion Mitigation Measure</i>	<i>Completion Date</i>
Cambridge Road at IH 610	Construct Cambridge overpass at IH 610	2015
SH 288 at IH 610	Traffic System Management improvements at Texas Medical Center: add exit ramp on IH 610 before Alameda Road, re-align existing connector and add entrance ramp on SH 288	2016
SH 288 at IH 610	Construct 2-lane direct connector from IH 610 eastbound to SH 288 southbound	2016

Source: Houston-Galveston Area Council

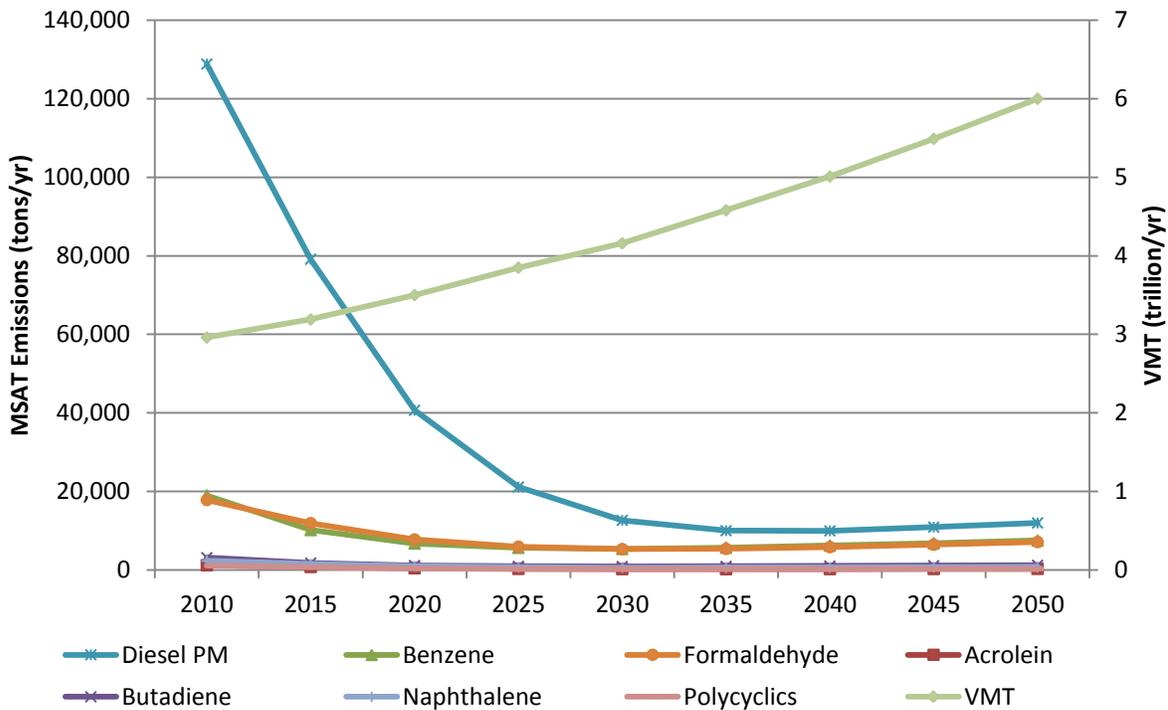
late matter with diesel exhaust organic gases (“diesel PM”), formaldehyde, naphthalene and polycyclic organic matter. While the Federal Highway Administration (FHWA) considers these the priority mobile source air toxins, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA Mobile Source Air Toxic (MSAT) Pollutants 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 MOVES 2010b model, as shown in Figure 9 and Table 7, even if vehicle-miles traveled (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.

Air toxic pollutant analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxins, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes due to lifetime MSAT exposure remain limited. These limits impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making in the context of the National Environmental Policy Act of 1969. FHWA, EPA, the Health Effects Institute and others have funded and conducted research studies to define potential risks from MSAT emissions associated with highway projects more clearly. 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 from project alternatives. The quali-

Figure 9: Projected National MSAT Emission Trends



Source: EPA MOVES 2010b model runs conducted during May–June 2012 by FHWA.

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

Table 7: Projected National MSAT Emission Trends

<i>Pollutant</i>	<i>Annual Pollutant Emissions (tons) or Vehicle Miles Traveled (VMT)</i>									<i>Change,</i>
	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030</i>	<i>2035</i>	<i>2040</i>	<i>2045</i>	<i>2050</i>	<i>2010 to 2050</i>
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%
Polycyclic organic matter	1,102	705	414	274	218	207	219	240	262	-76%
VMT (trillions)	2.96	3.19	3.50	3.85	4.16	4.58	5.01	5.49	6.00	+102%

Source: EPA MOVES 2010b model runs conducted during May–June 2012 by FHWA.

tative assessment presented below is derived in part from a study conducted by FHWA.¹⁵

For the proposed action in this document, the amount of MSAT emitted would be proportional to VMT. Because the estimated VMT for no action is lower than for the proposed action, higher levels of MSAT are expected from the proposed action as compared to no action. However, emissions will likely be lower than present levels in the design year because of EPA’s national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. 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 virtually all locations.

Under the proposed action, vehicles would travel between Willowbend Boulevard and 1,500 feet south of Holmes Road, in areas where there is currently no vehicle traffic. Therefore, there would be local areas where VMT would increase and localized increases in MSAT emissions may occur. The local increases in MSAT emissions would likely be most pronounced along the new roadway segment that would be built under the proposed action. However, even if these increases do occur, they too will be substantially reduced in the future due to EPA’s vehicle and fuel regulations.

In sum, under the proposed action, it is expected there would be higher MSAT emissions overall in the project area relative to no action due to vehicular traffic introduced into an area currently without traffic, but EPA’s MSAT reduction programs would reduce future levels through the design year.

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

In FHWA’s view, information is incomplete or unavailable to predict the project-specific health impacts credibly due to changes in MSAT emissions from proposed 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. It is the lead authority for administering the Clean Air Act and its amendments and it has specific statutory obligations with respect to hazardous air pollutants and

MSAT. The EPA continually assesses human health effects, exposures and risks posed by air pollutants. They maintain the Integrated Risk Information System, which is “a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects.”¹⁶ Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhaled exposures, with uncertainty spanning about 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. Two Institute studies are summarized in Appendix D of FHWA’s *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings, cancer in animals, and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious are the adverse human health effects of MSAT compounds at current environmental concentrations¹⁷ or in the future as vehicle emissions substantially decrease.¹⁸

The methods for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling and final determination of health impacts. Each step in the process builds 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 project alternatives. These difficulties are magnified for lifetime (*i.e.*, 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time, since such information is unavailable.

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

There is considerable uncertainty in the current estimates of toxicity of mobile source air toxic pollutants. Factors such as low-dose extrapolation and translation of occupational exposure data to the general population (a concern expressed by the Health Effects Institute¹⁹) lead to this uncertainty. Therefore, there is no national consensus on air dose-response values that can be assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA²⁰ and the Health Effects Institute²¹ have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. Currently, the EPA, as mandated by the Clean Air Act, determines if emission standards for industrial sources, such as benzene emissions from refineries, provide an ample margin of safety to protect public health and to prevent adverse environmental effects (subject to the maximum achievable control technology standards) or if more stringent controls are required. The decision framework is a two-step process. In the first step, EPA determines an acceptable level of risk due to emissions from a source, which is generally no greater than 100 attributable cancer cases among a million people. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one case among a million people due to emissions from a source. The results of this two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in a million; in some cases, the residual risk determination could re-

sult in maximum individual cancer risks that are as high as 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's two-step approach to assessing risk.

Information is incomplete or unavailable to establish that even the largest of highway projects would result in unacceptable levels of risk. Because of the limits to forecasting health impacts described above, 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, lower accident rates and fatalities, and improved access for emergency response, that are better suited for quantitative analysis.

In this document, a qualitative MSAT assessment has been provided for the MSAT emissions of the proposed action, acknowledging that the project may result in increased exposure to MSAT emissions in certain locations. Nonetheless, the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

4.5.3 Air Quality Impacts During Construction

Construction equipment would temporarily raise dust and emit air pollutants in their exhausts. Impacts would be minimized by 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.

4.6 Noise

This analysis was done in accordance with TxDOT's *Guidelines for Analysis and Abatement of Highway Traffic Noise*, which is approved by the Federal Highway Administration.

Sound from highway traffic is generated mostly from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies, but the human ear does not perceive all frequencies equally. An adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dBA."

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

Noise abatement criteria for various land use activity areas (Table 8) are used as one means to determine when a traffic noise impact will occur.

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

Absolute criterion: the predicted noise level at a receiver approaches, equals or exceeds the noise abatement criteria. "Approach" is defined as one dBA below the criterion. For example, a noise

Table 8: Noise Abatement Criteria

<i>Activity Category</i>	<i>Criterion L_{eq} (dBA)</i>	<i>Description</i>
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.

Source: Federal Highway Administration.

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

impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.

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

No noise impact would occur if the proposed action were built, because no noise receiver is located close to the proposed right-of-way.

Land use activity areas between Willowbend Boulevard and Holmes Road are currently Category G, undeveloped land, and land use activity areas south of Holmes Road along the proposed Buffalo Speedway right-of-way are currently Category F, industrial land. In addition, no new development is currently planned, designed or programmed in these areas. There is no noise abatement criterion for undeveloped or industrial land. However, to avoid noise impacts that may result from future development or redevelopment of properties adjacent to the project, local officials responsible for land use control programs should ensure that new activities are not planned or constructed along or within the predicted 2035 noise impact contours (Table 9).

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the

Table 9: Noise Contours for Future Development

<i>Land Use</i>	<i>Contour (dBA)</i>	<i>Distance from Right-of-Way (feet)</i>	
		<i>Along Bridge</i>	<i>Elsewhere</i>
Residential	66	27	44
Commercial	71	Inside ROW	Inside ROW

major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are tolerable. None of the receivers would be exposed to construction noise for long; therefore, extended disruption of normal activities is not expected. The plans and specifications would require the contractor to make reasonable efforts to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

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

4.7 Socioeconomic Impacts

4.7.1 Displacements

The proposed project would not displace homes or businesses.

4.7.2 Community Impacts

Since the project corridor does not traverse residential land, no residential neighborhood would be affected by the proposed project. In addition, the project would not affect community services, because no community service center, park or school is in the project corridor. Furthermore, the proposed action would not bisect, remove access to or otherwise affect intact neighborhoods.

4.7.3 Environmental Justice

Executive Order 12898, “Federal Actions to Address Environmental Justice in Minority and Low-Income Populations,” requires federal agencies to identify and avoid disproportionate adverse human health and environmental effects of federal actions on minority or low-income populations. Minority and low-income populations are present in the project area. Census Blocks 2090 and 2124 of Census Tract 3341 have at least 63 percent minority populations, and 12 percent of families in Block Group 2 of Census Tract 3341 have income below the poverty limit.

However, the land adjacent to project corridor is undeveloped, and minority and low-income residents live at least $\frac{3}{4}$ mile from the project corridor. Increased noise from the proposed project would not affect any resident, since no noise receiver is located along the project corridor. In addition, the project would not displace homes or businesses, communities would remain cohesive, and social service facilities would be no less accessible if the proposed project were built. Since the project would not affect residential communities, it would not disproportionately affect minority or low-income populations.

4.7.4 Limited English Proficiency

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency,” requires federal agencies to ensure that people with limited English proficiency have meaningful access to federal programs and activities. Of the 4,116 residents of Block Group 2 of Census Tract 3341 that were over five years old in 2010, 13 percent spoke English less than “very well.” The other language most commonly used is Spanish. TxDOT will accommodate non-English speakers for public involvement in this project by advertising public meetings in both English and Spanish, and by having several Spanish-speaking staff members attend public meetings to answer questions from Spanish-speaking attendees.

4.8 Archaeological Resources

TxDOT's Potential Archeological Liability map for the project corridor (Figure 10) shows that the northern 0.1 mile of the project corridor is in a Category 2a area. This area has potential for bearing archaeological resources, and TxDOT recommends a surface study of mounds only in this area; no deep reconnaissance is recommended. The rest of the project corridor is in a Category 4 area, with little potential for bearing archaeological resources, and no survey is recommended there.

TxDOT archaeologists have inspected aerial photographs from January 2009 to April 2014, which show that the proposed project lands in the Category 2a area had been completely cleared and graded for construction before the City of Houston began this project. The project lands have potential for archeological deposits only at the surface, because the soils are relict ancient soils on stable landforms that generally predate human occupation in Texas. Since no deeply buried archeological deposits are likely, and any intact archeological materials near the surface would have been destroyed by clearing and grading activity, TxDOT archaeologists have determined that the project lands do not warrant an archeological investigation.

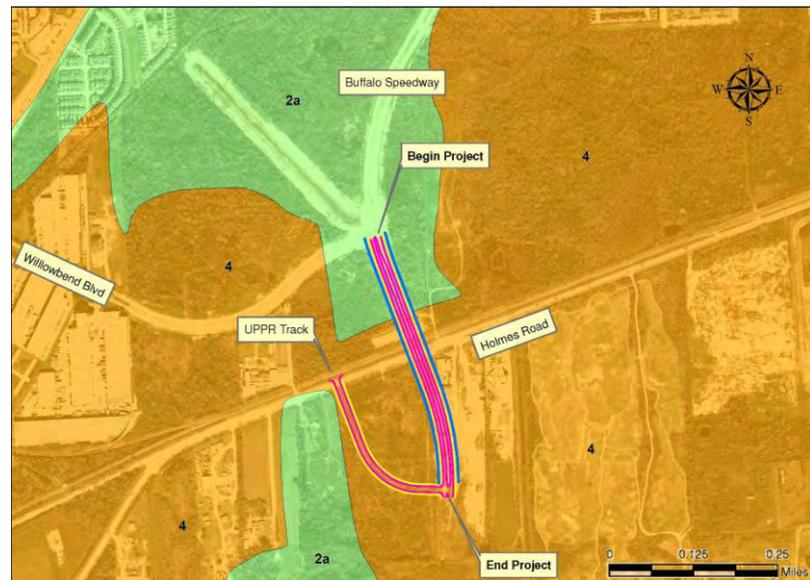
Section 106 review and consultation has been done in accordance with the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer and the Advisory Council on Historic Preservation regarding the Implementation of Transportation Undertakings, as well as the Memorandum of Understanding between the Texas Historical Commission and TxDOT.²²

Pursuant to Stipulation VI of the Programmatic Agreement, TxDOT finds that the project land does not contain archaeological historic properties, and thus the proposed project would not affect archaeological historic properties. The project does not merit further field investigations. Project planning may also proceed, in compliance with the Memorandum of Understanding. If unanticipated archaeological deposits are encountered during construction, work in the immediate area would cease, and TxDOT archaeological staff would be contacted to initiate post-review discovery procedures under the provisions of the Programmatic Agreement and the Memorandum of Understanding.

4.9 Historic Resources

A review of the National Register of Historic Places, the list of State Archeological Landmarks and the list of Recorded Texas Historic Landmarks indicates that no historically significant property has been documented within the area of

Figure 10: Potential Archaeological Liability Map



Source: Texas Department of Transportation.

2a: Surface study of mounds only; no deep reconnaissance recommended.

4: No survey recommended.

potential effects (APE). Through consultation with the State Historic Preservation Officer (SHPO), it has been determined that the APE for the proposed project is the area within 150 feet of the proposed right-of-way. A cultural resource survey conducted by TxDOT personnel shows that there is no historic-age resource (built before 1965) within the APE of the project. No Official State Historical Marker is within the APE of the project.

Pursuant to Stipulation VI, “Undertakings with Potential to Cause Effects” of the first amended statewide Programmatic Agreement for Cultural Resources and the Memorandum of Understanding between TxDOT and the Texas Historical Commission, TxDOT historians have determined that no historic-age resource is present within the APE of either proposed project. Therefore, individual coordination with the SHPO is not required.

4.10 Public Parks and Wildlife Refuges

Public parks, public recreation areas, wildlife and waterfowl refuges, historic sites and historic districts are protected under Section 4(f) of the Department of Transportation Act of 1966 against encroachment by transportation projects. The project corridor does not include any Section 4(f) land, so no such land would be affected by the proposed project. A Section 4(f) evaluation is not required.

4.11 Aesthetic Impacts

The proposed action would introduce a bridge that would rise about 35 feet over the surrounding landscape, changing the visual environment for several miles in each direction from the project corridor. A highway bridge of this height is not out of character with the surrounding landscape. US 90A has a bridge of similar height one mile to the west, and Almeda Road has an even higher bridge 1¾ miles to the east. Nonetheless, the project would introduce another bridge to this area and would have an effect on the visual environment for some residents.

4.12 Hazardous Materials

Databases maintained by the U.S. Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) were searched for potential hazardous materials sites within standard radii of the highway (Table 10 and Appendix D). In addition, current and prior land uses were investigated for indications of activities that could generate contamination. This study was performed in accordance with Practice E1527-05 of the American Society of Testing and Materials, and is pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 and the Resource Conservation and Recovery Act of 1976. The City of Houston maintains detailed files of the results of the results of this study.

One State Priority List Site is listed within one mile of the project corridor:

- Houston Lead, 300 Holmes Road (TCEQ No. 100664242), was a lead-acid battery recycling company, about ⅔ mile west of the project corridor. Contaminants of concern and affected media are not listed in the regulatory database information. However, even if groundwater were affected, it is unlikely to affect the project corridor due to the site’s distance and position (cross-gradient). The facility is listed as deleted from the State Priority List, indicating either remedial activity has been completed or the site’s hazard ranking was not high enough to remain on the list. This site is not an environmental concern to the project corridor.

One Texas Volunteer Cleanup site is within ¼ mile of the project corridor:

Table 10: Potential Hazardous Materials Sites

<i>Database</i>	<i>Regulatory Agency</i>	<i>Radius</i>	<i>Sites</i>
National Priority List	U.S. EPA	1 mile	0
Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)	U.S. EPA	½ mile	0
CERCLIS No Further Remedial Action Planned	U.S. EPA	½ mile	1
Resource, Conservation and Recovery Act (RCRA)	U.S. EPA	1 mile	1
Resource Conservation and Recovery Information System (RCRIS)	U.S. EPA	1 mile	0
Treatment, Storage and Disposal Facilities			
RCRIS Hazardous Waste Generators	U.S. EPA	¼ mile	1
RCRIS Hazardous Waste Generator Violations and Corrective Action Reports	U.S. EPA	1 mile	1
Toxic Release Inventory System	U.S. EPA	¼ mile	0
State Priority List	TCEQ	1 mile	1
Registered Petroleum Storage Tanks	TCEQ	¼ mile	3
Leaking Petroleum Storage Tanks	TCEQ	500 feet	0
Emergency Response Notification and Texas Spills	TCEQ	¼ mile	0
Municipal Solid Waste and Landfills	TCEQ	1 mile	1
Texas Voluntary Cleanup Program List	TCEQ	¼ mile	1

Source: HVJ & Associates, 2013.

- 922 Holmes Road (TCEQ No. 0630) was a battery reclamation and road equipment facility. TCEQ records were reviewed in 2007 and 2013 for this site. The site appears to include the current vacant industrial site used more recently by Mischer Harris Construction, Freedom Environmental Group and Koastal Precast (listed below), as well as the parcel of land immediately west of this parcel. Used battery casings were apparently used as roadbed materials and the site is reported to have had contamination of soil and groundwater with lead and other heavy metals, petroleum hydrocarbons, methyl tertiary butyl ether, volatile organic compounds and polycyclic aromatic hydrocarbons. The responsible party excavated and disposed of contaminated soil off-site as their remediation of the site, with a target maximum lead concentration of 200 milligrams per kilogram of host material. Most of confirmation samples were reported to have lead concentrations well below 200 mg/kg. In addition, groundwater monitoring indicated no need to treat groundwater. The TCEQ issued a final certificate of completion in September 2002, with the site deemed protective of non-residential uses and exposure to construction workers, and no additional investigation is required. However, the site has been declared closed to residential use according to the RRS2 standard. If soils are planned for removal from the site and transported for disposal or placement on another site, TCEQ advises that Toxicity Characteristic Leaching Procedure testing be done to assess disposal methods, and Synthetic Precipitation Leaching Procedure testing be done to assess suitability for off-site use.

One site within ½ mile of the project corridor is listed by the EPA as a CERCLIS No Further Remedial Action Planned site:

- Browning-Ferris Industries, Holmes Road Site, 1110 Homes Road (EPA No. TXD980514707) is a former landfill that was listed as contaminated in 1979. Preliminary assessment and site inspection was completed in 1981. This site has been determined to be free of contamination risk and was archived in 1994. It is currently a golf course. This site does not pose a threat to the project corridor.

One site within one mile of the project corridor is listed by the EPA as a RCRA Corrective Action site:

- Houston Lead, 300 Holmes Road (EPA No. TXD008070419) was a lead-acid battery recycling company. This site is also listed above as a State Priority List site. Three violations were reported, and one violation in 1987 was not resolved. However, the site does not pose a threat to the project corridor for the reasons given above.

One RCRA Hazardous Waste Generator site is within ¼ mile of the project corridor:

- Campbell Concrete and Materials LP, 934 Holmes Road (EPA No. TXR000056630) is a conditionally exempt small-quantity generator of hazardous wastes. It is reported to have no violation and does not pose a threat of contamination to the project corridor.

One site is listed as RCRA “Other” because it is not classifiable as “treatment, storage, disposal of hazardous material,” “hazardous waste generator” or “corrective action”:

- Freedom Environmental Group, Inc., 922 Holmes Road (EPA No. TXR000017533) was a used oil transporter. It was confirmed by the TCEQ to have operated without violation.

One Municipal Solid Waste and Landfill site is within ¼ mile of the project corridor:

- Browning-Ferris Industries, Holmes Road Landfill (Permit No. 1224) is the solid waste landfill site that is listed above under CERCLIS No Further Remedial Action Planned.

Three sites with registered petroleum storage tanks are listed within ¼ mile of the project corridor. The sites have underground tanks that are either are in use without reported violation, have been removed from the ground or are permanently filled in place. Therefore, these three sites do not pose an environmental concern to the project corridor.

Historical aerial photographs were reviewed to evaluate present and previous land use, structures, improvements, surface anomalies and historical development of the project area. The photos show that most of the project area was agricultural land. The northern part of the corridor near Holmes Road appears to have had previous industrial use. In addition, evidence of oil and gas wells is noted as present in and near the project corridor.

Parts of the project corridor were inspected on October 8 and 10, 2011, and the entire project alignment was inspected on foot on September 13, 2013, for visible evidence of contamination such as surface stains or slicks, stressed vegetation, piles of debris and used drums in the proposed right-of-way. No obvious evidence of contamination was found. The former industrial site on the south side of Holmes Road is currently vacant, with foundations of buildings evident and the entire site surface covered with fine gravel.

The City of Houston and TxDOT procedures would be used to minimize cost and construction delays if petroleum-contaminated soils were encountered during road construction. A contractor would remove underground tanks and excavate and dispose of petroleum-contaminated soils properly. If any hazardous substance were encountered during construction, it would be handled according to federal, state and local regulations.

4.13 Indirect Impacts

Indirect impacts result from the project causing other, reasonably predictable actions that have associated environmental impacts. Land development induced by the extension of a highway is a

common cause of indirect impacts. Indirect impacts are determined by estimating the amount of land (other than the proposed project right-of-way) likely to be developed as a result of the project, assessing the type of induced development, and then assessing the potential environmental impacts of that induced development.

The assessment of indirect impacts follows the steps below:

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 the proposed action from among the following categories:
 - Modification of regime
 - Land transformation and construction
 - Resource extraction
 - Processing
 - Land alteration
 - Resource renewal activities
 - Changes in traffic
 - Waste emplacement
 - Chemical treatment
 - Access alteration
5. Identify potentially substantial indirect effects for analysis from among the following categories:
 - Encroachment-alteration effects
 - Induced growth effects
 - Effects related to induced growth
6. Analyze indirect effects and evaluate results; and
7. Assess consequences and develop mitigation as appropriate.

Scoping for this project (Step 1) was performed at the onset of the Environmental Report. This step resulted in setting the area of influence of indirect impacts due to induced development to the area one mile from the project lands. Figure 11 is a map of the area of influence for indirect impact analysis. The reason the area of influence is set at one mile is because the proposed project could open access to adjacent lands for residential and commercial development, and incremental residential and commercial developments tend to be built in square-mile or smaller units. The area of influence is about 2,500 acres, of which about 1,250 acres are undeveloped.

The study area's goals and trends (Step 2) are as follows. The area of influence is wholly within the City of Houston, which does not have a zoning ordinance to control land use in this area. Most of the project corridor was in agricultural or industrial use from the 1920s to the 1990s. Oil and gas development has also occurred in this area from the 1920s to the 1960s. Since 2000, many of the industrial businesses along Holmes Road were abandoned, and there are many former industrial land parcels with aging industrial structures there. The Buffalo Lakes development, on the north side of Holmes Road, is already being developed for residential and commercial (retail and office) uses. Figure 5 shows the current land uses within the area of influence.

The 2035 Regional Transportation Plan by the Houston-Galveston Area Council defines transportation systems and services in the area of influence. The plan forecasts future travel demand from which regional transportation needs are identified. It then develops and evaluates system alternatives and selects options to meet the mobility needs of the region. The proposed extension of Buffalo Speedway is in the 2035 Regional Transportation Plan Update.

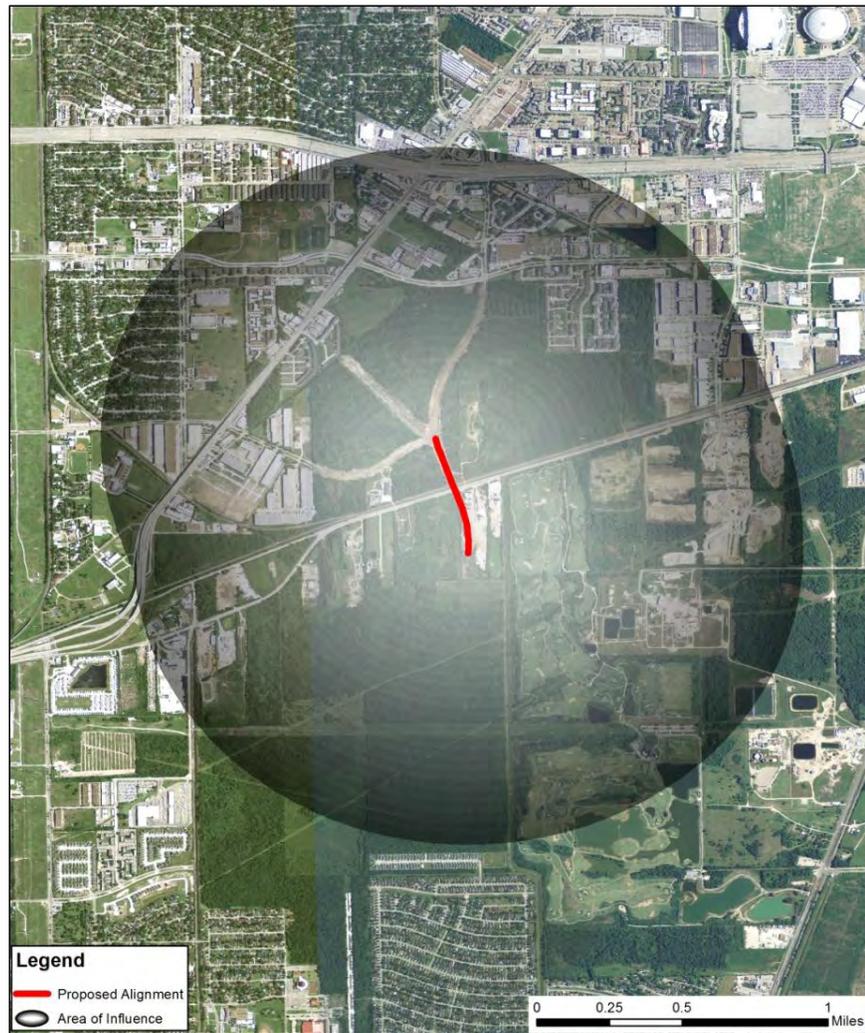
Air quality in the AOI is poor, but improving. The AOI is in the Houston-Galveston-Brazoria air quality region, which has not attained the national ambient air quality standard for ozone. Air quality has improved since the 1990s, from

“severe” to “marginal” non-attainment, and the annual number of days in which the region exceeds the ozone standard has been decreasing. Furthermore, the lands adjacent to the project corridor north of Holmes Road are beginning to redevelop as mixed-use areas and will probably continue to do so until most of the land is developed, about ten years.

Notable features in the AOI (Step 3) include Wildcat Golf Course east of the project corridor, Houston Express Soccer Club (South Campus Field) northwest of the project corridor, and the Willowbend residential neighborhood west of the project corridor. The AOI also has large areas of undeveloped land on both sides of Holmes Road, and commercial, industrial and residential land uses along Main Street.

The impact of the proposed action (Step 4) is “Changes in Traffic and Access Alteration.” The proposed roadway would provide access to the south side of Buffalo Lakes and to currently undeveloped land south of Holmes Road. It would increase traffic volumes on the segment of Buffalo Speedway north of the proposed project corridor, and on Holmes Road east and west of the proposed corridor.

Figure 11: Area of Influence for Indirect Impacts



The air quality in the AOI is currently considered poor, because it is within the Houston-Galveston-Brazoria nonattainment area for ozone. In addition, the proposed project will increase mobility within and access to lands north and south of Holmes Road for planned residential and commercial development. Such actions can result in changes of traffic patterns and thus have the potential to affect air quality indirectly.

The likely result of the new access provided by the proposed action (Step 5) would be “Induced Growth Effects.” Since the proposed project would provide thoroughfare access to adjacent areas that are currently without access and undeveloped, it would be expected to open these areas to commercial and residential development as well. It is likely that the project would spur development of 48 acres of commercial land use and 86 acres of residential land use within one mile of proposed Buffalo Speedway.

The AOI is part of the EPA-designated 8-county non-attainment area for ozone. The AOI is currently in attainment for all other NAAQS pollutants; please refer to Section 3.5. Based on the results of Steps 1 through 4 that evaluate the possible project-related actions that can indirectly affect air quality, the proposed project may cause indirect air quality impacts in the AOI. As the proposed project may result in indirect air quality impacts, further evaluation and discussion of air quality and MSATs is necessary in Steps 6-7.

The environmental effects of induced new development (Step 6) would likely include the loss of up to 112 acres of forest and 8 acres of grasslands in the undeveloped land within one mile of proposed Buffalo Speedway. About 16 acres of this loss appears to be wetlands, based on inspection of aerial photographs. Most of the forest would be replaced with buildings, pavement and grass lawns, although some trees would be retained in residential areas.

Direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity and accessibility, as well as the resulting projected increases in VMT. EPA’s new fuel and vehicle standards projected to reduce emissions of air pollutants and MSATs are expected to offset these impacts resulting from the increases in VMT. The net emissions reductions are expected to contribute to continued maintenance and improvement of air quality and MSAT levels in the AOI.

The potential indirect impacts on air quality and MSATs would result from expected development or redevelopment due to the project providing increased accessibility or capacity to the area. The project would be expected to bring increased development in the area. Potential types of development are residential and commercial uses, and area sources such as gas stations and dry cleaners.

The overall direct and indirect consequences of the proposed action (Step 7) are the loss of 116 acres of forest and 10 acres of grassland, which includes about 16 acres of wetland. Future land development would affect water quantity and quality; the additional paved surface would cause faster runoff, which could exacerbate flooding, and the additional 86 acres of residential land would contribute higher levels of pollutants in runoff due to application of lawn fertilizer.

Any increased air pollutant or MSAT emissions resulting from the potential development or redevelopment of the area must meet regulatory emissions limits established by the TCEQ and EPA, as well as obtain appropriate authorization from the TCEQ. Regulatory emission limits set by TCEQ and EPA are established to attain and maintain the national air quality standards by

assuring any emissions sources resulting from new development or redevelopment will not cause or contribute to a violation of those standards.

Therefore, because the project's potential direct and indirect 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.

Mitigation for the minor impacts of the project and indirectly related actions (Step 8) consists of the following recommendations:

- Induced development that results in additional impervious surface area and therefore faster runoff of rainwater should include detention basins to slow the flow of runoff water into streams. Detention basins are required of new development in Harris County and are effective against flood impacts of land development.
- Wetlands lost during induced development should be compensated for by on-site or off-site wetland creation to result in no net loss of wetlands.

4.14 Cumulative Impacts

Cumulative impacts are the incremental consequences of an action added to those of other past, present and foreseeable future actions. Cumulative impacts would occur if other infrastructure projects near the proposed project have similar environmental impacts, so that the cumulative result of all projects may be significant even though the individual impact from one project is not. An example of a cumulative impact is taking a wetland incrementally, first with minor amounts of wetland filled for highway use, followed by further loss of the wetland area due to other projects.

Assessment of cumulative impacts follows this procedure:

1. Identify the resources to consider in the analysis;
2. Define the study area for each affected resource;
3. Describe the current health and historical context for each resource;
4. Identify direct and 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; and
8. Assess and discuss mitigation issues for all adverse impacts.

The environmental resources that may have incremental consequences for this project (Step 1) are plant communities and air quality (ozone and MSATs – mobile source air toxins). These resources are included because they are potentially affected by the proposed action. Cumulative impact assessments are presented below for each resource.

4.14.1 Plant Communities

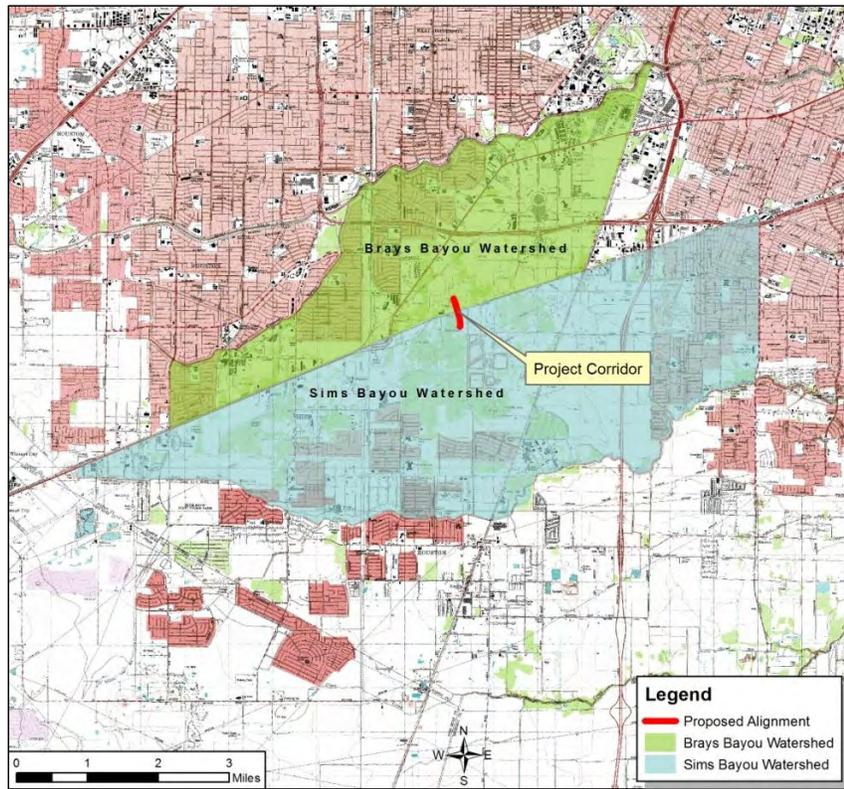
The resource study area (Step 2) for plant communities is the northern part of the Sims Bayou watershed from the headwaters at US 90A and the Sam Houston Parkway to Cullen Road, and the southern part of the Brays Bayou watershed from the confluence of Willow Waterhole Bayou to the Alameda Road crossing (Figure 12). Watersheds are selected as natural study areas because

the watershed is the natural unit dividing ecosystems by energy and nutrient flow, and the particular limits are based on the area that could be most affected by changes in vegetation due to the proposed project and other nearby actions. The Union Pacific Railroad divides the watersheds of Sims and Brays Bayous, and the proposed project is in both watersheds.

Temporal boundaries for cumulative impacts to plant communities and land use are 70 years in the past and 20 years in the future. The reason for the 70-year retrospective view is that aerial photographs are available from the project areas since the mid-1940s. The reason for looking 20 years into the future is that the project horizon year is 20 years from construction.

The current health and historical context (Step 3) is as follows. Plant communities in the Sims Bayou and Brays Bayou watersheds have declined in extent greatly since the 1940s and are still declining due to urban development. Most of the parts of both watersheds in the resource study area was in agricultural use before 1960 and was developed for residential, commercial and industrial use since the 1960s, reducing the forest area to small fragments. In addition, some cleared areas have developed into forests. Currently, forests are about 12 percent of the land in the resource study area.

Figure 12: Resource Study Area for Plant Communities



Source: Harris County Flood Control District

Table 11: Other Projects in the Project Area

<i>Project</i>	<i>Location</i>	<i>Sponsor</i>	<i>When Built</i>
Buffalo Speedway from West Bellfort Road to Willowbend Boulevard	North of the project corridor	City of Houston	2011
Kirby Drive from Holmes Road to Reed Road	East of the project corridor	City of Houston	2014
Buffalo Speedway from the south end of this project to Airport Blvd	South of the project corridor	City of Houston	2015
Buffalo Lakes Development	Between West Bellfort Road, South Main Street, Holmes Road and west of Kirby Drive	Buffalo Lakes LLP	2017
Holmes Road from Main Street to Kirby Drive	Crossed by the project corridor	City of Houston	2018
US 90A Commuter Rail Transit Line	Crossed by the project corridor	METRO	2025

The direct and indirect impacts of the proposed action (Step 4) on plant communities are as follows. The direct impact is the permanent removal of 1.77 acres of wood and 1.80 acres of grassland. The indirect impact of the proposed action on plant communities is the permanent removal of up to 112 acres of woods and eight acres of grassland, including 16 acres of wetlands. The forests and wetlands provide food, cover and roosting habitat for the urban-adapted birds and arboreal mammals that are found in the project corridor, and therefore the project and induced development would reduce the habitat for these species. Since no endangered species or their critical habitat is present in the project lands or vicinity, the project would not cause direct or indirect impacts to endangered species.

There are other past, current and reasonably foreseeable projects in the project area (Step 5). Table 11 is a list of other projects in the project area. The Buffalo Lakes development is currently under construction and will ultimately convert about 385 mostly wooded acres to residential and commercial land uses. Past and future highway projects in the project area include the two segments of Buffalo Speedway: the already completed segment from West Bellfort Road to Willowbend Boulevard and the future segment from south of Holmes Road to Airport Boulevard. Other future roadway projects in the project area include extending Kirby Drive south of Holmes Road to Reed Road and widening Holmes Road from Main Street to Kirby Drive as a 4-lane divided roadway. In addition, METRO plans to build a commuter rail line parallel to the Union Pacific Railroad, crossing the proposed project corridor.

The cumulative impacts of these other projects (Steps 6 and 7) are as follows. The total length of new roadways is 3.8 miles (widening Holmes Road would have little impact on plant communities) and the total area of new roadways is 74 acres. The proposed US 90A Commuter Rail Line would affect about eight acres of woods and about four acres of grassland. Buffalo Lakes will ultimately displace 369 acres of woods and 16 acres of grassland. Therefore, the cumulative impact of the proposed project and these other projects on plant communities would be about 445 acres of woods and 25 acres of grassland.

Mitigation for these cumulative impacts (Step 8) could include planting trees along the roadways and streets in all the projects listed in Table 11. This would provide wildlife with habitat and migration corridors as well as giving shade and improved aesthetics. The City of Houston has a program to encourage private developers to plant trees along roads, which would provide the impetus for this measure on newly developed land.

4.14.2 Air Quality

Evaluating cumulative impacts of Air Quality (Step 2) requires looking at three distinct RSAs, as described below:

- Ozone – The RSA for evaluating the ozone National Ambient Air Quality Standards (NAAQS) is designated as the Houston-Galveston-Brazoria 8-hour ozone nonattainment area, which includes Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller counties.
- Carbon Monoxide (CO) – The RSA for CO is based on the right-of-way line, which represents the location with potential for the highest for CO concentrations. However, the proposed project does not warrant a Transportation Air Quality Analysis. Therefore, CO levels caused by this project would not be expected to exceed the NAAQS for CO and would not affect air quality in this area.

- **Mobile Source Air Toxins (MSATs)** – The RSA for MSATs is all 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 RSA qualitatively evaluates emission changes based on the proposed project and national trends.

The current health and historical context (Step 3) for air quality is as follows. The EPA establishes limits on concentrations of six criteria air pollutants through the NAAQS. The EPA has designated the Houston-Galveston-Brazoria (HGB) air quality region, consisting of eight counties (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller) as not in attainment of the ozone standard. The region currently attains the standards for all other criteria pollutants. Although there have been yearly fluctuations, the ozone trend continues to show improvement. The trend of improving air quality in the region is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, improved emission control technologies and regional clean air initiatives sponsored by the Houston-Galveston Area Council.

The EPA published an 8-hour ozone standard in the Federal Register on July 18, 1997, and it became effective on September 16, 1997. Air quality non-attainment areas were designated in the Federal Register on April 30, 2004, and became effective on June 15, 2004. The HGB area was designated “moderate” non-attainment of the 1997 8-hour ozone standard, with an attainment deadline of June 15, 2010. EPA then required the Texas Commission on Environmental Quality (TCEQ) to submit an 8-hour ozone State Implementation Plan (SIP) revision by June 15, 2007, detailing how the HGB area would attain the ozone standard by that deadline.

On June 15, 2007, the TCEQ submitted a letter from the Governor of Texas to the EPA, requesting that the HGB area be reclassified from a “moderate” to a “severe” non-attainment area for the 1997 8-hour ozone standard, with an attainment deadline of June 15, 2019. The EPA granted the Governor’s request to reclassify the HGB ozone non-attainment area from “moderate” to “severe” on September 18, 2008, effective October 31, 2008. The EPA set April 15, 2010, as the deadline for TCEQ to submit a revised SIP under the “severe” ozone non-attainment status, and June 15, 2019, as the deadline to meet the NAAQS for ozone.

The direct and indirect impacts of the proposed action (Step 4) are as follows. Direct impacts on air quality and MSATs from the project would be caused by projected increases in vehicle miles traveled (VMT) due to the project’s increased vehicle capacity and accessibility. Emission reductions due to EPA’s new fuel and vehicle standards are likely to offset impacts caused by increases in VMT.

Indirect impacts on air quality and MSATs would result from future land development resulting from the project’s increased vehicle accessibility and capacity. 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 obtain appropriate authorization from the TCEQ; therefore, land development is not expected to cause degradation of air quality or MSAT levels.

Other past, current and reasonably foreseeable projects in the project area (Step 5) are as follows. 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 obtain appropriate authorization from the TCEQ; therefore; these projects are not expected to cause degradation of air quality or MSAT levels. Reasonably foreseeable actions that could affect air quality in the RSA are shown in Table 11.

The cumulative impacts of these other projects (Step 6) are as follows. 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. Therefore, projected traffic volumes are likely to cause no impact on regional ozone levels and minor impacts to local 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 the conforming RTP and TIP, coupled with EPA's vehicle and fuel regulations fleet turnover, are anticipated to have a cumulatively beneficial impact on air quality.

The results of the cumulative impact analysis for air quality (Step 7) are as follows. The cumulative impact on air quality from the proposed project and other reasonably foreseeable transportation projects are addressed at the regional level by analyzing the air quality impacts of transportation projects in the 2035 RTP Update and the 2013-2016 TIP, as amended. The proposed project and other reasonably foreseeable transportation projects are included in the 2035 RTP Update and the 2013-2016 TIP, as amended, and have been determined to conform to the SIP. 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.

Mitigation for these cumulative impacts on air quality (Step 8) is as follows. 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 Clean Air Act, as amended, provides the framework for federal, state, tribal and local rules and regulations to protect air quality. The Clean Air Act requires the EPA to establish NAAQS for pollutants that are 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 allows the TCEQ to 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 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 they can execute cooperative agreements with the TCEQ and other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution consistent with the provisions of the Texas Clean Air Act and the rules or orders of the TCEQ.

The Clean Air Act also requires states with areas that fail to meet the NAAQS prescribed for criteria pollutants to develop a SIP. The SIP describes how the state would reduce and maintain air pollution emissions in order to comply with the federal standards. Important components of a SIP include emission inventories, motor vehicle emission budgets, control strategies to reduce emissions, and an attainment demonstration. The TCEQ develops the Texas SIP for submittal to

the EPA. One SIP is created for each state, but portions of the plan are specifically written to address each of the non-attainment areas. These regulatory controls, as well as other local transportation and development initiatives implemented throughout the Houston-Galveston-Brazoria area by local governments and other entities provide the framework for growth throughout the area consistent with air quality goals. All transportation projects, including the proposed project, are evaluated at the regional level by the H-GAC for conformity with the SIP.

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

4.15 Summary and Comparison of Potential Effects

Table 12 is a summary of the predicted environmental impacts of no action and the proposed action and arrayed in a matrix for ease of comparison.

Table 12: Matrix of Environmental Impacts

<i>Environmental Area</i>	<i>No Action</i>	<i>Proposed Action</i>
Plant Communities	No impact.	Direct loss of 1.77 acres of woods and 1.80 acres of grassland. Indirect loss of 112 acres of woods and 8 acres of grassland.
Water Quality	No impact.	No direct impact. Induced residential development would increase nutrient pollutants in runoff.
Wetlands	No impact.	No direct impact. Indirect loss of 16 acres of wetlands.
Wildlife	No impact.	Minor direct loss. Indirect loss of 112 acres of wooded habitat.
Air Quality	No direct impacts to air quality are anticipated because of this project (see Section 4.5). In addition, 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, which are mandated to ensure that such growth and urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the other air quality standards.	No direct impacts to air quality are anticipated because of this project (see Section 4.5). In addition, 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, which are mandated to ensure that such growth and urbanization would not prevent compliance with the ozone standard or threaten the maintenance of the other air quality standards.
Noise	No impact.	No impact.
Land Use, Community Cohesion	No impact.	No impact on community cohesion. Undeveloped land within one mile of the project corridor would be expected to be developed for commercial and residential uses.

5 Public Involvement

A public meeting was held on the proposed project on December 9, 2014, at Montgomery Elementary School, 4000 Simsbrook Drive, Houston, Texas 77045. The meeting was held in an open house format from 5:30 to 7:30 pm. About 20 people attended the meeting. Informative exhibits about the project and the planning process were on display, and project engineers and scientists were available to answer questions from attendees.

Ten attendees filled out and submitted comment forms during the meeting. No other comment was received during the comment period ending on December 23, 2014. All ten commenters indicated that they support the project. About half the commenters own property near the proposed project corridor.

Two commenters offered specific comments about aspects of the project. One indicated that they felt the project would improve traffic flow. The other is concerned that the bicycle accommodations for the project are inadequate and potentially unsafe. (Bicycle facilities for this project have been designed under AASHTO, TxDOT and City of Houston standards.) This commenter also wants a better tie-in with METRORail and more information on the project to be published on the TxDOT Web site.

A Public Meeting Summary Report was prepared for this public meeting and is available at the City of Houston, 611 Walker Street, Houston, Texas 77002, and TxDOT Houston District, 7600 Washington Avenue, Houston, Texas 77007.

6 Conclusions and Recommendations

The proposed action would meet the project goal of establishing a through route connecting West Bellfort Road to south of Holmes Road and providing access to adjacent lands north and south of Holmes Road. It would meet the project objectives at a reasonable cost, without significant social or environmental impacts.

This project meets the criteria for Categorical Exclusion under 23 CFR 771.117(d)(2), “highway safety or traffic operations improvement projects.” No significant social, economic or environmental impact associated with this project has been discovered. This Environmental Report demonstrates that the specific conditions or criteria for this Categorical Exclusion are satisfied and that significant environmental effects will not result. Therefore, the proposed action qualifies as a Categorical Exclusion.

6.1 Mitigation and Monitoring Commitments

The following measures would mitigate environmental impacts at the proposed site:

- The City of Houston would minimize the time that streets would be closed, and provide clearly marked detour routes during closures.
- The contractor would be required to follow applicable regulations and ordinances to reduce construction impacts in the area, including:
 - Dust suppression procedures in construction and layover areas when necessary;
 - Mufflers on construction equipment to reduce noise impacts;
 - Construction equipment used only during daylight hours;
 - Construction equipment shut down when not in use to reduce both noise and air pollution; and
 - Temporary traffic control in accordance with the *Manual of Uniform Traffic Control Devices*.
- To reduce water pollution during construction, the contractor would also use silt fences, rock filter dikes and temporary vegetation to control erosion and sedimentation from the project during construction, and vegetation filter strips to control suspended solids after construction.
- In accordance with the Migratory Bird Treaty Act, no tree or bridge structure containing nests, eggs or young would be removed by project construction during the nesting and breeding season (March 1 through August 31).

6.2 Coordination Requirements

If the project were not built, no further coordination is required. If the project were built, the City of Houston would coordinate with several other government agencies:

- The Texas Commission on Environmental Quality would require a Notice of Intent and a *Storm Water Pollution Prevention Plan* during construction. The Commission regulates storm water discharges from construction sites that disturb more than one acre of land under the Texas Pollutant Discharge Elimination System General Permit for Industrial Activity. Since the proposed project would disturb more than one acre of land, the City of Houston would file a Notice of Intent to comply with guidelines of the Texas Commission on Environmental Quality and prepare a Storm Water Pollution Prevention Plan before construction.

- The Texas Parks & Wildlife Department has a Memorandum of Understanding with TxDOT regarding mitigation of habitat that is taken by highway projects. Coordination under this memorandum would begin during agency review of this document.

6.3 Certification

The State of Texas has determined that this project has no significant impact on the environment and there are no unusual circumstances as described in 23 CFR 771.117(b). As such, the project is categorically excluded from the requirements to prepare an environmental assessment or environmental impact statement under the National Environmental Policy Act. The State has been assigned, and hereby certifies, that it has carried out the responsibility to make this determination pursuant to Chapter 3 of Title 23, United States Code, Section 326 and a Memorandum of Understanding dated December 6, 2013, executed between the FHWA and the State.

Certified and Approved by:

Signature

Date

Name

Title

Agency

REFERENCES

- ¹ Houston-Galveston Area Council. 2014. *2015-2018 Transportation Improvement Program*. Houston-Galveston Area Council, Houston, Texas, May 30, 2014. <http://www.h-gac.com/taq/tip/docs/2015-2018%20TIP%20-%20As%20Adopted%20-%20052314.pdf>.
- ² Houston-Galveston Area Council. 2013. *2035 Regional Transportation Plan Update*. Houston-Galveston Area Council, Houston, Texas, July 16, 2013. http://www.h-gac.com/taq/plan/2035_rtp.aspx.
- ³ Houston-Galveston Area Council. 2013. *Houston Regional Traffic Count Map*. Houston-Galveston Area Council, Houston, Texas, dated 2009, accessed December 24, 2013. <http://tthouston.tamu.edu/hgac/trafficcountmap>.
- ⁴ Texas Commission on Environmental Quality. 2010. *2010 Texas Water Quality Inventory and 303(d) List*. <http://www.tceq.texas.gov/waterquality/assessment/10twqi/10twqi>. Austin, Texas.
- ⁵ Natural Resources Conservation Service. 1976. *Soil Survey of Harris County, Texas*. U.S. Department of Agriculture, Natural Resources Conservation Service, Washington, D.C.
- ⁶ Griffith, G.E., Bryce, S.A., Omernik, J.M., Comstock, J.A., Rogers, A.C., Harrison, B., Hatch, S.L., and Bezanson, D. 2004. *Ecoregions of Texas*. Map scale 1:2,500,000. U.S. Geological Survey, Reston, Virginia.
- ⁷ Texas Parks & Wildlife Department. 1984. *Vegetation Types of Texas*. Texas Parks & Wildlife Department, Austin, Texas.
- ⁸ U.S. Environmental Protection Agency. 2002. *Draft National Management Measures to Control Nonpoint Source Pollution from Urban Areas*. Washington, DC. <http://www.epa.gov/owow/nps>
- ⁹ Texas Commission on Environmental Quality. 2012. *2012 Texas Water Quality Inventory and 303(d) List*. http://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/12twqi/2012_303d.pdf. Austin, Texas.
- ¹⁰ Federal Emergency Management Agency. 2007. Flood Insurance Rate Map 48201 C 0870L. Houston, Texas. June 18, 2007.
- ¹¹ Cornell Laboratory of Ornithology. 2014. *All About Birds: Henslow's Sparrow*. Cornell University, Ithaca, New York. http://www.allaboutbirds.org/guide/henslows_sparrow/lifehistory.
- ¹² Houston-Galveston Area Council. 2012. *2013-2016 Transportation Improvement Program*. Houston-Galveston Area Council, Houston, Texas, April 27, 2012. http://www.h-gac.com/taq/tip/docs/H-GAC_2013-2016%20TIP-As_Adopted-04-27-2012.pdf.
- ¹³ Houston-Galveston Area Council, 2013, *op. cit.*
- ¹⁴ Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007.
- ¹⁵ Claggett, M., and T. L. Miller. 2005. *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*. Federal Highway Administration, Washington, D.C. June 2005. http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msa_temissions.pdf.
- ¹⁶ U.S. Environmental Protection Agency. 2013. *Integrated Risk Information System (IRIS)*. <http://www.epa.gov/ncea/iris/index.html>.
- ¹⁷ Health Effects Institute, Air Toxics Review Panel. 2007. *Mobile-Source Air Toxics: A Critical Review of the Literature on Exposure and Health Effects. Special Report 16*. Health Effects Institute, Boston, Massachusetts, November 2007. <http://pubs.healtheffects.org/view.php?id=282>.
- ¹⁸ Health Effects Institute, Air Toxics Review Panel, 2007, *op. cit.*, <http://pubs.healtheffects.org/view.php?id=306>.
- ¹⁹ Health Effects Institute, Air Toxics Review Panel, 2007, *op. cit.*, <http://pubs.healtheffects.org/view.php?id=282>.
- ²⁰ U.S. Environmental Protection Agency. 2013. *Basic Information: Risk Assessments*. <http://www.epa.gov/risk/basicinformation.htm#g>.

References continued on next page

References, continued

²¹ Health Effects Institute, Air Toxics Review Panel, 2007, *op. cit.*, Chapter: Summary of Studies of Diesel Exhaust. <http://pubs.healtheffects.org/getfile.php?u=395>.

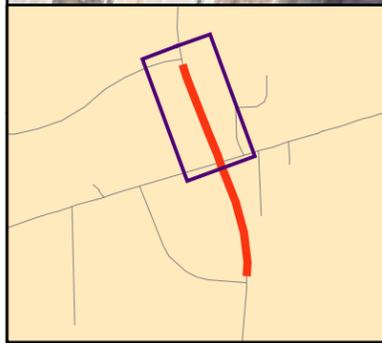
²² *Texas Administrative Code*, Title 13, Cultural Resources, Section 26.20(2), Archeological Permit Categories, and Title 43, Transportation, Section 2.24(f)(1)(C), Memorandum of Understanding with the Texas Historical Commission. *Texas Register*, Volume 27, Page 7789, August 28, 2002, and Volume 29, Page 4919, May 20, 2004.

APPENDIX A

PLAN VIEW OF THE PROPOSED ACTION

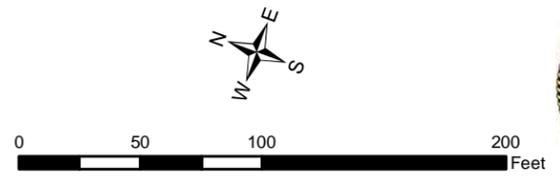
Sheet 1: from Station 189+00 to Station 198+00

Sheet 2: from Station 177+00 to Station 189+00



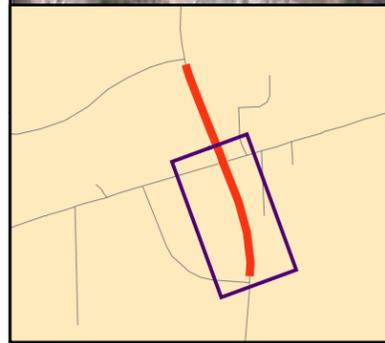
Legend

- - - Proposed ROW
- Proposed Roadway
- Proposed Sidewalk
- Proposed Bridge Bent
- - - Centerline
- ⊕ Stations



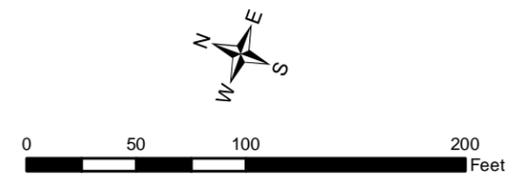
Buffalo Speedway Extension
Sheet 1 of 2

City of Houston Public Works & Engineering



Legend

- Existing ROW
- Proposed ROW
- Existing Roadway
- Proposed Roadway
- Proposed Bridge Bent
- Existing Sidewalk
- Proposed Sidewalk
- Centerline



Buffalo Speedway Extension

Sheet 2 of 2

City of Houston Public Works & Engineering

APPENDIX B

AGENCY CORRESPONDENCE

Meeting Minutes from Union Pacific Railroad on February 4, 2004 and May 5, 2005

Letter from Texas Parks & Wildlife Service, November 1, 2013

MEETING MINUTES

PROJECT NAME: Buffalo Speedway Paving Extension
West Belfort Boulevard to Holmes Road

BGE PROJECT NO.: CBR02-5T

DATE & TIME: May 5, 2005
11:00a.m.- 12:30 p.m.

LOCATION: Union Pacific Railroad (UPRR)
24125 Aldine Westfield
Spring, Texas 77373
(281) 350-7626
(218) 350-7671 Fax

ATTENDEES: Dale Hill; Union Pacific Railroad, Manager
Industry & Public Project Engineering
Joel Scott; TerraMark
Steve Campagna; City of Houston
Eric Hall; Brown & Gay Engineers, Inc. (BGE)

The purpose of the meeting was to discuss a crossing request at Buffalo Speedway and Holmes Road.

1. Mr. Hill (Dale) is the Manager of Industry & Public Project Engineering for the Harris and Galveston county areas. He commented that UP would not grant the request to make an at-grade crossing at Holmes and Buffalo Speedway. Dale gave Steve Campagna a copy of a letter from UP dated March 15, 2005 addressed to City of Houston Real Estate stating this denial.
2. Dale commented that UP denies at grade crossings as much as possible due to liability issues. He explained that the City has liability cover but UP, as a private company, is open to claims in case of an accident. He commented that this segment of track is a fast track. He explained that this is one of the only tracks in the area where UP can side cars without blocking public access. He also commented that the Metro test tract would be turned over to UP for main track use in 2006.

Joel commented, with respect to the siding issue, that it appeared that there was as much as two miles of track available from Buffalo Speedway to the next at-grade crossing where UP could side their cars. UP would also have the benefit of using the additional main track for operations.

3. Steve asked if UP would consider the closing of other crossings as a benefit that would allow UP the ability to grant this request. Dale commented that UP has a policy where they consider and may grant crossing consideration on a two to one basis, if the crossings are comparable. He seemed very interested in the City closing crossings that may be reasonably addressed during on-going City CIP projects. He stated that they would not give credit for closing if the City were already benefiting as a result of the "Quiet Zone" provision. He also commented that UP would be looking for some benefit related to operations as well.

Dale also commented that UP would be looking for more than a letter. He stated that they (UP) had a letter agreement with the City for the closing of crossings at Colorado Street and Manchester Street some years ago and the City still hasn't followed through. Dale gave Steve a copy of the letter agreement dated in 2001, addressed to Herb Lum.

4. Dale commented that UP looks at property access issues as well as part of their decision process. Steve commented that Buffalo Speedway would provide major North-South access in the area. Steve also explained that Buffalo Speedway is on the City's major thoroughfare plan and Buffalo Speedway improvements for the segment just south of Holmes Road is slated for improvement in FY 2008.

Follow-up Call

1. Dale called Steve Campagna after the meeting to say that approval for an at-grade crossing would need to be approved by the UP Superintendent (office is at Aldine-Westfield). Dale also mentioned that the superintendent was adamantly opposed to at-grade crossings and approvals would be difficult.
2. He commented that UP would also consider that an at-grade crossing would devalue UP property.
3. Steve commented in a call to Eric after the meeting to say that the City is meeting to address how at-grade crossings will be handled for each of the City projects and that they were trying to include Buffalo Speedway in the discussion.

Recommended Action Items

1. It is recommended that a formal letter requesting that Buffalo Speedway be built to the Holmes Road ROW be prepared and submitted to Street & Bridge. It is recommended that contact be made with Street & Bridge to verify whether or not Buffalo Speedway would be included in the rail discussions in house at the City offices.
-

MEETING MINUTES PRELIMINARY ENGINEERING REPORT IN-PROGRESS REVIEW

PROJECT NAME: Buffalo Speedway Paving Extension
West Belfort Boulevard to Holmes Road

BGE PROJECT NO.: CBR02-5T

DATE & TIME: February 4, 2004
10:45 a.m.- 1:00 p.m.

LOCATION: Union Pacific Railroad (UPRR)
24125 Aldine Westfield
Spring, Texas 77373
(281) 350-7626
(218) 350-7671 Fax

ATTENDEES: Douglas Woods; Union Pacific Railroad, Manager
Industry & Public Project Engineering
Doug Baker & Eric Hall; Brown & Gay Engineers, Inc. (BGE)

The purpose of the meeting was to discuss a crossing request (secure engineering requirements and specifications for a crossing at-grade for the proposed Buffalo Speedway and Holmes Road), and to get permission from UPRR to lower grade of existing tracks in accordance with the City of Houston (COH) Design Manual for major thoroughfares.

1. Mr. Woods stated UPRR has a problem over an at-grade crossing at Holmes Road and Buffalo Speedway. He also mentioned that the Greater Houston Partnership had initiated a project to evaluate the at-grade crossings thorough-out the Houston area. He thought they had hired DMJM for this effort. He asked if a grade separation could be utilized at this location due to some anticipated operational conflicts created by an at-grade crossing.
2. Mr. Woods indicated the proposed crossing is close to the Stella siding. The Stella siding is apparently the only location where trains can be sided in this area. Along with the Stella siding, the rail company utilizes the portion of track at the proposed crossing to park trains for extended periods of time. At times trains will block private access across the tracks. A public at-grade crossing would require UPRR to keep the proposed public crossing open based upon state law, and the train would have to be unhitched and split. By federal law the train engineer would be required, after a period of more than four hours, to re-air and recheck the brakes for each car before it starts to move again. This process would result in obstructing traffic at the proposed Buffalo Speedway crossing for significant periods of time.
3. Mr. Woods also reviewed some of his thoughts related to the design and operation of the proposed at-grade crossing. He stated the crossing would need to be designed to accommodate a 70 mph train (METRO runs trains at this speed along the test track). This would result in longer than normal train warning & signal arm actuation. Based on preliminary numbers, the train

indication would be received while the train is as far down the track as 6,000 lf. He believes this would likely result in too much lead-time, encouraging vehicle movement around the signal arm. He also commented the signal circuits have trouble registering that distance, requiring modifications further down the track. The approximate signal costs at Fannin and Kirby were close to \$600k to \$700k, and the cost for the proposed crossing estimated to be \$500k.

4. UPRR prefers the METRO track be relocated upward to match the current elevation of the freight rail. Mr. Woods feels it would be cheaper and would preclude the necessity of disturbing the base and sub-grade under the rail. The rail section detail is fine, but he suggested the French drains were not necessary (METRO detail). A question was raised concerning the potential impact on the overhead power structure of the METRO rail if the track was raised. He will leave that to METRO to evaluate, and a contractor, not UPRR, could make changes to the METRO rail. This would result in a cheaper installation. He will develop some preliminary cost estimates to raise and lower the rails.
5. Mr. Woods presented a mark-up of the section and plan that was prepared by BGE. He suggested the signal house be located on the drawing. It is a 6'x 6' building located 35+ feet from the road edge and no closer than 15 feet from rail edge, and UPRR prefers 40-50 feet. A driveway and/or a mountable curb would be required to access the signal house. He also requested the chaining stations be located on the drawings as well.
6. Mr. Woods will prepare correspondence this week addressing UPRR concerns along with estimated costs for raising and lowering the rails.

Action Items:

1. Once the concerns and costs are received from UPRR, a strategy will be recommended to the COH and the client. BGE has recommended the project be completed without the crossing. If the COH and the developer want to proceed with negotiations, a separate schedule and cost estimate can be produced for this effort.
 2. On Thursday, February 5, 2004, BGE will contact the COH and the client to give them a "heads up".
-

- **Rare Resources Review Requests**
- **(Including Threatened and Endangered Species), cont'd. –**

If this form is filled out electronically, please use a font or style that will contrast with the text below. If sending in a separate attachment, it is not necessary to return the blank form, providing all the information below is included on the attachment.

Name: Bruce Leon

Your Company: Quadrant Consultants

Your Company Address: 7322 Southwest Freeway, Suite 470

City, State, Zip: Houston, Texas 77074

Date: October 1, 2013

Phone: 713-779-2990

Fax: 713-779-3727

E-Mail: bleon@qconsultants.com

Project Title & Site Location: Buffalo Speedway Extension
from Willowbend Blvd to 1,400
feet south of Holmes Road

County(ies): Harris

1) Scope of Project

- a) What regulations will this review help you to comply with? OR If not regulatory, why is the review being requested? NEPA, Endangered Species Act, Migratory Bird Species Act
- b) What activities will be conducted at the site? (Especially activity types, extent, and acreage of ground, waterway, and vegetation disturbance and total acreage of site) Construction (clearing, grading, paving) of 3,000 feet of 4-lane divided roadway, with a bridge or underpass at the Union Pacific Railroad and Holmes Road, and a 1,500-foot long connector roadway from the southern terminus to Holmes Road, intersecting at Holmes Road about 1,000' west of the proposed roadway.
- c) Schedule of activities – Approximately when will the project be active on the site? Mid-2014 to early 2015.

- 2) Vegetation** –Species, structure and composition, vegetation layers, height of layers, natural vegetation community type: The project area is urban industrial, with fragmented woodlots and grassy areas interspersed with industrial sites and developed land. The project corridor north of Holmes Road has been cleared of trees and is best characterized as an old field plant community. Common species are Bermuda grass (*Cynodon dactylon*), annual marsh elder (*Iva annua*) and rattlebush (*Sesbania drummondii*). Giant reed (*Phragmites australis*) forms monospecific stands over part of the proposed right-of-way. Also present are sunflower (*Helianthus annuus*), goldenrod (*Solidago canadensis*) and snapdragon (*Gerardia tenuifolia*). South of Holmes Road, the right-of-way crosses a field dominated by common panic-grass (*Panicum capillare*) with small black willow trees (*Salix nigra*) and goldenrod, then a fencerow dominated by Macartney rose (*Rosa bracteata*) and sugarberry trees (*Celtis laevigata*), then a former industrial site covered with gravel and concrete paving. The proposed connector roadway from the south end of the project corridor and Holmes Road crosses old fields, meadows, rose thickets and giant reed stands similar to those described above, as well as scattered wooded areas. Trees in the proposed right-of-way range from 15 to 40 feet tall and include cottonwood (*Populus deltoides*), Chinese tallow (*Sapium sebiferum*), black willow, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*) and privet (*Ligustrum sinense*).

3) Other Natural Resources/Physical Features

- a) Soils and geology: The proposed project is wholly within an area mapped as Beaumont clay loam, a deep, somewhat poorly drained soil on uplands, with very

- **Rare Resources Review Requests**
- **(Including Threatened and Endangered Species), cont'd. –**

slow permeability and internal drainage. The project area is topographically flat except for one man-made fill just north of the UPRR.

- b) Habitat, watercourses, animals, etc. The project area is home to mammals and birds typical of grassland and woodland areas in east coastal Texas. Bird species seen in the project corridor include crows (*Corvus brachyrhynchos*), house sparrows (*Passer domesticus*) and mockingbirds (*Mimus polyglottos*). Mammal species likely to be in the project corridor include white-tailed deer (*Odocoileus leucocephalus*), opossum (*Didelphis virginiana*), nine-banded armadillos (*Dasypus novemcinctus*) and raccoons (*Procyon lotor*). There is no aquatic habitat in the project area.
- 4) **Existing Site Development** - Extent of pavement, gravel, shell, or other cover; buildings, landscaped, xeriscaped, drainage system, etc). The proposed right-of-way of Buffalo Speedway north of Holmes Road is undeveloped. South of Holmes Road is an industrial site that has been cleared, but the gravel surface and building foundations remain. The connector right-of-way is undeveloped.
- 5) **Historic Use/Function of Site** – Pasture, forest, urban, row crops, rangeland, wetland, etc. The project area was developed for industrial uses in the 1950s and much of the area is still industrial, although many parcels have been abandoned.
- 6) **Has a threatened and endangered species survey or assessment already been performed? Yes. (In general, TPWD recommends an on-site habitat assessment be performed).**
- a) If yes, provide surveyor name, qualifications, methods or protocols, acreage surveyed, level of effort, weather conditions, time of day, and dates the survey was performed. Bruce F. Leon, Ph.D., with a doctorate in Ecology and 35 years of experience in NEPA and biological assessments, conducted a field survey of the entire right-of-way on the morning of September 18, 2013. The weather was clear and sunny.
- b) If yes, please provide results and copy of survey/assessment report. The project area is in the potential range of the endangered Texas prairie-dawn (*Hymenoxys texana*) and Texas windmill-grass (*Chloris texensis*), a species of concern in Texas. A qualified biologist performed a field survey of the proposed right-of-way on September 18, 2013, and did not find any of the characteristic habitat for Texas prairie-dawn: sandy "mima mounds" that are completely unshaded and have good drainage. Therefore, Texas prairie-dawn is very unlikely to be present in the project right-of-way. Texas windmill-grass was not found during the field survey and is also very unlikely to be present.
- 7) **Could current on-site or adjacent habitat support rare species?** Specifically, explain why or why not. The proposed project right-of-way does not contain habitat for rare species. There is no native prairie or forest in the project area; the area consists of industrial sites, old fields and early successional forests. None of the rare species in Harris County could use this area as habitat.
- 8) **Brief description of potential negative impacts** from project activities and avoidance, minimization, and mitigation measures planned. The project could affect water quality during construction; sedimentation would be avoided by using silt fences, temporary vegetation and permanent vegetated buffers in the construction zone.

**- Rare Resources Review Requests
- (Including Threatened and Endangered Species), cont'd. -**

- 9) **Brief description of planned beneficial enhancements** or restoration efforts. The unpaved parts of the project right-of-way would be planted in native grasses and trees.
- 10) **Clearly delineate exact location of site** on original or photocopy of relevant portion of USGS 7.5' topographic quadrangle (most preferable) or best map available. Topographic map should show name of quadrangle. The map must contain identifiable features and a scale that allows us to accurately pinpoint your site. **See attached map.**
- 11) **Originals or color-copy photographs** of site and surrounding area with captions or narratives. **See attached photographs.**
- 12) **Aerial photographs** when available. Aerials should show the year photograph was taken. **See attached aerial photograph.**

	Based on the project description, the Wildlife Habitat Assessment Program does not anticipate significant adverse impacts to rare, threatened or endangered species, or other fish and wildlife resources.
	Signed: <u>Amy Turner Ph.D</u> Date: <u>11/1/13</u>

APPENDIX C

PHOTOGRAPHS OF PROJECT AREA



Photo 1: Buffalo Speedway at Willowbend Boulevard, at northern terminus of the project, looking north.



Photo 2: Proposed right-of-way about 500 feet south of Willowbend Boulevard, looking south



Photo 3: METRO test track, Union Pacific Railroad and Holmes Road at the proposed crossing location, looking south



Photo 4: Project right-of-way about 1,000 feet south of Holmes Road, looking north

APPENDIX D

HAZARDOUS MATERIALS DATABASE INFORMATION



On time. On target. In touch.™

GeoPlus Radius Report

<http://www.geo-search.net/QuickMap/index.htm?DataID=Standard0000061544>

Click on link above to access the map and satellite view of current property

Target Property:

**Extension of Buffalo Speedway from Willowbend
to South of Holmes Road Project
HOUSTON, Harris County, Texas 77045**

Prepared For:

HVJ Associates-Houston

Order #: 27406

Job #: 61544

Project #: HE1313280

PO #: 13-0643H

Date: 08/01/2013

DATABASE FINDINGS SUMMARY

DATABASE	ACRONYM	LOCA- TABLE	UNLOCA- TABLE	SEARCH RADIUS (miles)
FEDERAL				
AEROMETRIC INFORMATION RETRIEVAL SYSTEM / AIR FACILITY SUBSYSTEM	AIRSAFS	0	0	Target Property
BIENNIAL REPORTING SYSTEM	BRS	0	0	Target Property
CLANDESTINE DRUG LABORATORY LOCATIONS	CDL	0	0	Target Property
EPA DOCKET DATA	DOCKETS	0	0	Target Property
FEDERAL ENGINEERING INSTITUTIONAL CONTROL SITES	EC	0	0	Target Property
EMERGENCY RESPONSE NOTIFICATION SYSTEM	ERNSTX	0	1	Target Property
FACILITY REGISTRY SYSTEM	FRSTX	4	0	Target Property
HAZARDOUS MATERIALS INCIDENT REPORTING SYSTEM	HMIRS06	0	1	Target Property
INTEGRATED COMPLIANCE INFORMATION SYSTEM (FORMERLY DOCKETS)	ICIS	1	0	Target Property
INTEGRATED COMPLIANCE INFORMATION SYSTEM NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	ICISNPDES	3	0	Target Property
LAND USE CONTROL INFORMATION SYSTEM	LUCIS	0	0	Target Property
MATERIAL LICENSING TRACKING SYSTEM	MLTS	0	0	Target Property
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM	NPDES06	3	0	Target Property
PCB ACTIVITY DATABASE SYSTEM	PADS	0	0	Target Property
PERMIT COMPLIANCE SYSTEM	PCSR06	0	0	Target Property
RCRA SITES WITH CONTROLS	RCRASC	0	0	Target Property
CERCLIS LIENS	SFLIENS	0	0	Target Property
SECTION SEVEN TRACKING SYSTEM	SSTS	0	0	Target Property
TOXICS RELEASE INVENTORY	TRI	1	0	Target Property
TOXIC SUBSTANCE CONTROL ACT INVENTORY	TSCA	0	0	Target Property
NO LONGER REGULATED RCRA GENERATOR FACILITIES	NLRRCRAG	0	0	Target Property and Adjoining
RESOURCE CONSERVATION & RECOVERY ACT - GENERATOR FACILITIES	RCRAGR06	1	0	Target Property and Adjoining
HISTORICAL GAS STATIONS	HISTPST	0	0	0.2500
BROWNFIELDS MANAGEMENT SYSTEM	BF	1	0	0.5000
COMPREHENSIVE ENVIRONMENTAL RESPONSE,	CERCLIS	1	1	0.5000



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DATABASE FINDINGS SUMMARY

DATABASE	ACRONYM	LOCA- TABLE	UNLOCA- TABLE	SEARCH RADIUS (miles)
COMPENSATION & LIABILITY INFORMATION SYSTEM				
DELISTED NATIONAL PRIORITIES LIST	DNPL	0	0	0.5000
NO FURTHER REMEDIAL ACTION PLANNED SITES	NFRAP	1	0	0.5000
NO LONGER REGULATED RCRA NON-CORRACTS TSD FACILITIES	NLRRCRAT	1	0	0.5000
OPEN DUMP INVENTORY	ODI	0	0	0.5000
RESOURCE CONSERVATION & RECOVERY ACT - TREATMENT, STORAGE & DISPOSAL FACILITIES	RCRAT	0	0	0.5000
DEPARTMENT OF DEFENSE SITES	DOD	0	0	1.0000
FORMERLY USED DEFENSE SITES	FUDS	0	0	1.0000
NO LONGER REGULATED RCRA CORRECTIVE ACTION FACILITIES	NLRRCRAC	0	0	1.0000
NATIONAL PRIORITIES LIST	NPL	0	0	1.0000
PROPOSED NATIONAL PRIORITIES LIST	PNPL	0	0	1.0000
RESOURCE CONSERVATION & RECOVERY ACT - CORRECTIVE ACTION FACILITIES	RCRAC	0	0	1.0000
RECORD OF DECISION SYSTEM	RODS	0	0	1.0000
SUB-TOTAL		17	3	

STATE (TX)

GROUNDWATER CONTAMINATION CASES	GWCC	0	0	Target Property
HISTORIC GROUNDWATER CONTAMINATION CASES	HISTGWCC	1	0	Target Property
TCEQ LIENS	LIENS	0	0	Target Property
MUNICIPAL SETTING DESIGNATIONS	MSD	0	0	Target Property
NOTICE OF VIOLATIONS	NOV	1	0	Target Property
STATE INSTITUTIONAL/ENGINEERING CONTROL SITES	SIEC01	0	0	Target Property
SPILLS LISTING	SPILLS	0	0	Target Property
TIER II CHEMICAL REPORTING PROGRAM FACILITIES	TIERII	1	0	Target Property
DRY CLEANER REGISTRATION DATABASE	DCR	0	0	0.2500
INDUSTRIAL AND HAZARDOUS WASTE SITES	IHW	0	0	0.2500



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DATABASE FINDINGS SUMMARY

DATABASE	ACRONYM	LOCA- TABLE	UNLOCA- TABLE	SEARCH RADIUS (miles)
PERMITTED INDUSTRIAL HAZARDOUS WASTE SITES	PIHW	0	0	0.2500
PETROLEUM STORAGE TANKS	PST	5	0	0.2500
AFFECTED PROPERTY ASSESSMENT REPORTS	APAR	2	0	0.5000
BROWNFIELDS SITE ASSESSMENTS	BSA	0	0	0.5000
CLOSED & ABANDONED LANDFILL INVENTORY	CALF	0	0	0.5000
DRY CLEANER REMEDIATION PROGRAM SITES	DCRPS	0	0	0.5000
INNOCENT OWNER / OPERATOR DATABASE	IOP	0	0	0.5000
LEAKING PETROLEUM STORAGE TANKS	LPST	1	0	0.5000
MUNICIPAL SOLID WASTE LANDFILL SITES	MSWLF	4	1	0.5000
RAILROAD COMMISSION VCP AND BROWNFIELD SITES	RRCVCP	4	3	0.5000
RADIOACTIVE WASTE SITES	RWS	0	0	0.5000
VOLUNTARY CLEANUP PROGRAM SITES	VCP	3	0	0.5000
RECYCLING FACILITIES	WMRF	0	0	0.5000
INDUSTRIAL AND HAZARDOUS WASTE CORRECTIVE ACTION SITES	IHWCA	3	0	1.0000
STATE SUPERFUND SITES	SF	1	0	1.0000
SUB-TOTAL		26	4	

TRIBAL

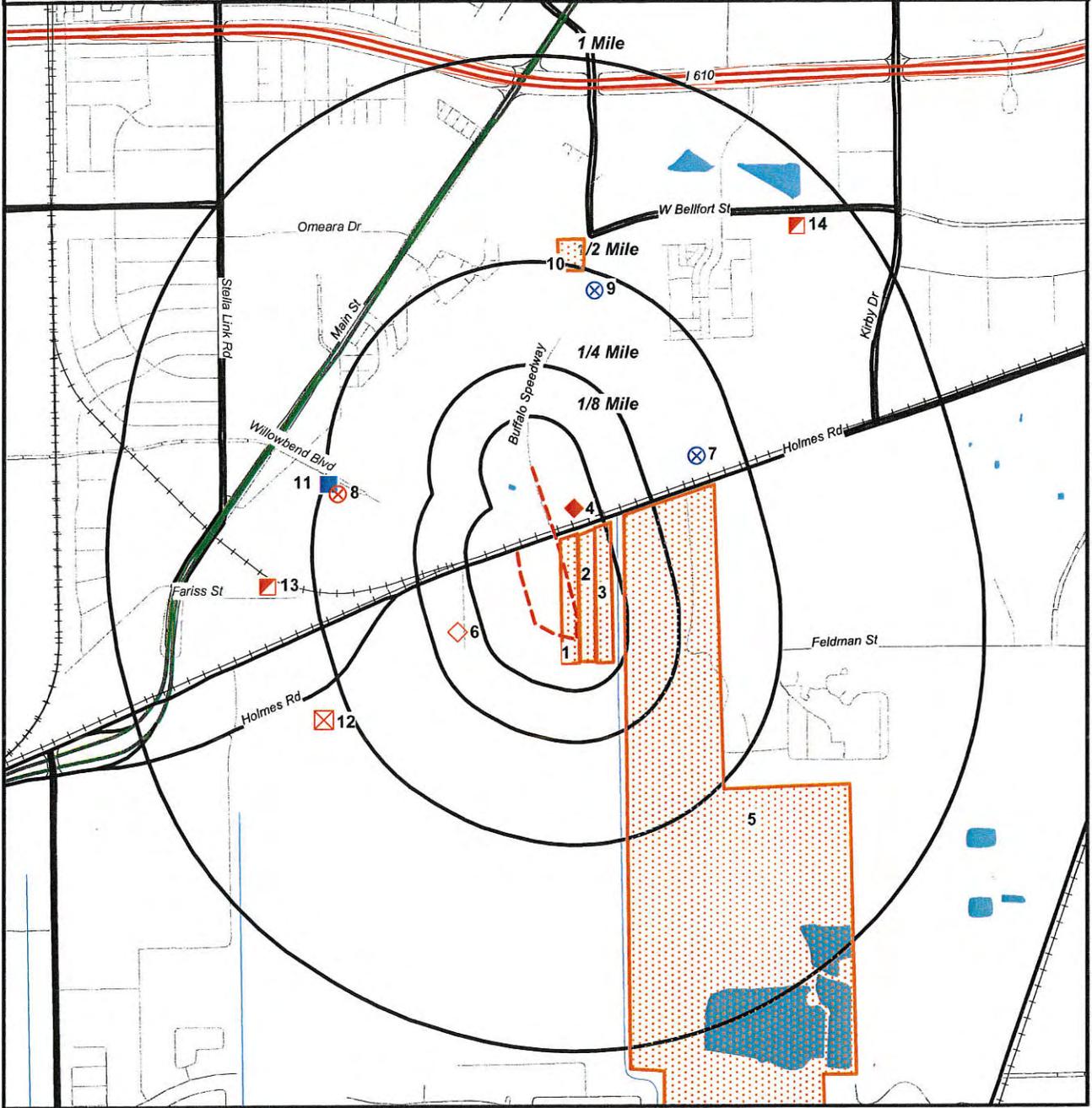
UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	USTR06	0	0	0.2500
LEAKING UNDERGROUND STORAGE TANKS ON TRIBAL LANDS	LUSTR06	0	0	0.5000
OPEN DUMP INVENTORY ON TRIBAL LANDS	ODINDIAN	0	0	0.5000
INDIAN RESERVATIONS	INDIANRES	0	0	1.0000
SUB-TOTAL		0	0	

TOTAL		43	7	
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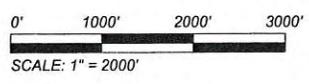
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RADIUS MAP

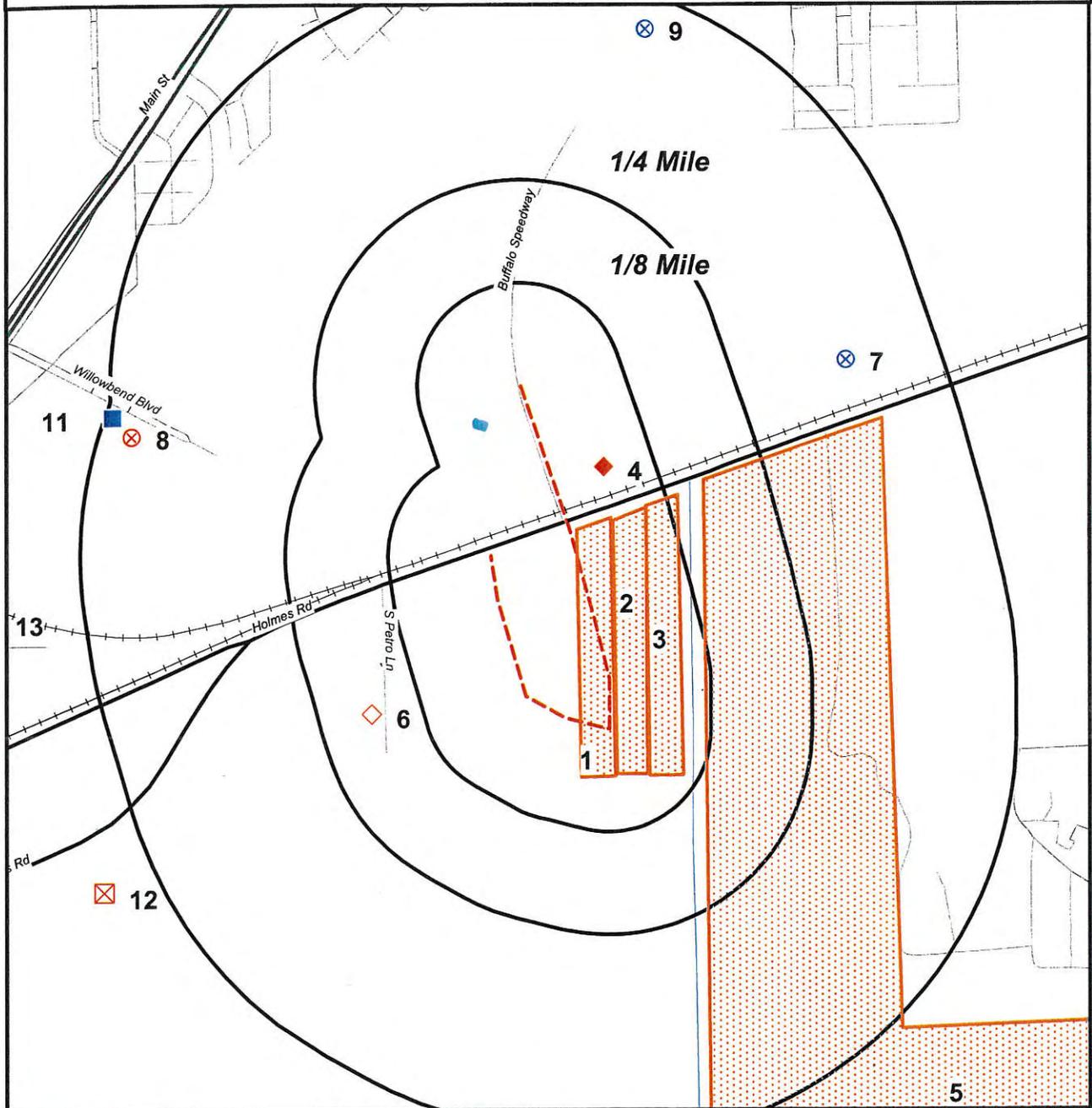


- | | | |
|----------------------|---------|----------|
| Target Property (TP) | ICIS | PST |
| NOV | RCRAG06 | RRCVCP |
| PST | TRI | VCP |
| VCP | LPST | NLRRCRAT |
| FRSTX | MSWLF | SF |
| ICISNPDES | BF | IHWCA |
| NPDESR06 | CERCLIS | |
| HISTGWCC | NFRAP | |
| TIERII | | |

**Extension of Buffalo Speedway
from Willowbend to South of
Holmes Road Project
HOUSTON, Texas
77045**

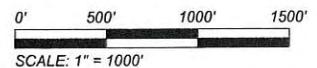


RADIUS MAP



- | | | |
|----------------------|----------|----------|
| Target Property (TP) | ICIS | PST |
| NOV | RCRAGR06 | RRCVCP |
| PST | TRI | VCP |
| VCP | LPST | NLRRCRAT |
| FRSTX | MSWLF | SF |
| ICISNPDES | BF | IHWCA |
| NPDESRO6 | CERCLIS | |
| HISTGWCC | NFRAP | |
| TIERII | | |

**Extension of Buffalo Speedway
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77045**



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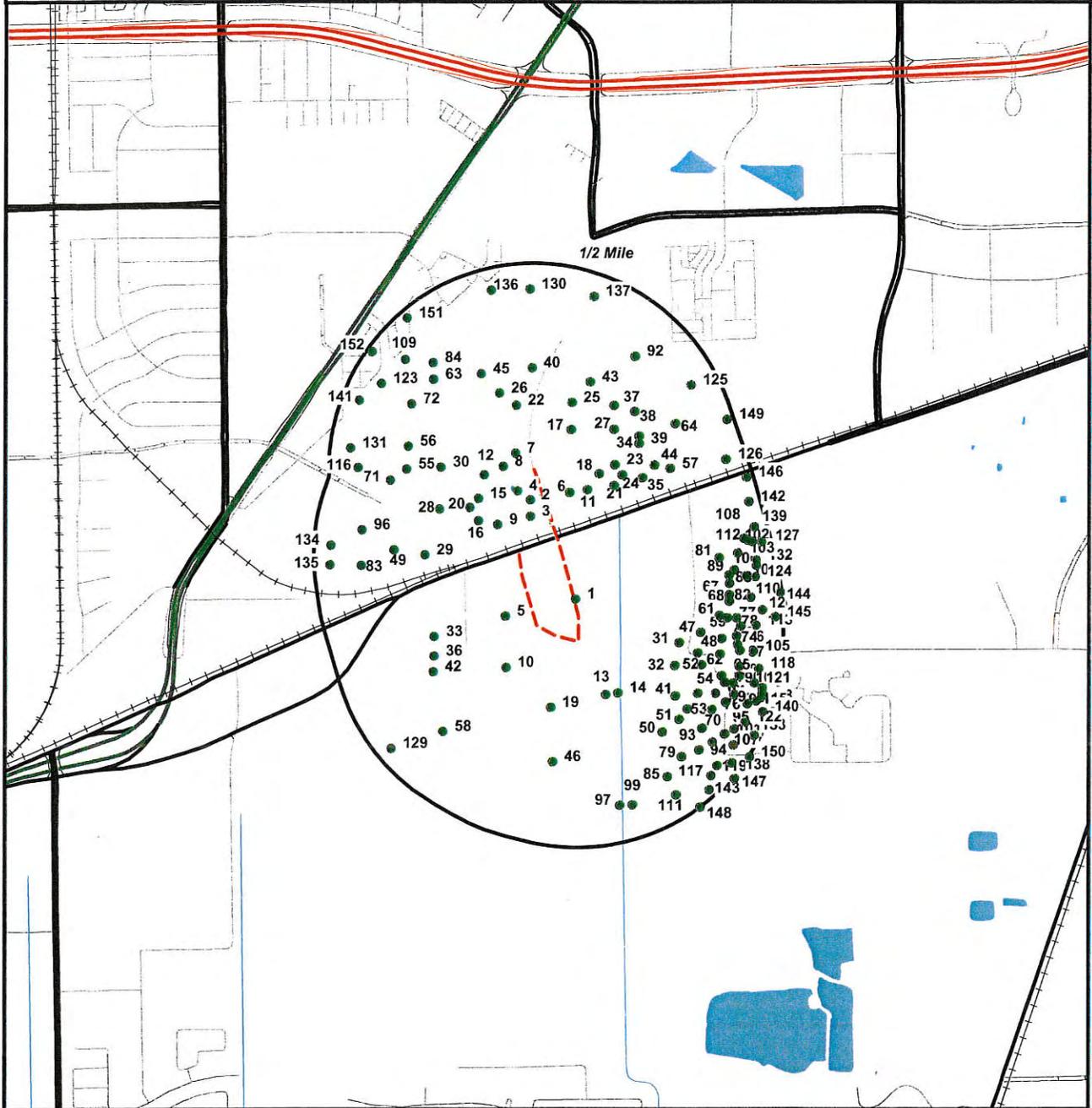
REPORT SUMMARY OF LOCATABLE SITES

MAP ID#	DATABASE NAME	SITE ID#	DISTANCE FROM SITE	SITE NAME	ADDRESS	CITY, ZIP CODE	PAGE #
1	NOV	RN101055069	0.001 N	KNUDSON KONCRETE PRECAST	922 HOLMES RD	HOUSTON, 77045-1006	1
1	PST	0018325	0.001 N	922 HOLMES RD	922 HOLMES RD	HOUSTON, 77045	2
1	VCP	630	0.001 N	922 HOLMES ROAD	922 HOLMES ROAD	HOUSTON	6
1	FRSTX	110023141036	0.001 N	KOASTAL PRECAST	922 HOLMES ROAD, BUILDING 3	HOUSTON, 77045-1006	7
1	FRSTX	110005174890	0.001 N	FREEDOM ENVIRONMENTAL GROUP INC	922 HOLMES RD	HOUSTON, 77045	8
1	FRSTX	110034089153	0.001 N	KNUDSON KONCRETE PRECAST	922 HOLMES RD	HOUSTON, 770451006	9
1	ICISNPDES	TXG110612	0.001 N	KNUDSON KOASTAL PRECAST,INC	922 HOLMES ROAD, BUILDING 3	HOUSTON, 77045	10
1	ICISNPDES	TXG110681	0.001 N	KOASTAL PRECAST	922 HOLMES RD	HOUSTON, 77045	28
1	NPDESR06	TXG110612	0.001 N	KNUDSON KOASTAL PRECAST	922 HOLMES ROAD, BUILDING 3 HARRIS	HOUSTON, 77045	43
1	NPDESR06	TXG110681	0.001 N	KNUDSON KOASTAL PRECAST INC	922 HOLMES RD HARRIS COUNTY	HOUSTON, 77045	44
1	HISTGWCC	630	0.001 N	922 HOLMES ROAD	922 HOLMES ROAD, HOUSTON	HOUSTON	45
2	TIERII	2UU2BD005JCX	0.010 N	DUPLICATE -	934 HOLMES ROAD	HOUSTON, 77045	46
2	FRSTX	110006688566	0.010 N	CAMPBELL CONCRETE & MATERIALS	934 HOLMES ROAD	HOUSTON, 77045	48
2	ICIS	2737541293	0.010 N	CAMPBELL RMC HOLMES ROAD	934 HOLMES ROAD	HOUSTON, 77045	49
2	ICISNPDES	TXG110052	0.010 N	PLANT 8 - HOLMES ROAD	934 HOLMES ROAD	HOUSTON, 77045	50
2	NPDESR06	TXG110052	0.010 N	CAMPBELL CONCRETE & MATERIALS,	934 HOLMES ROAD HARRIS COUNTY	HOUSTON, 77045	65
2	RCRAGR06	TXR000056630	0.010 N	CAMPBELL CONCRETE AND MATERIALS LP	934 HOLMES RD	HOUSTON, 77045	66
2	TRI	7704WCMPBL93	0.010 N	CAMPBELL RMC HOLMES ROAD	934 HOLMES RD	HOUSTON, 77045	67
2	PST	0069423	0.010 N	CCM PLANT 8	934 HOLMES RD	HOUSTON, 77045	68
3	PST	0032296	0.050 NE	HOLMES RM 16	936 HOLMES RD	HOUSTON, 77045	69
4	PST	0048803	0.070 NE	MISCHER-HARRIS CONSTRUCTION CO		HOUSTON, 77073	71
4	LPST	093513	0.070 NE	MISCHER HARRIS CONSTRUCTION CO	915 HOLMES RD	HOUSTON, 77045	77
5	MSWLF	38	0.120 SE	HOLMES ROAD LANDFILL	1110 HOLMES RD HOUSTON, TX 77045-1	HOUSTON, 77045-1102	78
5	MSWLF	1224	0.120 SE	BFI HOLMES ROAD LANDFILL	E OF S EXIT PETRO LANE S HOLMES RO	HOUSTON	79
5	BF	13980	0.120 SE	1110 HOLMES ROAD	1110 HOLMES ROAD	HOUSTON	80

REPORT SUMMARY OF LOCATABLE SITES

MAP ID#	DATABASE NAME	SITE ID#	DISTANCE FROM SITE	SITE NAME	ADDRESS	CITY, ZIP CODE	PAGE #
5	CERCLIS	TXD980514707	0.120 SE	BROWNING-FERRIS IND-HOLMES ROAD SITE	1110 HOLMES RD	HOUSTON, 77045	81
5	NFRAP	TXD980514707	0.120 SE	BROWNING-FERRIS IND-HOLMES ROAD SITE	1110 HOLMES RD	HOUSTON, 77045	82
5	MSWLF	377	0.120 SE	HOLMES ROAD LANDFILL	1110 HOLMES RD HOUSTON, TX 77045-1	HOUSTON, 77045-1102	83
6	PST	0010553	0.190 W	SOUTHERN PETROLEUM LABORATORIES	110 S PETRO LN	HOUSTON, 77225	84
7	RRCVCP	40009	0.390 E		N. HOLMES RD, W. OF KIRBY DR & E. O	HOUSTON, 77054	86
7	RRCVCP	40008	0.390 E		N. HOLMES RD, W. OF KIRBY DR & E. O	HOUSTON, 77054	87
8	APAR	1623	0.470 W	INDUSTRIAL BUSINESS PARK	3605 WILLOWBEND BLVD	HARRIS, 77054	88
8	VCP	1622	0.470 W	MAIN PARK INDUSTRIAL CENTER - 25 ACRES	3605 WILLOWBEND BOULEVARD	HOUSTON	89
8	VCP	1623	0.470 W	MAIN PARK INDUSTRIAL CENTER - 5 ACRES	3605 WILLOWBEND BOULEVARD	HOUSTON	90
8	APAR	1622	0.470 W	INDUSTRIAL BUSINESS PARK	3605 WILLOWBEND BLVD	HARRIS, 77054	91
9	RRCVCP	13004	0.470 N		0.13 MILES SOUTH OF BUFFALO SPEEDWA	HOUSTON, 77054	92
10	MSWLF	2082	0.490 N	ENERGY COMBUSTION SOLID WASTE INCINERATI	APPROXIMATELY 400 FEET SW INTERSECT	HOUSTON	93
11	NLRRCRAT	TXD988059309	0.500 W	MERRY X RAY CHEMICAL CORPORATION	3615 WILLOWBEND BLVD STE 400	HOUSTON, 77054	94
11	RRCVCP	30017	0.500 W		3605-3651 WILLOWBEND BLVD, HOUSTON	HOUSTON, 77054	96
12	SF	TXD008070419	0.580 SW	HOUSTON LEAD	300 HOLMES RD	HOUSTON, HARRIS COUNTY, 77045	97
12	IHWCA	31085	0.580 SW	HOUSTON LEAD	300 HOLMES RD	HOUSTON, 77045	99
13	IHWCA	T2888	0.630 W	TEXAS UNITED CHEMICAL CO	235 FARISS ST	HOUSTON, 77054	100
14	IHWCA	20426	0.890 NE	FLOW SERVE	2525 W BELLFORT ST STE 130	HOUSTON, 77054	101

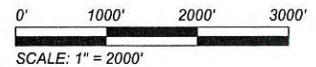
OIL & GAS WELL MAP



— Target Property (TP)

● Surface Location

**Extension of Buffalo Speedway
from Willowbend to South of
Holmes Road Project
HOUSTON, Texas
77045**



GeoSearch

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APPENDIX E

EXCERPTS FROM 2015-2018 TIP AND 2035 RTP UPDATE

DISTRICT		COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
HOUSTON		HARRIS		CS	C,E,R	HOUSTON	UPTOWN HOUSTON DISTRICT	\$8,100,000
STREET:		ALABAMA ST W				REV DATE: 05/2014		
LIMITS FROM:		SAGE ST				MPO PROJECT ID: 11007		
LIMITS TO:		IH 610				FUNDING CATEGORY: 3		
TIP		RECONFIGURE AND RECONSTRUCT ROADWAY INCLUDING PAVEMENT, SIGNALIZATION				MTP REFERENCE:		
DESCRIPTION:		AND SIDEWALK IMPROVEMENTS				NOx (KG/DAY): 3.669 VOC (KG/DAY): 1.775		
REMARKS:		Project History: Amendment #35 - 7/26/13 - Delay to FY 2016, per sponsor request.						
Total Project Cost Information:		Cost of Approved Phases:		Authorized Funding by Category/Share:				
Preliminary Engineering:	\$284,635			Federal	State	Regional	Local	Funding By Category
Right Of Way:	\$1,350,180			3-LOCAL:	---	---	\$8,100,000	Local Contribution
Construction:	\$5,400,720	\$8,100,000						---
Construction Engineering	\$270,036			Funding by Share:	---	---	\$8,100,000	---
Contingencies:	\$540,072							\$8,100,000
Indirects:	\$274,357							
Bond Financing:	---							
Total Project Cost:	\$8,100,000							
HOUSTON		HARRIS	0912-72-321	CS	C,E (REVIEW)	FRIENDSWOOD	HARRIS COUNTY	\$12,000,000
STREET:		BEAMER RD				REV DATE: 05/2014		
LIMITS FROM:		DIXIE FARM RD				MPO PROJECT ID: 16181		
LIMITS TO:		W OF TALL SHIPS LN				FUNDING CATEGORY: 3,7		
TIP		WIDEN TO 4-LANE CONCRETE BLVD W/ BRIDGES & DRAINAGE				MTP REFERENCE:		
DESCRIPTION:								
REMARKS:		Project History: Amendment #62 - 5/23/14 - Program available federal and state bond funds to support FY projects. Reflects additional federal funds made available by TXDOT through Cat-7 program due to project delays. (Engineering phase authorized for design review costs only) Amendment #30 - 5/24/13 - Split from 620 (0912-71-894) and add to FY 2016. (Engineering phase authorized for design review costs only)						
Total Project Cost Information:		Cost of Approved Phases:		Authorized Funding by Category/Share:				
Preliminary Engineering:	\$663,000			Federal	State	Regional	Local	Funding By Category
Right Of Way:	---			3-LOCAL CONT:	---	---	---	Local Contribution
Construction:	\$11,925,000	\$12,000,000		7-STP-MM:	\$6,404,936	---	\$1,801,234	\$3,993,830
Construction Engineering	\$600,000			Funding by Share:	\$6,404,936	---	\$1,801,234	\$3,993,830
Contingencies:	\$1,200,000							\$12,000,000
Indirects:	\$609,600							
Bond Financing:	---							
Total Project Cost:	\$14,997,600							
HOUSTON		HARRIS	0912-72-311	CS	C,E (REVIEW)	HOUSTON	CITY OF HOUSTON	\$5,000,000
STREET:		BUFFALO SPWY				REV DATE: 05/2014		
LIMITS FROM:		WILLOWBEND BLVD				MPO PROJECT ID: 16138		
LIMITS TO:		S OF HOLMES RD				FUNDING CATEGORY: 3		
TIP		CONSTRUCT 4-LANE GRADE SEPARATION OVER HOLMES RD AND UPRR				MTP REFERENCE:		
DESCRIPTION:								
REMARKS:		Project History: Amendment #49 - 2/28/14 - Delay from FY 2014 to FY 2016. (Engineering phase authorized for design review costs only) Amendment #31 - 5/24/13 - Program 2013-2016 Call for Projects awards. (Engineering phase authorized for design review costs only)						
Total Project Cost Information:		Cost of Approved Phases:		Authorized Funding by Category/Share:				
Preliminary Engineering:	\$320,000			Federal	State	Regional	Local	Funding By Category
Right Of Way:	---			3-LOCAL CONT:	---	---	---	Local Contribution
Construction:	\$4,925,000	\$5,000,000		3-TMF:	\$4,000,000	---	---	\$1,000,000
Construction Engineering	\$250,000			Funding by Share:	---	\$4,000,000	---	\$1,000,000
Contingencies:	\$500,000							\$5,000,000
Indirects:	\$254,000							
Bond Financing:	---							
Total Project Cost:	\$6,249,000							

PHASE: C=CONSTRUCTION, E = ENGINEERING, R = ROW, T = TRANSFER

Harris County Projects in the 2035 RTP Update - 'Phase III' Conformity				
MPOID	Street	Project Description	Total Project Cost	
Fiscal Yr	From Limit		Conformity Year	Length
Status	To Limit			Lanes*
Sponsor				
7510 2020 RTP	BROADWAY ST BARBOURS CUT BLVD L ST N	WIDEN TO 4-LANE ROAD	\$2,632,382	2025
PORT OF HOUSTON AUTHORITY			(2.4)	(0.0)
10348 2014 TIP	0912-71-799 BUFFALO BAYOU HERITAGE CORRIDOR MCKEE ST W OF JENSEN DR	12' WIDE CONCRETE SHARED USE PATH: BUFFALO HERITAGE CORRIDOR SHARED USE TRAIL IN HOUSTON	\$3,402,071	N/A
CITY OF HOUSTON			(0.0)	(0.0)
3064 [2011] Let	0912-71-503 BUFFALO BAYOU TRAIL SHEPHERD DR N-000420-018 SABINE ST	BIKE TRAIL ON BUFFALO BAYOU PARALLEL TO MEMORIAL DR & ALLEN PKWY	\$5,607,423	N/A
CITY OF HOUSTON			(0.0)	(0.0)
7537 2014 TIP	N-000784 BUFFALO SPWY HOLMES RD AIRPORT BLVD	CONSTRUCT 4-LANE DIVIDED, CONCRETE ROADWAY ON NEW ALIGNMENT W/ CURBS, SIDEWALKS, LIGHTING, UNDERGROUND UTILITIES	\$11,585,890	2017
CITY OF HOUSTON			(0.4)	(0.0)
14185 2020 RTP	BUFFALO SPWY FUQUA W CITY LIMIT	ROADWAY EXTENSION OF 4-LANES	\$1,383,764	2025
CITY OF HOUSTON			(0.4)	(0.0)
16136 2014 TIP	0912-72-311 BUFFALO SPWY WILLOWBEND BLVD S OF HOLMES RD	CONSTRUCT 4-LANE GRADE SEPARATION OVER HOLMES RD AND UPRR	\$6,249,000	2017
CITY OF HOUSTON			(0.4)	(0.0)
11029 2019 RTP	S015 BURKE RD SOUTHMORE PASADENA BLVD	RECONSTRUCT ROADWAY INCLUDING DRAINAGE, WATER, SEWER & SIDEWALKS	\$6,833,060	N/A
CITY OF PASADENA			(4.4)	(0.0)
13615 2020 RTP	N-000823 BURNETT ST CHESTNUT ST MAURY ST	ENGINEERING DESIGN OF PROPOSED BURNETT STREET FROM FULTON AVENUE TO PROPOSED BAYOU DRIVE. ROADWAY IS REQUESTED BY METRO OF CITY OF HOUSTON FOR ACCESS AND MOBILITY IMPROVEMENTS AT THE METRO INTERMODAL FACILITY NORTH OF DOWNTOWN HOUSTON. PROJECT INCLUDES REAL ESTATE ACQUISITION, CONSTRUCTION OF 48-FOOT WIDE CONCRETE PAVEMENT WITH CURBS, SIDEWALKS, STREET LIGHTING AND NECESSARY UNDERGROUND UTILITIES.	\$3,144,741	2025
CITY OF HOUSTON			(2.4)	(0.0)
13657 [2012] Let	510,520,530,540,550 BW 8 US 59 SH 288	WIDEN EXISTING FOUR-LANE TOLLWAY TO EIGHT-LANES	\$132,612,687	2014
HCTRA			(4.8)	(0.0)
14226 2015 TIP	3256-01-089 BW 8 SH 288 IH 45 S	WIDEN FROM 4 TO 8 MAIN LANES IN SECTIONS	\$200,000,000	2017
HCTRA			(4.8)	(3.3)
13863 [2013] Let	3256-01-095 BW 8 LITTLE YORK RD W N OF US 290	CONSTRUCT TWO 3-LANE FRONTAGE ROADS	\$35,221,305	2017
TXDOT HOUSTON DISTRICT			(0.0)	(0.6)
* (Existing, Proposed) Main Lanes then Frontage Roads.				
Houston-Galveston Area Council			Sorted by: Street, CSJ Number, then MPOID	
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