

STATE ENVIRONMENTAL ASSESSMENT

LOOP 1604

FROM FARM-TO-MARKET 471 (CULEBRA ROAD)

TO STATE HIGHWAY 16 (BANDERA ROAD)

BEXAR COUNTY

CSJ: 2452-01-055

TEXAS DEPARTMENT OF TRANSPORTATION

SAN ANTONIO DISTRICT

MARCH 2013

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1.0 PROPOSED ACTION

The Texas Department of Transportation (TxDOT) San Antonio District is proposing improvements to Loop (LP) 1604. Improvements would include constructing additional mainlanes as well as continuous frontage roads in order to upgrade the existing roadway to a four-lane expressway along approximately 4.7 miles of LP 1604 between Farm-to-Market (FM) 471 (Culebra Road) and State Highway (SH) 16 (Bandera Road) in the City of San Antonio, Bexar County, Texas.

Project location maps are included as **Figures 1 and 2** in **Appendix A**. **Figure 3** in **Appendix A** includes the existing and proposed typical sections. **Figures 4.1 through 4.4** depict land use/land cover and traffic noise receiver locations. **Figures 5.1 and 5.2** depict the water resources located in the project area. **Figure 6** provides karst zones in the proposed project area. **Figure 7** depicts the portions of the Edwards Aquifer located in the project area. Photographs of the project area are included in **Appendix B**. The 2013-2016 Transportation Improvement Program (TIP) page that contains the proposed project is located in **Appendix C**, and **Appendix D** provides agency coordination letters.

1.1 Existing

From SH 16 to approximately 1.2 miles south of SH 16, LP 1604 is currently a four-lane divided roadway with two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. Frontage roads are also located on both sides of the mainlanes and include a 10-foot wide inside shoulder, a 12-foot-wide inside lane, and a 14-foot-wide outside lane with no outside shoulder. From approximately 1.2 miles south of SH 16 to FM 471, LP 1604 is currently a four-lane divided roadway with two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. The existing right-of-way (ROW) width ranges from approximately 340 feet to 400 feet. The existing facility does not include bicycle or pedestrian accommodations. **Figure 3** provides typical sections for the existing facility.

1.2 Proposed

From SH 16 to approximately 1.2 miles south of SH 16, no changes to the mainlanes would occur. The proposed project would widen the existing frontage roads in order to accommodate a 4-foot-wide inside shoulder, two 12-foot-wide inside lanes, a 15-foot-wide outside lane, and a 6-foot-wide sidewalk. From approximately 1.2 miles south of SH 16 to FM 471, the proposed project would construct mainlanes and/or frontage roads. In portions of the proposed project, the existing mainlanes would be converted to frontage roads and new mainlanes would be constructed. In other portions of the proposed project, the existing mainlanes would be utilized and only new frontage roads would be constructed (**Figure 4.1 through 4.4**). Therefore, the proposed project would create a four-lane divided roadway with continuous frontage roads. The proposed roadway would consist of two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. Frontage roads along both sides of the mainlanes would include a 4-foot wide inside shoulder, a 12-foot-wide inside lane, a 15-foot-wide outside lane, and a 6-foot wide sidewalk. **Figure 3** provides typical sections for the proposed facility.

The proposed project would also include the construction of grade separations at Braun Road, New Guilbeau Road, and Shaenfield Road. The proposed grade separations would include a raised four-lane divided roadway consisting of two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. The proposed frontage roads would be at-grade and include a 4-foot wide inside shoulder, a 12-foot-wide inside lane, a 15-foot-wide outside lane, and a 6-foot wide sidewalk. **Figure 3** provides a typical section for the proposed grade separations.

The proposed improvements would require no new ROW or additional easements. Only existing ROW and existing easements would be needed in order to accommodate the proposed improvements. **Figures 4.1** through **4.4** show the existing ROW and existing easements on aerial photography.

1.3 Funding

The proposed project is included in the 2013-2016 TIP as amended and approved by the Metropolitan Planning Organization (MPO) Transportation Policy Board on January 28, 2013 (**Appendix C**). As of January 28, 2013, the total project costs for LP 1604 from FM 471 to SH 16 would total approximately \$82,000,000 and would be funded with both state and local funds. No federal funds would be used for the proposed project. The project is anticipated to let in August 2013.

1.4 Need for the Proposed Project

The proposed project is needed due to high traffic counts and congestion along LP 1604. According to the City of San Antonio Department of Planning and Community Development, the population of San Antonio grew from 1,144,646 in 2000 to 1,326,528 in 2010, a 15.9 percent increase. City Council District 6, where the proposed project is located, is one of the fastest growing districts with an overall population increase of 30.6 percent from 2000 to 2010. LP 1604 is currently the outermost loop around the City of San Antonio and provides a route for commuters who live within the area as well as commuters who live outside the City of San Antonio boundary. The mobility needs are shown in the historical and projected future traffic volumes on LP 1604 within the project limits, as demonstrated in **Table 1**. As shown, the demand for travel on LP 1604 is expected to increase in the future.

Table 1 Historical and Projected Traffic Volumes

Year	Average Daily Traffic--Vehicles Per Day (vpd)
2000	32,000 ¹
2005	60,830 ¹
2011	80,000 ¹
2013	87,500 ²
2033	158,400 ²
2043	174,400 ²

¹ TxDOT's San Antonio District traffic counts on LP 1604

² TxDOT Transportation Planning and Programming Division traffic data for LP 1604 from Wiseman Blvd. to SH 16, Bexar County (2012)

According to a LP 1604 traffic analysis performed for the Alamo Regional Mobility Authority (RMA) in January 2010 based on TxDOT 2006-2008 accident data, the intersection for LP 1604 and Braun Road was identified as a High Crash Location (more than 20 crashes over a 3-year period) with approximately

137 crashes reported between 2006 and 2008. Braun Road had over twice as many crashes from 2006 to 2008 as the next highest intersection (LP 1604 and West Military Drive reported 60 crashes).

1.5 Purpose of the Proposed Project

The purpose of the proposed project (the Build Alternative) is to improve mobility and safety by creating a freeway section of roadway and building grade separations at major side-street intersections within the proposed project boundaries. By turning LP 1604 from FM 471 to SH 16 into a freeway section, the proposed project would increase mobility for those traveling along LP 1604. Also, the construction of grade separations at LP 1604 and Braun Road, New Guilbeau Road, and Shaenfield Road would limit the interaction of high volume traffic traveling along LP 1604 and turning traffic from Braun Road, New Guilbeau Road, and Shaenfield Road onto LP 1604.

1.6 Alternatives

The following sections summarize the alternatives carried forward and evaluated in this document.

1.6.1 No-Build Alternative

Under the No-Build Alternative, LP 1604 between FM 471 and SH 16 would not be improved. The existing facility would operate as it currently does, with four travel lanes (two in each direction). Normal maintenance activities would continue and would potentially include seal coats and overlays (asphalt layer followed with rock aggregate), minor rehabilitation (reworking the top of the roadway surface followed by an overlay), pavement edge repair, and other activities, such as signing, striping, and patchwork. There would be no conversion of land cover or substantial adverse environmental impacts associated with this alternative. However, the No-Build Alternative would not improve mobility or increase safety; therefore, it would not address the need and purpose of the proposed project. The No-Build Alternative is carried forward in this document to provide a baseline for comparison to the Build Alternative.

1.6.2 Build Alternative

The Build Alternative would convert the existing LP 1604 roadway from FM 471 to SH 16 to a four lane freeway section (two lanes in each direction) with continuous frontage roads and grade separations at major intersections. **Figure 3** in **Appendix A** provides typical sections for the proposed facility.

The proposed improvements would not require any additional ROW or new easements. Also, the proposed project would not require relocation or displacement of any residential or commercial properties.

2.0 SURROUNDING AREA

According to *The Vegetation Types of Texas* (McMahan et al. 1984), the project area is located in three different vegetation types: Mesquite-Live Oak-Bluewood Parks (20), Live Oak-Ashe Juniper Woods (27), and Crops (44); however, the project is located in an urbanized area of the City of San Antonio that has

been largely developed with retail and/or commercial facilities along LP 1604, and residential areas in surrounding developments. Land use directly adjacent to the project is primarily developed, currently being developed, or is located within an approved Master Development Plan. Undeveloped areas generally contain remnant patches of woody vegetation, which is consistent with the vegetation type mapped by McMahan et al. (1984).

LP 1604 is located within the San Antonio River Basin and is drained by Culebra Creek and Helotes Creek as well as an unnamed tributary of Helotes Creek. The project is located within the Edwards Aquifer Transition Zone (**Figure 7**).

3.0 SPECIFIC AREAS OF ENVIRONMENTAL CONCERN

3.1 Right-of Way Acquisition and Displacements

The No Build and Build Alternatives would not require any additional ROW or new easements. No residential displacements would occur as a result of this project.

Various surface and subsurface utilities are located within the project area. These include existing overhead power lines, buried gas lines, telephone cable, sewer lines, and water lines. The Build Alternative would potentially require the adjustment of utilities located within the existing ROW or easements. Any utility adjustments would be implemented in a manner that would not result in a substantial disruption of service.

3.2 Environmental Justice and Limited English Proficiency

3.2.1 Environmental Justice

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

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

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

1. are predominately borne by a minority population and/or low-income population; or

2. would be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the nonminority population and/or non-low-income population.

A minority population is defined as a group of people and/or community experiencing common conditions of exposure or impact that consists of persons classified by the U.S. Bureau of the Census as Black/African-American; Hispanic; Asian or Pacific Islander; American Indian, Eskimo, or Aleut; or other non-white persons. Population, race, and ethnicity data from the 2010 U.S. Census was obtained for the Bexar County, census tracts, block groups, and blocks within the project area (**Table 2**).

According to the 2010 U.S. Census boundaries, the proposed project is located in seven census tracts, 10 block groups, and 43 blocks. Of those 43 blocks, 23 have a population of zero and are not included in **Table 2**. The data indicate that the project area is predominantly Hispanic/Latino with a majority of the blocks adjacent to the proposed project area have a Hispanic/Latino population greater than 50 percent.

Table 3 includes data from the 2007-2011 U.S. Census American Community Survey (ACS) regarding median household income and poverty within the project area census tracts, as well as the City of San Antonio and Bexar County. According to the U.S. Census Bureau, a low-income population is defined as a group of people and/or a community, which as a whole, lives below the national poverty level. The current (2013) poverty guideline in the 48 contiguous states and the District of Columbia is \$11,490 for an individual and \$23,550 for a family of four (Department of Health and Human Services 2013).

As indicated in **Table 3**, the proposed project area has a median household income well above the current poverty threshold. Additionally, the percentage of individuals below the poverty level in the project area is lower or equivalent to the percentage within the City of San Antonio as a whole and Bexar County. These data indicate that the project area is not expected to contain low-income residents; however, a mobile home park is located adjacent to LP 1604 just north of FM 471. Mobile homes are a low cost housing option and are often utilized by low income populations. The census data in **Table 2** indicate blocks in the project area contain populations that are predominantly Hispanic or Latino and due to the presence of a mobile home park adjacent to LP 1604, it was determined that EJ populations are present within the project area.

The No Build Alternative would not result in direct impacts to EJ populations. However, because the No Build Alternative would not meet projected traffic demands in the area, EJ populations may experience decreased mobility and safety on LP 1604.

The Build Alternative would not require additional ROW or easements; therefore, there would be no displacements or relocation impacts to EJ populations. Economic impacts to EJ populations are not expected to be substantial because much of the land adjacent to the project is already developed or zoned for development; therefore, tax rates are not expected to change substantially as a result of this project. Potential impacts to these populations of concern would be limited to impacts associated with accessibility and mobility, as detailed in **Section 3.2.3**. Because potential project impacts (e.g. noise, air, etc.) occur throughout the project length, impacts to EJ populations were determined not to be disproportionately high compared to impacts to the general population.

Table 2 Population, Race, and Ethnicity within Project Area

	Total Population	Hispanic or Latino	Not Hispanic or Latino	Not Hispanic or Latino						
				White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
Bexar County	1,714,773	1,006,958	707,815	519,123	118,460	3,809	39,561	1,806	2,881	22,175
		58.72%	41.28%	73.34%	16.74%	0.54%	5.59%	0.26%	0.41%	3.13%
City of San Antonio	1,327,407	838,952	488,455	353,106	83,365	2,771	30,596	1,097	2,105	15,415
		63.20%	36.80%	72.29%	17.07%	0.57%	6.26%	0.22%	0.43%	3.16%
Census Tract 1817.16	7,342	5,125	2,217	1,660	342	18	53	3	8	133
		69.80%	30.20%	74.88%	15.43%	0.81%	2.39%	0.14%	0.36%	6.00%
Block Group 1	2,332	1,814	518	397	64	6	21	1	0	29
		77.79%	22.21%	76.64%	12.36%	1.16%	4.05%	0.19%	0%	5.60%
Block 1001	204	146	58	47	6	0	1	0	0	4
		71.57%	28.43%	81.03%	10.34%	0%	1.72%	0%	0%	6.90%
Block 1005	903	704	199	151	30	5	5	0	0	8
		77.96%	22.04%	75.88%	15.08%	2.51%	2.51%	0%	0%	4.02%
Block Group 3	2,898	1,821	1,077	792	186	10	20	1	1	67
		62.84%	37.16%	73.54%	17.27%	0.93%	1.86%	0.09%	0.09%	6.22%
Block 3002	1,186	709	477	323	117	7	8	0	0	22
		59.78%	40.22%	67.71%	24.53%	1.47%	1.68%	0%	0%	4.61%
Census Tract 1817.18	5,208	2,521	2,687	2,279	191	8	90	8	13	98
		48.41%	51.59%	84.82%	7.11%	0.30%	3.35%	0.30%	0.48%	3.65%
Block Group 3	1,783	918	865	656	105	1	34	1	9	59
		51.49%	48.51%	75.84%	12.14%	0.12%	3.93%	0.12%	1.04%	6.82%

Table 2 Population, Race, and Ethnicity within Project Area

	Total Population	Hispanic or Latino	Not Hispanic or Latino	Not Hispanic or Latino						
				White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
Block 3000	971	502	469	337	66	0	24	1	9	32
		51.70%	48.30%	71.86%	14.07%	0.00%	5.12%	0.21%	1.92%	6.82%
Census Tract 1817.21	3,508	1,931	1,577	1,215	213	5	104	1	5	34
		55.05%	44.95%	77.05%	13.51%	0.32%	6.59%	0.06%	0.32%	2.16%
Block Group 1	2,113	1,160	953	751	106	0	69	1	2	24
		54.90%	45.10%	78.80%	11.12%	0.00%	7.24%	0.10%	0.21%	2.52%
Block 1008	904	484	420	321	51	0	34	1	2	11
		53.54%	46.46%	76.43%	12.14%	0.00%	8.10%	0.24%	0.48%	2.62%
Block 1012	346	196	150	118	12	0	17	0	0	3
		56.65%	43.35%	78.67%	8.00%	0.00%	11.33%	0.00%	0.00%	2.00%
Block Group 2	1,395	771	624	464	107	5	35	0	3	10
		55.27%	44.73%	74.36%	17.15%	0.80%	5.61%	0.00%	0.48%	1.60%
Block 2002	201	113	88	61	19	0	6	0	0	2
		56.22%	43.78%	69.32%	21.59%	0.00%	6.82%	0.00%	0.00%	2.27%
Census Tract 1817.23	4,591	2,638	1,953	1,416	312	16	125	7	11	66
		57.46%	42.54%	72.50%	15.98%	0.82%	6.40%	0.36%	0.56%	3.38%
Block Group 3	1,982	1,081	901	655	151	7	50	0	4	34
		54.54%	45.46%	72.70%	16.76%	0.78%	5.55%	0.00%	0.44%	3.77%
Block 3001	69	46	23	21	2	0	0	0	0	0
		66.67%	33.33%	91.30%	8.70%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 2 Population, Race, and Ethnicity within Project Area

	Total Population	Hispanic or Latino	Not Hispanic or Latino	Not Hispanic or Latino						
				White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
Census Tract 1817.24	4,267	2,114	2,153	1,757	159	7	130	0	5	95
		49.54%	50.46%	81.61%	7.39%	0.33%	6.04%	0.00%	0.23%	4.41%
Block Group 2	2,351	1,114	1,237	1,020	99	3	65	0	2	48
		47.38%	52.62%	82.46%	8.00%	0.24%	5.25%	0.00%	0.16%	3.88%
Block 2012	121	65	56	40	7	1	4	0	1	3
		53.72%	46.28%	71.43%	12.50%	1.79%	7.14%	0.00%	1.79%	5.36%
Block 2017	169	79	90	68	11	0	11	0	0	0
		46.75%	53.25%	75.56%	12.22%	0.00%	12.22%	0.00%	0.00%	0.00%
Census Tract 1817.26	9,610	5,217	4,393	3,318	540	30	297	20	13	175
		54.29%	45.71%	75.53%	12.29%	0.68%	6.76%	0.46%	0.30%	3.98%
Block Group 2	3,324	1,920	1,404	1,068	172	5	79	12	3	65
		57.76%	42.24%	76.07%	12.25%	0.36%	5.63%	0.85%	0.21%	4.63%
Block 2000	7	1	6	6	0	0	0	0	0	0
		14.29%	85.71%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block 2001	25	8	17	16	0	0	0	0	0	1
		32.00%	68.00%	94.12%	0.00%	0.00%	0.00%	0.00%	0.00%	5.88%
Block 2002	2	0	2	2	0	0	0	0	0	0
		0.00%	100.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block 2004	6	6	0	0	0	0	0	0	0	0
		100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table 2 Population, Race, and Ethnicity within Project Area

	Total Population	Hispanic or Latino	Not Hispanic or Latino	Not Hispanic or Latino						
				White Alone	Black or African American Alone	American Indian and Alaska Native Alone	Asian Alone	Native Hawaiian and Other Pacific Islander Alone	Some Other Race Alone	Two or More Races
Census Tract 1817.28	10,170	6,422	3,748	2,508	754	16	231	25	23	191
		63.15%	36.85%	66.92%	20.12%	0.43%	6.16%	0.67%	0.61%	5.10%
Block Group 1	6,928	4,336	2,592	1,773	482	12	154	20	18	133
		62.59%	37.41%	68.40%	18.60%	0.46%	5.94%	0.77%	0.69%	5.13%
Block 1025	44	19	25	15	6	0	4	0	0	0
		43.18%	56.82%	60.00%	24.00%	0.00%	16.00%	0.00%	0.00%	0.00%
Block 1030	74	49	25	24	1	0	0	0	0	0
		66.22%	33.78%	96.00%	4.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block 1042	10	10	0	0	0	0	0	0	0	0
		100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block 1045	15	14	1	0	1	0	0	0	0	0
		93.33%	6.67%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Block Group 2	3,242	2,086	1,156	735	272	4	77	5	5	58
		64.34%	35.66%	63.58%	23.53%	0.35%	6.66%	0.43%	0.43%	5.02%
Block 2000	91	50	41	19	17	0	5	0	0	0
		54.95%	45.05%	46.34%	41.46%	0.00%	12.20%	0.00%	0.00%	0.00%
Block 2011	105	67	38	22	12	0	1	0	0	3
		63.81%	36.19%	57.89%	31.58%	0.00%	2.63%	0.00%	0.00%	7.89%

Source: U.S. Census Bureau 2010 U.S. Census, Table P9

Table 3 Median Household Income and Poverty Status

	Median Household Income in the Past 12 Months (in 2010 inflation-adjusted dollars)		Percent Below Poverty Level	
	Estimate	Margin of Error	Estimate	Margin of Error
Bexar County	\$48,083	+/- 517	17.1%	+/- 0.5
City of San Antonio	\$43,961	+/- 510	19.2%	+/- 0.6
Census Tract 1817.16	\$43,581	+/- 5,168	11.9%	+/- 7.3
Census Tract 1817.18	\$63,708	+/- 3,874	5.5%	+/- 3.2
Census Tract 1817.21	\$79,335	+/- 6,396	7.4%	+/- 4.1
Census Tract 1817.23	\$71,116	+/- 4,188	4.0%	+/- 3.2
Census Tract 1817.24	\$78,348	+/- 20,685	2.2%	+/- 1.5
Census Tract 1817.26	\$69,883	+/- 7,648	4.5%	+/- 2.3
Census Tract 1817.28	\$61,440	+/- 4,420	5.2%	+/- 3.3

Source: U.S. Census Bureau, 2007-2011 American Community Survey, Table B19013 and S1701

3.2.2 Limited English Proficiency

Executive Order 13166, “Improving Access to Services for Persons with Limited English Proficiency” (LEP), requires agencies to examine the services they provide, identify any need for services to those with LEP, and develop and implement a system to provide those services so that LEP persons can have meaningful access to them. To determine if LEP populations may be affected by the proposed project, data from the 2007-2011 U.S. Census ACS were collected for populations that speak English “less than very well” within census tracts, the City of San Antonio and Bexar County (**Table 4**).

Table 4 Limited English Proficiency Percentage Comparison

Location	Population Who Speak English Less Than “Very Well”			
	Estimate	Margin of Error	Percent	Percent Margin of Error
Bexar County	193,453	+/- 4,186	12.4%	+/- 0.3
City of San Antonio	166,604	+/- 3,593	13.7%	+/- 0.3
Census Tract 1817.16	2,597	+/- 171	8.5%	+/- 2.6
Census Tract 1817.18	212	+/- 110	4.7%	+/- 2.3
Census Tract 1817.21	389	+/- 145	11.1%	+/- 3.8
Census Tract 1817.23	413	+/- 196	8.9%	+/- 4.3
Census Tract 1817.24	108	+/- 72	3.0%	+/- 2.1
Census Tract 1817.26	592	+/- 219	7.3%	+/- 2.6
Census Tract 1817.28	776	+/- 226	9.4%	+/- 2.7

Source: U.S. Census Bureau, 2007-2011 ACS, 5-year estimates, DP02

Although field observations revealed no indicators of LEP populations such as signage in languages other than English, census data indicate that there are LEP populations within the proposed project area. A majority of the LEP populations in the project area speak Spanish. Notices for the public meeting held on January 10, 2013, were provided in both English and Spanish. Although no requests for special communication accommodations were made for the public meeting, Spanish-speaking TxDOT employees attended the meeting and public comment forms were provided in both English and Spanish. All further public involvement/outreach will be conducted in a manner so that all interested parties can provide both oral and written comments concerning the proposed projects. Reasonable arrangements (such as special communication interpreters or accommodation needs) will be taken to ensure all persons have meaningful

access to the programs, services, and information TxDOT provides. Therefore, the project would be in compliance with Executive Order 13166.

3.2.3 Community Cohesion

According to the U.S. Department of Transportation and Federal Highway Administration's community impact assessment guidance, a community is defined in part by behavior patterns that individuals or groups of individuals hold in common. These behavior patterns are expressed through daily social interactions, the use of local facilities, participation in local organizations, and involvement in activities that satisfy the population's economic and social needs. A community is also defined by shared perceptions or attitudes, typically expressed through individuals' identification with, commitment to, and attitude towards a particular identifiable area. In addition, there are other concepts of community which are not based on spatial relationships. Communities may be based on a common characteristic or interest, such as religion, ethnicity, income strata, or concern for the economic viability of a region, which provides a psychological unity among members. Highway and street projects can affect community cohesion by dividing neighborhoods, displacing substantial numbers of residents or businesses, unfairly affecting a minority or low-income neighborhood, or introducing different kinds of businesses that change the overall character of the community.

The No Build and proposed Build Alternatives would not separate or divide neighborhoods, as access to community centers would be maintained. Community centers within the proposed project area include:

- Zion Lutheran Church
- Northwest Church of Christ
- Northwest Hispanic Baptist Church
- Northwest Park Baptist Church
- Brauchle Elementary School
- Jefferson Middle School
- Ward Elementary School

The project would not displace any commercial or residential properties. The proposed improvements include the construction of 6-foot wide sidewalks on either side of the proposed frontage roads as well as a 15-foot wide outside lane along the frontage roads to accommodate bicycles.

3.2.3.1 Permanent Changes in Access and Travel Patterns

The proposed project would slightly alter access to LP 1604 for businesses adjacent to the existing project area. Properties adjacent to the current roadway would no longer have direct access to northbound or southbound LP 1604. Instead, properties would have access to LP 1604 one-way frontage roads. Although the proposed improvements would result in changes in access to those businesses adjacent to LP 1604 with existing access to LP 1604 mainlanes, the project would not separate or isolate any businesses, distinct neighborhoods, ethnic groups, or other specific groups.

3.2.3.2 Temporary Changes in Access and Travel Patterns

The proposed project is a design-build project; therefore, the need for road closures or detours would be determined after the proposed project has let for construction and detailed design begins. Any detour or road closures during construction could result in increased travel time and increased traffic on adjacent roadways. Access to all properties would be maintained during and after construction.

3.3 Cultural Resources

Cultural resources are structures, buildings, archeological sites, districts (a collection of related structures, buildings, and/or archeological sites), cemeteries, and objects. Both federal and state laws require consideration of cultural resources during project planning. At the federal level, the National Environmental Policy Act (NEPA) and the National Historic Preservation Act (NHPA) of 1966, among others, apply to transportation projects such as this one. In addition, state laws such as the Antiquities Code of Texas apply to these projects. Compliance with these laws often requires consultation with the Texas Historical Commission (THC)/Texas State Historic Preservation Officer (SHPO) and/or federally-recognized tribes to determine the project's effects on cultural resources. Review and coordination of this project followed approved procedures for compliance with federal and state laws.

3.3.1 Historic Resources

State laws such as the Antiquities Code of Texas (ACT) require consideration of historic resources during project planning. Compliance with the ACT may require consultation with the THC to identify, protect, and preserve properties listed on the National Register of Historic Places (NRHP) or list of State Archeological Landmarks (SAL). Review and coordination of this project followed approved procedures for compliance with state laws.

Qualified historians determined that there are no NRHP or SAL-listed properties in the project Area of Potential Effect (APE), which is the existing ROW and existing easements, and the project complies with applicable state laws. Pursuant to the Memorandum of Understanding (MOU) between TxDOT and the THC, TxDOT Historians determined that the proposed action has no potential to affect historic properties and that individual project coordination with the THC is not required.

3.3.2 Archeological

Based on the background study and further research of the project area, no further work is warranted. Consultation with federally-recognized Native American tribes with a demonstrated historic interest in the area was initiated on March 1, 2013 (**Appendix D**). No objections or expressions of concern were received within the comment period. TxDOT archeologists completed their review of this project on February 27, 2013, and determined that the project would have no effect or no adverse effect on archeological sites or cemeteries that would be afforded further consideration under cultural resources laws (**Appendix D**). No consultation with the THC/SHPO was required.

In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures.

3.4 Vegetation

According to *The Vegetation Types of Texas* (McMahan et al. 1984), the vegetation in the project area is located in three different vegetation types: Mesquite-Live Oak-Bluewood Parks (20), Live Oak-Ashe Juniper Woods (27), and Crops (44). Field observations revealed that properties adjacent to LP 1604 are dominated by commercial and residential properties, but remnant vegetation located in undeveloped parcels is consistent with the vegetation types described by McMahan et al. 1984.

Vegetation within the project ROW is dominated by Grassland/Mixed Herbaceous vegetation with Mixed Deciduous Woods and Riparian vegetation located in parts of the existing ROW and dominating the existing easements (**Figures 4.1** through **4.4**). The following paragraphs provide detailed descriptions of each vegetation type observed.

Grassland/Mixed Herbaceous

The Grassland/Mixed Herbaceous vegetation type is found throughout the proposed project area and is generally composed of a mix of native and introduced grasses and forbs with a few scattered trees and shrubs (**Photo 1**). Much of this cover type is maintained by periodic mowing, but other smaller patches are unmaintained, especially along drainages and steeper terrain. Common grasses and forbs include little bluestem (*Schizachyrium scoparium*), guinea grass (*Urochloa maxima*), common bermudagrass (*Cynodon dactylon*), Johnsongrass (*Sorghum halapense*), western ragweed (*Ambrosia trifida*), common sunflower (*Helianthus annuus*), silverleaf nightshade (*Solanum elaeagnifolium*), plains bristlegrass (*Setaria macrostachya*), hairy grama-grass (*Bouteloua hirsuta*), three-awn grasses (*Aristida spp.*), Texas speargrass (*Nasella leucotricha*), Engelmann's daisy (*Engelmannia peristenia*), Carolina geranium (*Geranium carolinianum*), green sprangletop (*Leptochloa dubia*), and Louisiana vetch (*Vicia ludoviciana*). Along drainages where this cover type occurs, including along Culebra and Helotes Creeks, other common species include Canada wildrye (*Elymus canadensis*), giant ragweed (*Ambrosia trifida*), blackland aster (*Symphotrichum subulatus*), Kleburg bluestem (*Dichanthium annulatum*), and silver bluestem (*Bothriochloa laguroides*) (**Photo 2**).

There are scattered trees and shrubs located throughout this vegetation type, both in maintained and unmaintained areas, and along some fencerows. The most common species are live oak (*Quercus virginiana*), mesquite (*Prosopis glandulosa*), and hackberry (*Celtis laevigata*). Live oak trees observed in this vegetation type are generally 15 to 40 feet in height (average 28 feet) and have a diameter at breast height (dbh) ranging from 6 to 35 inches (average 14 inches), but one relatively large live oak tree estimated to be 60 inches dbh is located in the western portion of the ROW just south of SH 16 between the frontage roads and mainlanes (**Photo 3**). Mesquite trees observed in this vegetation type are 15 to 30 feet in height (average 20 feet) and have a dbh ranging from 6 to 21 inches (average 11 inches). Hackberry trees observed in this vegetation type are 20 to 30 feet in height (average 25 feet) and have a

dbh ranging from 10 to 18 inches (average 13 inches). The overall canopy cover does not exceed 10 percent in this vegetation type.

A series of landscaped areas occurs within the ROW at the intersection of LP 1604 and SH 16. Common planted species include cenizo (*Leucophyllum frutescens*), mountain laurel (*Sophora secundiflora*), yuccas (*Yucca* spp.), chinkapin oak (*Quercus muehlenbergii*), redbud (*Cercus canadensis*), flameleaf sumac (*Rhus copallinum*), sotol (*Dasyilirion texanum*), live oak, cedar elm, and agarita (*Berberis trifoliata*). The trees within the landscaped area are less than 10 feet in height. It is anticipated that none of these landscaped areas would be impacted by the project unless deemed necessary during the design/build portion of the project.

Mixed Deciduous Woodland

The Mixed Deciduous Woodland vegetation type occurs primarily in the existing easements located within the proposed project area (**Figures 4.1 through 4.4**). It is characterized as a mix of deciduous trees including mesquite, cedar elm (*Ulmus crassifolia*), and hackberry with a few scattered live oaks (**Photo 4**). Mesquite trees observed in this vegetation type are 10 to 25 feet in height (average 17 feet) and have a dbh ranging from 6 to 19 inches (average 9 inches). Cedar elm trees observed in this vegetation type are 18 to 40 feet in height (average 30 feet) and have a dbh ranging from 6 to 12 inches (average 8 inches). Hackberry trees observed in this vegetation type are 10 to 25 feet (average 15 feet) in height and have a dbh ranging from 6 to 12 inches (average 8 inches). The canopy cover varies from 70 to 90 percent. Common woody associates include huisache (*Acacia farnesiana*), retama (*Parkinsonia aculeata*), Texas prickly pear (*Opuntia engelmannii*), Ashe juniper (*Juniperus ashei*), Roemer's acacia (*Acacia roemeriana*), hogplum (*Colubrina texensis*), and winged elm (*Ulmus alata*). Common herbaceous and vine species include common bermudagrass, perennial ryegrass (*Lolium perenne*), switch-grass (*Panicum virgatum*), little bluestem, Texas vervain (*Verbena halei*), Canada wildrye, giant ragweed, greenbrier (*Smilax* spp.), poison ivy (*Toxicodendron radicans*), and plains tickseed (*Coreopsis tinctoria*).

Riparian

Riparian woodlands occur along Helotes Creek outside of the existing ROW, but within a drainage easement that extends along the creek east of LP 1604. This vegetation type is dominated by a mix of cedar elm with a few scattered live oak and deciduous trees including chinaberry (*Melia azedarach*) and western soapberry (*Sapindus saponaria*). The understory is sparse and consists of western soapberry, Mexican buckeye (*Ungnadia speciosa*), mountain laurel, and Ashe juniper (**Photo 5**). The canopy of these woodlands ranges from 80 to 90 percent and is between 25 to 40 feet in height with an average height estimated to be 35 feet. The canopy trees range from 5 to 19 inches dbh with an average dbh estimated to be 10 inches. Common herbaceous species include giant ragweed, Vasey-grass (*Paspalum urvillei*), Canada wildrye, and cedar sedge (*Carex planostachys*). The riparian woods occur along the banks of an unvegetated open water portion of Helotes Creek approximately 30 feet in width between the ordinary high water marks.

Unusual Vegetation and Special Habitat Features

According to the Memorandum of Agreement (MOA) between TxDOT and Texas Parks and Wildlife Department (TPWD), unusual vegetation may include the following:

- a) unmaintained vegetation
- b) trees or shrubs along a fence line (ROW) adjacent to a field (fencerow vegetation)
- c) riparian vegetation (particularly where fields/cropland extends up to or abuts the vegetation associated with the riparian corridor)
- d) trees that are unusually larger than other trees in the area
- e) unusual stand or islands (isolated) of vegetation

Special habitat features include:

- a) bottomland hardwoods
- b) caves
- c) cliffs and bluffs
- d) native prairies (particularly those with climax species of native grasses and forbs)
- e) ponds (temporary or permanent, natural, and manmade)
- f) seeps or springs
- g) snags (dead trees) or groups of snags
- h) water bodies (creeks, streams, rivers, lakes, etc.)
- i) existing bridges with known or easily observed bird or bat colonies

Unusual vegetation and special habitat features located in the project area include unmaintained vegetation, riparian vegetation, three stream crossings located in the project area, two bridges that could potentially be used by both birds and bats, one relatively large live oak tree (approximately 60 inches dbh) located on the western side of the ROW between the southbound main lanes and frontage roads just south of SH 16 (**Photo 3**), and a heritage oak tree located just north of Culebra Road between the southbound frontage road and southbound main lanes. The live oak tree south of SH 16 would not be impacted by the proposed project unless it is determined during the design/build that it poses a safety risk. The heritage oak located north of Culebra Road would not be impacted by the proposed project. Also, the proposed project would not demolish or reconstruct existing bridges; therefore, there would be no impacts to bird or bat colonies. Although both unmaintained and riparian vegetation are located in the area, they are not unusual since the unmaintained vegetation includes grasses and forbs also found outside the existing ROW, and the riparian vegetation is part of a larger riparian corridor. No other special habitat features, as outlined by the TxDOT–TPWD MOA, are present in the project area.

3.4.1 Impacts to Vegetation

Since the No Build Alternative would not include any improvements to LP 1604, no impacts beyond the existing mowing and maintenance practices would occur. Anticipated impacts resulting from the Build Alternative are summarized in **Table 5**.

Table 5 Potential Impacts to Vegetation

Land Cover Type	Area Within Existing ROW and Easements
Grassland/Mixed Herbaceous	159.67 acres
Mixed Deciduous Woodland	2.94 acres
Riparian	0.66 acre

Since detailed design would not be completed until after the proposed project is let for construction, impacts were determined to include the entire existing ROW and easements. Therefore, this document assumes that all vegetation within the project area, except the live oak trees described above, would be cleared in order to construct the proposed facility. The proposed project would impact approximately 159.67 acres of Grassland/Mixed Herbaceous, 2.94 acres of Mixed Deciduous Woodland, and 0.66 acre of Riparian vegetation (**Table 5**). Woody vegetation is scattered throughout the existing ROW and the existing easements and would be impacted by the proposed project. These vegetation impacts are a worst case scenario. During design, efforts would be made to avoid the removal of vegetation, especially mature woody vegetation. Also, permanent impacts to vegetation would be minimized to the extent possible during construction.

3.4.2 Mitigation

To minimize impacts to vegetation and wildlife during construction activities, the clearing of vegetation would be limited to those areas needed for construction, and disturbed areas will be reseeded with native vegetation where appropriate. In accordance with Provision (4)(A)(ii) of the TxDOT-TPWD MOU and the MOA, TxDOT considers non-regulatory mitigation for the following habitats:

- habitat for federal candidate species if mitigation would assist in the prevention of the listing of the species
- rare vegetation series (S1, S2, or S3) that also locally provide habitat for a state-listed species
- all vegetation communities listed as S1 or S2, regardless of whether the series in question provide habitat for state-listed species
- bottomland hardwoods, native prairies, and riparian sites
- any other habitat feature considered to be locally important

Although, a riparian area is located in one of the existing easements, there are currently no plans to construct any improvements within any existing easements. If it is determined during the design/build portion of the project that drainage improvements are required for the proposed LP 1604 facility, impacts within the existing easement may occur. These impacts, though, would be limited to activities deemed necessary to improve drainage along LP 1604. No other habitat types recommended for mitigation consideration in the TxDOT-TPWD MOA would be permanently impacted by the project. No compensatory mitigation is proposed or anticipated for this project. Per the TxDOT-TPWD MOU,

coordination with the TPWD would be required for this project because the project would affect mature woody vegetation and is located in potential habitat for state-listed threatened and endangered species.

3.4.3 Invasive Species

On February 3, 1999, the President issued EO 13112 to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts. In accordance with EO 13112 on invasive species, native plant species would be used in the landscaping and in the seed mixes where practicable.

3.4.4 Beneficial Landscape Practices

In accordance with the Executive Memorandum of August 10, 1995, all agencies shall comply with NEPA as it relates to vegetation management and landscape practices for all federally assisted projects. The Executive Memorandum directs that where cost-effective and to the extent practicable, agencies would (1) use regionally native plants for landscaping; (2) design, use, or promote construction practices that minimize adverse effects on the natural habitat; (3) seed to prevent pollution by, among other things, reducing fertilizer and pesticide use; (4) implement water-efficient and runoff reduction practices; and (5) create demonstration projects employing these practices. Landscaping included with this project would be in compliance with the Executive Memorandum and the guidelines for environmentally and economically beneficial landscape practices.

3.4.5 Farmland Protection Policy Act (FPPA)

Projects considered exempt under the FPPA include those that require no additional ROW or require ROW that is developed, urbanized, or zoned for urban use. The proposed project would be constructed using state and local funds and would be constructed within the existing ROW of LP 1604. Therefore, the project is considered exempt under the FPPA.

3.5 Threatened and Endangered Species

The Texas Natural Diversity Database (NDD) was reviewed on December 18, 2012 (date on which data was provided by TPWD) to assess the potential for rare, threatened, or endangered species to occur within the 10 miles of the proposed project limits. This review met the requirements of the TxDOT–TPWD MOA for sharing and maintaining NDD information. **Table 6** provides elements of occurrence records within 1.5 miles of the proposed project.

Table 6 Elements of Occurrence within 1.5 miles of the Proposed Project

Element of Occurrence ID No.	Common Name	Scientific Name	Federal/State Status
7786	Texas Garter Snake	<i>Thamnophis sirtalis annectens</i>	None

Table 7 lists the state and federal threatened/endangered species of concern for Bexar County.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
AMPHIBIANS					
Cascade Caverns Salamander <i>Eurycea latitans complex</i>	—	T	Endemic; subaquatic; springs and caves in Medina River, Guadalupe River, and Cibolo Creek watersheds within the Edwards Aquifer area.	No Impact	No habitat is located in the proposed project area; BMPs in place during construction would limit impacts to water quality.
Comal Blind Salamander <i>Eurycea tridentifera</i>	—	T	Semi-troglobitic, found in springs and waters of caves.	No Impact	No habitat is located in the proposed project area; BMPs in place during construction would limit impacts to water quality.
Texas Salamander <i>Eurycea neotenes</i>			Endemic; troglobitic; springs, seeps, cave streams, and creek headwaters; often hides under rocks and leaves in water; restricted to Helotes and Leon Creek drainages.	No Impact	No habitat is located in the proposed project area; BMPs in place during construction would limit impacts to water quality.
BIRDS					
American Peregrine Falcon <i>Falco peregrinus anatum</i>	DL	T	Potential migrant; nests in west Texas; prefers high, massive cliffs, preferably near water where avian prey densities are high.	No Impact	No habitat present in or adjacent to the project area.
Arctic Peregrine Falcon <i>Falco peregrinus tundrius</i>	DL	—	Migrant throughout state from subspecies' far northern breeding range; winters along coast and farther south; occupies wide range of habitats during migration, including urban, concentrations along coast and barrier islands; low-altitude migrant, stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No Impact	No habitat present in or adjacent to the project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Black-capped Vireo <i>Vireo atricapilla</i>	E	E	Typically occur in areas with thin soil and limestone bedrock that support scrubby vegetation dominated by broad-leaved shrubs. Shin oak or evergreen sumac (<i>Rhus virens</i>), and mountain laurel (<i>Sophora secundiflora</i>) are usually common in areas occupied by vireos in central Texas. Foliage volume generally high; relatively open upper canopy layer; territories typically range in size from about 2 to 4 acres.	No Take	No habitat present in or adjacent to the project area.
Golden-cheeked Warbler <i>Setophaga chrysoparia</i>	E	E	Live oak /Ashe juniper woodlands; mature Ashe juniper and high canopy closure needed for nesting material; broad-leaved deciduous species such as lacey oak (<i>Quercus glaucooides</i>) and Texas Oak necessary for insect prey; range usually 6 to 20 acres. Restricted to habitats in Hill Country and on Edwards Plateau.	No Take	Potential habitat was previously identified in a few patches adjacent to the ROW, but surveys in 2009 and 2010 determined that no birds were present in those patches.
Interior Least Tern <i>Sterna antillarum athalassos</i>	E ¹	E	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.	No Take	No potential habitat is located within the existing ROW or easements.
Mountain Plover <i>Charadrius montanus</i>	—	—	High plains, shortgrass prairies, and bare, dirt (plowed) fields.	No Impact	No habitat present in or adjacent to the project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Sprague's Pipit <i>Anthus spragueii</i>	C ¹	—	Only in Texas during migration and winter, mid September to early April; strongly tied to native upland prairie, can be locally common in coastal grasslands.	No Impact	No habitat present in or adjacent to the project area.
Western Burrowing Owl <i>Athene cunicularia hypugaea</i>	—	—	Prairies, pastures, agricultural areas, savannas, open areas, vacant lots near human habitation.	No Impact	No potential habitat is located within the project area.
White-faced Ibis <i>Plegadis chihi</i>	—	T	Prefers freshwater marshes, sloughs, and irrigated rice fields, but will use brackish and saltwater habitats; nests in marshes, in low trees, on the ground in bulrushes or reeds, or on floating mats.	No Impact	No potential habitat is located within the project area.
Whooping Crane <i>Grus Americana</i>	E	E	Potential migrant via plains throughout most of the state to the coast. Winters in coastal marshes of Aransas, Calhoun, and Refugio Counties.	No Take	No habitat present in or adjacent to the project area.
Wood Stork <i>Mycteria americana</i>	—	T	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including saltwater; usually roosts communally in tall snags, sometimes in association with other wading birds.	No Impact	No potential habitat is located within the project area.
Zone-tailed Hawk <i>Buteo albonotatus</i>	—	T	Arid open country, including open deciduous or pine-oak woodland, mesa or mountain country, often near major watercourses, and wooded canyons and tree-lined rivers along middle slopes of desert mountains; nests in various habitats and sites, ranging from small trees in lower desert, giant cottonwoods in riparian areas, to mature conifers in high mountain regions.	No Impact	No habitat present in or adjacent to the project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
ARACHNIDS					
Bracken Bat Cave Meshweaver <i>Cicurina venii</i>	E	—	Small, eyeless or essentially eyeless spider found in karst features of western Bexar County and eastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Cokendolpher Cave Harvestman <i>Texella cokendolpheri</i>	E	—	Small, eyeless harvestman found in karst features of north-central Bexar County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Government Canyon Bat Cave Meshweaver <i>Cicurina vespera</i>	E	—	Small, eyeless or essentially eyeless spider found in karst features of northwestern Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Government Canyon Bat Cave Spider <i>Neoleptoneta microps</i>	E	—	Small, eyeless or essentially eyeless spider found in karst features of northwestern Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Madla Cave Meshweaver <i>Cicurina madla</i>	E	—	Small, eyeless or essentially eyeless spider found in karst features of northern Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Robber Baron Cave Meshweaver <i>Cicurina baronia</i>	E	—	Small, eyeless or essentially eyeless spider found in karst features of north-central Bexar County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
FISHES					
Guadalupe Bass <i>Micropterus treculii</i>	—	—	Endemic to perennial streams of the Edwards Plateau region, including the Guadalupe River; introduced in the Nueces River system.	No Impact	No habitat is present in the project area; BMPs would be in place to avoid impacts to water quality during construction.
Toothless blindcat <i>Trogloganis pattersoni</i>	—	T	Troglobitic, blind catfish endemic to the San Antonio pool of the Edwards Aquifer occurring in the deep portions of the aquifer over the Balcones Fault Zone (1,350 to 2,000 feet below the surface).	No Impact	No habitat is present in the project area; BMPs would be in place to avoid impacts to water quality during construction.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Widemouth blindcat <i>Satan eurystomus</i>	—	T	Troglobitic, blind catfish endemic to the San Antonio pool of the Edwards Aquifer occurring in the deep portions of the aquifer (over 300 meters below the surface).	No Impact	No habitat is present in the project area; BMPs would be in place to avoid impacts to water quality during construction.
INSECTS					
A Ground Beetle <i>Rhadine exilis</i>	E	—	Small, essentially eyeless ground beetle found in karst features of northern Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
A Ground Beetle <i>Rhadine infernalis</i>	E	—	Small, essentially eyeless ground beetle found in karst features of northern and western Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Helotes Mold Beetle <i>Batrissodes venyivi</i>	E	—	Small, eyeless mold beetle found in karst features of northwestern Bexar County and northeastern Medina County.	No Take	A previous survey determined that no karst species habitat is present in the existing ROW.
Manfreda giant-Skipper <i>Stallingsia maculosus</i>	—	—	Small and stout-bodied; skipper larvae usually feed inside a leaf shelter and pupate in a cocoon made of leaves fastened together with silk.	No Impact	No habitat is present in the proposed project area.
Rawson's Metalmark <i>Calephelis rawsoni</i>	—	—	Moist areas in shaded limestone outcrops in central Texas, desert scrub or oak woodland foothills, or along rivers elsewhere.	No Impact	No habitat is present in the proposed project area.
MAMMALS					
Black Bear <i>Ursus americanus</i>	T/SA;N L	T	Possible as transient; prefers bottomland hardwoods and large tracts of inaccessible forested areas.	No Take	No extant populations known from Central Texas.
Cave Myotis Bat <i>Myotis velifer</i>	—	—	Colonial and cave-dwelling; also roosts in rock crevices, old buildings, carports, under bridges, and even in abandoned nests; roosts in clusters of up to thousands of individuals; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter.	No Impact	Potential habitat is located in the proposed project, but no demolition of existing bridge structures is proposed.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Ghost-faced Bat <i>Mormoops megalophylla</i>	—	—	Colonially roosts in caves, crevices, abandoned mines, and buildings; insectivorous; breeds late winter to early spring.	No Impact	Potential habitat is located in the proposed project, but no demolition of existing bridge structures is proposed.
Gray Wolf <i>Canis lupus</i>	E ¹	E	Extirpated; formerly known throughout the western two-thirds of the state in forests, brushlands, or grasslands.	No Take	Species is extirpated, and no habitat exists in or adjacent to project area.
Plains Spotted Skunk <i>Spilogale putorius interrupta</i>	—	—	Open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	May Impact	Habitat present in the proposed project area.
Red Wolf <i>Canis rufus</i>	E ¹	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No Take	Species is extirpated, and no habitat exists in or adjacent to project area.
MOLLUSKS					
Creeper (Squawfoot) <i>Strophitus undulatus</i>	—	—	Small to large streams, prefers gravel or gravel and mud in flowing water; Colorado, Guadalupe, San Antonio, Neches (historic), and Trinity (historic) River basins.	No Impact	No habitat present in the project area.
False Spike Mussel <i>Quadrula mitchelli</i>	—	T	Substrates of cobble and mud with water lilies present; Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins.	No Impact	No habitat present in or near the project area.
Golden Orb <i>Quadrula aurea</i>	C ¹	T	Sand and gravel in some locations and mud at others; intolerant of impoundment in most instances; Guadalupe, San Antonio, and Nueces River basins.	No Impact	No habitat present in the project area.
Mimic Cavesnail <i>Phreatodrobia imitata</i>	—	—	Subaquatic; only known from two wells penetrating the Edwards Aquifer.	No Impact	No habitat present in the project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Texas Fatmucket <i>Lampsilis bracteata</i>	C ¹	T	Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and coarse gravel or sand in moderately flowing water; Colorado and Guadalupe River basins.	No Impact	No habitat present in the project area.
Texas Pimpleback <i>Quadrula petrina</i>	C ¹	T	Mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe River basins.	No Impact	No habitat present in the project area.
REPTILES					
Spot-tailed Earless Lizard (<i>Holbrookia lacerata</i>)	—	—	Central and southern Texas and adjacent Mexico; moderately open prairie-bushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas.	No Impact	No habitat present in the project area.
Texas Garter Snake (<i>Thamnophis sirtalis annectans</i>)	—	—	Wet/moist microhabitats are conducive to species occurrence, but species not restricted to them; hibernates underground or in/under surface cover; breeds March-August.	May Impact	Potential habitat is present in the project area.
Texas Horned Lizard (<i>Phrynosoma cornutum</i>)	—	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; sandy to rocky soils; burrows into soil, enters rodent burrows, or hides under rocks when inactive.	May Impact	Potential habitat is present in the project area.
Texas Indigo Snake <i>Drymarchon melanurus erebennus</i>	—	T	Primarily a resident of Mexico, occurs peripherally in South Texas. Mesquite-grassland savannah will only support indigo snake populations where there is adequate moisture, such as in areas near streams, ponds, resacas, and windmill seeps. Drought-sensitive reptile intimately associated with water.	No Impact	No potential habitat is located in the proposed project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Texas Tortoise <i>Gopherus berlandieri</i>	—	T	Open brush with a grass understory is preferred; open grass and bare ground are avoided; when inactive occupies shallow depressions at base of bush or cactus, sometimes in underground burrows.	No Impact	No potential habitat is located in the proposed project area.
Timber/Canebrake Rattlesnake <i>Crotalus horridus</i>	—	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil or black clay; prefers dense ground cover, i.e. grapevines or palmetto.	May Impact	Potential habitat is present in the project area.
PLANTS					
Big Red Sage <i>Salvia pentstemonoides</i>	—	—	Endemic; moist to seasonally wet clay or silt soils in creekbeds and seepage slopes of limestone canyons; flowering June to October.	May Impact	Potential habitat is present in the project area.
Bracted Twistflower (<i>Streptanthus bracteatus</i>)	C ¹	—	Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and in canyon bottoms; several known soils include Tarrant, Brackett, or Speck over Edwards, Glen Rose, and Walnut geologic formations; flowering mid April to late May.	No Impact	No habitat is present in the proposed project area.
Correll's False Dragon-head <i>Phystostegia correllii</i>	—	—	Wet soils including riverbanks, streamsides, creekbeds, roadside ditches and irrigation channels; flowering June-July.	May Impact	Potential habitat is present in the project area.

Table 7 Federal and State-listed Threatened, Endangered, and Rare Species of Potential Occurrence in Bexar County

Common Name (Scientific Name)	Federal Status	State Status	Preferred Habitat	Species Impacted/Take by Project	Justification for Impact/Effect Assessment
Elmendorf's Onion <i>Allium elmendorfi</i>	—	—	Texas endemic; grassland openings in oak woodlands on deep, loose, well-drained sands; in Coastal Bend, on Pleistocene barrier island ridges and Holocene Sand Sheet that support live oak woodlands; flowering March to April.	No Impact	No habitat is present in the proposed project area.
Hill Country Mercury <i>(Argythamnia aphoroides)</i>	—	—	Texas endemic; mostly in bluestem-grama grasslands associated with plateau live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands, also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes; flowering April to May with fruit persisting until midsummer.	May Impact	Potential habitat is present in the project area.
Parks' Jointweed <i>Polygonella parksii</i>	—	—	Texas endemic; mostly found on deep, loose, whitish sand blowouts in Post Oak Savanna landscapes over the Carrizo and Sparta formations; also occurs in early successional grasslands, along ROW, and on mechanically disturbed areas; flowering June to late October or September and November.	No Impact	No habitat is present in the proposed project area.
Sandy Woollywhite <i>Hymenopappus carrizoanus</i>	—	—	Texas endemic; disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations; flowering April to June.	No Impact	No habitat is present in the proposed project area.

Sources: USFWS (Accessed December 2012), TPWD, Rare, Threatened, and Endangered Species of Texas by County, Bexar County (October 2, 2012), and Field Visit (November 2012).

E – Endangered; T – Threatened; C- Candidate; NL- Not Federally listed; DL- Delisted taxon “–” – No designation occurring within identified county

¹ The USFWS does not list these species for Bexar County; however, these species are listed on the TPWD's county list.

3.5.1 Federally Listed Threatened, Endangered, or Candidate Species

According to the US Fish and Wildlife Service (USFWS) (accessed December 2012) and TPWD

threatened and endangered species lists for Bexar County (dated October 2, 2012), 20 species that are federally listed as threatened or endangered or candidate species have the potential to occur in Bexar County. These species and potential consequences by implementing the Build Alternative are described in further detail below.

Black-capped Vireo

The black-capped vireo (*Vireo atricapilla*) is an insectivorous songbird that nests in portions of Mexico, Texas, and Oklahoma and winters on the Pacific coast of Mexico (States of Durango, Sinoloa, Nayarit, Jalisco, Sonora, Guerrero, and Oaxaca) (USFWS 1991). The black-capped vireo arrives in Texas between late March and late April to breed and then leaves by late September. Black-capped vireos construct small, cup-shaped nests in the densest zones of deciduous vegetation, usually suspended from forks in horizontal branches at a height ranging between 40 and 120 centimeters (USFWS 1991).

No critical habitat is designated for the black-capped vireo. Breeding habitat throughout the black-capped vireo's range varies considerably in its vegetation characteristics. Generally, the habitat is described as shrubland thickets of various size and distribution where vegetation cover extends to ground level. In Texas and Oklahoma, this configuration typically is found on shallow soils over rocky substrate, along gullies and ravine edges, and on eroded slopes. Periodic disturbances (e.g., fire, browsing, etc.) also influence the quality of the habitat for vireo nesting (USFWS 1991). Based on research conducted in central and southeast portions of the Edwards Plateau, the areas most heavily utilized by breeding vireos tend to be in vegetation communities that occur over limestone formations (e.g., the Fredricksburg formation) and are recovering from burning or clearing. The most common type of nesting substrate appears to be species of sumac (*Rhus* spp.) that are typically associated with shin oaks (*Quercus* spp.), Ashe juniper, Texas red oak (*Quercus buckleyi*), plateau live oak, and other woody vegetation forming open shrubland or savannah with highly developed edges. No suitable habitat is present in or adjacent to the project. Therefore, the project would not result in a "take" of this species.

Golden-cheeked Warbler

The golden-cheeked warbler (*Setophaga chrysoparia*) is a small neotropical songbird that nests only in the mixed juniper-oak woodlands of Texas. Of the 600-plus avian species known recently to have occurred in Texas, the golden-cheeked warbler is the only bird whose breeding range is entirely confined within the state's boundaries. The breeding range of the warbler includes 37 Texas counties on the Lampasas Cut Plain, Edwards Plateau, and Llano Uplift regions of Texas. It is a migratory species whose wintering habitat has been documented in southern Mexico (State of Chiapas) and in the Central American countries of Guatemala, Honduras, and Nicaragua (USFWS 1992). It spends its breeding season in Central Texas from about March through August.

No critical habitat is designated for the golden-cheeked warbler. Optimum breeding habitat for the species consists of closed-canopy woodlands characterized by a mix of mature Ashe juniper and various mixed deciduous trees and shrubs. The principal limiting factor for suitable nesting habitat is the presence of sufficiently sized Ashe juniper with stripping bark because the bark constitutes the main nest construction material. Other factors conducive to nesting activity include a high availability of arthropod prey, moderate to high degree of canopy cover, and proximity to water (USFWS 1992).

Although the project area is largely urban, potential habitat was previously identified along LP 1604 outside of the existing ROW. Subsequently, presence-absence surveys conducted in 2009 and 2010 determined that no nesting birds were observed in the areas identified as potential habitat. In May of 2011, USFWS provided concurrence on the findings (USFWS 2011). Therefore, although during preliminary habitat assessments potential habitat was identified, it was determined that no golden-cheeked warbler were present. The project would not result in a “take” of this species.

Interior Least Tern

The smallest of North American terns, the interior least tern (*Sterna antillarum athalassos*) is a colonial nesting shorebird adapted to lacustrine and riverine sandbar and gravel beach habitats. The proposed project area does not contain sandbars or gravel beach habitats to support the interior least tern. Therefore, the project is not likely to result in a “take” of this species.

Sprague’s Pipit

Sprague’s pipit is a medium-sized cryptic songbird endemic to the grasslands of North America (<http://audubon2.org/watchlist/viewSpecies.jsp?id=195>). The species has experienced significant declines in overall population density in recent years. Sprague’s pipit breeds in the upper Great Plains and winter in the lower plains, including grasslands in the southern two-thirds of Texas, where it may be seen from mid-September to early April. This species inhabits native upland prairie and can be locally common in coastal grasslands, especially at the Anahuac and Attwater’s Greater Prairie Chicken National Wildlife Refuges. However, they tend to avoid areas with human development (<http://www.fws.gov/mountain-prairie/pressrel/10-61.htm>).

In September 2010, the USFWS determined the listing of Sprague’s pipit is warranted but is precluded by other listing priorities (<http://www.fws.gov/mountain-prairie/pressrel/10-61.htm>). In October 2010, the USFWS announced it was reducing the candidate priority status from 2 to 8 in response to new data on threats to the species on the breeding grounds (<http://www.gpo.gov/fdsys/pkg/FR-2011-10-26/pdf/2011-27122.pdf>).

The project is largely urban and does not support coastal grasslands or native prairies for Sprague’s pipit. In addition, no Sprague’s pipits have been documented in or adjacent to the project area. Therefore, it was determined the project would have no impact on Sprague’s pipit.

Whooping Crane

The whooping crane (*Grus americana*) was included in the first list of endangered species under the Endangered Species Protection Act of 1966. The whooping crane is North America’s tallest bird with a standing height of 5 feet or more. It is a large, white crane with a dagger-like yellow bill and with reddish skin on the crown that is darker on the face and lower part of the beak. The breeding range of the whooping crane is within the Wood Buffalo National Park in the southern Northwest Territories and northern Alberta provinces of Canada. Its migratory path extends south to North Dakota, Iowa, and the central coastal prairie in Texas and southwest Louisiana. In Texas, whooping cranes winter at the Aransas National Wildlife Refuge and at Matagorda and St. Joseph’s islands in Aransas, Calhoun, and Matagorda Counties. The project area is in the migration path for the whooping cranes during their 2,600-mile flight

each spring (late March to late April) and fall (mid-October to late November) (Oberholser 1974). Whooping cranes may use agricultural fields and grasslands as well as large open-water wetlands as stopover sites during migration, but they generally avoid urban areas. The whooping crane is currently listed as endangered (32 FR 4001, 11 March 1967) except where nonessential experimental populations exist (66 FR 33903-33917, 26 June 2001; 62 FR 38932-38939, 21 July 1997; and 58 FR 5647-5658, 22 January 1993, and 66 FR 33903-33917, 26 June 2001). The reintroductions of an experimental population in the western half of the U.S. in Colorado, New Mexico, Utah, and the western half of Wyoming was not successful. However, the USFWS is currently working on a project to establish a nonessential experimental population in 20 states in the eastern U.S., but this area does not include Texas (<http://www.fws.gov/midwest/whoopingcrane/>). No suitable habitat for the whooping crane was identified in or adjacent to the project area. Therefore, the project would not result in a “take” of this species.

Karst Species

There are nine federally listed karst invertebrate species in Bexar County: Bracken Bat Cave meshweaver (*Cicurina venii*), Cokendolpher Cave harvestman (*Texella cokendolpheri*), Government Canyon Bat Cave meshweaver (*Cicurina vespera*), Government Canyon Bat Cave spider (*Neoleptoneta microps*), Madla Cave meshweaver (*Cicurina madla*), Robber Baron Cave meshweaver (*Cicurina baronia*), *Rhadine exilis*, *Rhadine infernalis*, and helotes mold beetle (*Batrisodes venyivi*). To facilitate the assessment of potential for an area to contain habitat for karst invertebrates, USFWS delineated five karst zones. The proposed project area is located entirely in karst zone 3, which is defined as an area that probably does not contain listed invertebrate karst species (**Figure 6**). However, previous surveys of the existing ROW determined that no habitat for karst invertebrate species is located within the LP 1604 existing ROW (ZARA 2010). During construction, BMPs would be employed to minimize impacts to the water quality of surface runoff. Therefore, the project would not result in a “take” of this species.

Black Bear

The Louisiana black bear (*Ursus americanus luteolis*) is a federal threatened species that inhabits the piney woods of east Texas, Louisiana, and Mississippi (<http://www.tpwd.state.tx.us/huntwild/wild/species/endang/animals/mammals/louisianablackbear/>). Because of the similar characteristics between the Louisiana black bear and the Mexican and New Mexican subspecies, which are more likely to be observed in the Texas hill country, all American black bears in Texas are treated as federal and state threatened due to similarity in appearance to the Louisiana black bear (<http://www.tpwd.state.tx.us/huntwild/wild/species/blackbear/>). The project is urban and does not provide suitable habitat for black bears. Therefore, the project would not result in a “take” of this species.

Gray Wolf

The gray wolf (*Canis lupus*) historically ranged through North America south through Mexico. Currently, gray wolf populations still exist in Canada and a few mountainous states in the U.S., but are thought to be extirpated in Texas. Therefore, the project would not result in a “take” of this species.

Red Wolf

The red wolf (*Canis rufus*) historically ranged throughout the southeastern U.S., from the Atlantic coast to central Texas, and from the Gulf Coast to central Missouri and southern Illinois. Between 1900 and 1920, red wolves were extirpated from most of the eastern portion of their range. A small number persisted in the wild in southeastern Texas and southwestern Louisiana until the late 1970s; however, by 1980 the species was declared extinct in the wild (<http://www.fws.gov/redwolf/>). Since then, experimental populations have been successfully reintroduced in North Carolina. Red wolves are considered extirpated in Texas (<http://www.nsrl.ttu.edu/tmot1/canirufu.htm>). Therefore, the project would not result in a “take” of this species.

Mussels

Five freshwater mussel species were state-listed as Threatened on January 17, 2010, and added as Federal candidates on October 6, 2011. It was determined the five species warranted listing, but their listing is precluded by other priorities. Of these, three species have potential to occur in Bexar County: golden orb (*Quadrula aurea*), Texas fatmucket (*Lampsilis bracteata*), and Texas pimpleback (*Quadrula petrina*). The stream channels located within the proposed project area are mainly highly disturbed and ephemeral or intermittent. Water that does exist in the project area has little to no water flow and does not provide suitable habitat for these mussels. Therefore, the proposed project would have no impact on the candidate mussel species.

Bracted Twistflower

The bracted twistflower (*Streptanthus bracteatus*) is endemic to south-central Texas. Suitable habitat includes oak-juniper woodlands on steep to moderate slopes with shallow soils over limestone. No potential habitat for the species was identified during field visits, therefore no impacts to the species are anticipated.

3.5.2 State-Listed Threatened and Endangered Species and Otherwise Rare Species

In addition to the federally listed/candidate species described above, TPWD includes several other species on their Annotated County List of Rare Species for Bexar County (TPWD 2012). These include state threatened species (that are not also federally listed) and rare species with no state or federal status of potential occurrence in Comal County. These species, along with their state regulatory status, and potential effect information are summarized in **Table 7**. The following paragraphs describe each state-listed or otherwise rare species relative to the Build Alternative.

Cascade Caverns Salamander

The Cascade Caverns salamander (*Eurycea latitans complex*) is an unpigmented subaquatic species known only from the subterranean waters of several caves and springs in Bandera, Bexar, Kendall, Kerr, Comal, and Hays Counties (<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Eurycea+latitans>). It is state threatened species. Little is known of the biology of this species, but its habitat is limited to aquatic environments within cave systems, and it is known to hybridize with the Comal blind salamander (*Eurycea tridentifera*) (Sweet 1984). The project area does not support suitable habitat for this species, and the project would not result in direct impacts to the species. The project area is within the transition zone of the Edwards Aquifer, and BMPs would be in place during construction

that would minimize the potential to impact the quality of construction run-off. Therefore, the proposed project would have no impact on the Cascade Caverns salamander.

Comal Blind Salamander

The Comal blind salamander is very similar to the Cascade Caverns salamander, being an unpigmented subaquatic species known only from the subterranean waters of several caves and springs in Bexar, Comal, and maybe Kendall Counties in central Texas (<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=Comal+Blind+Salamander+&x=5&y=5>). The project area does not contain suitable habitat for the Comal blind salamander, and the project would not result in direct impacts to the species. The project area is within the transition zone of the Edwards Aquifer, and BMPs would be in place during construction that would minimize the potential to impact the quality of runoff from construction. Therefore, the proposed project would have no impact on the Comal blind salamander.

Texas Salamander

The Balconian Biotic province is characterized in part by the presence of at least eight endemic species of neotenic salamanders in the genus *Eurycea*. This unique assemblage of urodeles inhabit isolated portions of the Edwards Aquifer and associated spring runs of the Balcones Fault Zone. The Texas salamander (*Eurycea neotenes*) was once thought to be widespread, but through recent genetic analyses, the species is thought to be limited to Helotes Creek Spring, Leon Springs, and Mueller's Spring, all northwest of the project area and upstream of the project area on Helotes Creek. Therefore the project is not expected to impact the Texas salamander.

American and Arctic Peregrine Falcon

Peregrine falcons (*Falco peregrinus*) are bird-hunting raptors that are cosmopolitan, occurring nearly worldwide, but are elusive and unpredictable in their distribution. In Texas, they typically utilize coastal habitats during the winter, and breed in mountainous areas (Peterson and Zimmer 1998). However, they can be found in almost every type of habitat, especially during migrations (http://www.allaboutbirds.org/guide/Peregrine_Falcon/lifehistory/ac). The American peregrine falcon and Arctic peregrine falcon are migrants through the project area, and their presence there would be considered incidental. The project is not expected to impact the peregrine falcon.

Mountain Plover

The mountain plover (*Charadrius montanus*) is a medium-sized shorebird associated with grasslands. In Texas, the mountain plover breeds in undeveloped remote shortgrass prairie habitats of the High Plains. They also breed in dry grasslands in the Trans Pecos and migrate throughout much of the state except along the coast. This bird generally avoids moist soils and prefers winter habitat consisting of shortgrass plains and fields, plowed fields, and sandy deserts, as well as commercial sod farms (Knopf 1996). The project area is not considered suitable habitat for this species. Therefore, the project is not expected to impact the mountain plover.

Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea*) is a long-legged, ground-dwelling owl that inhabits treeless short-grass plains and prairies where they generally utilize mammal burrows, often in black-tailed prairie dog (*Cynomys ludovicianus*) colonies. They breed in the Great Plains and shortgrass prairies throughout the western U.S. and winter in similar habitats further to the south of their breeding grounds. In Texas they tend to be year-round residents of the High Plains and Trans Pecos regions but are known to utilize agricultural areas and pipe culverts for artificial cover in areas such as the blackland prairies and coastal plains (<http://www.fws.gov/mountain-prairie/species/birds/wbo/Western%20Burrowing%20Owlrev73003a.pdf>). The project area does not provide suitable habitat for this species. Therefore, the project is not expected to impact the western burrowing owl.

White-faced Ibis

The white-faced ibis (*Plegadis chihi*) is a wading aquatic bird frequently encountered in inland freshwater marshes, irrigated fields, and canals. The white-faced ibis nests along the plains of the Texas coast and are considered migrants through the project area (<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Plegadis+chihi>). No suitable stopover habitat was identified in or adjacent to the project area. Therefore, the project is not expected to impact the white-faced ibis.

Wood Stork

Wood storks (*Mycteria americana*) are semi-aquatic wading birds that prefer forested wetlands, irrigated fields, mudflats, and a variety of wet environments. Like the white-faced ibis, the wood stork nests along the plains of the Texas coast and are considered migrants through the project area (<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Mycteria+americana>). No suitable stopover habitat was identified in or adjacent to the project area. Therefore, the project is not expected to impact the wood stork.

Zone-tailed Hawk

The zone-tailed hawk (*Buteo albonotatus*) is a southwestern buteo that is rare throughout its range. The ecological requirements of this hawk are not well understood, but the species generally inhabits remote areas in mountainous terrain of the trans-pecos region of Texas. Zone-tailed hawks prefer arid open country, especially open deciduous or pine-oak woodland, and mesas and mountain country, often near watercourses. Other suitable habitats include wooded canyons and tree-lined rivers along middle slopes of desert mountains, and open country with scattered trees or thickets, especially near marshes or streams. Suitable habitat for this species does not exist in the project area. Therefore, the project is not expected to impact the zone-tailed hawk.

Guadalupe Bass

The Guadalupe bass (*Micropterus treculii*) is endemic to the perennial headwater streams of the San Antonio, Guadalupe, Colorado, and Brazos River systems (<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=guadalupe+bass>). Unlike other black bass species, the Guadalupe bass prefers clear running water, often associated with spring-fed drainages. The project area does not contain suitable habitat for the Guadalupe bass. Therefore, the proposed project would have no impact on the Guadalupe bass.

Toothless Blindcat

The toothless blindcat (*Trogloganis pattersoni*) is one of the rarest and least understood catfish in the country. It is known only from a handful of wells that penetrate the San Antonio pool of the Edwards Aquifer in the area around San Antonio. There are no currently known localities for this species within the project area. In addition, the project is within the transition zone of the Edwards Aquifer and would not likely impact the aquifer therefore, the proposed project would have no impact on the toothless blindcat.

Widemouth Blindcat

The widemouth blindcat (*Satan eurystomus*) is another one of the rarest and most poorly understood catfish in the country. It is known only from a handful of wells that penetrate the San Antonio pool of the Edwards Aquifer in the area around San Antonio at depths from 1,000-1,909 feet. This species is considered a top predator in the Edwards Aquifer that likely feeds on lower vertebrates and invertebrates. There are no currently known localities for this species within the project area. In addition, the project is within the transition zone of the Edwards Aquifer and would not likely impact the aquifer; therefore, the proposed project would have no impact on the widemouth blindcat.

Manfreda Giant-skipper

The Manfreda giant skipper (*Stallingsia maculosus*) is a rare butterfly that inhabits undisturbed thornshrub and is dependent on its larval hostplant, the Texas tuberose, which is also relatively rare (http://www.xerces.org/wp-content/uploads/2008/09/stallingsia_maculosus.pdf). The project area is not considered suitable habitat for the Manfreda giant skipper and no host plants of this species were observed in the project area. Therefore, the project is not expected to impact the Manfreda giant skipper.

Rawson's Metalmark

The Rawson's metalmark (*Calephelis rawsoni*) is endemic to Texas, New Mexico, and Arizona (<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=calephelis+rawsoni>). Their host plants are shrubby boneset (*Eupatorium havanense*) and palmleaf eupatorium (*E. greggii*). In Texas it inhabits limestone outcrops with moist micro-climates (TPWD 2012). The proposed project area does not contain suitable habitat and would not impact the Rawson's metalmark.

Cave Myotis Bat

The cave myotis (*Myotis velifer*) is a cave dwelling bat species known to inhabit karst features, abandoned buildings, bridges, and even abandoned cliff swallow (*Hirundo pyrrhonota*) nests (TPWD 2012). Structures located within the proposed project area that could be used by the cave myotis would not be impacted. Therefore, the project is not expected to impact the cave myotis.

Ghost-faced Bat

The ghost-faced bat (*Mormoops megalophylla*) is a rare western species known to occur in the Trans Pecos region of Texas as well as the southern Edwards Plateau. The species is documented in several caves in Uvalde, Kinney, Bexar, and Medina Counties (<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Mormoops+megalophylla>). Structures located within the proposed project area

that could be used by the ghost-faced bat would not be impacted. Therefore, the project is not expected to impact the ghost-faced bat.

Plains Spotted Skunk

The plains spotted skunk (*Spilogale putorius interrupta*) is a rare mammal that occupies a variety of habitats including woodlands, farm fields, croplands, prairies, and others (TPWD 2012). Because of the woodlands in the project area, its presence in the project area cannot be ruled out. The project could impact a small amount of potential habitat (2.94 acres) for the plains spotted skunk.

Creeper (Squawfoot)

The creeper (Squawfoot) (*Strophitus undulatus*) is one of the most widely distributed mollusks of North America (<http://www.natureserve.org/explorer/servlet/NatureServe?searchSciOrCommonName=Strophitus+undulatus>). It inhabits small to large streams where it is generally associated with slow-moving currents over gravel or mud substrates. In Texas it is currently found in the Colorado, Guadalupe, and San Antonio River basins (TPWD 2012). No suitable habitat for the species was identified in the project area or in the vicinity of the project area. Therefore, the project is not expected to impact the creeper.

False Spike Mussel

The false spike mussel (*Quadrula mitchelli*) inhabits small to large streams where it is associated with substrates that consist of a mix of sand, gravel, cobble, or mud (TPWD 2012). No suitable habitat for the species was identified in the project area or in the vicinity of the project area. Therefore, the project is not expected to impact the false spike mussel.

Mimic Cave Snail

The mimic cave snail (*Phreatodrobia imitata*) is endemic to the Edwards Aquifer and is only known from two wells penetrating the aquifer (<http://www.natureserve.org/explorer/servlet/NatureServe?searchName=%20Phreatodrobia+imitata>). The project would not affect the Edwards Aquifer; therefore the project would not affect the mimic cave snail.

Spot-tailed Earless Lizard

The spot-tailed earless lizard (*Holbrookia lacerata*) inhabits open prairies and savannas in Texas and Mexico. No potential habitat is located within the proposed project area; therefore, the proposed project would have no impact on the spot-tailed earless lizard.

Texas Garter Snake

The Texas garter snake (*Thamnophis sirtalis annectans*) generally inhabits mesic hill country streams with permanent water or soil moisture in floodplains. Although the project area does not contain a permanent source of water, the presence of Texas garter snakes in the wooded portion of the project area cannot be ruled out. Therefore, the project could impact a small amount (2.94 acres) of suitable woodland habitat for the Texas garter snake.

Texas Horned Lizard

The Texas horned lizard (*Phrynosoma cornutum*) is a broad and flattened lizard with conspicuous elongated scales that form spines on their head, neck, and back. Their preferred habitat includes semi-arid

open areas with scattered vegetation on a variety of sandy or loamy soil types where they utilize burrows. The project area contains grass areas with sparse vegetation; therefore, the proposed project would potentially impact Texas horned lizard habitat.

Texas Indigo Snake

The Texas indigo snake (*Drymarchon corais*) is a large constrictor that inhabits native grasslands and savannas with dense ground cover. No suitable habitat was identified for this species. Therefore, the project is not expected to impact the Texas indigo snake.

Texas Tortoise

The Texas tortoise (*Gopherus berlandieri*) is a desert species that generally occupies arid native grasslands and savannas. No suitable habitat was identified for this species. Therefore, the project is not expected to impact the Texas tortoise.

Timber/Canebrake Rattlesnake

The timber/canebrake rattlesnake occurs in lowland areas such as swamps, riverine thickets, pine and deciduous woodlands, abandoned farmland, and limestone bluffs. It appears to be partial to areas with sandy soil or black clay and dense ground cover. Potential habitat for the species is present in the project area and could be impacted by the project.

Rare Plants

TPWD has identified that six rare plant species have potential to occur in Bexar County. Of these six rare species, it was determined that three have potential habitat located in the LP 1604 project area: big red sage (*Salvia pentstemonoides*), Correll's false dragon-head (*Phystostegia correllii*), and hill country mercury (*Argythamnia aphyroides*). All three plants species have the potential to occur in the existing easements located within the proposed project area. Impacts to areas within the existing easements are expected to be minimal, and the potential to impact the species is low.

3.5.3 Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. Migratory birds may arrive in the project area to breed during construction of the proposed project, and appropriate measures would be taken to avoid adverse impacts to migratory birds, including the following: The contractor would remove all old migratory bird nests that would be affected by the proposed project and be prepared to prevent migratory birds from building nests per the Environmental Permits, Issues, and Commitments plans. In the event that migratory birds are encountered on-site during project construction, adverse impacts to protected birds, active nests, eggs, and/or young would be avoided.

3.5.4 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act, as amended on October 11, 1996, directs that all federal agencies, whose actions would impact essential fish habitat, must consult with the

National Marine Fisheries Service regarding potential adverse effects. This means that any project that receives federal funding must address potential impacts to essential fish habitat. This project would be constructed using state and local funds only; therefore, the Magnuson-Stevens Fishery Conservation and Management Act does not apply.

3.5.5 Bald and Golden Eagles

The project area is located in an urbanized area, and no suitable habitat for bald or golden eagles is present in or near the project area; therefore, the proposed project would not impact bald or golden eagles.

3.6 Water Resources

LP 1604 is located within the San Antonio River Basin and is drained by Culebra Creek and Helotes Creek. These local drainages flow into Leon Creek and eventually into a Traditionally Navigable Water (TNW), the Medina River, which is located southeast of the LP 1604 corridor. Hydrology in the proposed project area is primarily related to water conveyance rather than water storage in wetlands or other water features. Water conveyance tends to occur infrequently in rapid and high-volume events following rainfall due to relatively shallow soils, exposed limestone bedrock, and topography.

The proposed project is not located within the Edwards Aquifer recharge zone or contributing zone. It is located within the Edwards Aquifer transition zone (**Figure 7**).

3.6.1 Section 404 of the Clean Water Act: Waters of the U.S.

Investigations to identify potential waters of the U.S. included a review of pertinent background information including USGS 24K topographic maps, soils, USFWS National Wetlands Inventory (NWI) maps, and Federal Emergency Management Agency (FEMA) floodplain maps, followed by a pedestrian survey of the entire study area in November 2012. Features were evaluated in accordance with the 1987 U.S. Army Corps of Engineers (USACE) wetland delineation manual and the Great Plains Regional Supplement to the 1987 USACE manual, 33 CFR 328.3(a) and joint USACE–Environmental Protection Agency guidance on Clean Water Act jurisdiction following the U.S. Supreme Court’s decision in *Rapanos v. United States* and *Carabell v. United States*.

Three potential waters of the U.S. features were identified within the existing ROW and easements. These features are Culebra Creek, Helotes Creek, and an unnamed tributary of Helotes Creek (**Figures 5.1 to 5.2**).

Culebra Creek

In the project area Culebra Creek is an intermittent drainage feature with a shallow and variable channel and wide floodplain. The channel varies from 10 to 72 feet wide between the ordinary high water marks (OHWM) and is characterized by silt, gravel and rock rubble deposits with depressional portions holding water during the November site visit (**Photo 6**). The channel is largely unvegetated except in small patches along the margins where a mix of hydrophytic and upland species are found including Johnsongrass, pigweed (*Amaranthus* sp.), smartweed (*Polygonum hydropiperoides*), giant ragweed

(*Ambrosia trifida*), clover (*Trifolium dubium*), and water hyssop (*Bacopa monieri*). The channel is intermittently lined with shrubs and small trees including eastern cottonwood (*Populus deltoides*), hackberry (*Celtis laevigata*), chinaberry, green ash (*Fraxinus pennsylvanica*), and false willow (*Baccharis neglecta*). The floodplain is characterized as a flat area with distinct boundaries defined by the relatively steep concrete-lined slopes extending approximately 15 feet above the drainage channel to the surrounding grade of the roadway. The floodplain consists of loamy soils, gravel and rock rubble deposits and is covered primarily by herbaceous species including Johnsongrass, giant ragweed, western ragweed (*Ambrosia trifida*), doveweed (*Croton* spp.), and King Ranch bluestem. In the eastern portion of the ROW, the Culebra Creek feeds into a large detention pond via a concrete-lined spillway. Culebra Creek would be considered a water of the U.S. because it has a defined bed and bank and it is a tributary to a TNW.

Unnamed Tributary of Helotes Creek

This feature is an ephemeral drainage with an eroded and shallow channel that varies from 15 to 25 feet wide between OHWMs and less than 2 feet deep below the OHWMs. The channel has moderate to steep banks and consists of dark clay loam and rocky substrates (**Photo 7**). No water was present in the channel during the November site visit. The channel and surrounding floodplain is lined with upland herbaceous and woody species including mesquite, huisache (*Acacia farnesiana*), live oak, cedar elm, Johnsongrass, southern dewberry (*Rubus trivialis*), common bermudagrass, Kleberg bluestem (*Dichanthium annulatum*), King Ranch bluestem, western ragweed, and giant ragweed. This feature would be considered a water of the U.S. because it has a defined bed and bank and it is a tributary to a TNW.

Helotes Creek

Helotes Creek is an intermittent drainage feature with a very shallow channel in the ROW that varies from 15 to 25 feet wide between OHWMs and is characterized by an unvegetated dark clay loam substrate. Only one small puddle of water was present in a low scoured out portion of the channel during the November site visit. The channel and surrounding floodplain is lined with herbaceous species including Johnsongrass, common bermudagrass, King Ranch bluestem, marsh aster (*Aster subulatus*), western ragweed, and silver bluestem. A few small shrubs and trees less than 10 feet in height including hackberry, cedar elm, chinaberry, and western soapberry (*Sapindus saponaria*) occur along the channel and in the adjacent floodplain. The floodplain is characterized as a flat area with distinct boundaries defined by the relatively steep concrete-lined slopes extending approximately 12 feet from the drainage channel to the surrounding grade of the roadway. Downstream of the ROW within a drainage easement Helotes Creek is impounded by a gravel deposit and support a ponded portion of the creek that is unvegetated but lined with closed canopy riparian woodlands (**Photo 8**). Dominant species in the canopy surrounding Helotes Creek include cedar elm, American elm (*Ulmus americana*), hackberry, chinaberry, and western soapberry. Common understory species include elbowbush (*Forestiera pubescens*), Ashe juniper, mountain laurel (*Sophora secundiflora*), and Mexican buckeye (*Ungnadia speciosa*). The trees are generally 25 to 40 feet in height with a range of tree sizes from 5 to 19 inches dbh and an average size estimated to be approximately 8 inches dbh. Helotes Creek would be considered a water of the U.S. because it has a defined bed and bank and it is a tributary to a TNW.

Since the No Build Alternative would not involve roadway construction, it would not affect the waters of the US beyond any future maintenance projects. Anticipated impacts resulting from the Build Alternative are summarized in **Table 8**. Due to the extension of the culvert at the Unnamed Tributary to Helotes Creek and the construction of frontage roads at Helotes Creek, permanent impacts to waters of the U.S. may occur. Since detailed design will not be completed until after the proposed project is let for construction, impacts were determined to be the entire existing ROW and easements for the unnamed tributary to Helotes Creek and Helotes Creek. No construction would occur at Culebra Creek; therefore, no impacts to Culebra Creek are expected. During design, efforts would be made to reduce the amount of permanent impacts to waters of the U.S. No wetlands or special aquatic sites are present in the proposed project area.

Table 8 Potential Impacts to Waters of the U.S. and Anticipated Permits

Water of the U.S. Feature	Existing Structure	Proposed Structure	Potential Impacts		Nationwide Permit (NWP)	Pre-Construction Notification
			Stream	Wetlands/Other Special Aquatic Sites		
Culebra Creek	Bridge	Bridge	None	None Present	No	No
Unnamed Tributary to Helotes Creek	Culvert	Culvert	0.15 acre	None Present	14	No
Helotes Creek	Bridge	Bridge	0.41 acre	None Present	14	Yes

The placement of dredge or fill material into jurisdictional waters of the U.S. at the Unnamed Tributary to Helotes Creek and Helotes Creek would be authorized under Nationwide Permit (NWP) 14. Potential impacts to Helotes Creek could exceed 0.1 acre; therefore, it is assumed that a pre-construction notification (PCN) may be required.

Appropriate measures would be taken to maintain normal downstream flows and minimize flooding. Temporary fills would be placed in a manner that would not be eroded by expected high flows. Temporary fills would be removed in their entirety and the affected area returned to pre-construction elevations, and revegetated as appropriate. The activity would comply with all general and regional conditions applicable to NWP 14.

3.6.2 Section 401 of the Clean Water Act: Water Quality Certification

Since the proposed construction within waters of the U.S. would be authorized by NWP 14, compliance with Section 401 of the Clean Water Act would entail the implementation of at least one approved BMP from each of the three categories identified in the TCEQ's 401 Water Quality Certification Conditions for NWPs. The categories include erosion control, sedimentation control, and post-construction total suspended solids (TSS) control. With the implementation of temporary and permanent best management practices (BMPs), including required permanent structures that would capture and treat runoff from the additional impervious cover resulting from the project, no long-term impacts to water quality in the area is anticipated.

3.6.3 Executive Order 11990, Wetlands

No wetlands are located in the proposed project area; therefore, Executive Order 11990 on wetlands does not apply.

3.6.4 Rivers and Harbors Act of 1899, Section 10

This project does not involve work in or over a navigable water of the U.S., therefore Section 10 of the Rivers and Harbors Act does not apply.

3.6.5 Section 303(d) of the Clean Water Act

The project is drained primarily by Culebra and Helotes Creeks, which convey water to Leon Creek approximately 4.5 miles east of the proposed project area. Leon Creek is designated as Segment 1604 and is listed as threatened/impaired for depressed dissolved oxygen and PCBs in edible tissue on the 2012 Clean Water Act 303(d) list. Leon Creek is within 5 miles of the proposed project area. As a result, coordination with the Texas Commission on Environmental Quality (TCEQ) would be required. However, the project is not expected to impact water quality in Leon Creek because the project would not contribute the constituent of concern to the impaired water body.

3.6.6 Section 402 of the Clean Water Act: Texas Pollutant Discharge Elimination System

The proposed project would include five or more acres of earth disturbance. As a result, TxDOT would comply with the TCEQ's Texas Pollutant Discharge Elimination System (TPDES) Construction General Permit (CGP). A Storm Water Pollution Prevention Plan (SW3P) would be implemented, and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) would also need to be submitted to the TCEQ and the City of San Antonio's storm sewer system operator. BMPs that would be implemented during construction would minimize potential water quality impacts that may occur during construction.

The proposed project is located within the boundaries of the City of San Antonio Municipal Separate Storm Sewer System (MS4) and would comply with the applicable MS4 requirements.

3.6.7 Floodplains

The project is located within a Federal Emergency Management Agency (FEMA) designated 100-year floodplain. The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The facility would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream or property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Coordination with the local Floodplain Administrator would be required.

3.6.8 General Bridge Act/Section 9 of the Rivers and Harbors Act

This project does not involve work in or over a navigable water of the U.S.; therefore Section 9 of the Rivers and Harbors Act does not apply.

3.7 Air Quality

The proposed project is included in the 2013-2016 TIP (**Appendix C**). The proposed project is located in Bexar County, which is in an area in attainment or unclassifiable for all National Ambient Air Quality Standards (NAAQS); therefore, the transportation conformity rules do not apply.

3.7.1 Traffic Air Quality Analysis (TAQA)

Bexar County is in attainment for all NAAQS. A Transportation Air Quality Analysis (TAQA) is required for the proposed project because its design year (2033) average daily traffic, 158,400 vehicles per day (vpd), exceeds the TAQA-triggering threshold (140,000 vpd) (TxDOT 2012). The topography and meteorology of the area in which the proposed project is located would not seriously restrict dispersion of the air pollutants. Combined peak average daily traffic on the LP 1604 main lanes and frontage roads between FM 471 and SH 16 is projected to be 122,900 vpd for the estimated-time of completion (ETC) year (2013), and 227,700 vpd for the design year (2033) (**Table 9**). Carbon monoxide (CO) concentrations for the proposed project were modeled using CALINE3, factoring in worst-case emission factors for CO from MOVES2010b; adverse meteorological conditions; peak hour traffic; and, locating receptors at the ROW line in accordance with the TxDOT 2006 Air Quality Guidelines. The results of this analysis show that the local concentrations of CO for both the 1-hour and the 8-hour averaging periods are not expected to exceed their respective primary NAAQS in the ETC year or in the design year (**Table 10**).

Table 9 Peak Traffic Projections on Mainlanes and Frontage Roads

	Average Daily Traffic 2013 (vehicles per day)	Average Daily Traffic 2033 (vehicles per day)
Eastbound Mainlanes	32,000	58,000
Eastbound Frontage Road	26,100	47,300
Westbound Mainlanes	32,000	58,000
Westbound Frontage Road	32,800	59,000
TOTAL	122,900	227,700

Source: TxDOT TPP (5 November 2012)

Table 10 Carbon Monoxide TAQA Results

Year	1-hour averaging period				8-hour averaging period			
	Ambient concentration* (ppm)	Primary NAAQS** (ppm)	CALINE3 result (ppm)***	% of NAAQS	Ambient concentration* (ppm)	Primary NAAQS** (ppm)	CALINE3 result (ppm)***	% of NAAQS
2013	1.7	35	2.8	8.0	1.1	9	1.5	16.7
2033	1.7	35	3.4	9.7	1.1	9	1.8	20.0

*Source: http://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/env/air/air_guidelines_0606.pdf

**Source: <http://EPA.gov/air/criteria.html>

***The CALINE3 result is inclusive of the background ambient concentration.

3.7.2 Congestion Management Process (CMP)

This project is located in an area that is in attainment or unclassifiable for all NAAQS; therefore, a CMP analysis is not required.

3.7.3 Mobile Source Air Toxics (MSAT)

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act (CAA) Amendments of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (<http://www.epa.gov/ncea/iris/index.html>). 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 particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA MSAT rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled (VMT)) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in **Graph 1** and **Table 11**.

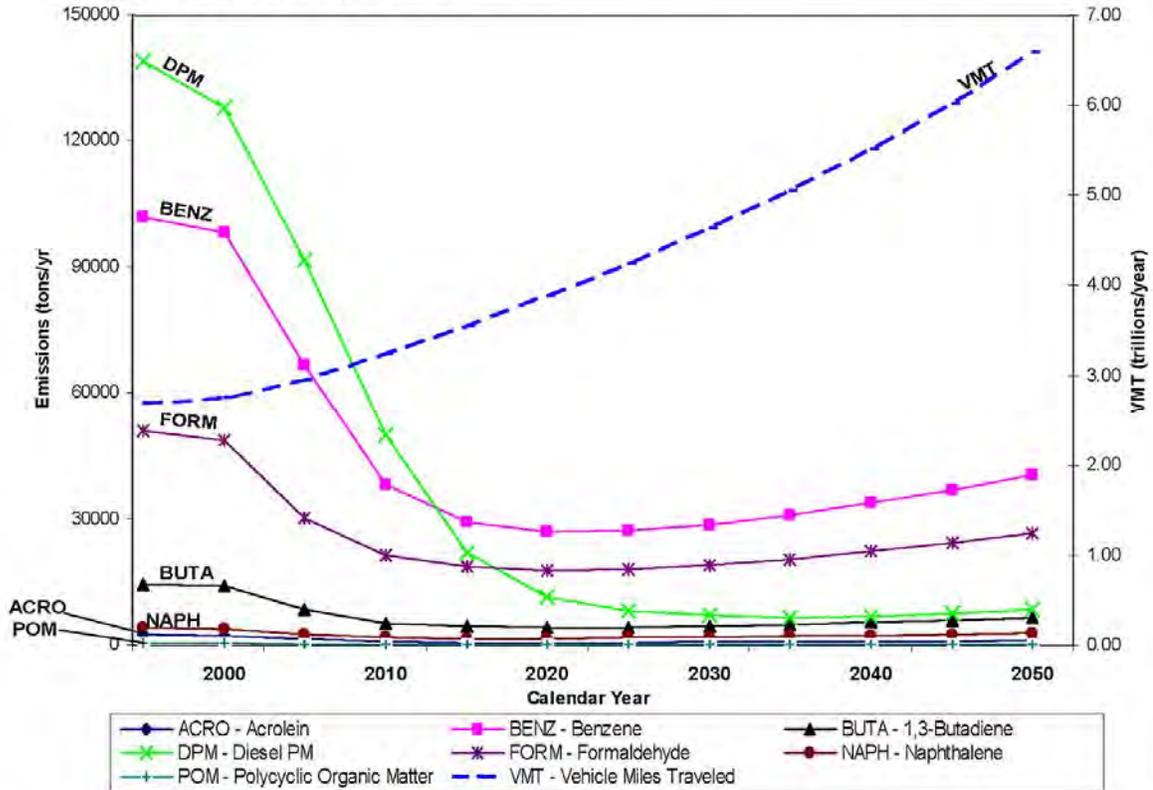
Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

3.7.3.1 Project-Specific MSAT Information

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

http://www.fhwa.dot.gov/environment/air_quality/air_toxics/research_and_analysis/mobile_source_air_toxics/msatemissions.pdf.

Graph 1: National MSAT Emission Trends 1999-2050 for Vehicles Operating on Roadways Using EPA's MOBILE6.2 Model



Note:

- (1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
- (2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Table 11 Projected National MSAT Emissions and Percent Reduction for 1999-2050 for Vehicles Operating on Roadways Using EPA's MOBILE6.2 Model

Pollutant/VMT	Pollutant Emissions (tons) and VMT by Calendar Year							Reduction 1999 to 2050
	1999	2000	2010	2020	2030	2040	2050	
Acrolein	2,570	2,430	1,000	775	824	970	1,160	-55%
Benzene	102,000	98,400	38,000	27,000	28,700	33,900	40,500	-60%
1,3-Butadiene	14,400	14,100	5,410	4,360	4,630	5,460	6,520	-55%
Diesel PM	139,000	128,000	50,000	11,400	7,080	7,070	8,440	-94%
Formaldehyde	50,900	48,800	21,400	17,800	19,000	22,400	26,800	-47%
Naphthalene	4,150	4,030	1,990	1,780	2,030	2,400	2,870	-31%
Polycyclic Organic Matter	561	541	259	233	265	313	373	-33%
Trillions VMT	2.69	2.75	3.24	3.88	4.63	5.51	6.58	145%

Source: EPA. MOBILE6.2 Model run 20 August 2009

For each alternative in this document, the amount of MSAT emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is higher than that for the No Build Alternative because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation

network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6.2 emissions model, emissions of all of the priority MSAT except for diesel PM decrease as speed increases. The extent to which these speed-related emissions decreases would offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the Build Alternative will have the effect of moving some traffic closer to nearby homes and businesses located near the existing LP 1604 roadway; therefore, there may be localized areas where ambient concentrations of MSAT could be higher under the Build Alternative than the No-Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be lower in the future.

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

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

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

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's 2009 Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents, which can be found at the following address: http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/100109guidmem.cfm). This Appendix also discusses a variety of FHWA research initiatives related to air toxics. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, <http://pubs.healtheffects.org/view.php?id=282>) or in the future as vehicle emissions substantially decrease (HEI, <http://pubs.healtheffects.org/view.php?id=306>).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for 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 frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's MOVES model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel PM emissions and significantly overestimates benzene emissions. Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in an NCHRP study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country - three where intensive monitoring was conducted plus an additional seven with less intensive monitoring. The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (<http://pubs.healtheffects.org/view.php?id=282>). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (<http://www.epa.gov/risk/basicinformation.htm#g>) and the HEI (<http://wwwcf.fhwa.dot.gov/exit.cfm?link=http://pubs.healtheffects.org/getfile.php?u=395>) 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. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

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

3.7.3.3 Conclusion

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

3.7.4 Construction and Post-Construction Emissions Reduction Strategies

During the construction phase of this project, temporary increases in air pollutant emissions may occur from construction activities. The primary construction-related emissions are PM (fugitive dust) from site preparation. These emissions are temporary in nature (only occurring during actual construction); it is not possible to reasonably estimate impacts from these emissions due to limitations of the existing models.

The construction activity phase of this project may generate a temporary increase in MSAT emissions from construction activities, equipment and related vehicles. The primary MSAT construction related emissions are particulate matter from site preparation and diesel particulate matter from diesel powered construction equipment and vehicles.

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

3.8 Noise

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

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

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

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

The traffic noise analysis typically includes the following elements:

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

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur (**Table 12**).

Table 12 Noise Abatement Criteria

Activity Category	FHWA dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary 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, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	--	Agricultural, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	Undeveloped lands that are not permitted.

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

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

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

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

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise. The traffic noise model used for this analysis assumed that no solid (i.e. concrete) safety barriers would be placed within the existing median. If a solid traffic barrier is placed within the median, the noise analysis may need to be revised.

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 13** and **Figures 4.1** through **4.4** in **Appendix A**), which represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 13 Traffic Noise Levels dB(A) Leq

Representative Receiver	NAC Category	FHWA NAC Level	Existing	Predicted 2033	Change (+/-)	Noise Impact
R1 Church	D	52	39	42	+3	No
R2 Residence	B	67	60	64	+4	No
R3 Residence	B	67	60	63	+3	No
R4 Residence	B	67	61	65	+4	No
R5 Daycare	C	67	56	58	+2	No
R6 Residence	B	67	55	57	+2	No
R7 Daycare	C	67	58	60	+2	No
R8 Residence	B	67	54	56	+2	No
R9 Residence	B	67	62	67	+5	Yes
R10 Residence	B	67	53	57	+4	No
R11 Residence	B	67	56	59	+3	No
R12 Apartments	B	67	60	65	+5	No
R13 Apartments	B	67	60	64	+4	No
R14 Residence	B	67	59	64	+5	No
R15 Residence	B	67	54	61	+7	No
R16 Residence	B	67	57	62	+5	No
R17 Residence	B	67	53	60	+7	No
R18 Ballfield	C	67	65	67	+2	Yes
R19 Hotel	E	72	56	60	+4	No

Table 13 Traffic Noise Levels dB(A) Leq

Representative Receiver	NAC Category	FHWA NAC Level	Existing	Predicted 2033	Change (+/-)	Noise Impact
R20 Playground	C	67	66	67	+1	Yes
R21 Restaurant	E	72	64	65	+1	No
R22 Cemetery	C	67	56	58	+2	No
R23 Restaurant	E	72	61	63	+2	No
R24 Church	C	67	63	64	+1	No
R25 Residence	B	67	61	62	+1	No
R26 Residence	B	67	61	62	+1	No
R27 Residence	B	67	63	63	0	No
R28 Residence	B	67	58	58	0	No
R29 Residence	B	67	63	65	+2	No
R30 Golf	C	67	62	67	+5	Yes
R31 Residence	B	67	65	67	+2	Yes
R32 Playground	C	67	59	60	+1	No
R33 Motel	E	72	56	57	+1	No
R34 Restaurant	E	72	62	65	+3	No
R35 Restaurant	E	72	64	66	+2	No

As indicated in **Table 13**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone, and the construction of noise walls.

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

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one dB(A) per 5 mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

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

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

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for the impacted receptor location with the following results:

R9: This receiver is a single residence with a driveway connected to the frontage road. A continuous

noise barrier would restrict access to the residence. A gap for the driveway would satisfy access requirements, but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) or the noise reduction design goal of 7 dB(A).

R18: This receiver represents a sports field facing the roadway. The sports field has a backstop, bases, and a single bench, and is located adjacent to a large church parking lot. Based on average residential lot sizes in the area, the sports field represents approximately eight receivers. A noise barrier that would achieve the minimum feasible reduction of 5 dB(A) while achieving a 7 dB(A) noise reduction design goal for these representative receivers would exceed the reasonable, cost effectiveness criterion of \$25,000.

R20: This receiver represents a playground with benches, picnic tables, and swings, and is associated with a church connected to the frontage road by two driveways. Based on average residential lot sizes in the area, the playground represents approximately two receivers. A noise barrier, placed between the driveways, that would achieve the minimum feasible reduction of 5 dB(A) while achieving a 7 dB(A) noise reduction design goal for these representative receivers would exceed the reasonable, cost effectiveness criterion of \$25,000.

R30: This receiver represents an outdoor golf driving range with a driveway connected to the frontage road. A continuous noise barrier would restrict access to the driving range. A gap for the driveway would satisfy access requirements, but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of 5 dB(A) or the noise reduction design goal of 7 dB(A).

R31: This receiver represents two residences on Winter Creek Drive with backyards that face the roadway. A noise barrier that would achieve the minimum feasible reduction of 5 dB(A) while achieving a 7 dB(A) noise reduction design goal would exceed the reasonable, cost-effectiveness criterion of \$25,000.

None of the above noise abatement measures would be both feasible and reasonable; therefore, no abatement measures are proposed for this project.

Land use activity areas in several areas along the project corridor are currently Category G, undeveloped land which is not permitted for development. To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, that no new activities are planned or constructed along or within the following predicted (2033) noise impact contours.

LAND USE	IMPACT CONTOUR	DISTANCE FROM ROW
NAC category B & C	66 dB(A)	120 feet
NAC category E	71 dB(A)	52 feet

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction

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

A copy of this traffic noise analysis will be available to local officials to assist in future land use planning. On the date of approval of this document (Date of Public Knowledge), TxDOT is no longer responsible for providing noise abatement for new development adjacent to the project.

3.9 Hazardous Materials

Hazardous materials are substances that are toxic to plants, animals, or humans; corrosive to materials; flammable; or explosive. An initial site assessment of the project area was conducted in January 2013 in order to identify any potential hazardous materials concerns located within or adjacent to the project area. As part of the assessment, a database search for potential hazardous materials sites in and adjacent to the project area was also conducted as described below. Site reconnaissance of the ROW was conducted in November 2012. The following paragraphs provide a summary of these investigations.

3.9.1 Site Reconnaissance

A preliminary onsite visual investigation was performed along the proposed project alignment to identify sites of potential environmental contamination by hazardous materials located in and adjacent to the project ROW. The onsite investigation identified visual evidence of potential environmental concerns, including underground petroleum storage tanks. These observations were consistent with the results of the database search (detailed below) and site reconnaissance did not reveal additional potential hazardous materials sites or areas of concern.

3.9.2 Database Search

A database search for potential hazardous materials was conducted in February 2013 in accordance with American Society for Testing Materials (ASTM) 1527 standards. **Table 14** identifies the federal and state databases searched and the corresponding findings.

Table 14 Hazardous Materials Data Search and Findings

Sources	Database Acronym	Minimum Search Distance	Findings	
			Locatable	Unlocatable
Federal				
Aerometric Information Retrieval System/ Air Facility Subsystem	AIRSAFS	target property	0	0
Biennial Reporting System	BRS	target property	0	0
Clandestine Drug Laboratory Locations	CDL	target property	0	0
EPA Docket Data	DOCKETS	target property	0	0
Federal Engineering Institutional Control Sites	EC	target property	0	0
Emergency Response Notification System	ERNS	target property	1	0
Facility Registry System	FRS	target property	4	0

Table 14 Hazardous Materials Data Search and Findings

Sources	Database Acronym	Minimum Search Distance	Findings	
			Locatable	Unlocatable
Hazardous Materials Incident Reporting System	HMIRS	target property	0	0
Integrated Compliance Information System	ICIS	target property	0	0
Integrated Compliance Information System National Pollutant Discharge Elimination System	ICISNPDES	target property	0	0
Material Licensing Tracking System	MLTS	target property	0	0
National Pollutant Discharge Elimination System	NPDES	target property	0	0
PCB Activity Database	PADS	target property	0	0
Permit Compliance System	PCS	target property	0	0
CERLIS Liens	SFLIENS	target property	0	0
Section Seven Tracking System	SSTS	target property	0	0
Toxics Release Inventory	TRI	target property	0	0
Toxic Substance Control Act Inventory	TSCA	target property	0	0
No Longer Regulated RCRA Generator Facilities	NLRRCRAG	target property and adjoining	0	0
Resource Conservation and Recovery Act – Generator Facilities	RCRAGR06	target property and adjoining	1	0
Brownfields Management System	BF	0.5 mi	0	0
Comprehensive Environmental Response, Compensation, and Liability Information System	CERCLIS	0.5 mi	0	0
Land Use Control Information System	LUCIS	0.5 mi	0	0
No Further Remedial Action Planned	NFRAP	0.5 mi	0	0
No Longer Regulated RCRA Non-CORRACTS TSD Facilities	NLRRCRAT	0.5 mi	0	0
Open Dump Inventory	ODI	0.5 mi	0	0
Resource Conservation and Recovery Act – Treatment, Storage & Disposal Facilities	RCRAT	0.5 mi	0	0
Delisted National Priorities List	DNPL	1.0 mi	0	0
Department of Defense Sites	DOD	1.0 mi	0	0
Formerly Used Defense Sites	FUDS	1.0 mi	0	0
No Longer Regulated RCRA Corrective Action Facilities	NLRRCRAC	1.0 mi	0	0
Resource Conservation and Recovery Act - Corrective Action Facilities	RCRAC	1.0 mi	0	0
National Priority List	NPL	1.0 mi	0	0
State				
Groundwater Contamination Cases	GWCC	target property	0	0
TCEQ Liens	LIENS	target property	0	0
Municipal Setting Designations	MSD	target property	0	0
Notice of Violations	NOV	target property	0	0
State Institutional/Engineering Controls	SIEC01	target property	0	0
Spills Listing	SPILLS	target property	0	0
Dry Cleaner Registration Database	DCR	0.25 mi	2	0
Industrial and Hazardous Waste Sites	IHW	0.25 mi	3	0
Permitted Industrial Hazardous Waste Sites	PIHW	0.25 mi	0	0
Petroleum Storage Tanks	PST	0.25 mi	13	0
Affected Property Assessment Reports	APAR	0.5 mi	0	0
Brownfields Site Assessments	BSA	0.5 mi	0	0

Table 14 Hazardous Materials Data Search and Findings

Sources	Database Acronym	Minimum Search Distance	Findings	
			Locatable	Unlocatable
Closed and Abandoned Landfill Inventory	CALF	0.5 mi	3	0
Innocent Owner/Operator Database	IOP	0.5 mi	1	0
Leaking Petroleum Storage Tanks	LPST	0.5 mi	4	0
Municipal Solid Waste Landfill Sites	MSWLF	0.5 mi	0	0
Railroad Commission VCP and Brownfield Sites	RRCVCP	0.5 mi	0	0
Radioactive Waste Sites	RWS	0.5 mi	0	0
Tier II Chemical Reporting Program Facilities	TIERII	0.5 mi	15	0
Voluntary Cleanup Program Sites	VCP	0.5 mi	1	0
Recycling Facilities	WMRF	0.5 mi	0	0
State Superfund Sites	SF	1.0 mi	0	0
Total			47	0

Source: GeoSearch 2013

An Initial Site Assessment (ISA) was conducted to identify potential hazardous materials in the project area based on the following project activities:

- Trenching, drilled shafts, or other excavations exceeding three feet in depth
- Underground utility adjustments

The ISA consisted of the following actions:

- Visual survey (conducted November 2012) of the project limits and surrounding areas
- Research of existing and previous land use
- A review of federal and state regulatory databases/lists

An analysis of the ISA data indicates that this project would not involve the acquisition of known unresolved contamination where TxDOT could reasonably expect to assume liability for corrective action upon acquisition. In addition, this project does not involve known hazardous materials impacts that could be anticipated to adversely affect construction (e.g. cannot resolve before letting or during construction). A total of 17 locatable sites representing 23 database findings were identified within 1/8 mile of the proposed project. Based on the database search and onsite visual investigations, none of these sites are expected to pose a contamination threat during roadway construction and would not require further assessment.

Any unanticipated hazardous material and/or petroleum contamination encountered during construction of the proposed project should be handled according to applicable federal and state regulations per TxDOT's *Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges*. These specifications apply to all highway projects and include guidelines addressing the contractor's responsibilities regarding the discovery of hazardous materials. During construction the contractor should

also take the appropriate measures to prevent, minimize and control the spill of fuels, lubricants and hazardous materials in the construction staging area.

3.10 Construction Impacts

There would be some noise impacts resulting from the construction of the proposed project. The contractors would be required to ensure maintenance of the mufflers on their construction equipment to minimize noise impacts.

During construction, due to operation normally associated with road construction, there is a possibility that noise levels would be above normal in the areas adjacent to the ROW. Construction is normally limited to daylight hours when occasional loud noises are more tolerable. Due to the relatively short-term exposure periods imposed on any one receptor, extended disruption of normal activities is not considered likely. Every possible effort would be made to minimize construction noise.

Construction would temporarily degrade the air quality through dust and exhaust gasses associated with construction equipment. Measures to control dust would be considered and incorporated into the final design and construction specifications. However, considering the temporary and transient nature of construction-related emissions, as well as the mitigation actions to be utilized, it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

3.11 Indirect and Cumulative Impacts

This section analyzes the indirect and cumulative impacts of the proposed project. The evaluation of these impacts is based on the *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (TxDOT 2010). The screening tools for indirect and cumulative impacts documentation in TxDOT's guidance indicated the need for further analysis of indirect and cumulative impacts for the proposed project. According to the TxDOT screening tools, an indirect impacts analysis is required if a project adds capacity. Because an indirect impacts analysis will be conducted and due to the project's proposed added capacity, a cumulative impacts analysis is also required.

3.11.1 Indirect Impacts Analysis

Indirect impacts are defined as those that are caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems (40 CFR § 1508.7).

This analysis of indirect impacts was conducted using the seven-step process outlined in TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (2010). The seven steps consist of:

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 and alternatives
5. Identify potentially substantial indirect effects for analysis
6. Analyze indirect impacts and evaluate results
7. Assess consequences and consider/develop mitigation (when appropriate)

3.11.1.1 Step 1. Scoping

Scoping efforts were developed and evaluated based on the need and purpose of the project and included identifying the social, cultural, and natural resource issues that potentially could affect the human environment. The proposed improvements to LP 1604 are needed to accommodate population growth in the area and increased traffic volumes. The proposed roadway widening would result in impacts to aspects of both the natural and human environment.

Scoping for the proposed LP 1604 project included field observations, research of the North Sector Plan, West Sector Plan, 2011 Northwest Community Plan, and the San Antonio-Bexar County MPO Mobility 2035 transportation planning document. The purpose of this scoping effort was to outline the methodology for analysis of indirect impacts and determine the study area boundaries for the analysis. The indirect impacts analysis is based on reasonably foreseeable land development in the study area expressed in development and planning documents as well as ongoing or potential future development observed during a November 2012 field visit.

Area of Influence

The TxDOT guidance on assessing indirect impacts refers to the geographic study area for potential indirect impacts as the "area of influence" or "AOI." The AOI associated with the proposed project has been defined as a 1,522-acre study area that includes the parcels adjacent to the proposed project. It was determined that the adjacent parcels is the area most likely to be indirectly impacted by the proposed project due to a change in existing access (i.e. the addition of frontage roads and the loss of direct access to LP 1604 mainlanes from adjacent properties). The AOI is located within the City of San Antonio city limits. See **Insert 1** for a map of the AOI.

Data Research

The City of San Antonio's Comprehensive Plan is the primary planning document in the area; however, the City of San Antonio has also developed Sector Plans and Community Plans which are smaller components of the Comprehensive Plan. The Sector Plans provide long-range planning for future growth, conservation, and redevelopment on a regional level while the Community Plans provide planning guidelines for areas with a population of 10,000 or more and can include multiple neighborhoods. The Sector Plan and Community Plan for the proposed project area, in addition to the city's current zoning map, future land use map, and major thoroughfare plan, were used as the long-range planning forecasting tools in this analysis.

Timeframe considerations for this analysis are defined as those occurring through the year 2035. This temporal limit to the indirect impacts assessment was based on the availability of long-range planning information within the San Antonio-Bexar County MPO Mobility 2035 planning document.

3.11.1.2 Step 2 Identify the Study Area's Direction and Goals

According to the San Antonio-Bexar County MPO Mobility 2035, Bexar County is projected to have approximately 2.1 million residents, which represents over half a million new residents in the San Antonio area. The Northwest Community Plan outlines specific goals for the proposed project area in relation to Growth and Development, Community Facilities and Public Services, Parks and Open Spaces, Schools and Education, Transportation, and Land Use and Zoning. Goals outlined in the Community Plan that characterize the area's growth and planning objectives include (but are not limited to):

- Citizens taking an active role in the growth and development process
- Preserve and increase parks and open spaces as well as encourage citizen involvement to promote park development
- Provide safer, controlled traffic flow (Pedestrian, Cyclist, and Vehicular) on major thoroughfares and arteries
- Maintain high level road construction and maintenance
- Promote streetscape beautification along major arterials
- Add more bicycle facilities and bike connectivity
- Encourage neighborhood-friendly business development
- Encourage commercial development at nodes (LP 1604 intersections at FM 471 and SH 16 were both identified as major nodes while the LP 1604 and Braun Road intersection was identified as a neighborhood node)

These development and growth goals are intended to guide the project area's decisions about planning, zoning, and land use.

3.11.1.3 Step 3. Inventory the Study Area's Notable Features

The objective of this step is to identify specific environmental issues within the AOI against which the project may be assessed. The term notable features includes specific valued, vulnerable, or unique elements of the environment.

The AOI is comprised of undeveloped, residential, and commercial land uses. Notable features within the AOI include:

- Water of the US (including Culebra Creek, Unnamed tributary to Helotes Creek, and Helotes Creek)
- Potential habitat for two state-listed threatened species, the Texas horned lizard and timber/canebrake rattlesnake
- Remnant native vegetation
- Commercial centers located along LP 1604 at SH 16 and FM 471
- Zion Lutheran Church and Northwest Church of Christ, both located along LP 1604 at Braun Road

3.11.1.4 Step 4. Identify Impact-Causing Activities of the Proposed Action and Alternatives

This step consists of listing the impact-causing actions of the proposed project or general types of impacts to be expected from the proposed project. The general types of project-impact causing activities are:

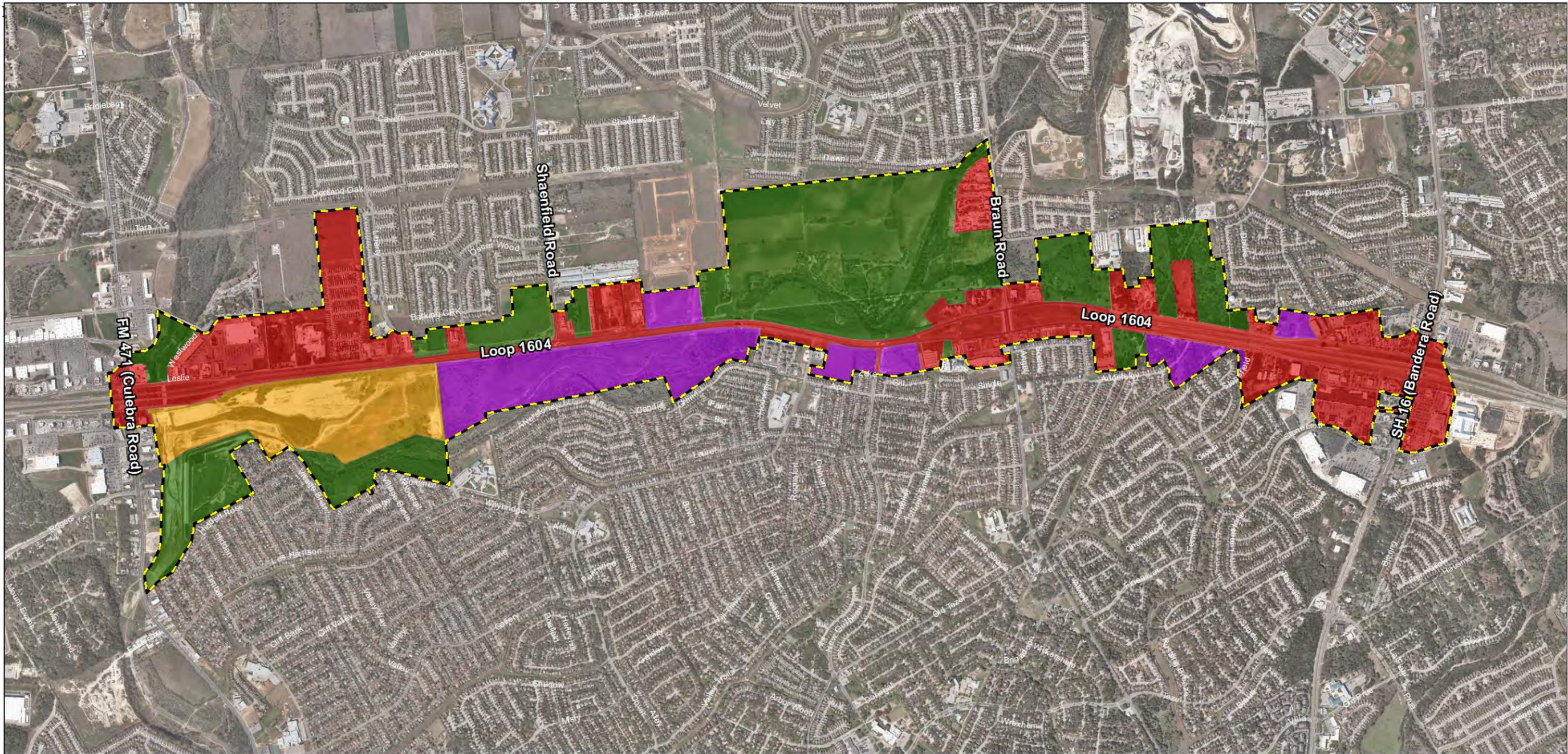
Modification of Regime/Resource Renewal

The proposed project could impact approximately 159.67 acres of Grassland/Mixed Herbaceous vegetation, 2.94 acres of Mixed Deciduous Woodland, and approximately 0.66 acre of Riparian vegetation. Permanent impacts would be limited to the footprint of the proposed construction and any areas required for drainage facilities. A mix of native and introduced grasses and forbs would be used to reseed the ROW outside of paved areas, and disturbed areas would be restored and reseeded where appropriate.

The proposed project could also potentially permanently impact waters of the U.S., although permanent impacts to waters of the U.S. would be minimized by spanning the OHWM where possible.

Land Transformation and Construction

The proposed project would include the construction of frontage roads and/or mainlanes in order to convert the existing LP 1604 to a freeway section. The proposed project would also include the construction of grade separations at major intersections within the project area. The proposed project would not require any additional ROW or easements.

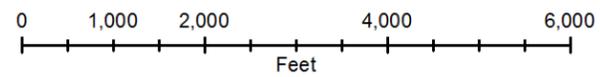


Base Map: City of San Antonio Imagery 2012 Bexar County, Texas

-  Area of Impact Boundary
-  Developed
-  Undeveloped
-  Currently Being Developed
-  Master Plan Development Area



1:24,000



Insert 1
 Area of Impact
 Loop 1604
 From FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Resource Extraction and Land Alteration

The proposed improvements would not require any resource extraction or any land alteration.

Processing

Temporary storage facilities are usually required during construction. Stored materials typically include aggregate, concrete sewer pipes, traffic control barricades, steel rebar, and road signs. These are commonly located within TxDOT ROW in the project limits.

Waste Emplacement

The proposed project would not include waste discharge or work in or near landfills.

Chemical Treatment

Fertilizers are only used during the revegetative phase of TxDOT construction and use within the ROW is discontinued after construction is complete. TxDOT uses herbicides to control noxious weeds or areas that are difficult to mow, but does not use pesticides to control destructive lawn insects. An Environmental Impact Statement conducted for TxDOT's pest management program determined that modeled chemical concentrations in surface water related to herbicides would be extremely low. TxDOT principally uses inert sand materials for ice control, and these are only applied on bridges and culverts.

Roadway construction materials include soil stabilizers like cement, liquid asphaltic emulsions, concrete curing compounds, and concrete paint, among others. The contractor is required to clean up any spills of their construction equipment and materials.

Changes in Traffic and Access Alteration

The proposed project area is part of the larger LP 1604, which is an existing, mature roadway system providing the outermost loop around the City of San Antonio. The proposed project is not expected to change traffic patterns. According to the TxDOT Transportation Planning and Programming Division (TxDOT-TPP), projected traffic numbers along LP 1604 within the project area are the same for both the No-Build and Build Alternative. Therefore, the project is not expected to alter traffic within the area.

The proposed project would cause a minor change to access for properties located adjacent to LP 1604 within the project limits. Currently, properties have direct access to LP 1604 mainlanes. The proposed project would remove the direct access to mainlanes and instead provide access to one-way frontage roads.

3.11.1.5 Step 5. Identify Potentially Substantial Indirect Effects for Analysis

This step summarizes the methods used to identify indirect impacts and presents the framework for determining which impacts merit further analysis, or, conversely, which impacts require no further analysis.

The methods used to identify indirect impacts are primarily qualitative. This technique focused on the elements or indicators that characterize the study area using ecological, economic, demographic, and social information and data from the baseline investigations. The discussion of indirect impacts is organized by three types of impacts: encroachment-alteration impacts, induced growth impacts, and

impacts related to induced growth. Encroachment-alteration impacts are defined as the alteration of the behavior and functioning of the affected environment caused by project encroachment. These impacts are generally categorized as ecological and socioeconomic.

Encroachment-Alteration Impacts (ecological)

The proposed project could impact approximately 159.67 acres of Grassland/Mixed Herbaceous vegetation, 2.94 acres of Mixed Deciduous Woodland, and approximately 0.66 acre of Riparian vegetation. Up to 0.15 acre of the unnamed tributary to Helotes Creek and 0.44 acre of Helotes Creek could be impacted by the proposed project. These estimates represent all potential vegetation and waters of the US disturbances and are a worst case scenario. Permanent impacts would be limited to the footprint of the proposed construction and any areas required for drainage facilities. Encroachment effects to vegetation are expected to be minimal due to the fact that the areas adjacent to the project are largely developed and do not contain substantial amounts of intact habitat.

During construction, areas within the existing ROW could be exposed to erosion and sedimentation as well as potential leaks and spills. The proposed project is located in the Edwards Aquifer transition zone; therefore, any leaks or spills would not discharge directly into groundwater recharge. Also, an SW3P would be required and would outline BMPs that would be used during construction to minimize pollutants and sedimentation from travelling offsite through storm water runoff. Construction BMPs may include temporary vegetation, blankets/matting, mulch and sod for erosion control and rock berms and silt fences for sedimentation control. The BMPs would be implemented prior to construction and inspected and maintained throughout construction. Based on the required BMPs during construction and the fact that the proposed project is not located within the Edwards Aquifer recharge zone, the proposed project improvements are not expected to result in adverse water quality impacts to the Edwards Aquifer system or associated species and habitats.

The project would not result in direct impacts to any federally listed threatened, endangered, or candidate species. Although habitat for two state-listed species, the Texas horned lizard and timber/canebrake rattlesnake, is located in the existing ROW and easements, the proposed project would have minimal impacts (less than 4 acres) to potential habitat.

The proposed project would have minimal direct impacts to waters of the US and vegetation and would not impact any federally listed threatened and endangered species. Also, no ecological encroachment effects are anticipated since the project would be constructed within existing ROW and easements only. Therefore, this action will not be carried forward for analysis.

Encroachment-Alteration Impacts (socioeconomic)

The proposed project would add capacity to the roadway and improve safety. The improved roadway would better serve traffic through the area and access to adjacent land uses would be maintained or improved.

The proposed project would not cause the relocation or displacement of homes or businesses or adversely impact existing community or neighborhood character. Through the construction of a freeway section along this portion of LP 1604, the proposed project is expected to increase mobility in the project vicinity.

The majority, approximately 62 percent, of the existing corridor is already developed, currently being developed, or located within an area that is already part of a larger master development plan. The remaining 38 percent of the corridor (approximately 586 acres) is undeveloped. While these undeveloped parcels may become more attractive for development with the increased mobility in the project area, the growth and development of the project area would continue regardless if the proposed project was constructed based on development and growth trends in the AOI. Therefore, the proposed project would not impact development in the area. Instead, it is a response to the development that is already occurring or has occurred along LP 1604. This indicates that substantial land use changes resulting in changes to the composition of the adjacent neighborhoods and overall community are not expected.

No socioeconomic encroachment effects are anticipated since the project would be constructed within existing ROW and easements, would not require any displacements or relocations, and would not impact development in the area. Therefore, this action will not be carried forward for analysis.

Induced Growth Effects

Induced growth effects are those impacts associated with new or improved access to adjacent land as well as reduction in the time or cost of travel and other factors that may increase the attractiveness of adjacent land to developers and consumers. Given the scope of the proposed improvements (adding capacity to an existing facility with no new ROW or easements) and the context of the study area (relatively mature urban setting), the direct and indirect impacts of the proposed LP 1604 improvements would support the continued development of the project area but are not likely to induce growth. LP 1604 is considered a mature roadway since the construction of LP 1604 began in the 1960s, with the route being formally designated as LP 1604 in 1977. The proposed project would not provide new access or substantially increase access to areas along LP 1604. Also, a majority of the land adjacent to the proposed project is already developed or slated for development. Therefore, the project area would likely develop regardless of the construction of additional mainlanes along LP 1604. While the increased mobility provided by the proposed project may increase the rate of development, the proposed project is not expected to lead to new development within the area. Due to the lack of induced growth effects, this action will not be carried forward for analyses.

Impacts Related to Induced Growth

The project is not expected to induce development in the area; therefore it would not result in impacts related to induced growth. This action will not be carried forward for analysis.

3.11.1.6 Step 6 and 7. Analyze Indirect Effects and Evaluate Results and Assess Consequences and Consider/Develop Mitigation (When Appropriate)

The objective of Step 6 is to assess the effects identified in the previous step by determining magnitude, probability of occurrence, timing and duration, and degree to which any adverse effects have the potential to be substantial. The objective of this Step 7 is to assess the consequences of the analyzed indirect impacts and develop strategies to address unacceptable indirect impacts. As indicated in Step 5, the proposed project is not anticipated to cause any induced growth in the proposed project area. Also, the proposed project would not have any socioeconomic encroachment effects. Although direct impacts to vegetation and waters of the US are expected within the existing ROW and easements, no ecological

encroachment effects are anticipated due to the fact that the proposed project would not require any additional ROW or easements. Due to the lack of both encroachment and induced growth impacts, it is anticipated that the proposed project would not result in any substantial indirect impacts on resources located within the AOI.

3.11.2 Cumulative Impacts Analysis

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 C.F.R. § 1508.8).

Cumulative impacts include both direct and indirect impacts. The steps for identifying and assessing indirect and cumulative impacts are outlined below.

The eight-step framework for identifying and assessing cumulative impacts are:

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 the direct and/or indirect impacts that may contribute to a cumulative impact
5. Identify other reasonably foreseeable actions that may affect resources
6. Assess potential cumulative impacts to each resource
7. Report the results
8. Assess and discuss mitigation issues for all adverse impacts

3.11.2.1 Step 1 Resource Identification

Based on TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (TxDOT 2010), the cumulative impact analysis should focus on: 1) those resources substantially impacted by the project; and 2) resources currently in poor or declining health or at risk even if the impact of TxDOT's proposed action is minimal. **Table 15** addresses each of the potentially impacted resources and justification for the inclusion in the analysis of cumulative impacts. Based on the analysis of direct and indirect impacts depicted in **Table 15**, vegetation and water resources are the resources that will be carried forward in the following cumulative impacts analysis.

3.11.2.2 Step 2 Study Area for Each Affected Resource

TxDOT's September 2010 Guidance recommends the assignment of a past and future temporal context to each affected resource, in addition to a spatial resource study area (RSA). The following section describes the temporal and spatial context for each resource.

Table 15 Potentially Impacted Resources and Justification for Inclusion in the Analysis of Cumulative Impacts

Resource	Summary of Direct Impacts	Summary of Indirect Impacts	Health of Resource	Included in Cumulative Impacts Analysis?
Land Use	Land use directly adjacent to the project is primarily developed. No new ROW or easements would be required for the proposed project.	The proposed project is not expected to induce growth in the AOI.	The project area is largely developed. Because ongoing and reasonably foreseeable development within the City of San Antonio is consistent with zoning and land use plans, the health of this resource is considered stable.	No. There is a low likelihood of future development and land use changes directly associated with the proposed project. Based on TxDOT’s 2010 guidance, if a project will not cause substantial direct or indirect impacts on a resource, it will not contribute to a cumulative impact on the resource. Therefore, cumulative impacts to land use will not be considered further in this analysis.
Vegetation	The proposed project could impact approximately 159.67 acres of Grassland/Mixed Herbaceous vegetation, 2.94 acres of Mixed Deciduous Woodland, and approximately 0.66 acre of Riparian vegetation. Permanent impacts would be limited to the footprint of the proposed construction and any areas required for drainage facilities.	Encroachment effects to vegetation are not expected due to the fact that the areas adjacent to the project are largely developed and do not contain substantial amounts of intact habitat.	Native vegetation in much of the immediate project area has been cleared and developed with residential and commercial construction. Any intact vegetation located within the AOI is already slated to be developed; therefore, the health of this resource is considered declining.	Yes. The proposed project would directly impact over 150 acres of vegetation and the resource is considered in declining health within the AOI. Therefore, impacts to vegetation will be considered further in this analysis.
Water Resources	<p>Three potential waters of the US were identified within the proposed project area. No wetlands or other special aquatic sites were identified along the unnamed tributary or anywhere else in the project area. Permanent and temporary impacts to waters of the U.S. resulting from construction could total approximately 0.56 acre.</p> <p>The proposed project, once completed, would not directly affect groundwater resources.</p>	Indirect impacts to water resources are not expected due to the use of BMPs during construction and the lack of induced growth in the proposed project area.	The proposed project is located within 5 miles of Leon Creek, which is listed on the 2012 303(d) list for impaired waters. Due to the amount of development in the proposed project area and the proximity to an impaired water, the health of the resource is considered declining.	Yes. Although indirect impacts to water resources are not expected, the proposed project could impact 0.56 acre of waters of the US and the resource is considered in declining health. Therefore, impacts to water resources will be considered further in this analysis.

Table 15 Potentially Impacted Resources and Justification for Inclusion in the Analysis of Cumulative Impacts

Resource	Summary of Direct Impacts	Summary of Indirect Impacts	Health of Resource	Included in Cumulative Impacts Analysis?
Threatened and Endangered Species	No suitable habitat for any federally listed/candidate species is present in or adjacent to the project area. As a result, the proposed project would not directly affect any federally listed or candidate species. The project could directly impact potential habitat for state listed threatened species. However, the potential to impact the species is low.	Potential indirect impacts to threatened and endangered species are not anticipated due to the fact that the areas adjacent to the project are largely developed and do not contain substantial amounts of intact habitat.	A review of the current health of federally listed species with the potential to occur in the project area indicates the species are in declining health due to the degradation of habitat.	No. Based on TxDOT’s 2010 guidance, if a project will not cause substantial direct or indirect impacts on a resource, it will not contribute to a cumulative impact on the resource. Therefore, impacts to threatened and endangered species will not be considered further in this analysis.
Air Quality	Direct impacts on air quality and potential increases in MSATs from the project are primarily those associated with the increased capacity, accessibility and the resulting projected increases in VMT. Emission reductions as a result of EPA’s new fuel and vehicle standards are anticipated to offset impacts associated with VMT increases.	Potential indirect impacts to air quality and potential increases in MSATs are primarily related to any future development resulting from increased mobility associated with the proposed project. 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 as well as obtain appropriate authorization from the TCEQ.	The project is located in Bexar County which is in an area in attainment of all NAAQS. In 2008, the EPA issued final action to designate the San Antonio area (and 12 other Early Action Compact areas) in attainment for the eight-hour ozone standard. This designation means that there are no further state implementation plan requirements for the existing standard as long as the area continues to monitor attainment for the standard. Therefore, the health of this resource in the region is considered stable.	No. The project will not result in any meaningful changes in traffic volumes, vehicle mix, location of existing roadways, or any other factor that would cause an increase in emissions impacts relative to the no-build alternative. Therefore, the project will not result in actions that could possibly impact air quality. As such, TxDOT has determined that this project would generate minimal indirect and cumulative impacts on air quality. Consequently, an Indirect and Cumulative Impacts analysis for air quality was not required for this project.

Table 15 Potentially Impacted Resources and Justification for Inclusion in the Analysis of Cumulative Impacts

Resource	Summary of Direct Impacts	Summary of Indirect Impacts	Health of Resource	Included in Cumulative Impacts Analysis?
EJ and LEP Populations	Although EJ and LEP populations are present in the project area, the proposed improvements to LP 1604 would not result in disproportionately high adverse impacts to these populations of concern and are not anticipated to substantially alter the overall character of the community. Access to all adjacent neighborhoods and businesses would be maintained throughout construction and the project would not separate or isolate any businesses, distinct neighborhoods, ethnic groups, or other specific groups.	The proposed improvements would not limit access to businesses, schools, and residences and is not expected to result in indirect changes in access or community cohesion. Disproportionately adverse indirect impacts to minority, LEP, or low income populations as a result of this project are not anticipated.	By definition, EJ groups are considered marginalized populations. However, there are regulations and policies in place to protect vulnerable populations, and because there are no direct effects or anticipated indirect impacts to these groups, the resource is considered stable within the AOI.	No. Because the proposed project is not expected to result in disproportionately adverse direct or indirect impacts to EJ populations, a cumulative impacts analysis is not required.

Vegetation

The RSA for the evaluation of the cumulative effects to vegetation has been defined as the same boundaries previously defined in the AOI (**Insert 2**). These boundaries indicate the area where changes in access and mobility could increase the rate of planned development. Although no indirect impacts to vegetation are expected as a result of the proposed project, the RSA contains defined development areas adjacent to LP 1604. The combination of LP 1604's direct impacts to vegetation and the known development in the RSA could contribute to a cumulative impact on vegetation. Effects to land use outside of this RSA are subject to other influences where the effect of the improvements to LP 1604 would not be expected to be measurable or would be inconsequential. The temporal context for this analysis is set from the year 1997, when the San Antonio Master Plan Policy was adopted, to the year 2035, in order to include the long-range transportation planning.

Water Resources

The RSA for the evaluation of the cumulative effects to waters resources has been defined as the Leon Creek watershed (**Insert 3**). These boundaries were chosen due to the proposed project's direct impacts on waters of the US (Helotes Creek and an unnamed tributary to Helotes Creek) that drain into Leon Creek, a Section 303(d) impaired water. The temporal context for this analysis is set from the year 1997, when the San Antonio Master Plan Policy was adopted, to 2035, in order to include the long-range transportation planning.

3.11.2.3 Step 3 Current Health and Historic Context for Each Affected Resource

Vegetation

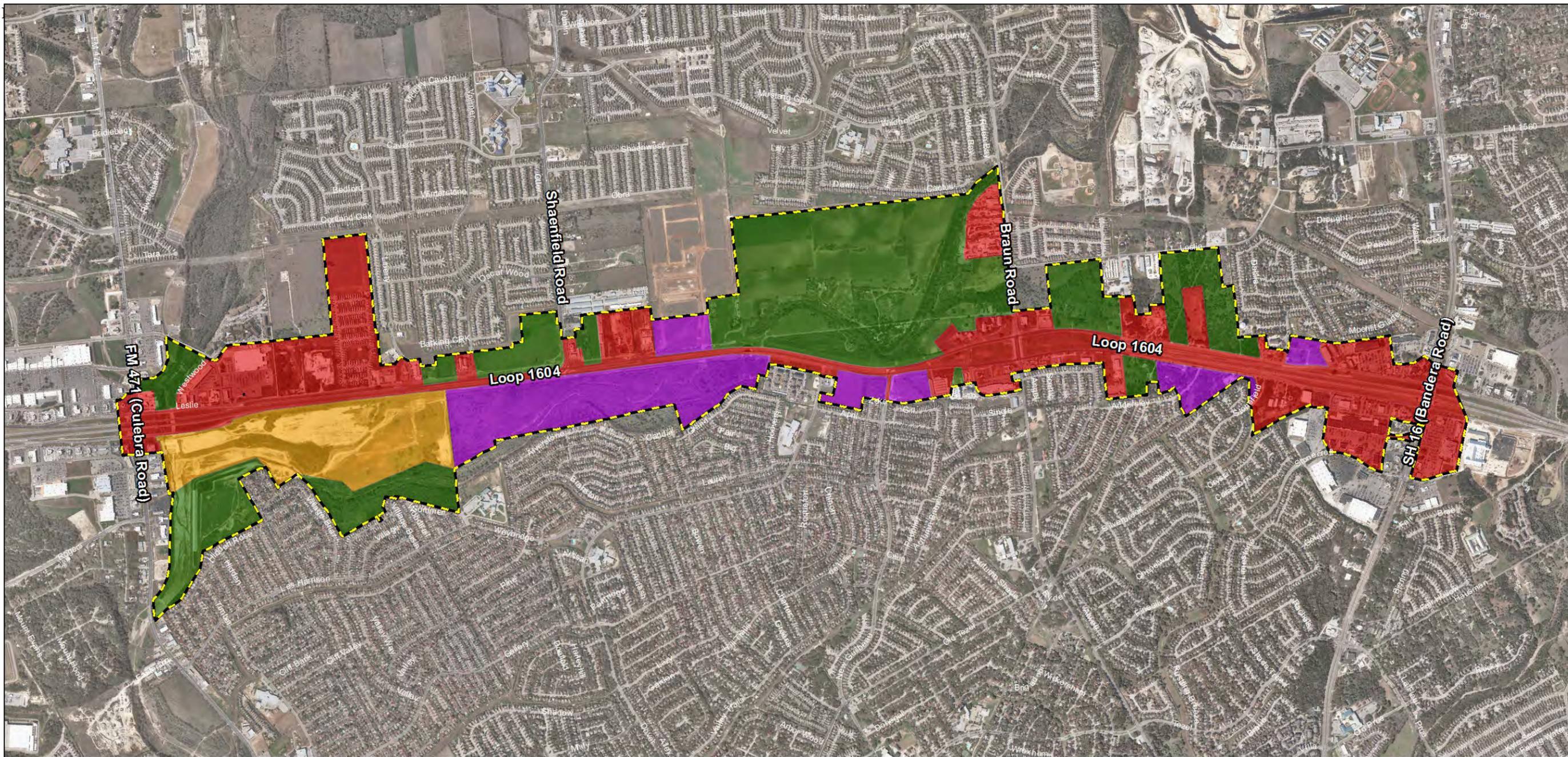
The RSA for vegetation encompasses approximately 1,522 acres. Of the 1,522 acres, approximately 52.3 percent (796 acres) is currently undeveloped. Of the 796 acres of undeveloped land, 210 acres (26.4 acres) is located in a master development plan and could be developed in the foreseeable future. A large portion of the undeveloped, remnant native vegetation located within the RSA is in located along Helotes Creek just east of LP 1604. This area is part of a master development plan, is zoned for Mixed Use development, and is currently slated for development in the near future. Therefore, the relative health of vegetation within the RSA is considered declining.

Water Resources

The RSA for water resources encompasses approximately 151,947 acres of the Leon Creek watershed. Approximately 54.4 percent (82,603 acres) is currently developed. Leon Creek is designated as Segment 1604 and is listed as threatened/impaired for depressed dissolved oxygen and PCBs in edible tissue on the 2012 Clean Water Act 303(d) list. Leon Creek was first listed for depressed dissolved oxygen in 1999 and PCBs in edible tissue in 2004. Therefore, the relative health of waters resources within the RSA is considered declining.

3.11.2.4 Step 4 Identify the Direct and Indirect Impacts That May Contribute to a Cumulative Impact

The proposed project could impact approximately 159.67 acres of Grassland/Mixed Herbaceous vegetation, 2.94 acres of Mixed Deciduous woodland, and approximately 0.66 acre of Riparian

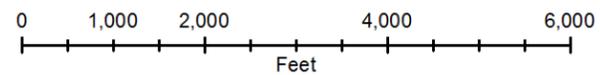


Base Map: City of San Antonio Imagery 2012 Bexar County, Texas

-  Resource Study Area Boundary
-  Currently Being Developed
-  Developed
-  Master Plan Development Area
-  Undeveloped

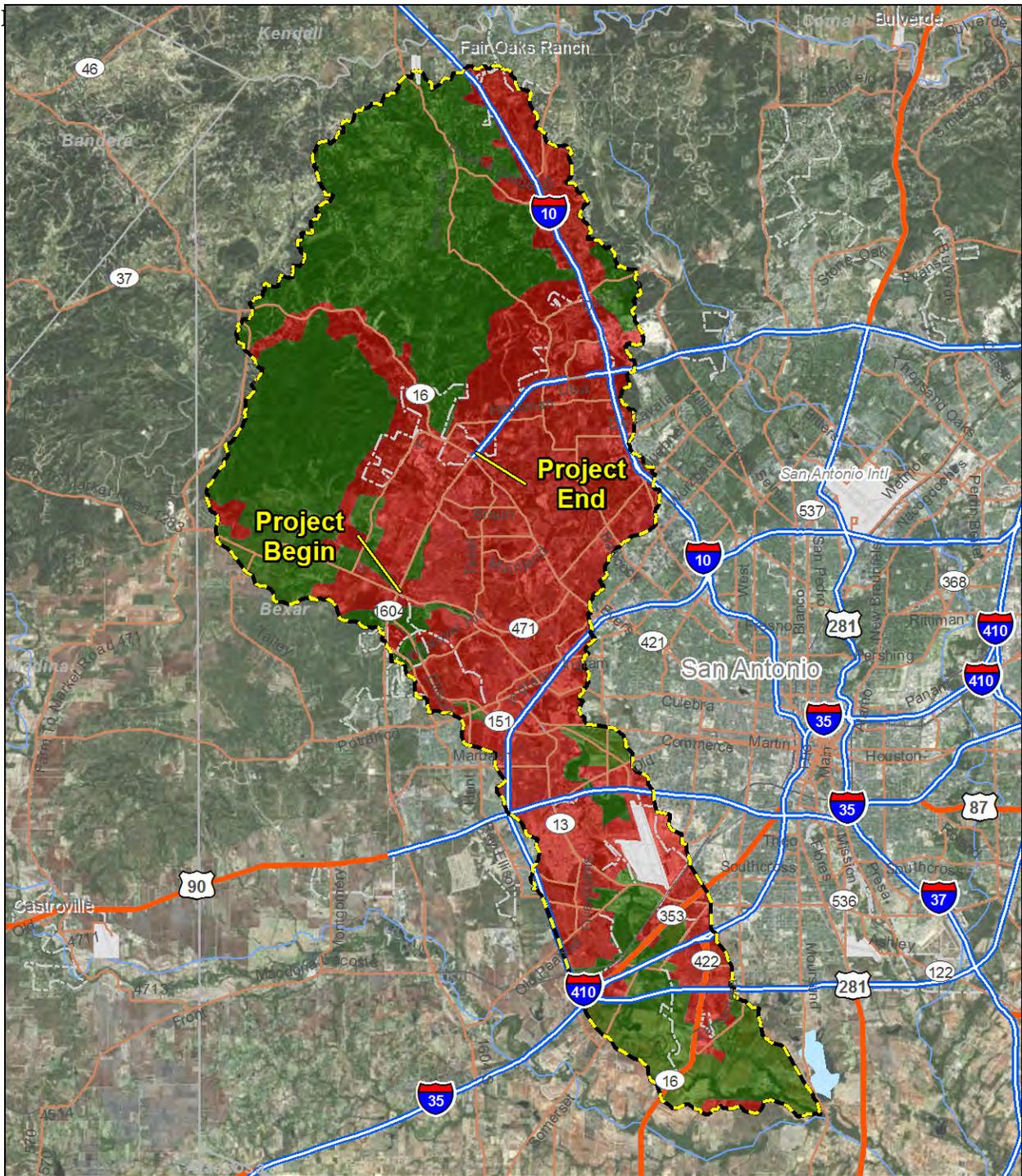


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Insert 2
 Vegetation Resource Study Area
 Loop 1604
 From FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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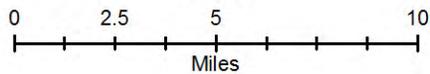


Base Map: Bing Aerial Imagery 2010 Atascosa, Bandera, Bexar, Comal and Medina Counties, Texas

-  Resource Study Area Boundary
-  Developed
-  Undeveloped



1:300,000



Insert 3
Waters of the U.S.
Resource Study Area
Loop 1604
From FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055

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vegetation. Up to 0.15 acre of the unnamed tributary to Helotes Creek and 0.44 acre of Helotes Creek could be impacted by the proposed project. These estimates represent all potential vegetation and waters of the US disturbances and are a worst case scenario. Permanent impacts would be limited to the footprint of the proposed construction and any areas required for drainage facilities.

The RSA for water resources is also located within the recharge and contributing zones of the Edwards Aquifer. The proposed project would have no direct or indirect impacts on the Edwards Aquifer recharge or contributing zones. Based on TxDOT’s 2010 guidance, if a project will not cause substantial direct or indirect impacts on a resource, it will not contribute to a cumulative impact on the resource; therefore, groundwater resources are not included in the cumulative impacts analysis.

Although the project is not anticipated to indirectly impact vegetation and water resources since it would not induce development, the direct impacts of the proposed LP 1604 construction combined with large amounts of known development in the project area could contribute to a cumulative impact to vegetation and water resources.

3.11.2.5 Step 5 Identify Other Reasonably Foreseeable Actions That May Affect Resources

Reasonably foreseeable actions located within the project area that may contribute to impacts to vegetation and water resources include both private developments and TxDOT projects. The main private action is the development of the undeveloped tract of land near Helotes Creek into a mixed use development. In order to develop this tract of land, the developer has identified the need to realign the existing Helotes Creek drainage and build a road on the property in order to access the tract. Also, the area located on the east side of LP 1604 and just north of FM 471 is currently under construction. Construction includes a car dealership as well as other commercial buildings. Both activities would impact both vegetation and waters of the US within the project area.

Other areas located within the project area are identified as part of a larger Master Development Plan. Although no development is currently taking place within these areas, it is assumed that they will be developed based on their inclusion in development plans listed within the City of San Antonio.

In addition to the development projects discussed above, there are other reasonably foreseeable actions in the RSAs for both vegetation and water resources that may contribute to impacts. **Table 16** identifies the major transportation undertakings, according to the Mobility 2035, currently in progress or planned for the near future within the project vicinity.

Table 16 Transportation Projects within Project Area

Highway	Description	Fiscal Year
LP 1604 from W Military Drive to SH 16	Expand to 6 and 8 lane expressway	2010
LP 1604 at SH 151	Construct overpass/underpass	2012
LP 1604 from Potranco Road to FM 471	Expand to 4 lane expressway	2015
LP 1604 from Braun Road to SH 16	Expand to 8 lane expressway including toll direct connectors at IH 10	2015
LP 1604 from SH 16 to FM 1535 (N.W. Military Highway)	Expand to 8 lane expressway	2015

Table 16 Transportation Projects within Project Area

Highway	Description	Fiscal Year
LP 1604 from W. Military Drive to Braun Road	Expand to 6 lane expressway including toll direct connectors at SH 151	2016
FM 471 from FM 3487 to LP 1604	Expand from 4 to 6 lane divided	Unfunded
FM 471 from Old FM 471 to FM 1560	Widen road from 2 to 4 lanes	2014
LP 1604 at SH 151	Intersection improvements	2014

The northwest portion of the RSA for water resources encompasses Government Canyon State Natural Area, an approximately 8,624 acre area located in Bexar County that was purchased by TPWD in 1993 and opened to the public in October 2005. Therefore, it is assumed that no development would occur within this portion of the Leon Creek Watershed. The other major portion of undeveloped land within the water resources RSA is located outside of LP 1604 between SH 16 and IH 10. This area is currently interspersed with residential homes, ranch homes, and large undeveloped parcels. This area is also outside of the City of San Antonio boundaries. Although there are no known developments within this area, the City of San Antonio's outward growth may increase the number of residential homes built on undeveloped parcels.

3.11.2.6 Step 6 Assess Potential Cumulative Impacts to Each Resource

Development trends in the project area, such as the conversion of undeveloped land and planned transportation improvements, would result in additional impacts to vegetation and water resources. The extent of impacts would depend on the location of the undertaking and the amount of land or ROW required. It is not expected that this development would compromise the overall health of any of the resources considered in this analysis or change the nature of the area since the LP 1604 corridor is already highly developed.

Vegetation

A majority of the development located outside LP 1604 within the vegetation RSA has occurred since 1997. In 1997, there were no residential communities located on the western side of LP 1604 based on historical imagery. Now, a majority of the RSA located west of LP 1604 is encompassed by residential neighborhoods and commercial properties that support the neighborhoods. Potential cumulative impacts to vegetation include vegetation removal associated with the past, current, and future development within the LP 1604 corridor. The proposed project could impact approximately 159.67 acres of Grassland/Mixed Herbaceous vegetation, 2.94 acres of Mixed Deciduous Woodland, and approximately 0.66 acre of Riparian vegetation. It is expected that future known development could result in the clearing of approximately 210 acres of vegetation located within the RSA.

Water Resources

In 1997, a majority of the Leon Creek watershed was already developed within LP 1604. There was little to no high-density development outside of LP 1604 until the early 2000's, when residential neighborhoods began to develop west of LP 1604. The purchase of Government Canyon State Natural Area preserved a portion of the undeveloped areas located within the water resources RSA, protecting that

portion of the Leon Creek watershed from future development. Also, some of the planned residential communities located within the Leon Creek watershed provide for green space along the tributaries and creeks located within their neighborhoods. The proposed project could impact up to a total of 0.56 acre of waters of the US. Potential cumulative impacts to water resources within the RSA include increased runoff associated with development and impacts to waters of the US. The conversion of undeveloped land to residential or commercial uses may require vegetation removal and result in increased erosion and water quality issues.

3.11.2.7 Step 7 Report the Results

This analysis indicates that past, present, and reasonably foreseeable actions have the potential for effects that may cumulatively impact vegetation and water resources. The LP 1604 project's contribution to the total potential effects is small and efforts would be made to reduce overall impacts to the footprint of the proposed improvements. Detailed design might reduce impacts to vegetation and waters of the US by bridging stream crossings and not clearing existing easements. Therefore, none of the project's contributions to potential cumulative effects would be significant.

3.11.2.8 Step 8 Assess and Discuss Mitigation Issues for All Adverse Impacts

During construction, every effort would be made to minimize impacts to vegetation. Impacts to vegetation would be assessed and addressed for each individual project that might involve federal funds, including TxDOT projects. However, other development projects might not be addressed through public environmental documentation. Continued development is expected, likely resulting in the conversion of undeveloped land to commercial uses.

Future actions (including federal, state, local, and private actions) that may result in impacts to water quality and quantity or threatened and endangered species are subject to Federal, State, and regional rules and regulations. Actions within the project area are covered by several regulations that protect water quality, including the Environmental Protection Agency's Clean Water Act, the TCEQ's Texas Surface Water Quality Standards (30 TAC 307), as well as the TCEQ's Edwards Aquifer rules (30 TAC 213) that address activities that could pose a threat to water quality in the Edwards Aquifer.

4.0 MITIGATION AND COMMITMENTS

Mitigation and commitments proposed for the Build Alternative are discussed in the following sections.

4.1 Environmental Justice and Community Cohesion

- TxDOT will ensure that LEP populations have meaningful access to project information.
- TxDOT will maintain access to all properties at all times during and after construction.

4.2 Vegetation/Wildlife Habitats

- In compliance with the MBTA, TxDOT requires that the construction contractor (1) clear outside nesting season if possible, (2) remove all unoccupied migratory bird nests from September 1 through the end of February from any structure where work will be done, (3) prevent migratory birds from

building nests in the project area between March 1 and August 31, and (4) avoid established bird nests during nesting season.

- A mix of native and introduced grasses and forbs would be used to reseed the ROW outside of paved areas, and disturbed areas would be restored and reseeded where appropriate.

4.3 Water Resources and Water Quality

- The proposed project would require work in two waters of the US. The proposed construction meets the terms and conditions of a NWP 14 with a PCN.
- In order to comply with the TCEQ's 401 Water Quality Certification Conditions for NWPs, at least one BMP from each of three categories of onsite water quality management (erosion control, post-construction TSS control, and sedimentation control) will be used on the proposed project.
- An SW3P will be implemented, and an NOI will be posted due to soil disturbances of over 5 acres. The plan will include temporary erosion and sedimentation control items to be used as directed by the Engineer in response to changing field conditions and by the contractor for industrial activities within state ROW. Where appropriate, these temporary erosion and sedimentation control structures will be in place before initiation of work and would be maintained throughout the duration of the project.

4.4 Hazardous Materials

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

5.0 PUBLIC INVOLVEMENT

TxDOT held a public meeting to present proposed project details on January 10, 2013 at Zion Lutheran Church Family Life Center. The meeting was attended by TxDOT representatives, consultants, local officials and representatives, and interested citizens for a total of 134 attendees. The proposed project design as well as environmental constraints were available for review. A majority of the comments from the public were in support of the proposed construction. Other comments ranged from concerns regarding drainage to specific design suggestions for proposed access ramps and turning lanes at intersections. TxDOT responded to each comment received during the comment period and these responses are documented in the Public Meeting Summary (dated February 2013), available at the TxDOT San Antonio District Office.

TxDOT will either afford an opportunity for a public hearing or schedule and hold a public hearing. The opportunity for a public hearing or public hearing would be scheduled after agency coordination has been completed and the project has been determined to be satisfactory for further processing.

6.0 SUMMARY

The analysis of alternatives for the proposed project determined that improvements to LP 1604 proposed by the Build Alternative would meet the need and purpose of the project and project objectives. Specifically, the Build Alternative would improve mobility and safety.

The engineering, social, economic, and environmental constraints conducted on the proposed improvements to LP 1604 as proposed by the Build Alternative (Preferred Alternative) indicate that the project would result in no significant adverse impacts of a level that would warrant an Environmental Impact Statement.

7.0 REFERENCES

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- Texas Department of Transportation (TxDOT). 2010. Revised Guidance on Preparing Indirect and Cumulative Impact Analyses.
- _____. 2012. Traffic Data Memorandum from the Transportation Planning and Programming Division.
- Texas Natural Diversity Database (TXNDD). 2012. Element Occurrence Records; records searched within 10-mile radius of LP 1604.
- Texas Parks and Wildlife Department (TPWD). 2012. Annotated List of Rare Species for Bexar County.
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- _____. 1991. Black-capped vireo (*Vireo atricapillus*) recovery plan. Austin, Texas.

_____. 1992. Golden-cheeked warbler (*Dendroica chrysoparia*) Recovery Plan. Albuquerque, New Mexico.

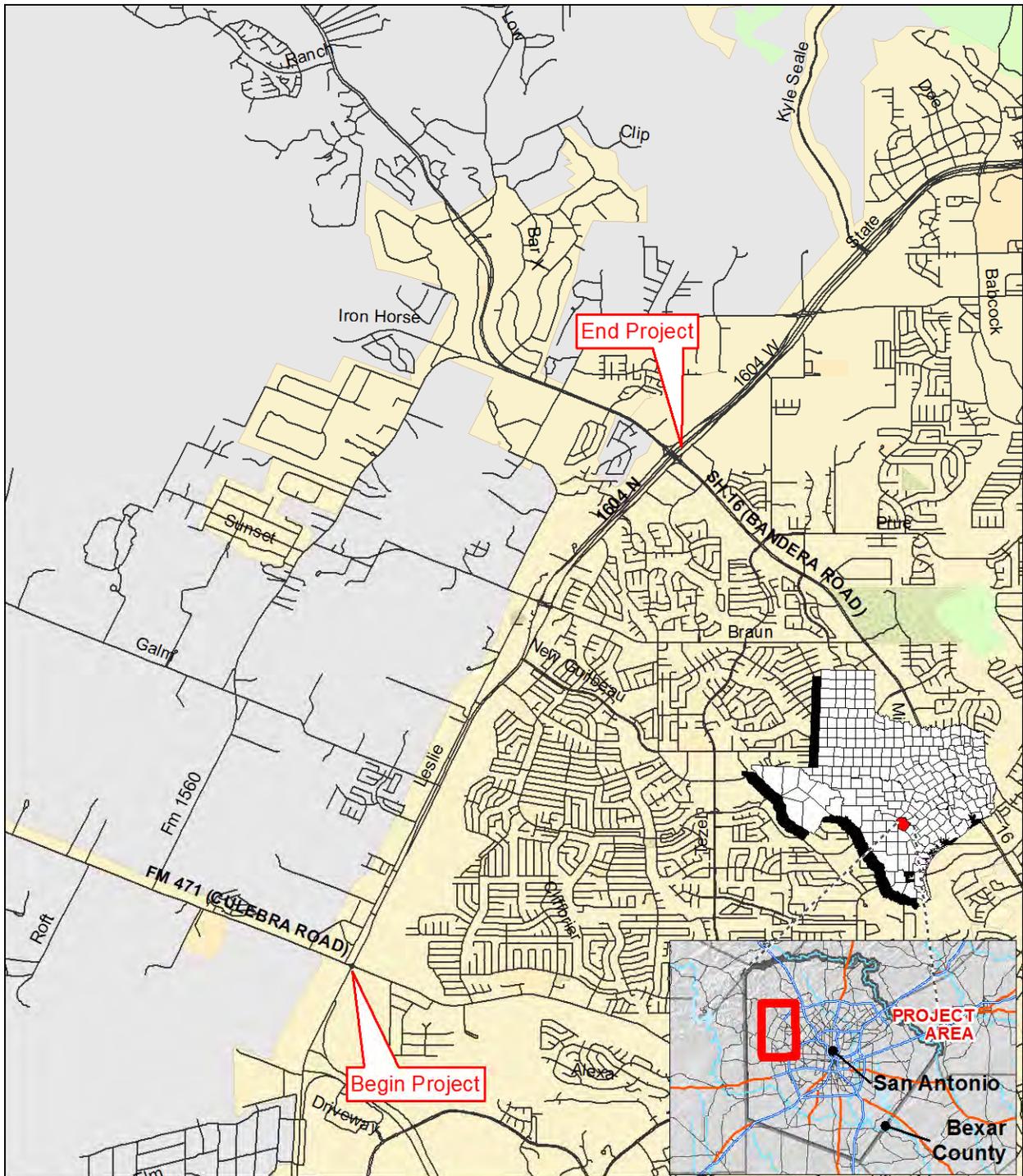
_____. 2011. Letter to Alamo Regional Mobility Authority dated May 11, 2011.

ZARA Environmental LLC. 2010. Draft Karst Invertebrate Technical Report for Loop 1604 From Interstate Highway 35 to State Highway 90, Bexar County, Texas. Manchaca, Texas

Appendix A

Figures

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Base Map: ESRI-USA Base Map,
ESRI-U.S. and Canada Detailed Streets



1:80,000

Miles

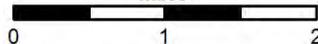
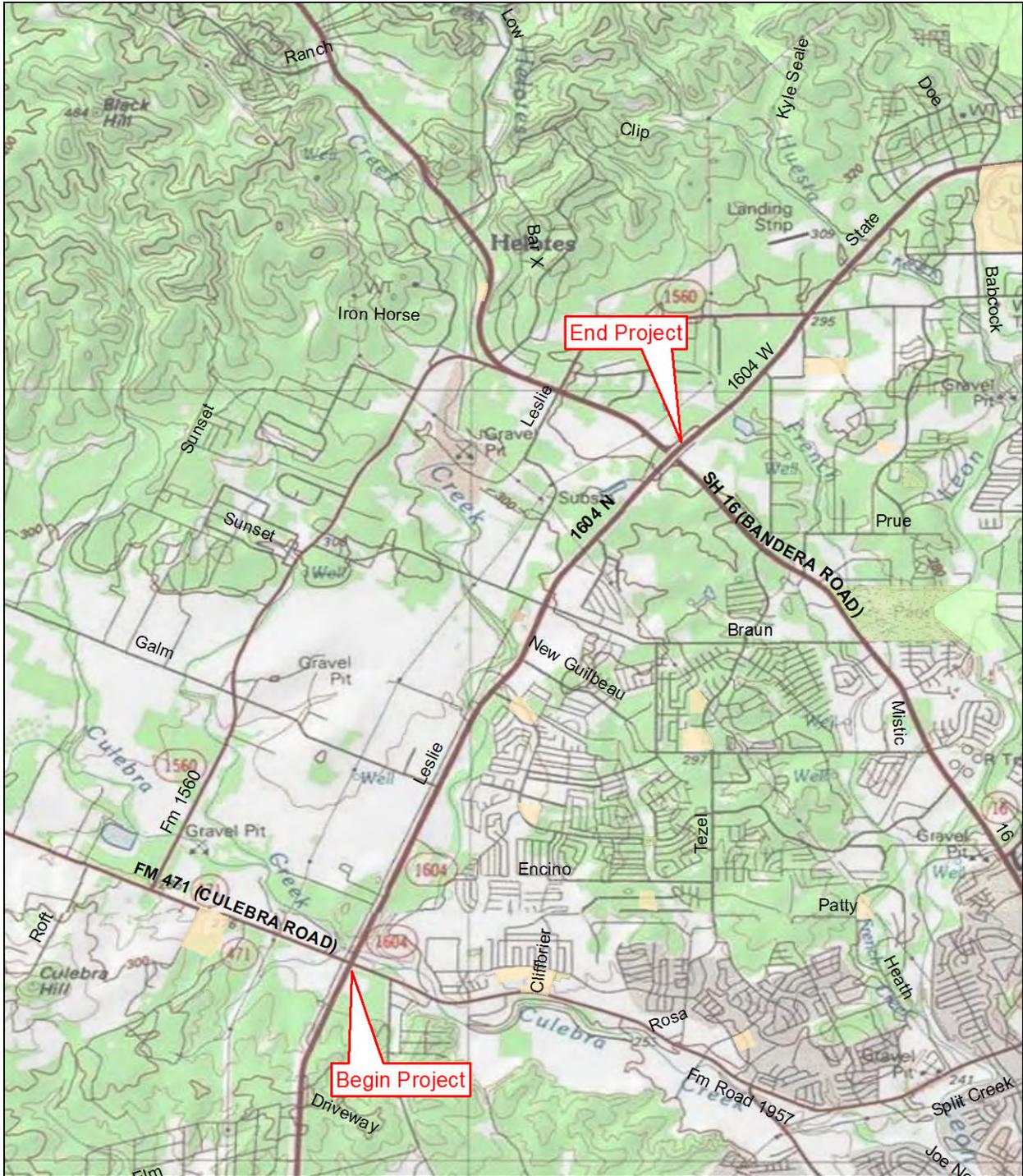


Figure 1
Project Location on County Base Map
Loop 1604 from
FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055



Base Map: 7.5' USGS topographic quadrangles: Bexar County, Texas



1:80,000

Miles



Figure 2
Project Location on USGS Base Map
Loop 1604 from
FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055

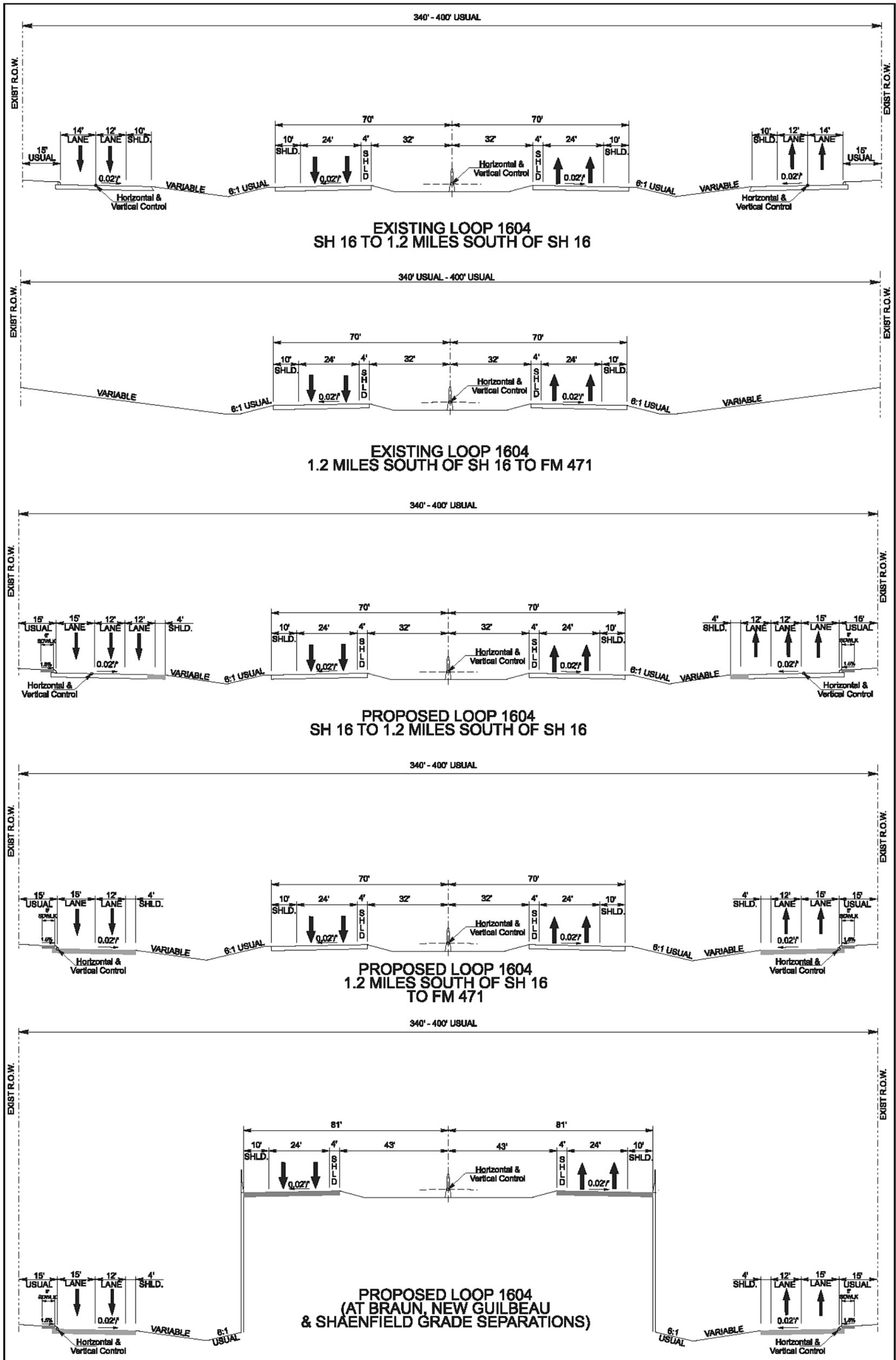


Figure 3
 Existing and Proposed Typical Sections
 Loop 1604 from FM 471 to SH 16
 Bexar County
 CSJ: 2452-01-055

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Base Map: Bing Aerial Imagery 2010 Bexar County, Texas

- | | | | |
|-----------------------|----------------------------|--------------------------|----------------------------------|
| Existing Right-of-way | Developed | Mixed Deciduous Woodland | Noise Receiver R# (Not Impacted) |
| Proposed Improvements | Existing Transportation | Riparian | Noise Receiver R# (Impacted) |
| Existing Easement | Grassland/Mixed Herbaceous | Stream Channel | |

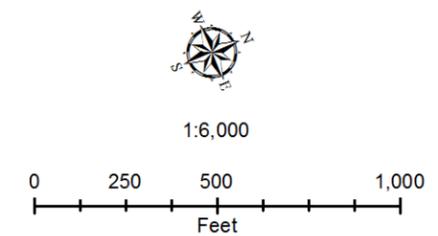
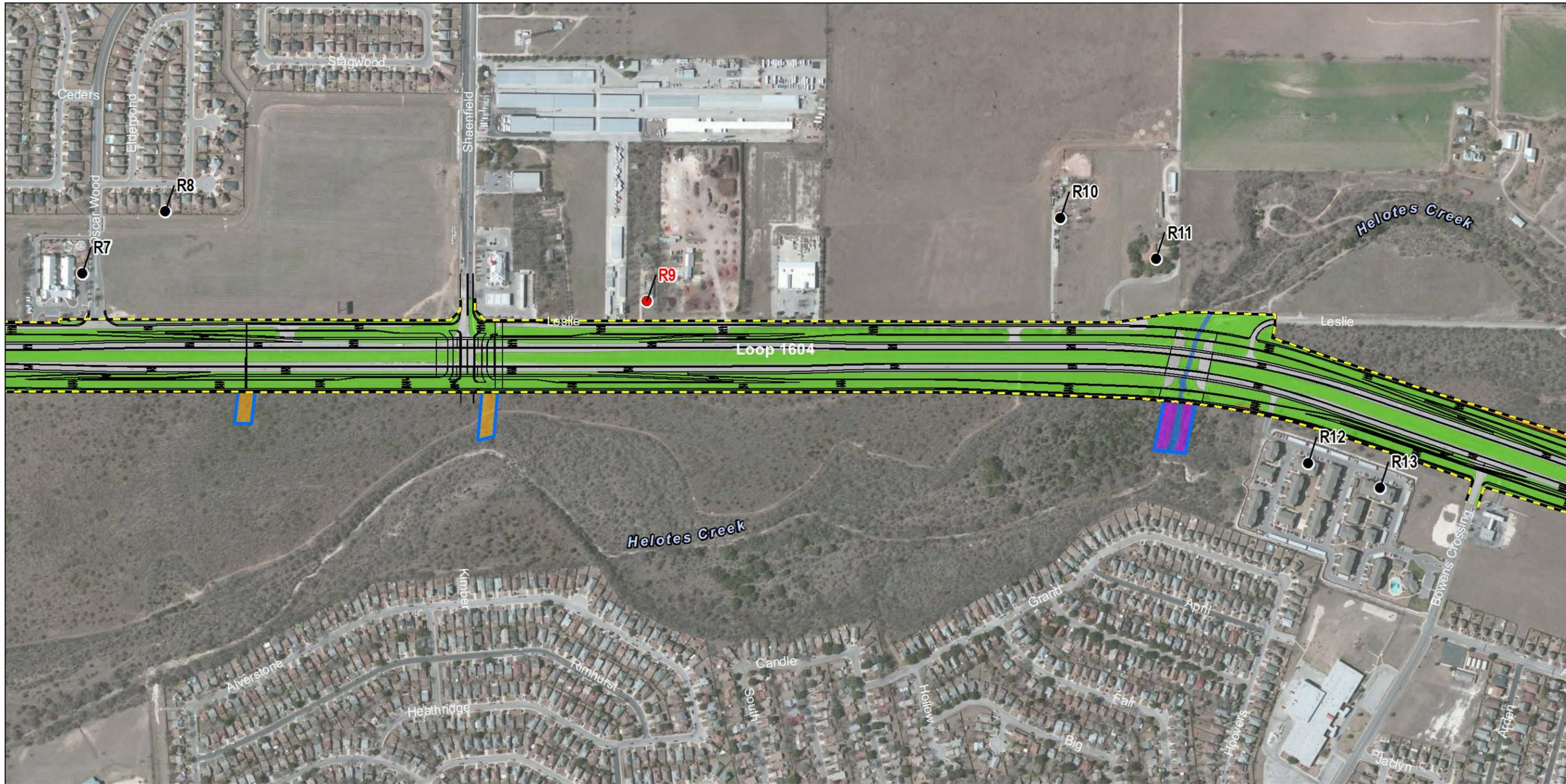


Figure 4.1
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Base Map: Bing Aerial Imagery 2010 Bexar County, Texas

- | | | | |
|-----------------------|----------------------------|--------------------------|----------------------------------|
| Existing Right-of-way | Developed | Mixed Deciduous Woodland | Noise Receiver R# (Not Impacted) |
| Proposed Improvements | Existing Transportation | Riparian | Noise Receiver R# (Impacted) |
| Existing Easement | Grassland/Mixed Herbaceous | Stream Channel | |

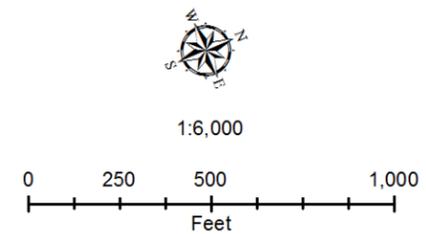


Figure 4.2
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Base Map: Bing Aerial Imagery 2010 Bexar County, Texas

- | | | | |
|-----------------------|----------------------------|--------------------------|----------------------------------|
| Existing Right-of-way | Developed | Mixed Deciduous Woodland | Noise Receiver R# (Not Impacted) |
| Proposed Improvements | Existing Transportation | Riparian | Noise Receiver R# (Impacted) |
| Existing Easement | Grassland/Mixed Herbaceous | Stream Channel | |

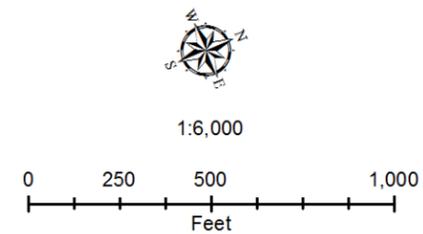
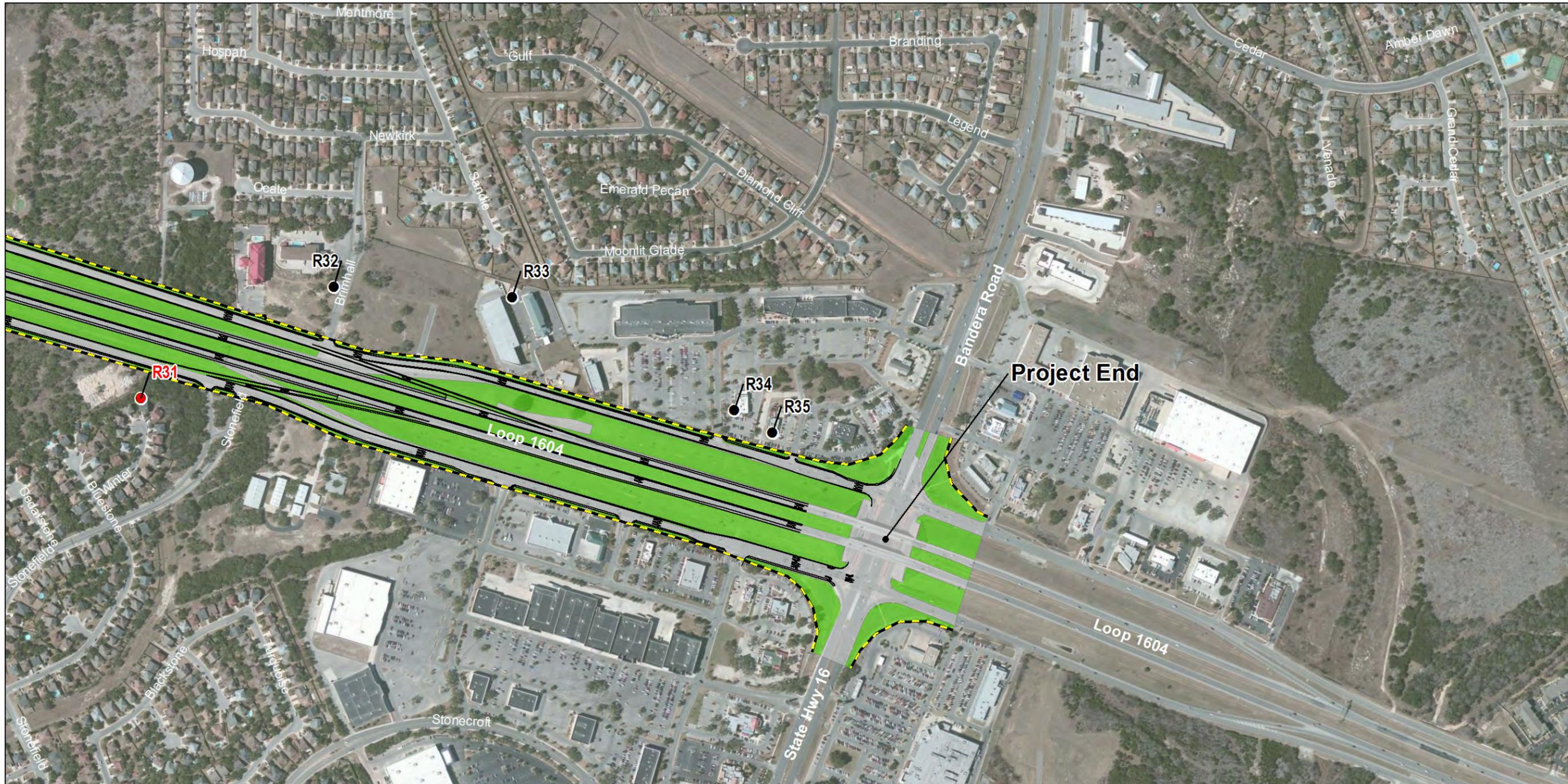


Figure 4.3
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Base Map: Bing Aerial Imagery 2010 Bexar County, Texas

- | | | | |
|-----------------------|----------------------------|--------------------------|----------------------------------|
| Existing Right-of-way | Developed | Mixed Deciduous Woodland | Noise Receiver R# (Not Impacted) |
| Proposed Improvements | Existing Transportation | Riparian | Noise Receiver R# (Impacted) |
| Existing Easement | Grassland/Mixed Herbaceous | Stream Channel | |



1:6,000

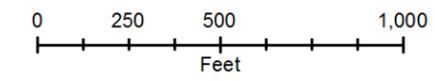
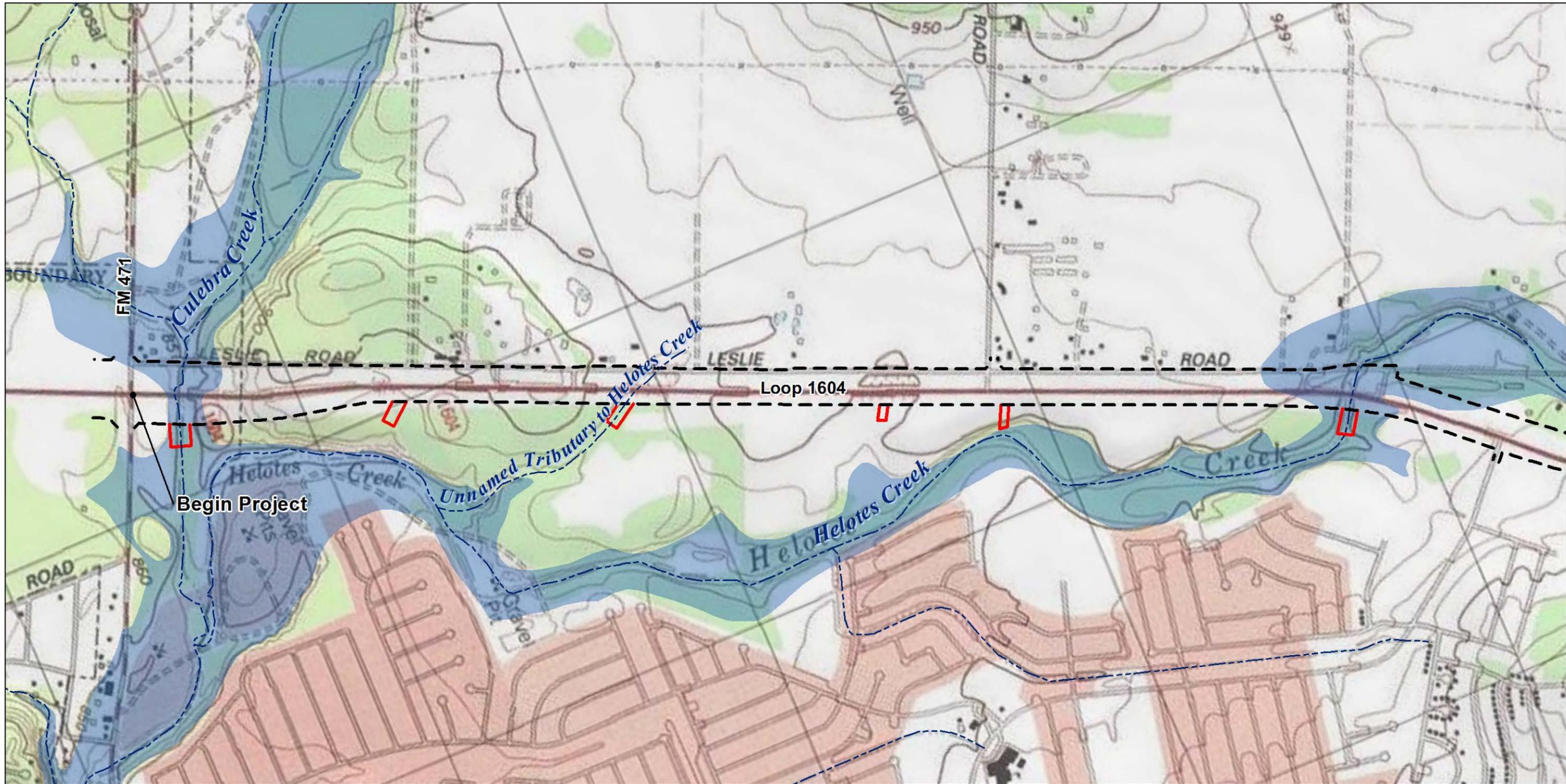


Figure 4.4
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Base Map: USGS Topographic Bexar County, Texas

- Existing Right-of-way
- Existing Easement
- - - Streams
- 100-year Floodplain

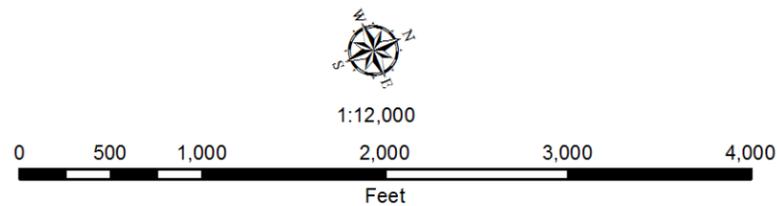


Figure 5.1
 Water Resources
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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Base Map: USGS Topographic Bexar County, Texas

- Existing Right-of-way
- Existing Easement
- - - Streams
- 100-year Floodplain



1:12,000

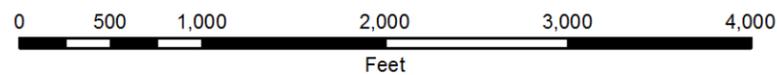
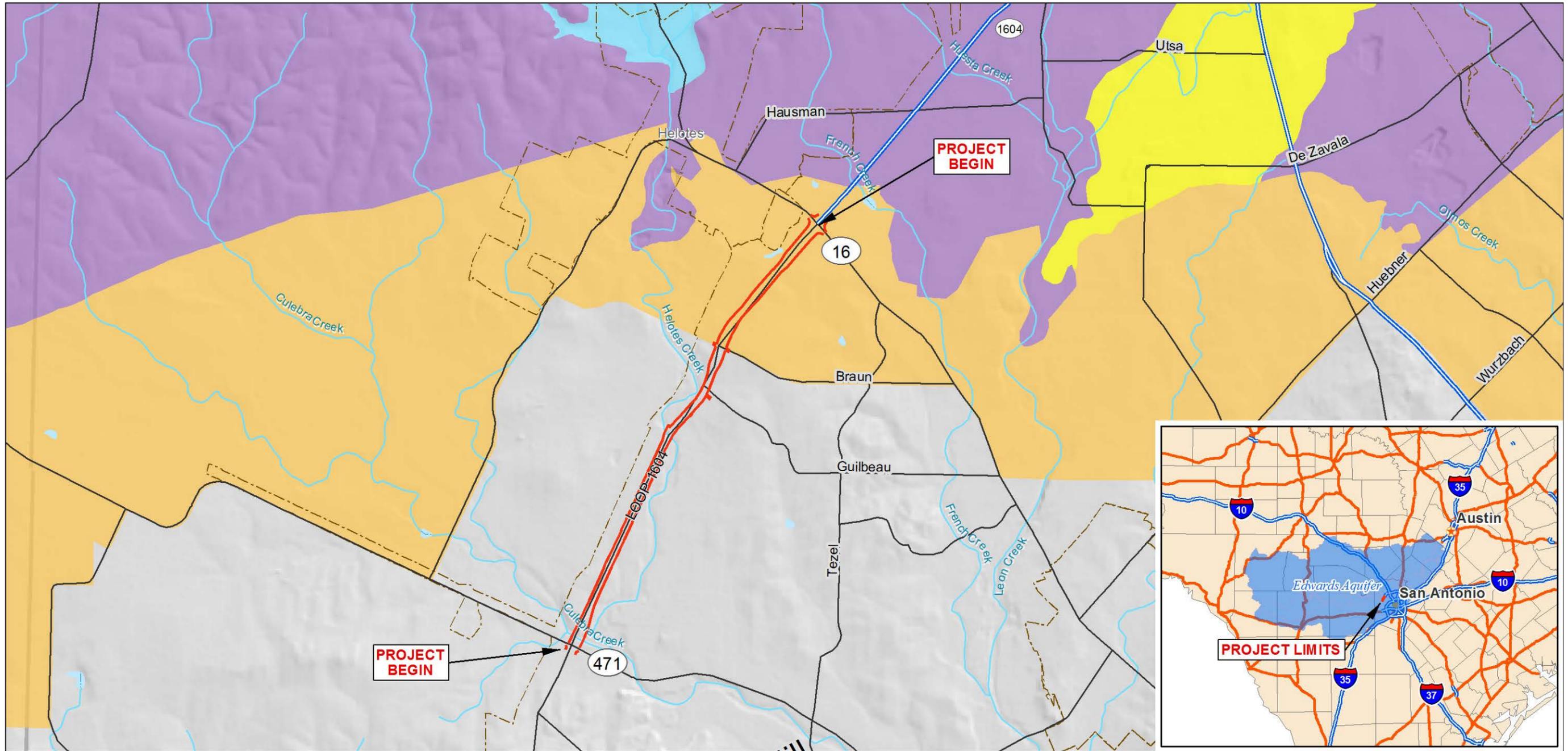


Figure 5.2
 Water Resources
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

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- Project Area (Approximate Existing ROW)
- City Boundary
- Edwards Aquifer Zone**
- Edwards Aquifer Contributing Zone
- Edwards Aquifer Contributing Zone within the Transition Zone
- Edwards Aquifer Recharge Zone
- Edwards Aquifer Transition Zone



1:63,360

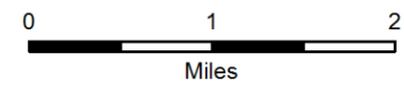


Figure 7
 Edwards Aquifer Zone
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055

Base Map: USGS 1:24,000 Hillshade
 Source (Aquifer): Texas Commission on Environmental Quality (TCEQ)

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Appendix B

Photos

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Photo 1 Grassland/Mixed Herbaceous Vegetation Facing South on East Side of Existing ROW



Photo 2 Grassland/Mixed Herbaceous Vegetation along Culebra Creek



Photo 3 Large Live Oak Tree in ROW Between Southbound Main Lanes and Frontage Road



Photo 4 Mixed Deciduous Woodland Within a Drainage Easement on East Side of ROW



Photo 5 Riparian Woods in Easement East of ROW along Helotes Creek



Photo 6 Culebra Creek



Photo 7 Unnamed Tributary to Helotes Creek

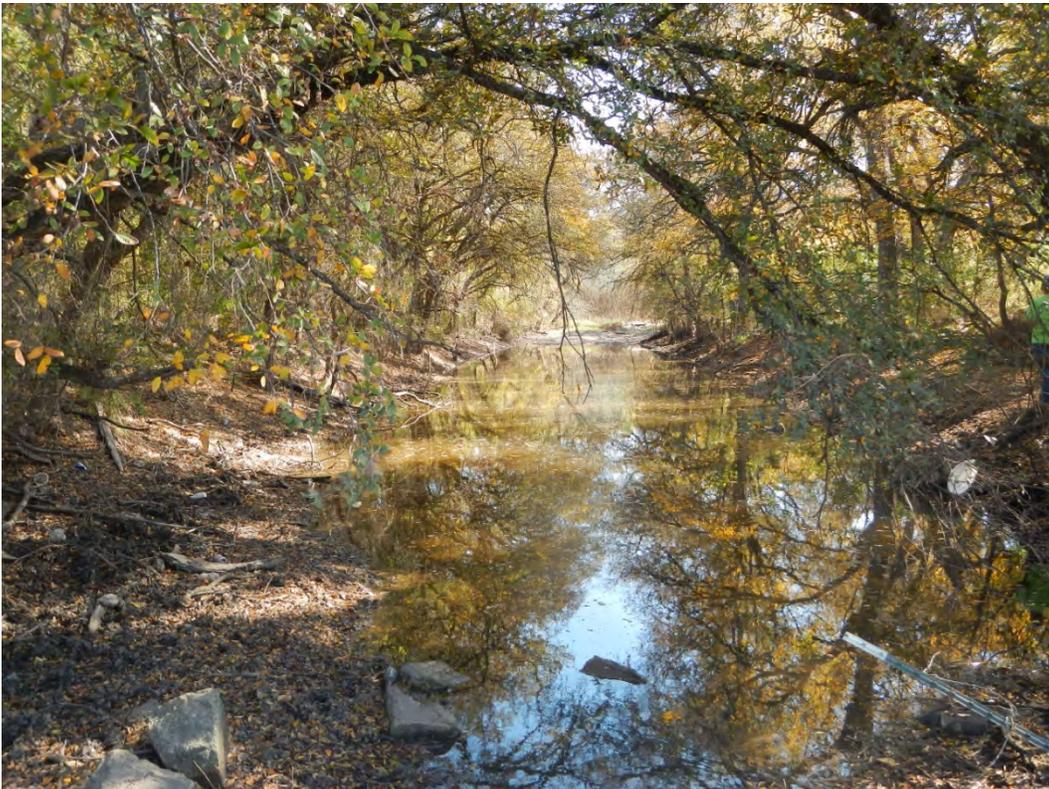


Photo 8 Helotes Creek

Appendix C
2013-2016 Transportation Improvement Program

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SAN ANTONIO-BEXAR COUNTY METROPOLITAN PLANNING ORGANIZATION
FY 2013-2016 TRANSPORTATION IMPROVEMENT PROGRAM
SECOND QUARTER 2013 AMENDMENTS
FY 2013

TxDOT District	County	CSJ	Hwy	Phase	City	Project Sponsor	MPO Proj ID No.	Year of Expenditure Cost
15 - San Antonio	Bexar	0915-12-526	VA	T	San Antonio	VIA	3996.0	\$10,000,000
Limits From: In San Antonio East - West and							Revision Date:	2/2013
Limits To: North - South through downtown							Project History:	1/13 - move from 2015 to 2013; 8/12 - revised from CNG station to streetcar project per VIA's request; 4/12 - funded through STP-MM project selection process; will flex to FTA
Description: Construction of North-South & East-West Streetcar System in Downtown San Antonio								
Remarks: 2nd Qtr 13 - move from FY 2015 to FY 2013								

Total Project Cost Information (TxDOT %):		Cost of Approved Phases:	Type of Work: Transit					
			<u>Funding Categories</u>	<u>Federal</u>	<u>State</u>	<u>Local</u>	<u>Local Contribution</u>	<u>Total</u>
Preliminary Engineering:	\$0	\$10,000,000	7 - STP-MM	\$8,000,000	\$0	\$2,000,000	\$0	\$10,000,000
ROW Purchase:	\$0		Other	\$0	\$0	\$0	\$0	\$0
Construction Cost:	\$10,000,000		Other	\$0	\$0	\$0	\$0	\$0
Construction Engineering:	\$0		Other	\$0	\$0	\$0	\$0	\$0
Contingencies:	\$0		Totals	\$8,000,000	\$0	\$2,000,000	\$0	\$10,000,000
Indirect Costs:	\$0							
Other Field	\$0							
Total Project Cost:	\$10,000,000							

TxDOT District	County	CSJ	Hwy	Phase	City	Project Sponsor	MPO Proj ID No.	Year of Expenditure Cost
15 - San Antonio	Bexar	0915-12-528	VA	C	San Antonio	VIA	4031.0	\$92,000,000
Limits From: Various Locations in Bexar County							Revision Date:	2/2013
Limits To: -							Project History:	1/13 - swap Cat 3 TMF with ATD
Description: Modern streetcar, bus rapid transit, park & ride facilities and other related facilities in Bexar County								
Remarks: 2nd Qtr 13 - add project								

Total Project Cost Information (TxDOT %):		Cost of Approved Phases:	Type of Work: Transit					
			<u>Funding Categories</u>	<u>Federal</u>	<u>State</u>	<u>Local</u>	<u>Local Contribution</u>	<u>Total</u>
Preliminary Engineering:	\$0	\$92,000,000	3 - TMF	\$0	\$92,000,000	\$0	\$0	\$92,000,000
ROW Purchase:	\$0		Other	\$0	\$0	\$0	\$0	\$0
Construction Cost:	\$92,000,000		Other	\$0	\$0	\$0	\$0	\$0
Construction Engineering:	\$0		Other	\$0	\$0	\$0	\$0	\$0
Contingencies:	\$0		Totals	\$0	\$92,000,000	\$0	\$0	\$92,000,000
Indirect Costs:	\$0							
Other Field	\$0							
Total Project Cost:	\$92,000,000							

TxDOT District	County	CSJ	Hwy	Phase	City	Project Sponsor	MPO Proj ID No.	Year of Expenditure Cost
15 - San Antonio	Bexar	2452-01-055	Loop 1604	C	San Antonio	TxDOT	4011.0	\$82,000,000
Limits From: FM 471							Revision Date:	2/2013
Limits To: SH 16 (Bandera Road)							Project History:	1/13 - rev limits, cost & fund cats
Description: Expand to 4 lane expressway (4 non-toll lanes)								
Remarks: 2nd Qtr 13 - revise limits, cost and funding categories								

Total Project Cost Information (TxDOT %):		Cost of Approved Phases:	Type of Work: Added Capacity: Non - Toll					
			<u>Funding Categories</u>	<u>Federal</u>	<u>State</u>	<u>Local</u>	<u>Local Contribution</u>	<u>Total</u>
Preliminary Engineering:	\$3,237,451	\$66,070,421	3 - Prop 12	\$0	\$360,000	\$0	\$0	\$360,000
ROW Purchase:	\$0		3 - Prop 14	\$0	\$54,440,000	\$0	\$0	\$54,440,000
Construction Cost:	\$66,070,421		3 - ATD	\$0	\$0	\$0	\$27,200,000	\$27,200,000
Construction Engineering:	\$3,138,345		Other	\$0	\$0	\$0	\$0	\$0
Contingencies:	\$6,184,191		Totals	\$0	\$54,800,000	\$0	\$27,200,000	\$82,000,000
Indirect Costs:	\$3,369,592							
Other Field	\$0							
Total Project Cost:	\$82,000,000							

Appendix D
Agency Coordination Letters

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MEMORANDUM

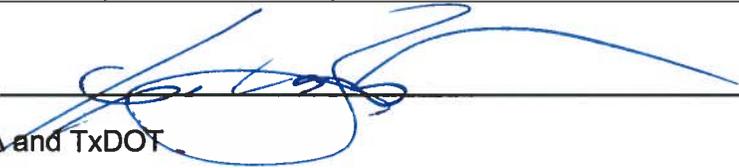
TO: 850 File, Various Road Projects, Various CSJs, Various Districts

FROM: Scott Pletka, Ph.D. **DATE:** February 27, 2013

SUBJECT: Internal review under 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 (PA-TU), and internal review under the Memorandum of Understanding (MOU) Between the Texas Historical Commission and the Texas Department of Transportation

Listed below, are the projects reviewed internally by qualified TxDOT archeologists from 02/21/13 to 02/27/13. These projects either do not warrant survey as a result of a low probability of encountering archeological historic properties and State Archeological Landmarks, or the projects were inspected by survey or impact evaluation and do not warrant further work. As provided under the PA-TU, consultation with the Texas State Historic Preservation Officer is not necessary for these undertakings. As provided under the MOU, the proposed projects do not require individual coordination with the Texas Historical Commission.

CSJ	DISTRICT	ROADWAY	WORK PERFORMED
0334-01-030	Austin	FM 112	Survey
0912-73-151	Houston	Frenchtown Road	Survey
0641-05-016	Paris	FM 1567	Impact Evaluation
0666-01-024	Paris	FM 691	Impact Evaluation
0253-06-035	San Antonio	Spur 536	No Survey
0328-01-014	San Antonio	SH 97	No Survey
0328-02-043	San Antonio	SH 97	No Survey
0328-03-032	San Antonio	SH 97	No Survey
2452-01-055	San Antonio	Loop 1604	No Survey
0424-01-045, etc.	Tyler	SH 31	Survey
0903-30-015	Wichita Falls	CR 339	No Survey

Signature  Date: 2/27/2013

For FHWA and TxDOT

cc: ECOS Data Entry; PD; ENV_ARC: PA File

Background Study/No Survey

February 26, 2013

CSJ: 2452-01-055

Loop 1604 from FM 471 (Culebra Road) to SH 16 (Bandera Road)

ENV ARCH: Eric Oksanen

ENV: Vicki Crnich

ENV SAN ANTONIO:

Contractor: Blanton and Associates

The proposed project will utilize only state or local funds, and therefore, coordination and consultation for cultural resources were conducted under the MOU and Texas Antiquities Code.

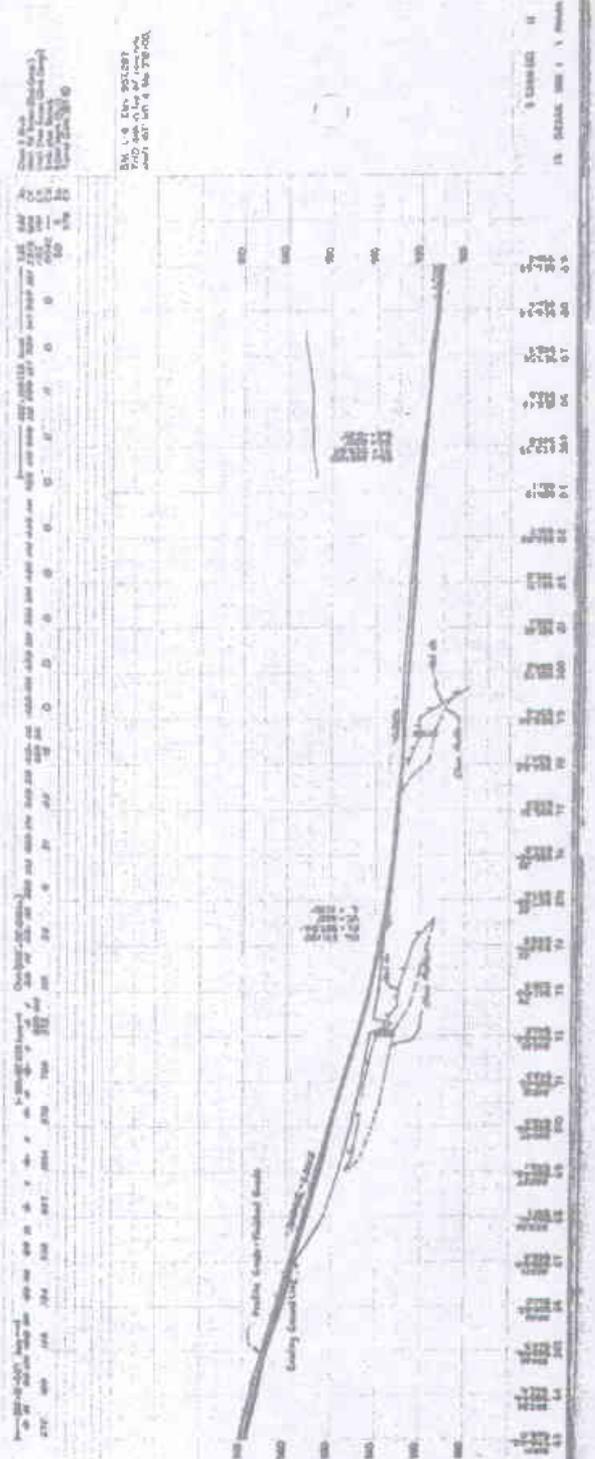
The attached background study was prepared by Blanton and Associates. The report satisfies the requirements for a TxDOT Archeological Background Study. TxDOT disagrees with the Blanton and Associates recommendation for additional archeological investigations at several locations, drainage easements extending perpendicular to the right of way. The existing right of way has been severely impacted by road construction and given the thin soils overlaying Cretaceous age bedrock, it is unlikely any intact historical or prehistoric sites exist in the proposed APE. The easements selected for possible survey are either high energy channels and/or channelized easements. Typical channeling of the drainage easements is shown in the attached as built from the 1966 plans for the initial construction of Loop 1604 (CSJ: 2452-01-001). Therefore, because of the documented disturbances to the proposed APE, TxDOT recommends no further archeological investigations and the project should be allowed to proceed.

Pursuant to 43 TAC 2.24(f)(1)(C) of the MOU, TxDOT finds that the proposed undertaking would not affect State Archeological Landmarks. No further investigations are warranted. In the event that unanticipated archeological deposits are encountered during construction, work in the immediate area will cease, and TxDOT archeological staff will be contacted to initiate post-review discovery procedures under the provisions of the MOU.

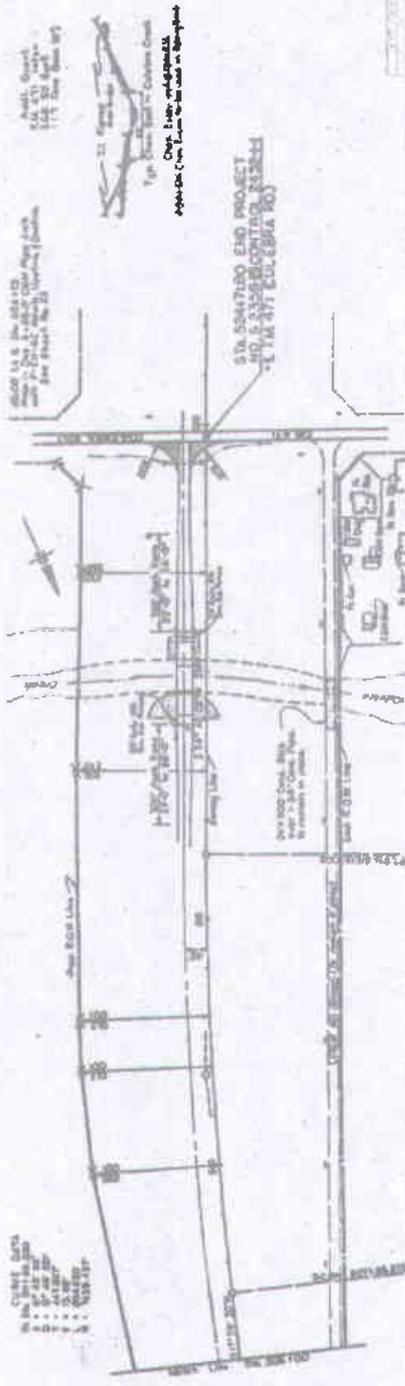
Attachments:

1966 As Builts 2452-01-001 4 Sheets

Blanton and Associates Background Report 17 pages



1966 2452-01-001 Sheet 0012 As Builts at Helotes Creek Easements



CURVE DATA
 R = 1000.00
 Δ = 90.00°
 L = 314.16
 ELEVATION
 1. 52+70.00
 2. 52+70.00
 3. 52+70.00
 4. 52+70.00



Check data on drawing
 for the curve data

STA. 52+70.00 TO STA. 52+70.00
 CULEBRA CREEK

Station	0+00	0+10	0+20	0+30	0+40	0+50	0+60	0+70	0+80	0+90	1+00	1+10	1+20	1+30	1+40	1+50	1+60	1+70	1+80	1+90	2+00	
Elevation	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

STA. 52+70.00 TO STA. 52+70.00
 CULEBRA CREEK



Station	0+00	0+10	0+20	0+30	0+40	0+50	0+60	0+70	0+80	0+90	1+00	1+10	1+20	1+30	1+40	1+50	1+60	1+70	1+80	1+90	2+00	
Elevation	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

STA. 52+70.00 TO STA. 52+70.00
 CULEBRA CREEK

1966 2452-01-001 Sheet 017 As Builts Typical Sections at Culebra Creek

January 11, 2013

**ARCHEOLOGICAL BACKGROUND STUDY
LOOP 1604 FROM CULEBRA ROAD (FM 471) TO BANDERA ROAD (SH 16)
BEXAR COUNTY, TEXAS
(CSJ No. 2452-01-055)**

The Texas Department of Transportation (TxDOT), San Antonio District, proposes to expand the existing Loop (LP) 1604 roadway to a four-lane expressway with continuous frontage roads between Farm-to-Market (FM) 471 (Culebra Road) and State Highway (SH) 16 (Bandera Road) within the City of San Antonio. **Figures 1** and **2** show the project location on a county base map and on the *Culebra Hill* and *Helotes*, Texas U.S. Geological Survey (USGS) topographic maps, respectively. This report presents the results of the background study to determine potential impacts to archeological cultural resources resulting from the proposed improvements to LP 1604 from FM 471 to SH 16 in Bexar County, Texas.

The proposed improvements would be 100 percent funded by state and local monies, and no federal permits for the project have been identified.

PROJECT DESCRIPTION

TxDOT proposes to construct additional mainlanes as well as continuous frontage roads in order to upgrade the existing roadway to a four-lane expressway along LP 1604 from FM 471 to SH 16, a distance of approximately 4.7 miles. The purpose of the proposed project is to improve safety and enhance mobility and operational efficiency. The following sections provide a description of the existing and proposed facilities.

Existing Facility

From SH 16 to approximately 1.2 miles south of SH 16, LP 1604 is currently a four-lane divided roadway with two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. Frontage roads are also located on both sides of the mainlanes and include a 10-foot wide inside shoulder, a 12-foot-wide inside lane, and a 14-foot-wide outside lane with no outside shoulder. From approximately 1.2 miles south of SH 16 to FM 471, LP 1604 is currently a four-lane divided roadway with two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders. The existing right-of-way (ROW) width ranges from approximately 340 feet to 400 feet. **Figure 3** provides typical sections for the existing facility.

Proposed Facility

From SH 16 to approximately 1.2 miles south of SH 16, no changes to the mainlanes would occur (**Figures 4.1** through **4.4**). The proposed project would widen the existing frontage roads in order to accommodate a 4-foot-wide inside shoulder, two 12-foot-wide inside lanes, a 15-foot-wide outside lane, and a 6-foot-wide sidewalk. From approximately 1.2 miles south of SH 16 to FM 471, the proposed project would construct both mainlanes and/or frontage roads. In portions of the proposed project, the existing mainlanes would be converted to frontage roads and new mainlanes would be constructed. In

other portions of the proposed project, the existing mainlanes would be utilized and only new frontage roads would be constructed (Figure 4.1 through 4.4). Therefore, the proposed project would create a four-lane divided roadway with continuous frontage roads. The proposed roadway would consist of two 12-foot-wide mainlanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders (see Figure 3). Frontage roads along both sides of the mainlanes would include a 4-foot wide inside shoulder, a 12-foot-wide inside lane, a 15-foot-wide outside lane, and a 6-foot wide sidewalk.

The proposed project would also include the construction of grade separations at Braun Road, New Guilbeau Road, and Shaenfield Road. The proposed grade separations would include a raised four-lane divided roadway consisting of two 12-foot-wide travel lanes in each direction, 4-foot-wide inside shoulders, and 10-foot wide outside shoulders (see Figure 3). The proposed frontage roads would be at-grade and include a 4-foot wide inside shoulder, a 12-foot-wide inside lane, a 15-foot-wide outside lane, and a 6-foot wide sidewalk.

The proposed improvements would require no new ROW or additional easements. Only existing ROW and existing easements would be needed to accommodate the proposed improvements. The overall Area of Potential Effects (APE) for the proposed project would include the existing LP 1604 ROW and existing easements.

ENVIRONMENTAL SETTING

The proposed project is located in the Edwards Plateau ecoregion of Texas as defined by the Texas Parks and Wildlife Department (TPWD). Commonly referred to as the "Hill Country," the Edwards Plateau is a rough rocky area that supports a tall or mid-grass understory and an overstory made up primarily of live oak (*Quercus virginiana*), Ashe juniper (*Juniperus ashei*), and mesquite (*Prosopis glandulosa*).

Geology

The geology near the LP 1604/Culebra Road (FM 471) intersection consists of Quaternary-age (late Pleistocene) fluvial terrace deposits and Cretaceous chalk formations (Barnes 1966). The terrace deposits are gravel, sand, silt, and clay. When adjacent to the Edwards Plateau, as is the currently proposed project area, the deposit is primarily gravel and limestone. Just south of the LP 1604/Bandera Road (SH 16), the geology transitions to Austin Chalk and Pecan Gap Chalk before crossing an area of Edwards Limestone undivided that extends beyond SH 16. Edwards Limestone undivided occupies parts of the Balcones fault zone and contains abundant chert resources exploited by prehistoric groups for stone tool manufacturing. Given the age of the Cretaceous geology, which predates known human occupation in Texas, those areas within the proposed project area have little to no potential to contain buried intact archeological material.

Given the character of the late Pleistocene terrace deposits that are located above current floodplains, there is a potential for prehistoric lithic procurement sites in areas where the gravels are exposed at the ground surface or within drainage channels, though such sites would likely be palimpsests of surface artifacts spanning thousands of years of prehistoric activity and would have little research potential. The

project area lacks recent (Holocene) alluvium that regionally has been shown to have a good potential to contain intact buried archeological resources.

Soils

Soils throughout the project area are generally very shallow to shallow and overlay limestone to deep, calcareous clayey soils overlying chalk, marl, and Pleistocene gravelly alluvium. The dominant soil unit mapped throughout the proposed project area is the Tarrant-Brackett soil association, followed by the Lewisville-Houston Black and Crawford-Bexar association. The Tarrant-Brackett association consists of shallow to very shallow rocky and clayey soils that developed *in situ* from limestone and therefore have little to no potential to contain intact buried archeological material. The Lewisville-Houston Black association consists of clayey Pleistocene alluvial soils and dense clays that developed *in situ* from chalk and marl (e.g., Houston Black) (Taylor et al. 1991). Given the Pleistocene age of the Lewisville soils, those areas have a low potential for containing shallowly buried intact archeological deposits. Based on the results of a 2006–2007 survey of LP 1604 by the Center for Archaeological Research (CAR) (Thompson et al. 2008), few natural sediments remain along the drainages within the existing LP 1604 ROW due to erosion and mechanical removal from urban development and construction.

Vegetation

According to *The Vegetation Types of Texas* (McMahan et al. 1984), the vegetation in the project area is located in three different vegetation types: Mesquite-Live Oak-Bluewood Parks, Live Oak-Ashe Juniper Woods, and Crops. Field observations revealed that properties adjacent to LP 1604 are dominated by commercial and residential properties, but remnant vegetation located in undeveloped parcels is consistent with the vegetation types described by McMahan et al. 1984. Vegetation within the LP 1604 ROW is dominated by Grassland/Mixed Herbaceous vegetation with Mixed Deciduous Woods and Riparian vegetation located in parts of the existing ROW and dominating the existing drainage easements along Helotes Creek (Figures 4.1 through 4.4).

PREVIOUS INVESTIGATIONS

A review of records available on the Texas Historical Commission's online Texas Archeological Sites Atlas (ATLAS) on January 03, 2013 indicated that there are ten previously recorded prehistoric sites and a total of ten archeological surveys located within a 1,000-meter search radius of the APE. No historic structures were observed within the APE on the 1961 *General Highway Map, Bexar County, Texas* (Texas State Highway Department) and the 1903, 1964 and 1980 USGS 7.5' *San Antonio, Texas* topographic quadrangle maps (Perry-Castaneda Library Map Collection 2011).

Pertinent to the current project are the results of an intensive archeological survey and test excavations conducted by CAR in 2006 and 2007 of existing and proposed ROW for a planned LP 1604 improvement project from Military Drive West on the west side of San Antonio to FM 1346 on the east side of town (under Texas Antiquities Permits 4092 and 4182) (Thompson et al. 2008). CAR's investigations and subsequent report were approved and accepted by TxDOT and THC February 1, 2008. CAR's survey of 41.09 miles [66.12 kilometers (km)] overlaps with the currently proposed ROW.

In 2010, Blanton & Associates, Inc. surveyed selected parts of LP 1604 between US 90 and IH 35 (Young and Sanchez 2012), which overlap with the currently proposed project area, and determined that the area had been intensively surveyed (Thompson et al. 2008). As well, the majority of the proposed improvements would occur within the disturbed existing LP 1604 ROW. B&A recommended that only selected areas within the their APE warranted additional archeological survey; many of the recommended survey locales were previously known sites.

In 1990, TxDOT surveyed 5.7 miles of the existing LP 1604 ROW from FM 1535 (Military Drive Northwest) to 0.5 mile north of the LP 1604/FM 471 (Culebra Road) intersection but discovered no archeological resources (ATLAS 2013).

Site 41BX1465

Site 41BX1465 was identified during a 2002 linear survey for a San Antonio Water System (SAWS) project along the south bank of Culebra Creek (Ahr and Duke 2002). The site is approximately 500 meters southeast of the LP 1604/FM 471 (Culebra Road) interchange on a terrace above Culebra Creek. Lithic debitage and cores were distributed across the site and buried cultural deposits were estimated to extend from 0 to 80 centimeters below ground surface (Ahr and Duke 2002). The site was revisited in 2007 during an assessment of the Leon Creek watershed, at which time the site was reported to have been destroyed since 2002 by the construction of a church and parking lot (Osburn and Phillips 2008). Therefore, no further investigations are recommended at this site.

Sites 41BX1422, 41BX1423, and 41BX1424

In 2001, CAR conducted a 40 acre survey for a private development project along the north bank of Culebra Creek just northwest of the LP 1604/FM 471 (Culebra Road) interchange (Figuroa and Frederick 2008). The survey resulted in the recording of two prehistoric burned rock midden sites (41BX1423 and 41BX1424) and one prehistoric lithic scatter (41BX1422). CAR recommended that parts of site 41BX1424 may be intact and should be capped with fill to prevent looting and protect the remainder of the site during development (Figuroa and Frederick 2008). Therefore, site 41BX1424 is presumably buried beneath parking facilities. Recent aerial photography of the area indicates that site 41BX1423 is no longer intact due to new development. Site 41BX1422 was described as being more than 500 meters west of LP 1604 and would not be impacted by the proposed project. No further investigations are recommended at these three sites.

Site 41BX1863

This site is a prehistoric surface scatter of non-diagnostic chert artifacts on the 1.5 to 2.0-meter tall T1 terrace above Culebra Creek in Culebra Creek Park (Butler and McClain 2010). The site was discovered during a survey for the City of San Antonio prior to proposed park improvements. During investigations, shovel testing and inspection of erosional surfaces on the terrace (and down its face) showed no buried archeological material. It was suggested that the artifacts eroded down slope from a site or sites previously destroyed by the construction of an apartment complex. Dog-leash sampling revealed that surface density is sparse, with concentrations around one artifact per 57 meter². Given site conditions, no

additional work was recommended (Butler and McClain 2010). The site is approximately 375 meters west of the existing LP 1604 ROW and would not be impacted by the proposed improvements. No additional investigations are recommended within the existing LP 1604 ROW near this site.

Site 41BX126

Prehistoric lithic scatter and procurement site 41BX126 was originally documented in 1971 during a survey for the proposed LP 1604 construction (ATLAS 2013). The site is located several hundred meters north of the LP 1604/FM 471 interchange and was capped under sand and fill prior to the LP 1604 construction, as the site was located within the proposed highway ROW. The site was revisited in 2006–2007 by CAR (Thompson et al. 2008) prior to a previously proposed LP 1604 improvement project and again in 2007 during a survey of the Leon Creek watershed (Osburn and Phillips 2008). According to CAR, the part of site 41BX126 within the existing LP 1604 ROW is beneath the highway, but parts do extend east of the ROW onto adjacent private property (Thompson et al. 2008). Given these circumstances, in conjunction with no proposed new ROW, further investigations at 41BX126 are not recommended.

Site 41BX1003

In 1993, LP 1604 from 0.5 mile west of Babcock Road to 1.2 miles west of SH 16 was surveyed by TxDOT (ATLAS 2013). Site 41BX1003 is a historic site consisting of a stone farmhouse and associated cistern located between Shaenfield Road and New Guilbeau Road that was initially recorded by TxDOT at that time. ATLAS data indicate that the house dates from the early to mid-twentieth century. During CAR's 2006–2007 survey for LP 1604 improvements, part of the site was discovered extending into the existing LP 1604 ROW, though the house and cistern are on adjacent private property west of the existing ROW boundary. The 2006–2007 proposed ROW boundaries intersected the northwest corner of the structure. B&A conducted investigations in 2010 (Young and Sanchez) recommending a revisit to site 41BX1003, to clarify its extent within the existing LP 1604 ROW, if the LP 1604 ROW is expanded in the future. There is no currently proposed ROW in this area; however, if new ROW is extended into the private property encompassing site 41BX1003 west of the existing LP 1604 ROW, then additional intensive archeological survey in the form of vegetation clearing, backhoe trenching, and possible mechanical scraping would be necessary.

Sites 41BX1615 and 41BX1616

Sites 41BX1615 and 41BX1616 were documented in 2005 by Kay Hinds and David Calame during a survey of the circa 1850s German Reumpel property at 9861 Braun Road in the southwest quadrant of the LP 1604/Braun Road intersection approximately 600 meters west of the existing LP 1604 ROW (ATLAS 2013). The site, recorded as 41BX1615, retains a large barn and residence near the corner of Braun Road and LP 1604. The barn is rough-hewn limestone and the residence is made of cut limestone blocks measuring 18 inches thick. The site is now a San Antonio City Landmark. The site is located outside of the existing LP 1604 ROW and will not be impacted by the proposed construction.

Site 41BX1616 is the historic Reumpel Farmstead, a circa 1850 German settlement at 9760 Braun Road west of, and within, the existing LP 1604 ROW just north of the LP 1604/Braun Road intersection. Based on available ATLAS data, 41BX1616 extends into the LP 1604 ROW. The site was revisited in 2006–2007 by CAR while surveying LP 1604. Although no artifacts were observed within the LP 1604 ROW adjacent to the site, no shovel tests were excavated due to previous disturbances. Shovel testing of the LP 1604 ROW, adjacent to 41BX1616, was conducted in 2010 (Young and Sanchez 2010) and no subsurface components were discovered within the existing or proposed ROW for that project. Therefore, no further investigations are warranted at 41BX1616 within the existing ROW.

Site 41BX69

Site 41BX69 is a prehistoric site documented in 1971 during a survey of LP 1604. As plotted on the ATLAS (2013) topographic map, the site is located beneath LP 1604 where LP 1604 crosses French Creek north of SH 16. The site was described as a prehistoric lithic scatter disturbed by bulldozing activities. One unidentified dart point was recovered, as well as lithic preforms and debitage. Recommendations called for additional testing if another lane was added to LP 1604 (ATLAS 2013). The site was revisited in 2007 during CAR's survey of LP 1604, at which time it was confirmed that there is no trace of the site within the existing LP 1604 ROW (Thompson et al. 2008). As such, additional investigations at/near 41BX69 are not recommended.

RECOMMENDATIONS

Based on the results of this cultural background study, geologic and soil conditions, and the previous level of disturbances within the existing LP 1604 ROW from FM 471 (Culebra Road) to SH16 (Bandera Road), B&A recommends an archeological survey of only three existing drainage easements. These include the easement located on the west side of LP 1604 at Helotes Creek near the Helotes Cemetery (see **Figure 5.2**) and the two northernmost easements located east of LP 1604 on or adjacent to Helotes Creek (see **Figure 5.1**). It is anticipated that these drainage easements have not been previously surveyed and have the potential to contain *in-situ* archeological resources. The remainder of the proposed construction within the existing LP 1604 ROW should be allowed to proceed as planned.

However, if it is determined that the LP 1604 project ultimately requires impacts to the private property encompassing site 41BX1003 west of the existing LP 1604 ROW, then additional intensive archeological survey in the form of vegetation clearing, backhoe trenching, and possible mechanical scraping would be necessary prior to any disturbances to ensure no archeological resources eligible for listing as State Archeological Landmarks (SALs) (13 TAC 26.12) would be impacted. Additionally, if new ROW is needed in undeveloped areas of LP 1604, an intensive survey may be warranted, in those areas, to determine potential impacts to archeological resources eligible for SAL listing (13 TAC 26.12).

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Young, B. and J. Sanchez

2010 *Intensive Archeological Survey of Selected Parts of Loop 1604 from US 90 to IH 35 in the City of San Antonio, Bexar County, Texas*. Blanton & Associates, Inc., Austin, Texas.

ATTACHMENTS:

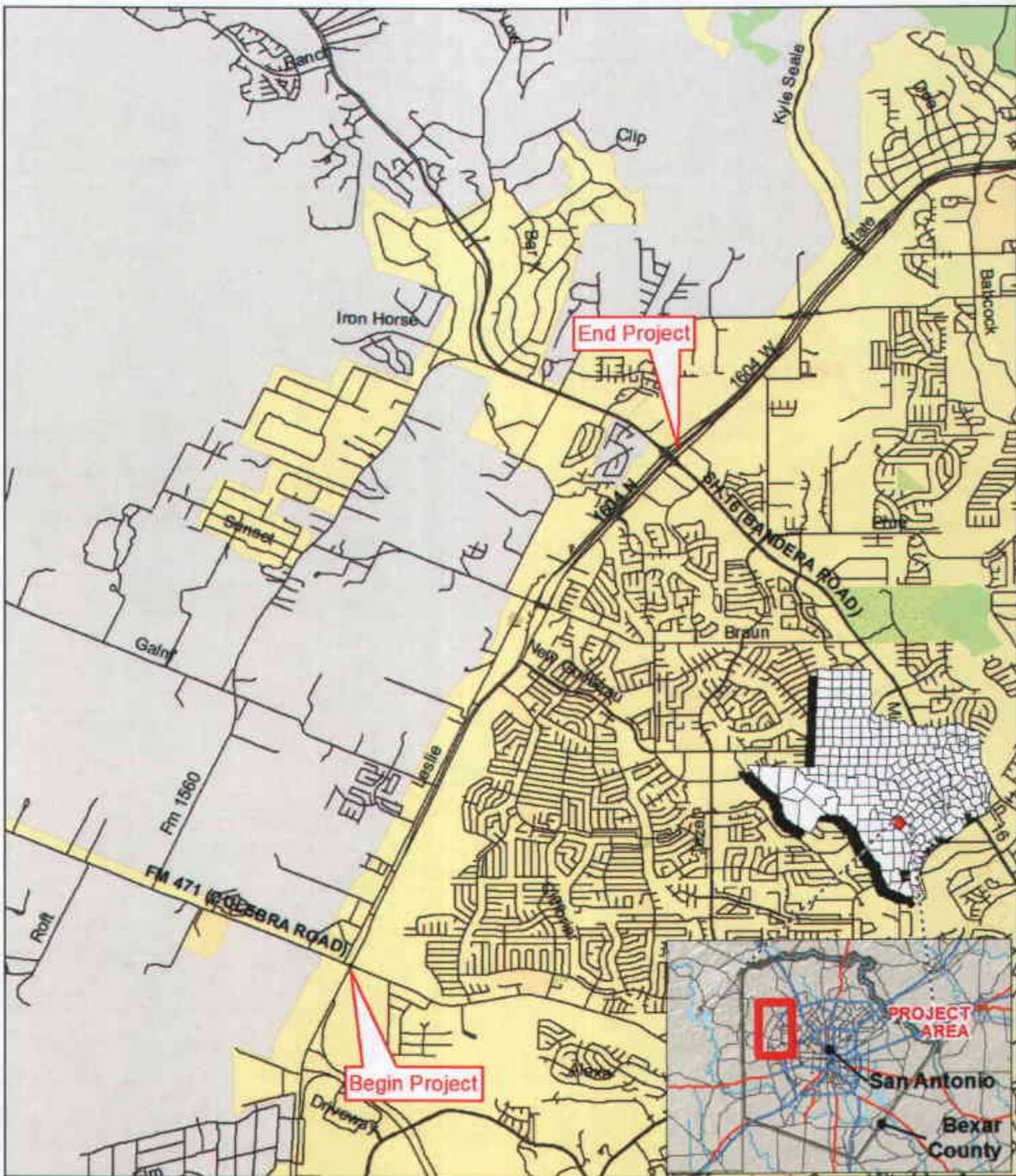
Figure 1. Project Location on County Map

Figure 2. Project Location on USGS Topographic Maps

Figure 3. Existing and Proposed Typical Sections

Figures 4.1-4.4. Land Use/Land Cover on Aerial Imagery

Figures 5.1-5.2. Water Resources Showing Proposed Archeological Survey Boundaries



Base Map: ESRI-USA Base Map,
 ESRI-U.S. and Canada Detailed Streets

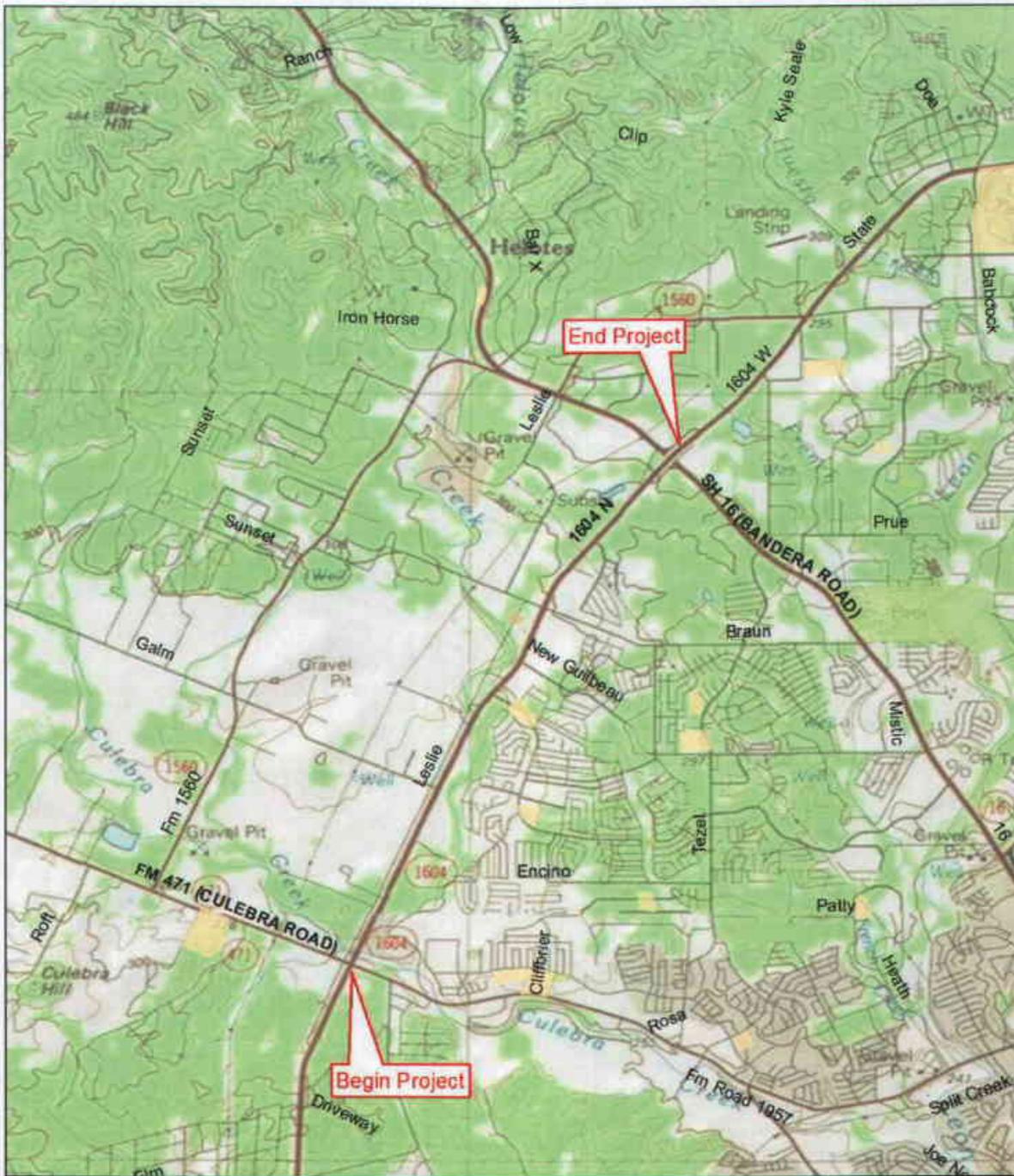


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Figure 1
 Project Location on County Base Map
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Base Map: 7.5' USGS topographic quadrangles: Bexar County, Texas

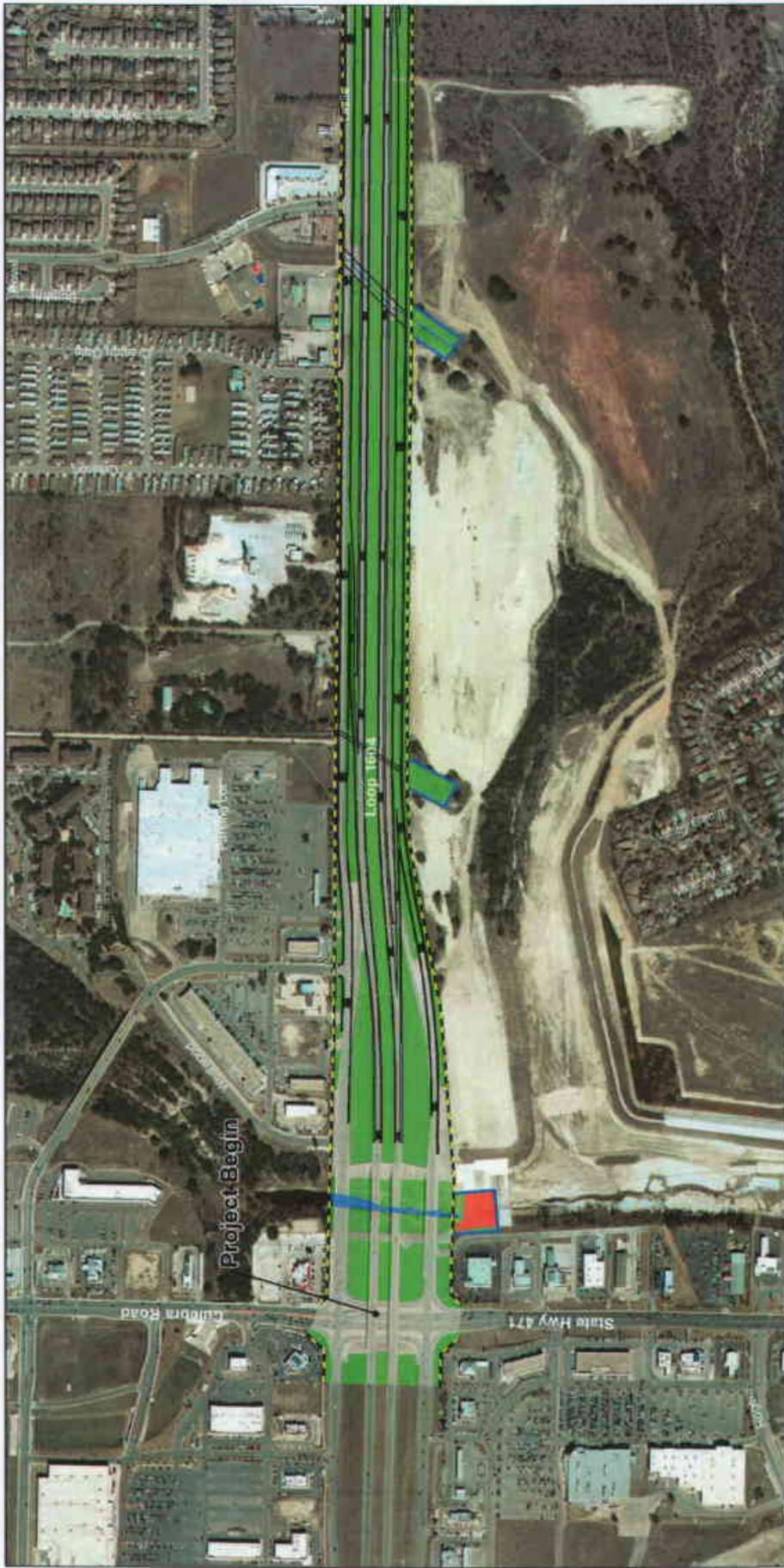


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Figure 2
Project Location on USGS Base Map
Loop 1604 from
FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055



State Map City Aerial Imagery 2010 Bexar County, Texas

Figure 4.1
Land Use/Land Cover
Loop 1604 from
FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055



- Existing Right-of-way
- Proposed Improvements
- Existing Easement
- Developed
- Existing Transportation
- Grassland/Mixed Herbaceous
- Mixed Deciduous Woodland
- Riparian
- Stream Channel



Base Map: Bing Aerial Imagery, 2010 Bexar County, Texas

- Existing Right-of-way
- Proposed Improvements
- Existing Easement
- Developed
- Existing Transportation
- Grassland/Mixed Herbaceous
- Mixed Deciduous Woodland
- Riparian
- Stream Channel



Figure 4.2
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Base Map: Bing Aerial Imagery © 2010 Baidu, Inc.

Figure 4.3
Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Base Map: Bing Aerial Imagery, 2008, Bexar County, Texas

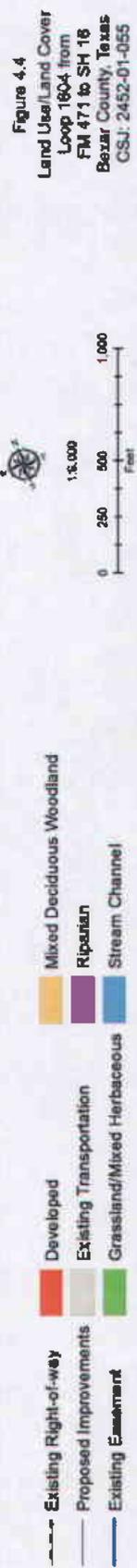
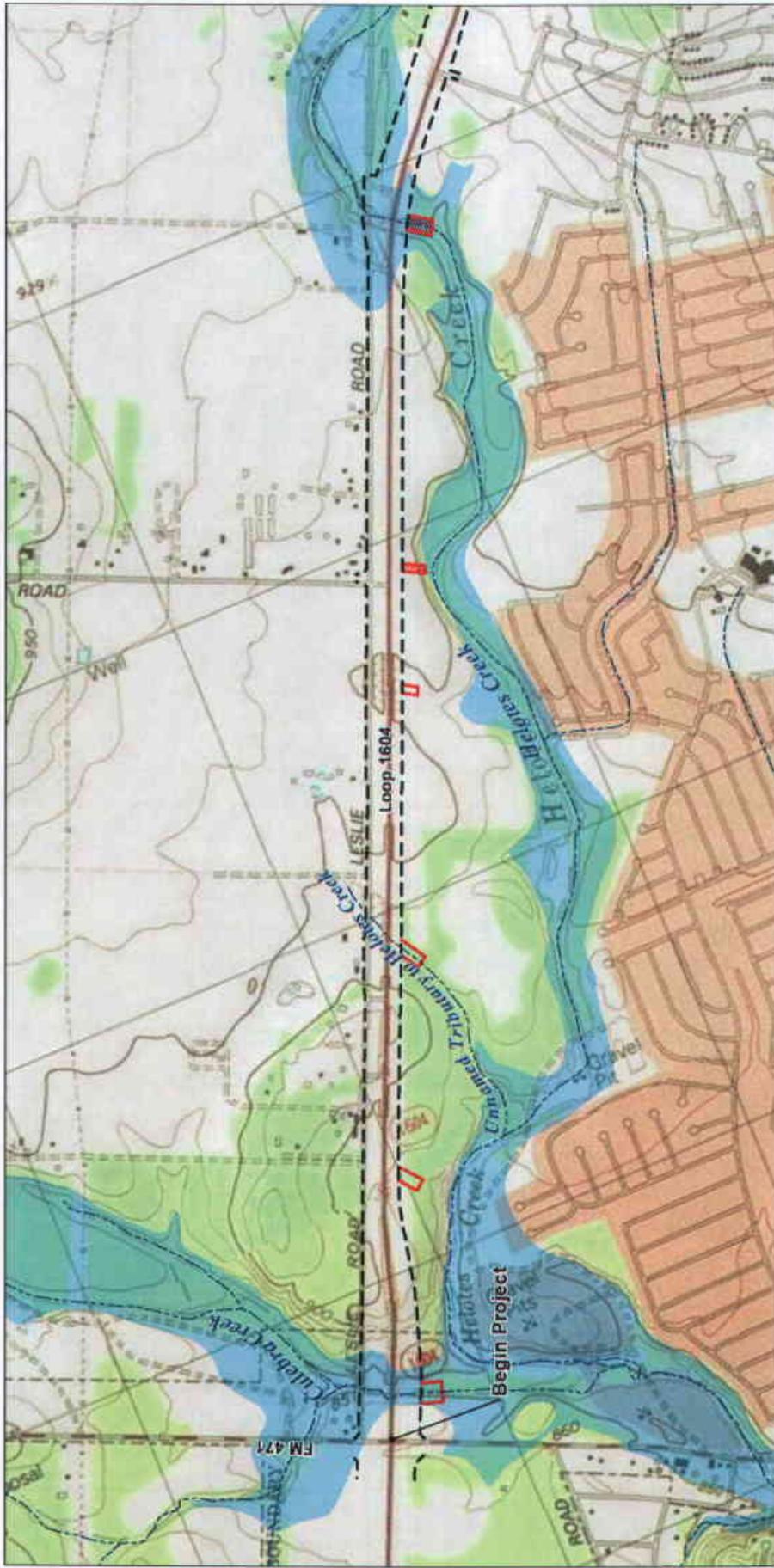


Figure 4.4
 Land Use/Land Cover
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Base Map: USGS Topographic, Bexar County, Texas

- Existing Right-of-way
- Existing Easement
- Streams
- ▨ Proposed Survey Boundary
- 100-year Floodplain



Figure 5.1
Water Resources Showing
Proposed Archaeological Survey Boundaries
 Loop 1604 from FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Base Map: USGS Topographic, Bexar County, Texas

-  Existing Right-of-way
-  Proposed Survey Boundary
-  Existing Easement
-  100-year Floodplain
-  Streams



Figure 5.2
Water Resources Showing
Proposed Archaeological Survey Boundaries
Loop 1604 from FM 471 to SH 16
Bexar County, Texas
CSJ: 2452-01-055



Texas Department of Transportation[®]

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

March 1, 2013

Mr. Bryant J. Celestine,
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, TX 77351

RE: Texas Department of Transportation Proposed Roadway Improvement Projects in
Bexar County, San Antonio District
CSJ: 2452-01-055; Loop 1604, between FM 471 and SH 16
CSJ: 0253-06-035; Spur 536 (Roosevelt Avenue), between East Southcross Boulevard
and Mission Road

Dear Mr. Celestine:

The above referenced transportation projects are being considered for construction by the Texas Department of Transportation. As currently proposed, these projects do not involve federal oversight or funding. Therefore, this letter initiates consultation in compliance with the Antiquities Code of Texas under the 2004 Memorandum of Understanding (MOU) (43 TAC 2.24) between the Texas Department of Transportation (TxDOT) and the Texas Historical Commission (THC). We are in the process of completing environmental studies for these projects. The purpose of this letter is to solicit your comments regarding potential project impacts to archeological sites. The projects are located in an area that may be of interest to your Tribe.

The proposed projects are located on Loop 1604, between Farm-to-Market Road (FM) 471 and State Highway (SH) 16 and on Spur 536 (Roosevelt Avenue), between East Southcross Boulevard and Mission Road. Both projects would be completed within the existing right of way (ROW); no new ROW or easements would be required. Maps that show the proposed project areas are enclosed, as well as a map of the state that indicates the location of Bexar County.

OUR GOALS

MAINTAIN A SAFE SYSTEM • ADDRESS CONGESTION • CONNECT TEXAS COMMUNITIES • BEST IN CLASS STATE AGENCY

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CSJ: 2452-01-055; Loop 1604, between FM 471 and SH 16

The proposed project would upgrade the existing 4-lane roadway and 2-lane frontage road to an expressway. The existing right of way varies between 340 and 400 feet. The proposed improvements would include construction of additional frontage roads, widening existing frontage roads, addition or widening of shoulders, and construction of sidewalks. The area of potential effects (APE) would be the existing right of way and associated drainage easements between FM 471 and north to SH 16. The project length would be 4.7 miles and the width of the right of way ranges from 340 to 400 feet wide. The estimated project area would be approximately 228 acres, based upon the maximum width of 400 feet and include the drainage easements. Typical depth of impact is less than two feet for adding pavement and sidewalks. Deeper depths to impact (to seven feet) can occur in those areas where utilities and storm water drainage systems are installed. For the purposes of this cultural resources review, potential impacts are considered within an area that includes the stated APE, as well as a 50-foot lateral buffer to account for potential alterations to the proposed APE included in the final project design. Consultation would be continued if potential impacts extend beyond this buffer, based on the final design.

Blanton and Associates produced an archeological background study for the proposed APE. Using the Texas Archeological Sites Atlas, they identified 10 previously recorded archeological sites and 10 archeological projects located within 1.0 kilometer (0.62 mile) of the APE. There are no previously recorded sites or cemeteries within the proposed APE. The nearest known site is located approximately 50 meters (164 feet) from the proposed APE. Several of the surveys were conducted in portions of the APE. The background study determined that the APE had been disturbed by road construction and development. An examination of TxDOT records show that the APE was extensively disturbed during construction of Loop 1604 and is unlikely to contain intact archeological deposits, and therefore, no further work is recommended.

CSJ: 0253-06-035; Spur 536 (Roosevelt Avenue), between East Southcross Boulevard and Mission Road

The proposed project would increase roadway width along Spur 536 (Roosevelt Avenue) to add a continuous left turn lane and sidewalks, from East Southcross Boulevard southward to Mission Road. The project would extend approximately 12 to 15 feet from the existing pavement edge. All work would be in existing right of way and no additional right of way or easements are required. The estimated length of the project is 3,184 feet within a 120-foot-wide existing right of way. The estimated depth of impact

would be typically less than 2.0 feet, with a maximum of 7.0 feet for installation of drainage infrastructure and relocation of utilities.

The proposed APE would be the project length and existing right of way width, for an area of approximately 8.8 acres. The depth of impacts would typically be less than two feet below surface with a maximum seven feet for the installation of drainage infrastructure and the relocation of utilities. For the purposes of this cultural resources review, potential impacts are considered within an area that includes the stated APE, as well as a 50-foot lateral buffer to account for potential alterations to the proposed APE included in the final project design. Consultation would be continued if potential impacts extend beyond this buffer, based on the final design.

TxDOT archeologists completed a background study for the proposed project APE. The Texas Archeological Sites Atlas shows that the proposed APE is within 1.0 kilometer (0.62 mile) of 15 previously recorded archeological sites and numerous archeological projects. One historic-age archeological site (41BX267), a Spanish colonial acequia (irrigation ditch), may cross the APE. In this area, the acqueia transported irrigation water from the San Antonio River. Given the disturbances within the APE, it is unlikely that evidence of the acequia remains in the APE. At several nearby locations, this acequia was archeologically tested and evaluated; and the preservation at those locations is considered better than would be expected in the proposed APE. The background study determined that the APE has been extensively disturbed; and, therefore, it was unlikely that any significant archeological deposits or sites occur within the APE. TxDOT recommends that the proposed project would have no effect on archeological resources.

Therefore, TxDOT proposes the following findings and recommendations for these two proposed projects:

- that no known archeological sites or State Archeological Landmarks (13 TAC 26.8) would be affected by this project;
- that a buffer zone of 50 feet beyond the APE be considered as part of the cultural resources evaluation;
- that no further archeological investigation is warranted at this time.

In accordance with the MOU between TxDOT and THC, we are writing to request your comments on sites of cultural or religious significance to your Tribe that may be affected by the proposed undertaking. Any comments you may have on the TxDOT recommendation should also be provided. If you do not object with the recommendation of "no archeological sites affected," please sign below to indicate your concurrence. In the event that further investigations by our office disclose the presence of archeological deposits, we will contact your Tribe to continue consultation.

Proposed Texas Department of Transportation Projects, Bexar County, San Antonio District
CSJ: 2452-01-055; Loop 1604, between FM 471 and SH 16;
CSJ: 0253-06-035; Spur 536, between East Southcross Boulevard and Mission Road

Thank you for your attention to this matter. If you have questions, please contact Eric Oksanen (TxDOT Archeologist) at 512/416-2505 (email: Eric.Oksanen@txdot.gov) or me at 512/416-2638 (email: Sharon.Dornheim@txdot.gov). When replying to this correspondence, please ensure that the envelope address includes reference to the Archeological Studies Branch, Environmental Affairs Division.

Sincerely,



Sharon Dornheim
Staff Archeologist / Consultation Coordinator
Archeological Studies Branch
Environmental Affairs Division

Concurrence by:

Date:

Attachments

cc w/attachments:

Barrlynn West, TxDOT San Antonio District Environmental Coordinator;
Sonya Hernandez, ENV-PD TxDOT;
Eric Oksanen, ENV-ARCH TxDOT;
ENV-ARCH Project File
ENV-ARCH ECOS / EDMS Scan

The attached notification letter was sent to the following tribes on March 1, 2013:

Mr. Bryant J. Celestine
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, TX 77351

Mr. Tarpie Yargee, Chief
Alabama-Quassarte Tribal Town
P.O. Box 187
Wetumka, OK 74883

[sent by email]

Mr. Donnie Cabaniss, Chairman
Apache Tribe of Oklahoma
P.O. Box 1330
Anadarko, OK 73005

Mr. Robert Cast, THPO
Caddo Nation of Oklahoma
P.O. Box 487
Binger, OK 73009

Mr. Jimmy Arterberry, THPO
Comanche Nation of Oklahoma
Comanche Nation Office of Historic Preservation
P.O. Box 908
Lawton, OK 73502

Mr. Gilbert Salazar, Chairperson
Business Committee
Kickapoo of Oklahoma
P.O. Box 70
McLoud, OK 74851

Mr. Juan Garza, Jr., Chairperson
NAGPRA Coordinator
Kickapoo Traditional Tribe of Texas
HC1 Route, Box 9700
Eagle Pass, TX 78852

Ms. Amie Tah-Bone
Museum Director and Acting NAGPRA
Representative
Kiowa Indian Tribe of Oklahoma
P.O. Box 369
Carnegie, OK 73015

Mr. Frederick Chino, Sr., President
c/o Holly Houghten
Mescalero Apache Tribe
P.O. Box 227
Mescalero, NM 88340

Mr. Don Patterson, President
Tonkawa Tribe of Indians of Oklahoma
1 Rush Buffalo Rd
Tonkawa, OK 74653

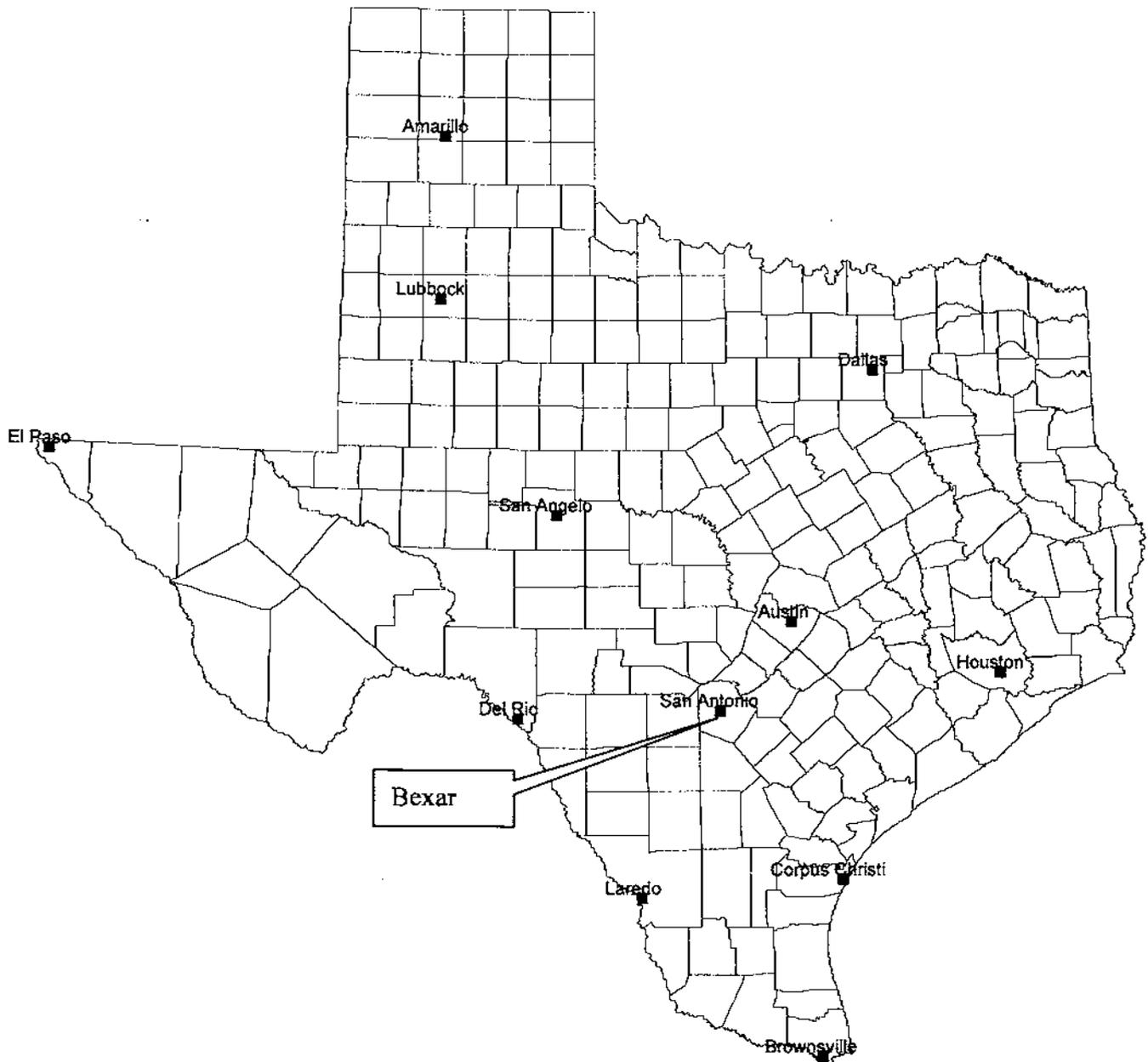
[emailed to Miranda Myer]

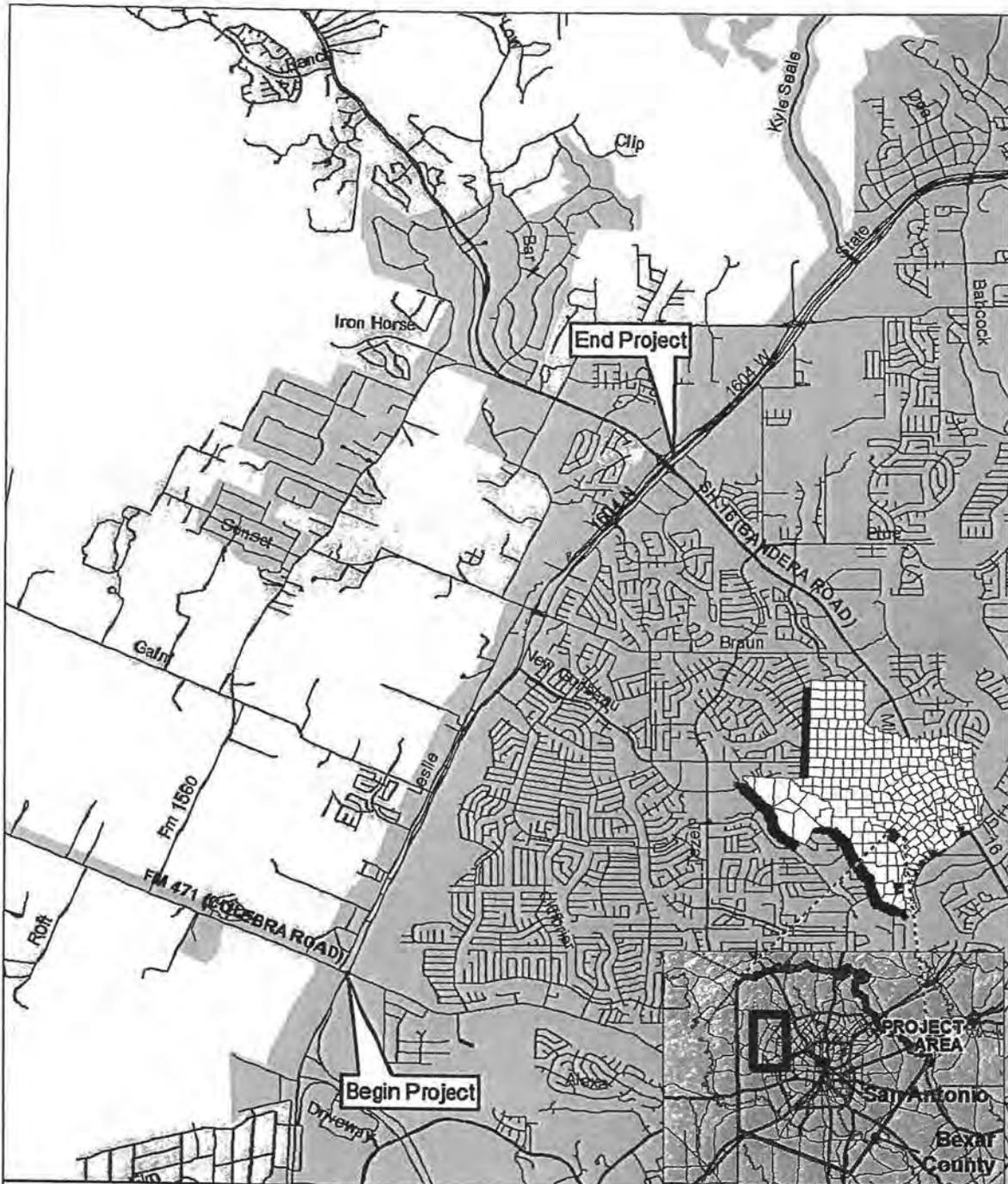
Ms. Terri Parton, President
Wichita and Affiliated Tribes
P.O. Box 729
Anadarko, OK 73005

County Location Map

County: Bexar

CSJs: 2452-01-055 Loop 1604 from FM 471 to SH 16
0253-06-035 Spur 536 (Roosevelt Avenue) from E. Southcross
Boulevard to Mission Road





Base Map: ESRI-USA Base Map,
 ESRI-U.S. and Canada Detailed Streets



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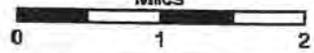


Figure 1
 Project Location on County Base Map
 Loop 1604 from
 FM 471 to SH 16
 Bexar County, Texas
 CSJ: 2452-01-055



Figure 2.
 7.5 minute USGS Southton topographic quadrangle (2998-132) CSJ: 0253-06-035
 Roosevelt Avenue (SP 536) From E Southcross Boulevard to Mission Road
 San Antonio, Bexar County, San Antonio District, Texas

