



# Cumulative Impacts Technical Report

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Loop 1604 from SH 16 to I-35

Bexar County, Texas

TxDOT San Antonio District

CSJ: 2452-02-083, 2452-03-113, 2452-03-087, 0072-08-144

July 2020

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 9, 2019, and executed by FHWA and TxDOT.

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## **1.0 INTRODUCTION**

### **1.1 PURPOSE OF THE TECHNICAL REPORT**

This technical report presents the analysis conducted to assess the potential for cumulative impacts associated with the proposed State Loop 1604 (Loop 1604) project in Bexar County, Texas. It provides definitions of direct, indirect, and cumulative impacts, and also summarizes the Texas Department of Transportation (TxDOT) guidance utilized to determine the magnitude of potential cumulative impacts.

### **1.2 PROJECT OVERVIEW**

The San Antonio District of TxDOT proposes improvements to the Loop 1604 corridor from State Highway 16 (SH 16) to Interstate Highway 35 (I-35) in northern Bexar County. The proposed project traverses the cities of San Antonio, Shavano Park, and Live Oak, and the town of Hollywood Park.

The proposed project would expand Loop 1604 from a four-lane expressway to a ten-lane expressway. The proposed project would include two high-occupancy vehicle (HOV) special purpose lanes (one in each direction) and eight general purpose lanes (four in each direction). The proposed improvements include continuous sidewalks and bicycle accommodations along the entire length of the project. No new right-of-way or permanent easements would be required.

**Appendix A: Figure 1** shows the project location and limits.

The environmental impacts of the proposed improvements to the Loop 1604 corridor are being analyzed in technical reports, and the project will be processed as an Environmental Assessment (EA).

## **2.0 DEFINITIONS AND GUIDANCE**

### **2.1 DEFINITIONS OF DIRECT, INDIRECT, AND CUMULATIVE IMPACTS**

The Council on Environmental Quality (CEQ) defines direct effects as those effects that are “caused by the action and occur at the same time and place” (40 Code of Federal Regulations [CFR] § 1508.8). Direct effects are predictable and are a direct result of the project.

In addition to direct effects, major transportation projects may also have indirect effects on land use and the environment. As defined by the CEQ, indirect effects are “caused by an action and occur later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems” (40 CFR § 1508.8).

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

## 2.2 GUIDANCE

The approach for conducting cumulative impacts analysis is ultimately guided by the following TxDOT publications, which are available online in the TxDOT Indirect and Cumulative Impacts Toolkit: *Risk Assessment for Cumulative Impacts* (TxDOT ENV 2014) and *Cumulative Impacts Analysis Guidelines* (TxDOT ENV 2019).

### 2.2.1 Identification of Resources

According to TxDOT’s *Cumulative Impacts Analysis Guidelines* (TxDOT ENV 2019), if a project does not cause direct or indirect impacts on a resource, it would not contribute to a cumulative impact on that resource. **Table 1** describes direct and indirect impacts for each resource category that will be addressed in the EA and whether the resource is in poor or declining health or at risk. This analysis focuses on those resources substantially impacted by the project or those that are currently in poor or declining health or at risk, even if project impacts (either direct or indirect) are relatively small; only those resources meeting these criteria are brought forward for further analysis of cumulative effects.

Table 1: Resources/Issues Considered for Cumulative Impacts Analysis				
Subject Considered for Direct and Indirect Impacts	TxDOT/CEQ Criteria <sup>1</sup>		Included for Cumulative Impacts Analysis?	Explanation for Including or Excluding the Subject from Cumulative Impacts Analysis
	Would Proposed Project or Induced Growth Result in Substantial Impacts?	Is Subject a Scarce Resource or in Poor or Declining Health?		
Air Quality	No	Yes	No	Excluded. The proposed project is located Bexar County which is designated in marginal nonattainment for ground level Ozone. According to the Alamo Area Council of Governments, ozone levels have experienced a steady decline since 2014. In addition, results of the MSAT and CO air modeling conducted for this project show improvements in air quality. Due to improvement in air quality in the San Antonio area, improved traffic flow in the project area which will likely decrease localized air emissions and because regional air quality is managed and analyzed by the MPO and this project is included in regional air model for management of Ozone; the proposed project is not analyzed in further detail for cumulative impacts.
<b>NATURAL RESOURCES</b>				
Waters of the U.S., including Wetlands	No	Yes	No	Excluded. Thirty-one crossings, comprised of 35 water features and two wetlands, were identified within the project limits. It is anticipated that impacts would be permitted under Nationwide Permit 14 without Pre-Construction Notification to the U.S. Army Corps of Engineers. Potential induced growth is not anticipated to adversely impact waters of the U.S., including wetlands, due to protection provided by Section 404 of the Clean Water Act.
Floodplains	No	No	No	Excluded. Although a portion of the proposed project would lie within the 100-year floodplain, the hydraulic design of the project would permit conveyance of the 100-year flood, and potential inundation of the highway would not cause substantial damage to it, the streams, or other property. Potential induced growth is not anticipated to adversely impact floodplains.
Water Quality (Groundwater)	No	Yes	Yes	Included. The Edwards Aquifer is a unique resource and development on its recharge zone (RZ) and contributing zone (CZ) can be contentious. There is concern over the long-term quality due to the aquifers vulnerability to pollution and continued urbanization of the RZ and CZ.

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Water Quality (Surface water)	No	Yes	No	Water runoff from the project is within five stream miles and drains to two impaired stream segments. The proposed project is not anticipated to contribute to the constituents of concern for these two impaired waters. Efforts would be made to avoid and minimize impacts to the aquatic ecosystem during roadway design. Minimization would be achieved by preparing and implementing a SW3P and by implementing BMPs, including temporary erosion, sedimentation, and TSS water pollution controls.
Federally Listed Threatened/Endangered Species	Yes	Yes	Yes	Included. Much of the project area is within U.S. Fish and Wildlife Service (USFWS) Karst Zones that are known to contain endangered karst invertebrate species or have a probability of containing habitat suitable for endangered karst invertebrate species. Karst Zone 1 includes areas that are known to contain endangered karst invertebrate species. Karst Zone 2 includes areas having a high probability of containing habitat suitable for endangered karst invertebrate species. Karst Zone 3 includes areas that probably do not contain endangered karst invertebrate species. Karst Zone 5 is defined as areas that do not contain endangered karst invertebrate habitat. Five federally listed endangered karst species, <i>Cicurina madla</i> (Madla Cave meshweaver), <i>C. baronia</i> (Robber Baron Cave meshweaver), <i>Rhadine exilis</i> (unnamed ground beetle), <i>R. infernalis</i> (unnamed ground beetle), and <i>Batrisodes venyivi</i> (Helotes mold beetle), are known to occur in areas adjacent to the proposed project and would be potentially impacted by the proposed project. Potential impacts to karst species include: 1) intersecting karst features during construction; 2) altering surface drainage patterns which may alter recharge and nutrient flow to karst features; 3) altering surface plant communities which buffer temperature and humidity fluctuations in karst features; 4) increasing contaminant loads in surface runoff, which may recharge karst features, and; 5) reducing troglodene foraging areas which may result in decreased nutrient input to karst features. Impacts to all listed species would be limited mostly to the project area and edge effects on non-TxDOT properties that are located adjacent to the project area. Edge effects on non-TxDOT properties may include increases in impervious cover or altering surface

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	Would Proposed Project or Induced Growth Result in Substantial Impacts?	Is Subject a Scarce Resource or in Poor or Declining Health?		
				plant and animal communities within cave subsurface drainage basins or troglodite foraging area. Formal consultation with the USFWS would occur for the federally listed karst invertebrates, along with other species that are not likely to be adversely affected.
<b>Vegetation and Wildlife Habitat (including Habitat for State-Listed Species)</b>	No	Yes	No	<p>Excluded. The proposed project footprint encompasses Disturbed Prairie vegetation, Riparian vegetation, Tallgrass Prairie, Grassland vegetation, Edwards Plateau Savanna, Woodland, and Shrubland vegetation, and Urban vegetation. These habitat types are not considered rare or important remnant vegetation as mapped by the Texas Conservation Action Plan. The project area contains fragmented patches of potentially suitable habitat for 55 state-threatened species and species of greatest conservation need (SGCNs). However, due to the fragmentation, any impact to these species would be localized to individuals of the population. These impacts would not be expected to be significant to these species throughout their range.</p> <p>Impacts associated with the proposed project and subsequent induced growth are not anticipated to result in any effects to state-listed species. Anticipated induced growth (private development) would be regulated by the local municipalities' land development ordinances. Additionally, state regulations prohibit harm to individuals of state-listed species. All development, whether publicly or privately funded, is subject to state regulations.</p>

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<b>COMMUNITY IMPACTS</b>				
<b>Community Impacts</b>	No	No	No	Excluded. The proposed project would not significantly adversely affect, separate, or isolate any distinct neighborhoods, ethnic groups, or vulnerable populations within the project area. Mobility would be enhanced for all users of the facility due to the added capacity and pedestrian and bicycle infrastructure. Overall, the proposed project is anticipated to result in beneficial impacts to access and travel patterns for the communities directly adjacent to the Loop 1604 corridor. However, the proposed repositioning of on- and off-ramps throughout the project area would result in slight changes to access and travel patterns throughout the corridor. Drivers who commonly use access ramps within this section of Loop 1604 would have to familiarize themselves with the new entrance and exit points, and this might change the length of some trips. The proposed project would not cause any displacements. No existing neighborhoods would be divided.
<b>Section 4(f) and 6(f) Properties</b>	No	No	No	Excluded. The project would not involve the use of a Section 4(f) resource because the trail that occurs on an easement for the project would not be directly affected by construction. No adverse effects are anticipated to occur to any resources eligible for the National Register of Historic Places (NRHP).
<b>Environmental Justice</b>	No	Yes	No	Excluded. No disproportionately high or adverse impacts to minority or low-income populations are anticipated as a result of the proposed project. No existing neighborhoods would be divided. Increased mobility associated with the proposed project would be beneficial for the community at large, including the traveling public. Potential changes to access and travel patterns from the proposed repositioning of on- and off-ramps would occur in EJ and non-EJ communities equally.
<b>Public Facilities/ Services/ Utilities</b>	No	No	No	Excluded. The proposed project would generally improve mobility such that the community resources become more easily accessible. Potential induced growth is not anticipated to adversely impact any public facilities/services/utilities.

Table 1: Resources/Issues Considered for Cumulative Impacts Analysis				
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<b>Cultural Resources</b>				
<b>Historic-Age Properties</b>	No	No	No	Excluded. The project area has been previously surveyed in 2007 and 2015 for properties constructed prior to 1969. In addition, bridges constructed between 1945 and 1965 within the project area of potential effects (APE) have been previously reviewed for eligibility for listing in the National Register of Historic Places (NRHP) as part of the Statewide Historic Bridge Inventory. Many of the bridges in the APE are exempt from consideration for listing in the NRHP as part of programmatic agreements or program comments. There are no properties that are listed in or eligible for listing in the NRHP on parcels within the APE for the proposed project. Potential induced growth is not anticipated to adversely impact historic-age properties.
<b>Archeological Resources</b>	Unknown	No	No	Excluded. Seven archeological sites are located within the APE; however, all have been determined to be ineligible for inclusion on the NRHP within the right-of-way. Further, all of the APE's existing right-of-way has been recently subjected to archeological survey and limited testing. Approximately 51 acres of drainage easements will be utilized for this project that lie outside of the existing right-of-way; this utilization will consist of varying levels of ground disturbance. CMEC's background study recommended survey of these locations. TxDOT conducted these surveys, and the 13.25 acres that required archeological survey were covered during RKI's 2020 survey (Matthews 2020).  There is potential for impacts to unknown archeological deposits in either surficial or sub-surface contexts in the areas of potential induced growth. However, according to Texas Historical Commission (THC) Atlas data, surveys have not been conducted throughout the full extent of the area of induced growth to date (THC 2020).

<sup>1</sup> In accordance with TxDOT and CEQ selection criteria for limiting the scope of cumulative impacts analyses.

Based on the results of TxDOT's cumulative impacts risk assessment and supported by the information summarized in **Table 1** reflecting the technical reports prepared for the proposed project, a Cumulative Impacts Analysis is required.

As shown in **Table 1**, the proposed project may potentially have cumulative impacts on federally listed species *C. madla*, *C. baronia*, *R. exilis*, *R. infernalis* and *B. venyivi*.

### 2.2.2 Evaluation of Cumulative Impacts to Resources

The evaluation of cumulative impacts discussed in this document follows TxDOT's *Cumulative Impacts Analysis Guidelines* (TxDOT ENV 2019). According to TxDOT's 2019 Guidance, the five steps of a cumulative effects analysis for a TxDOT project are as follows:

- (1) Resource study area, conditions, and trends
- (2) Direct and indirect effects on each resource from the proposed project
- (3) Other actions—past, present, and reasonably foreseeable—and their effect on each resource
- (4) The overall effects of the proposed project combined with other actions
- (5) Mitigation of cumulative effects

## 3.0 CUMULATIVE IMPACTS

As previously stated, cumulative impacts can result from “individually minor but collectively significant actions taking place over a period of time” (40 CFR § 1508.7). As this regulation suggests, the purpose of a cumulative impacts analysis is to view the direct and indirect impacts of the proposed project within the larger context of past, present, and future activities that are independent of the proposed project, but which are likely to affect the same resources in the future. Environmental and social resources are evaluated from the standpoint of relative abundance among similar resources within a larger geographic area. Broadening the view of resource impacts in this way provides the decision maker an insight into the magnitude of project-related impacts in light of the overall health and abundance of selected resources.

In essence, a cumulative impacts evaluation first paints a conceptual picture of the existing or “baseline” condition of each resource, which is based on historical information and an assessment of the current condition of the resource. Second, the analysis then inventories future projects in the vicinity that are planned and financed, but unrelated to the proposed project, and assesses the likely collective impacts of those projects for each resource. Third, the analysis then describes the expected future status of the resource (i.e., in terms of quantity and condition) after the combined (i.e., cumulative) effects of the proposed project and other foreseeable projects are fully realized. Finally, the cumulative impacts analysis assesses the level of concern that should be associated with the expected cumulative impacts to a resource based on the scarcity or current condition of that resource. All

relevant, reasonable mitigation measures must be identified, even if they are outside the jurisdiction of TxDOT. Mitigation measures identified to address the proposed project's direct and indirect effects can also minimize, rectify, or compensate for negative cumulative effects. These measures are typically considered and disclosed in other technical reports or environmental assessments.

### 3.1 FEDERALLY LISTED SPECIES

#### 3.1.1 Step 1 – Resource Study Area, Conditions, and Trends

##### 3.1.1.1 Resource Study Area for Federally Listed Species

The geographic boundary of the resource study area (RSA) for cumulative impacts to federally listed species is a combination of the 345-foot buffer of the project area to account for impacts to the troglodene foraging areas of nearby caves, and the Stone Oak and UTSA Karst Faunal Regions (KFRs), which the project traverses. Troglodene species include cave crickets, small mammals such as raccoons, and reptiles such as snakes, which use the cave for portions of their lifecycles and are significant sources of nutrients to cave ecosystems. The RSA for federally listed species encompasses approximately 77,167 acres (See **Figure 1** in **Appendix A**). This area is in Bexar County and includes areas of Karst Zones 1, 2, 3, and 5, Critical Habitat Unit (CHU) 9, as well as areas of the Edwards Aquifer Recharge, Contributing, and Transition Zones.

The temporal RSA for cumulative impacts to these species is 2000 through 2045. In 2000, nine karst invertebrates, including the four species analyzed in this report, were listed as endangered in Bexar County. 2045 is the horizon year of the Alamo Area Metropolitan Planning Organization's (AAMPO) current long-range transportation plan.

##### 3.1.1.2 Resource Conditions and Trends

Cumulative impacts to the federally listed species *C. madla*, *C. baronia*, *R. exilis*, *R. infernalis*, and *B. venyivi* will be considered within the context of the geographic RSA.

#### Current Conditions

Karst invertebrates are troglobitic species that spend their entire lifecycle underground and are adapted to a narrow range of environmental conditions. Habitat for federally listed karst invertebrates occurs in subterranean voids, including caves, solution cavities, fractures, and mesocavernous voids that may or may not be humanly accessible. They require high humidity, stable temperatures, and are entirely reliant on external nutrient sources such as: organic particles, such as leaf litter, washed in through openings that may or may not be visible entrances (i.e., cave entrances); organic carbon washed in through entrances or

seeps and drips; animal droppings and carcasses from troglomen (animals such as crickets and small mammals that utilize caves periodically); and predation on other invertebrates (USFWS 2011). Vegetative communities buffer subterranean temperature and humidity fluctuations, provide nutrients that wash into the subsurface, provide habitat for troglomen such as cave crickets, and may filter some pollutants from water entering the karst system.

The project area is located within USFWS Karst Zone 1, 2, 3, and 5, the Stone Oak and UTSA KFRs, and crosses part of CHU 9. Karst Zone 1 includes areas that are known to contain endangered karst invertebrate species. Karst Zone 2 includes areas having a high probability of containing habitat suitable for endangered karst invertebrate species. Karst Zone 3 includes areas that probably do not contain endangered karst invertebrate species. Karst Zone 5 is defined as areas that do not contain endangered karst invertebrate habitat (Veni 2002). A karst fauna region is a geographic area delineated based on the discontinuity of karst habitat that may limit interaction between troglobitic populations. Typically, the discontinuity is caused by a significant geologic or topographic barrier, such as a fault or incised stream valley (Veni 1994). Federally listed karst invertebrates known to occur in the UTSA KFR include *R. exilis*, *R. infernalis*, *C. madla*, and *B. venyivi*. Federally listed karst invertebrates known to occur in the Stone Oak KFR include *R. exilis*, *R. infernalis*, and *C. madla* (USFWS 2011). *C. barona* was previously only known from the Alamo Heights KFR; however, Green Mountain Road Cave, which is located in the project area, is known to be occupied by this species despite being outside of any KFR.<sup>1</sup> Although present in both KFRs, *R. infernalis* and *R. exilis* are not known from any locality within or adjacent to the project area, but do occur within the RSA.

Urbanization is cited as the main threat to karst invertebrate species through destruction of karst voids, degradation, fragmentation or destruction of surface plant and animal communities, and through changes to the quantity and quality of stormwater runoff and groundwater recharge (USFWS 2011, USFWS 2012). During construction, bedrock disturbing activities may encounter karst voids that contain federally listed karst species or are hydrologically connected to occupied karst features. Effects could include destruction of the voids, desiccation of exposed habitat, severing of groundwater flow paths that lead to occupied features, flooding of exposed features, or introducing contaminants into the

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<sup>1</sup> A *Cicurina* species collected in 2010 was analyzed, but due to an incongruence between nuclear and mitochondrial DNA, a species could not be assigned. Another author examined only mitochondrial DNA and concluded the best match was *C. baronia*. The USFWS advised that the site be treated as occupied by *C. baronia*.

groundwater system. The project is incorporating several mitigation strategies that will reduce impacts to groundwater flowpaths and occupied habitat such as avoidance of known voids, water quality BMPs that overtreat stormwater, and mitigation measures when voids are encountered. Urbanization also results in the loss of natural vegetative cover and increases impervious cover, which could impact karst features, troglodite foraging areas, alter hydrologic or temperature regimes, or otherwise result in changes in nutrient and water flow, which could affect subsurface habitat.

There has been substantial urbanization and development in the San Antonio region, and specifically within the RSA, in recent years. With the recent growth of people and businesses moving to the area, this has also increased the rate of development and in turn the amount of impervious cover in the RSA.

### Regulatory Conditions

In December 2000, the USFWS listed nine karst invertebrate species occurring in northern Bexar County as endangered under the Endangered Species Act (ESA) of 1973 (USFWS 2000). These species include *C. madla* (Madla Cave meshweaver), *C. baronia* (Robber Baron Cave meshweaver), *C. venii* (Bracken Bat Cave meshweaver), *C. vespera* (Government Canyon Bat Cave meshweaver), *Neoleptoneta microps* (Government Canyon Bat Cave spider), *Texella cokendolpheri* (Cokendolpher cave harvestmen), *R. exilis* (ground beetle no common name), *R. infernalis* (ground beetle no common name), and *B. venyivi* (Helotes mold beetle). All nine species are currently listed as endangered by the USFWS.

The Bexar County Karst Invertebrates Recovery Plan outlines the USFWS recovery strategies and goals. The recovery strategy is to “reduce the threats to the species by protecting an adequate quantity and quality of karst areas to ensure a high probability of the species long-term survival” (USFWS 2011). This includes the protection, monitoring, and management of caves and karst features that represent the range and genetic diversity of each species.

CHUs are areas designated by USFWS that contain one or more of the habitat constituent elements required for the species for which the unit is designated. They are set up to provide for special management and protection to endangered species. Only one of these units, CHU 9, occurs within the project area. Although CHU 9 is located within the project area, the openings to caves containing federally listed species are outside of the project area and the cricket foraging area buffer (345 feet) but within the UTSA KFR. Within the RSA there are 14 CHUs, including seven in the Stone Oak KFR and seven in the UTSA KFR. In addition to the CHUs, there are state-level protections in place. One of the most stringent regulations includes water quality protections for the Edwards Aquifer (30 Texas Administrative Code [TAC] Chapter 213) which regulates developments over the Recharge, Contributing, and Contributing Zone within the Transition Zone of the Edwards Aquifer.

These regulations provide for protective natural buffers around caves and karst features and the installation of water quality Best Management Practices (BMPs) to reduce contaminated runoff from developments in the Edwards Aquifer zones.

Federally listed karst invertebrates are known to occupy five caves that are within or adjacent to the project area. Two caves located within CHU 9, Mastodon Pit and Feature No. 50, are known to contain *C. madla* and *R. exilis*. Two caves, La Cantera Cave #1 and La Cantera Cave #2, located north of Loop 1604 in wooded areas between Loop 1604 and the Shops at La Cantera Mall are occupied by *C. madla* and *R. exilis*. Green Mountain Road Cave is located within TxDOT ROW between the eastbound Loop 1604 travel lanes and an exit ramp from the eastbound travel lanes to Green Mountain Road and is known to be occupied by *C. baronia*.<sup>2</sup>

### Trends

When listed in 2000, *C. madla* was known from six locations, in 2011 the species was known from 22 locations (USFWS 2011), and as of 2019 is known to occur or potentially occurs in 29 caves or karst features (USFWS 2019). As of 2011 *R. exilis* was known from 51 caves, *B. venyivi* was known from eight caves, and *C. baronia* was known from two caves (USFWS 2011). Since 2011, multiple new localities for these species have likely been identified, but the USFWS does not keep an official database of species localities. Factors affecting the federally listed species in the RSA are like those affecting the species range-wide. The RSA is a mosaic of suburban residential development, commercial development, and transportation infrastructure. Land use surrounding the proposed project area is mostly urban, with limited space for additional development. Surrounding pressures include earthmoving activities such as construction of residential and commercial developments and road/utility improvements. These actions may result in destruction of habitat or permanent alteration of available habitat in the vicinity of the project through collapse or filling of unknown caves in Karst Zones 1, 2, 3, and 4, alteration of drainage patterns and surface plant and animal communities, introduction of contaminated runoff, and the potential invasion of invasive species. Mitigation measures such as avoidance of known voids and critical habitat, overtreatment of stormwater, and minimization of additional impervious cover will help mitigate these impacts.

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<sup>2</sup> A *Cicurina* species collected in 2010 was analyzed, but due to an incongruence between nuclear and mitochondrial DNA, a species could not be assigned. Another author examined only mitochondrial DNA and concluded the best match was *C. baronia*. The USFWS advised that the site be treated as occupied by *C. baronia*.

### 3.1.2 Step 2 – Direct and Indirect Effects from the Proposed Project

The proposed project may affect and is likely to adversely affect *R. exilis*, *R. infernalis*, *B. venyivi*, and *C. baronia*, and *C. madla*. All five of these species occur within the KRFs that intersect the project area; therefore, direct impacts to these species from the proposed project are likely. Although the proposed project has been designed to minimize impacts to the known occupied caves in the area, each of these species may still be encountered unexpectedly during construction. Excavation into bedrock for roadways, bridges and storm sewers will probably encounter underground caves and voids that are not evident at the surface. This encounter may kill listed species and cause harm by removing protective layers and exposing the cave to the surface environment, including the effects of sun, wind, rain and pollutants.

Additionally, the project may affect, but is not likely to adversely affect, critical habitat. Work in the right-of-way portion of the CHU 9 will be minimized and will include a porous concrete shared use path in instead of regular concrete. Construction would be avoided in the approximately 0.78-acre channel easement on CHU 9. The proposed project would add impervious cover to the watershed of the UTSA tributary to Leon Creek, which runs along the west side of CHU 9. The proposed project would include detention mitigation to maintain the rate and volume of runoff from the right-of-way to match existing conditions. Water discharging into CHU 9 from the right-of-way would be overtreated so that 100 percent of the impervious cover increase and 33 percent of the existing impervious cover would be treated. TSS produced from the existing conditions is 25,979 pounds per year, and the TSS produced by the proposed design is 17,415 pounds per year, which is a 33 percent reduction from existing conditions. In addition to the proposed reduction in TSS, the peak stormwater discharge rate and total discharge to CHU 9 would be maintained at current levels by rerouting stormwater flow from 2.8 acres that currently discharges into CHU 9, into an adjacent drainage that does not discharge into CHU 9. The stormwater reroute would offset impacts to CHU 9 that would have been caused by additional impervious cover within the project area. The project would also include hazardous materials controls that would mitigate any hazardous material spills on the roadway. TxDOT would complete consultation with the USFWS prior to construction to determine additional conservation measures for this species.

As discussed in the *Indirect Impacts Technical Report* (TxDOT 2020a), the areas of potential induced growth include approximately 1 acre of Karst Zone 1, 18 acres of Karst Zone 2, and 17 acres of Karst Zone 3. Additionally, the areas of potential redeveloped include approximately 2 acres of Karst Zone 1, 341 acres of Karst Zone 2, and 30 acres of Karst Zone 3. Due to potential significant excavation from induced development in these areas

within Karst Zones 1, 2, and 3, and the proximity of occupied caves, direct and indirect effects to *R. exilis*, *R. infernalis*, *B. venyivi*, *C. baronia*, and *C. madla* would likely occur.

### 3.1.3 Step 3 — Other Actions—Past, Present, and Reasonably Foreseeable—and Their Effect on Federally Listed Species

According to TxDOT’s 2019 guidance, the cumulative effects analysis should include “the full range of other actions, not just transportation projects” with a focus on activities “that are likely or probable, rather than merely possible” (TxDOT 2019; Federal Highway Administration 2003). An RSA that encompasses impacts to federally listed species was used to obtain information about past, present, and reasonably foreseeable future projects. Other actions, possible cumulative effects, and mitigating factors are also discussed in this section. Various published documents and plans were reviewed, and interviews and discussions with City of San Antonio and City of Live Oak staff members provided further information about other actions.

The past and present actions in the RSA are illustrated by 2019 land use data from the San Antonio River Authority (SARA). Approximately 44,574 acres of land in the RSA are estimated to be currently developed, representing approximately 58 percent of the RSA, and approximately 32,593 acres are estimated to be undeveloped, representing approximately 42 percent of the RSA. (See **Figure 2** in **Appendix A**.)

Additionally, one overarching trend that provides a backdrop for resource-specific analysis is population growth in the jurisdictions within the RSA. According to the decennial census, the population of the City of San Antonio increased approximately 15 percent between 2000 and 2010. Similarly, the population of Bexar County increased approximately 23 percent between 2000 and 2010 (U.S. Census Bureau 2000, 2010). The Alamo Area Metropolitan Planning Organization (AAMPO) develops future population and employment projections for a four-county area (Bexar, Comal, Guadalupe, and Kendall Counties). According to AAMPO (2018), projections for population and employment in Bexar County is expected to continue to see a high level of growth between 2015 and 2045 (**Table 2**).

**Table 2: 2015–2045 Projected Population and Employment Growth for Bexar County**

Bexar County	2015	2045	Percent Growth (2015–2045)
Population	1,898,173	3,004,011	58.3%
Employment	893,782	1,571,410	75.8%

Source: AAMPO (2018).

Given this information, Bexar County is expected to see a high rate of growth for both people and jobs coming to the area. Based on discussions with the City of San Antonio and the City of Live Oak, continued residential and commercial development is anticipated within the area. The City of San Antonio Development Services Department tracks site development permits and large developments in the City and the ETJ. In all, 451 Master Development Plans (MDP) have been submitted within the vicinity of the RSA. An MDP is a conceptual development plan that is submitted prior to the platting of a proposed project and represents the premise for future development. These types of projects are designed to be platted over multiple years. In addition to the MDPs, 230 preliminary plats and 326 recorded plats have been submitted in the area. These MDPs, preliminary plats, and recorded plats are listed in **Table B-1, Table B-2, and Table B-3** in **Appendix B**.

The RSA also encompasses other TxDOT projects, including I-10 from FM 3351 to La Cantera Parkway, Loop 1604 at FM 2696, and I-35 from I-410 S to FM 1103. The cumulative effect of all intersecting TxDOT projects are included in this analysis.

Additionally, as described in the *Indirect Impacts Technical Report* (TxDOT 2020a), the Planning Coordinator from the City San Antonio explained that the proposed improvements to Loop 1604 might also further influence development in the areas not already involved in the development process (i.e., areas without MDPs or plats), and growth and redevelopment could also be expected at the major interchanges along the project limits. The representative from the City of San Antonio specifically identified parcels within a half-mile buffer around the intersections of I-10 and Loop 1604 as well as US 281 and Loop 1604 as areas of potential induced growth from the proposed project. Additionally, the representative from the City of Live Oak specifically identified three parcels at the corner of Lookout Road and Loop 1604 that would be subject to induced growth from the proposed project.

Given the pattern of continued population and economic growth that has occurred in and around the project area, the numerous future developments planned within the vicinity of the RSA, and the potential for induced growth from the proposed project, a total of approximately 11,811 acres have likelihood to develop in the future and represent the reasonably foreseeable future actions within the RSA. (See **Figure 2** in **Appendix A**.)

In addition to the information gathered through databases, discussions, and interviews described above, online research was conducted to identify some of the transportation, land use, and conservation plans that have some overlap with the RSA. **Appendix C** includes maps of planned transportation projects and future land use plans from the Cities of San Antonio, Helotes, Shavano Park, Live Oak, Hill Country Village, Selma, and the Town of Hollywood Park. These plans indicate that the various municipalities along the project corridor are anticipating and planning for additional growth in the RSA in terms of infrastructure, capital improvements, zoning, and future land-use plans. These plans reflect

the community's goals and visions for the future and provide a visual reference for where the municipalities would apply their land development codes and subdivision development requirements, including environmental controls. In addition, maps are included that represent conservation actions undertaken by the Southern Edwards Plateau Habitat Conservation Plan (SEP-HCP) for aquifer habitat in Bexar County. Maps in **Appendix C** include:

- *City of San Antonio North Sector Plan*
- *SA Corridors Strategic Future Land Use Plan*
- *The City of Helotes Zoning Map*
- *The City of Shavano Park Zoning Map*
- *Town of Hollywood Park Zoning Map*
- *City of Hill Country Village Zoning Map*
- *The City of Live Oak's Future Land Use Plan*
- *The City of Live Oak's Business Enhancement Strategies*
- *City of Selma Zoning Map*
- *The Southern Edwards Plateau Habitat Conservation Plan (SEP-HCP)*

### **3.1.4 Step 4 – The Overall Effects of the Proposed Project Combined with Other Actions**

#### *3.1.4.1 Methodology*

A combination of planner interviews, cartographic analysis, technical expert research, and data collection was used to assess the overall effects of the proposed project combined with other actions on the federally listed species.

#### *3.1.4.2 Results*

As discussed above, the proposed project may affect and is likely to adversely affect *R. exilis*, *R. infernalis*, *B. venyivi*, *C. baronia*, and *C. madla* due to their high likelihood of occurrence in the project area. Effects associated with roadway and development projects could take the form of direct mortality or harm to individuals resulting from the disturbance, destruction, and removal of subsurface habitat by geotechnical borehole drilling, pier drilling, surface milling, grading, and excavation. Any of these activities may entirely or partially remove a subsurface void in bedrock that contains habitat for the species. In cases where voids are mostly intact, exposure of subsurface habitat can cause climate alteration such as temperature swings, desiccation, or flooding. Additionally, any surface disturbance of karst habitat, such as vegetation removal, may result in fragmentation of troglodene foraging areas, alterations in nutrient input and outflow, reduction in the carrying capacity of karst habitat, and the introduction of invasive species. Reasonably foreseeable projects

undertaken within the RSA would be subject to regulation under the ESA if it is anticipated that they would impact any federally listed species or their habitat. Urbanization and the addition of impervious cover resulting from development within the RSA could alter the surface and subsurface drainage regimes in karst habitat. Additionally, the increase in impervious cover creates the potential for the introduction of surface contaminants, including stormwater runoff, into caves and other connected features. The impacts of additional impervious cover by reasonably foreseeable projects within the Edwards Aquifer zones will be mitigated by compliance with the TCEQ Edwards Aquifer Rules, which places limits on impervious cover and requires stormwater BMPs.

The geographic RSA for federally listed species covers approximately 77,167 acres. Within that area, approximately 44,574 acres (approximately 58 percent) are estimated to be currently developed. Considering the reasonably foreseeable future developments, approximately 11,811 additional acres (approximately 15 percent) are estimated to develop in the future. Table 3 below provides a breakdown of this current and future development acreage by Karst Zone.

Table 3: Current and Future Development Acreage by Karst Zone					
	Karst Zone 1	Karst Zone 2	Karst Zone 3	Karst Zone 4	Karst Zone 5
Current Development (acres)	15,432	26,011	2,352	-	779
Future Development (acres)	6,892	13,153	676	-	61

Sources: Veni (2002); CMEC (2020).

While the exact type, location, timing, and density of future developments within the RSA area unknown at the time of this report preparation, when comparing the direct impacts of the construction of the proposed project and potential indirect induced growth impact as a result of the Loop 1604 project, the incremental effects from the proposed project to the species is negligible in the context of the overall cumulative effects of the past, present, and reasonably foreseeable future projects assessed in this document. Additionally the karst invertebrate habitat avoidance and impact minimization measures will lessen the direct effects from the proposed project on the species.

### 3.1.5 Step 5 – Mitigation of Cumulative Effects

*R. exilis*, *R. infernalis*, *B. venyivi*, *C. baronia*, and *C. madla* may be affected and are likely to be adversely affected by the proposed project because all five of these species occur within the KRFs that intersect the project area. Formal consultation will be completed with the USFWS to develop minimization and mitigation strategies to offset any potential effects to

these species. Voluntary conservation measures are often agreed upon as part of the consultation process and typically include stormwater BMPs to protect water quality, void encounter mitigation measures, and other similar measures. Voluntary conservation measures and any other USFWS requirements will be detailed in the Biological Opinion issued by USFWS at the end of the consultation process.

Projects moving forward as a result of induced growth from the proposed project, and present or reasonably foreseeable projects, would be subject to regulation under the ESA if it is anticipated that they would impact federally listed species, or their habitats significantly enough to be qualified as a *take* of the species. The ESA defines *take* as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct” (ESA 1973).

In 1997, the City of San Antonio initiated a Land Acquisition Program to protect and preserve the quality and quantity of water entering into Edwards Aquifer. To date, 9,140 acres of land have been preserved for this purpose, which includes land in the RSA such as the Government Canyon State Natural Area and surrounding properties (SAWS 2020). Land set aside in northern Bexar County for the protection of groundwater quality and federally listed karst invertebrates will indirectly benefit the species impacted by the proposed project and its cumulative effects. Water quality protections for the Edwards Aquifer will further benefit the species as they call for natural buffers around sensitive karst features and for water quality BMPs that improve the quality of water discharging from projects within the regulated zones. These existing protections would help to mitigate for future effects to the listed species.

## 3.2 GROUNDWATER

The majority of the information presented below derives from the *Groundwater Resources Technical Report* (TxDOT 2020b).

### 3.2.1 Step 1 – Resource Study Area, Conditions, and Trends

#### 3.2.1.1 Resource Study Area for Groundwater

The San Antonio segment of the Edwards Aquifer spans approximately 180 miles from Kinney County to Hays County. It is unique in its attributes and regulatory protection. Its groundwater is replenished by precipitation and streamflow losses (i.e., losing streams) on Edwards Group limestone outcrop. Most recharge to the aquifer occurs in the western counties and most discharge occurs from wells and springs in the eastern counties. Endangered species depend on springs in the eastern counties. Its karstic nature characterized by solution cavities and caves allows water levels to recover quickly with

rainfall, and makes the aquifer vulnerable to pollution. It is the principal source of water for the region.

The Recharge Zone (RZ) is where the highly fractured and solutioned Edwards Group limestone is exposed at the surface and infiltration occurs. Because much of the recharge to the aquifer occurs in the RZ, this zone is particularly vulnerable to pollution by overlying and upstream land use. The area upstream of the RZ is known as the Contributing Zone (CZ). Land use in the CZ can affect the quality of surface water that runs off the CZ and infiltrates into the RZ. The Transition Zone (TZ) is an area where Edwards limestone is partially protected by overlying rock layers but still vulnerable to pollutants.

The project coincides with the RZ in the Leon Creek, Olmos Creek and Salado Creek watersheds and the approximately 169,851-acre RSA includes the extents of the RZ, CZ and TZ within these watersheds (see **Figure 3** in **Appendix A**). The RSA includes approximately 68,000 acres of RZ and generally coincides with USGS drainage basin 9, which accounts for 10 percent of the average annual recharge to the aquifer. The RSA is the most urbanized portion of the aquifer.

The timeframe for this analysis begins at the onset of urban growth over the RZ in the RSA in the 1960s to the year 2045, which is the AAMPO's current planning horizon.

### 3.2.1.2 *Resource Conditions and Trends*

#### Groundwater Quality

The aquifer's water quality is excellent despite the existing level of development. However, there is concern over its long-term quality due to its vulnerability to pollution and continued urbanization of the RZ and CZ. There have been incidents of contamination of the aquifer where unacceptable levels of pollutants spread to nearby wells. Most of those incidents resulted from use of hazardous materials several decades ago before the development of regulatory programs in the mid-1970s.

According to the EAA, potential threats to Edwards Aquifer water quality include:

- transport and use of hazardous materials and other chemicals in the RZ,
- abandoned or poorly completed water wells,
- improperly installed or maintained septic systems and sewer lines, and
- urban nonpoint source runoff.

The EAA and predecessor agencies have monitored water quality for decades and a small number of pollutants have been found, typically at very low levels. These conditions are consistent with most major aquifers across the nation. Although data are insufficient to

confirm whether concentrations are increasing or decreasing, detections indicate that a variety of organic compounds have reached the aquifer from multiple sources. EAA reported that organic compounds were detected in 1.2 percent of the water samples.

### Groundwater Quantity

The City of San Antonio has historically depended heavily upon groundwater from the Edwards Aquifer. The Edwards Aquifer contains a tremendous volume of water with estimates ranging from 45 million acre feet to 173 million acre feet. To put this into perspective, it would take approximately 63 to 244 years to deplete these volumes at a pumping rate of 572,000 acre-feet per year, which is the annual cap.

The Sierra Club filed a lawsuit against the USFWS in 1991 citing negligence to provide the necessary protection required by the ESA. The lawsuit sought to require the USFWS to ensure minimum spring flows from the Edwards Aquifer at Comal and San Marcos springs to protect endangered species.

In 1993, U.S. District Court ruled in favor of the Sierra Club and ordered that spring flow be maintained and that the Texas State Legislature must put into place a regulatory system to limit withdrawals from the Edwards Aquifer. The legislature created the Edwards Aquifer Authority (EAA) to oversee management of the aquifer. In 2007, the Texas Legislature set the region's pumping cap at 572,000 acre-feet per year.

Unlike other aquifers, there is no right of capture in the Edwards Aquifer; the water rights to the allowable pumping have been established and are regulated and enforced by the Edwards Aquifer Authority (EAA). Establishment of the water rights has created a cap on the maximum amount that can be pumped in one year, and all water rights have been allocated. Therefore, cities that have depended upon the aquifer in the past have to consider alternatives such as acquiring another entity's water right or obtaining water elsewhere to serve growing needs. Cities are discouraged from stocking up on Edwards rights due to the limited quantity of water rights, market conditions, and pumping limitations enforced by the EAA during drought conditions referred to as Critical Period Management (CPM). CPM triggers require reductions in pumping if aquifer levels and spring flow volumes drop below certain thresholds. Under CPM, water rights cannot be fully utilized. Since these regulations went into effect the City of San Antonio public water utility, the San Antonio Water System (SAWS), has diversified its water sources for the future. As a result of legislation, a long and sustained growth trend in pumping from the aquifer that tracks back to the 1940s suddenly began to flatten in 1997 and has remained flat since.

### 3.2.2 Step 2 – Direct and Indirect Effects from the Proposed Project

The project involves the redevelopment of State-owned right-of-way to expand an existing highway. Direct effects of the project involve construction within a 1,535-acre project area which would disturb over 600 acres of land, excavate 1.1 million cubic yards of fill, soil, and rock including nine sensitive features, and ultimately add 198 acres of impervious cover to the RZ, 3 acres to the CZ and 35 acres to the portions of the TZ that drain to the RZ.<sup>3</sup>

#### Effects to Groundwater Quality

The proposed project would not directly affect groundwater because it is located 140 to 225 feet below ground. However, the near surface impacts enumerated above may indirectly affect underlying groundwater quality during construction through the erosion of disturbed soils and spills of construction related materials. After construction, the additional impervious cover would accumulate pollutants which may infiltrate to the underlying groundwater if the runoff is not treated.

The project would not generate sanitary waste; however, SAWS has sanitary sewer lines in the right-of-way and a Contractor Waste and Materials Management Plan (CWMP) would be implemented to prevent spills of sanitary waste and hazardous materials. At a minimum, 80 percent of the net increase in total suspended solids (TSS) that drain to the RZ would be removed by BMPs. The installation of BMPs that use media filtration or detention would be outfitted with valves to increase the spill control capacity of the facility. Nine sensitive features, primarily solution cavities located at the base of roadcuts adjacent to the main lanes would be removed by the project. This would prevent any future spills from entering them. Due to the water treatment and spill containment BMPs the project would not be expected to adversely impact water quality.

#### Effects to Groundwater Quantity

The project's effects to groundwater quantity would be negligible. The project would not affect rainfall or pumping from the Edwards Aquifer, which are the dominant controls over water quantity. Nine sensitive features, primarily solution cavities located at the base of roadcuts adjacent to the main lanes would be removed by the project. They have generally small drainage areas and any runoff that entered these features would be diverted to other pervious areas. Nine different sensitive features with large drainage areas that are located in streams would be avoided by the project. Adding 198 acres of impervious cover to the RZ would divert an insignificant quantity (approximately 0.16 percent) of potential recharge

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<sup>3</sup> Some of these values are for the entire project which extends beyond the RSA and Edwards Aquifer regulatory zones.

water as runoff to BMPs for treatment before being released to unpaved streambeds in the RZ where recharge may occur.

### **3.2.3 Step 3 – Other Actions—Past, Present, and Reasonably Foreseeable—and Their Effect on Water Resources**

#### Past and Present Actions Effects to Groundwater Quality

Although the RSA was sparsely developed in the 1960s, reports from the USGS expressed growing concern over the presence of sanitary waste in this area and its potential effect on groundwater quality. Most homes and businesses on the RZ were on septic systems. Many of the homes in small cities (Hill Country Village, Hollywood Park, Shavano Park, Helotes) on the RZ remain on septic systems in 2020. The influence of sanitary wastes is evident in water samples tested for pharmaceuticals and personal care products.

The past and present actions include approximately 97,252 acres of existing development; thus, approximately 57 percent of the RSA is already developed. This includes the 1,535-acre Loop 1604 project area because it is an existing facility. Loop 1604 was a two-lane road until it was expanded to its main lane and frontage road configuration in the 1980s and 1990s. The existing development includes residential, commercial, conservation, military, and institutional lands. Industrial activity other than aggregate mining is minor. See **Figure 4** in **Appendix A**.

The impervious cover on these developments accumulates pollutants which may infiltrate to the underlying groundwater if the runoff is not treated. Many of these developments were constructed before 1999 and may not be subject to TSS removal requirements until they are redeveloped.

Reports from the 1960s documented discoveries of bacteria in wells on or near the RZ and expressed concern about sanitary waste practices in this sensitive area. Most of these bacterial issues were isolated to single wells that were in poor condition and allowed surface pollutants to enter them. There have been incidents of contamination of the aquifer where unacceptable levels of pollutants spread to nearby wells, including these in the RSA:

- Tetrachloroethylene (PCE) released from a former landfill in Castle Hills (1982). PCE is by far the most commonly detected organic pollutant in the aquifer.
- Gasoline released from gas station in northern San Antonio (1982).
- Combustion leachate from a mulch fire in Helotes (2006).

Incidents have occurred elsewhere in the San Antonio area and in Uvalde. Most of the incidents involved hazardous materials and occurred before the development of regulatory programs in the mid-1970s and some incidents were followed by rule changes. Factors

contributing to these incidents included improper disposal, fire, and wells that were abandoned or in poor condition.

The TCEQ adopted increasingly strict regulations (30 TAC 213) specifically to protect the quality of the Edwards Aquifer in 1985, 1989 and 1999. The protection is provided by land use restrictions, requirements for TSS removal, special design and inspection of sewage collection systems (SCS), and special regulations for underground storage tanks (USTs). The EAA banned installation of new USTs in the RZ in 2002. These regulations provide substantial water quality protection although there are critics in witness of ongoing development who believe that TCEQs regulations are inadequate. The TCEQ adopted its regulations as a proactive step towards the protection of the resource and has the authority to revise these regulations as they have done in the past

The present water quality reflects past and present actions. The EAA has been monitoring water quality for decades. Historical data are characterized by occasional detections of a small number of organic compounds, a small fraction of which occur in concentrations that exceed protective concentration levels. Overall, the aquifer produces high quality water suitable for almost any purpose and the vast majority of the aquifer appears to be unimpaired.

#### Past and Present Actions Effects to Groundwater Quantity

The substantial litigation and regulatory actions during the 1990s and 2000s greatly enhanced the stability of the Edwards Aquifer to maintain spring flows.

#### Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions include approximately 21,078 acres of future development in the RSA (see **Figure 4** in **Appendix A**). The future development will include residential and commercial land uses that are expected to be constructed by 2045. In all, 451 MDPs have been submitted within the vicinity of the RSA. In addition to the MDPs, 230 preliminary plats and 326 recorded plats have been submitted in the area. These MDPs, preliminary plats, and recorded plats are listed in **Table B-1**, **Table B-2**, and **Table B-3** in **Appendix B**.

#### Future Actions Effects to Groundwater Quality

Future actions would involve activities and attributes similar to existing developments with regard to construction phase disturbances (soil disturbance, excavation, construction-related spills), operation, and maintenance (water, wastewater, landscaping) depending upon the specific land use.

Future actions are expected to include dry cleaners and gasoline stations except in the RZ where new USTs are prohibited. These land uses are documented to cause contamination of

the aquifer and are considered threats. Although the TCEQs Edwards Rules do not address dry cleaners, there are other regulations regarding handling the chemicals they use. Although there will be persistent threats any time and place that sanitary waste and hazardous materials are present, their expected presence is not sufficient to conclude they will cause adverse effects especially since standards have improved with time.

A notable difference between existing and future development is that all of the future development would be subject to the current TCEQ regulations, including requirements for TSS removal and special design and inspection of sewage collection systems. Future actions are not expected to adversely impact the quality of the groundwater.

#### Future Actions Effect to Groundwater Quantity

Future actions would not affect rainfall or pumping from the Edwards Aquifer which are the dominant controls over water quantity. Although future actions such as residential and commercial land uses would require long term sources of potable water, this demand would not be met through increased pumping of the Edwards Aquifer because pumping from this aquifer is capped. Regardless of how much the region grows in the future, overall pumping from the Edwards Aquifer cannot increase under existing regulations.

For the new developments located in the RZ portion of the RSA, it is expected that rainfall on the new impervious cover would runoff (with treatment as required) to pervious portions of the RZ where infiltration and recharge would occur. Similarly, impervious cover in the CZ may increase runoff available for infiltration (i.e., recharge) into losing streams in the RZ. The future actions are not expected to adversely impact the quantity of groundwater.

### **3.2.4 Step 4 – The Overall Effects of the Proposed Project Combined with Other Actions**

The effects of the proposed project, past and present actions, and future actions add up to approximately 118,330 acres of development within the RSA by 2045. Thus, approximately 70 percent of the RSA would be developed in 2045. The remaining 30 percent of the RSA is undeveloped land which includes areas that may still be developed in the future, and areas are not developable such as parks and conservation land, such as the Government Canyon State Natural Area. Additionally, Camp Bullis military installation is expected to remain substantially undeveloped to support its mission.

#### Groundwater Quantity

No adverse cumulative effects to the quantity of water in the Edwards Aquifer are expected due to the substantial regulations that are in place to manage it. Actions in the RSA would have negligible effects on rainfall and Edwards Aquifer pumping which are the dominant factors affecting the volume of water in the aquifer. Although it is commonly stated that

groundwater recharge is reduced with urbanization because of the increase in impervious cover, the reverse is the more common condition – urbanization increases groundwater recharge. This effect is partially due to increased runoff from impervious cover flowing into losing streams where recharge occurs. In addition, urbanization adds artificial recharge from leaking water mains, sewers, storm drains, detention ponds and irrigation return flows from overwatering. Recharge generally increases within urban areas.

### Groundwater Quality

No adverse cumulative effects to the quality of water in the Edwards Aquifer are expected. The development that existed in the RSA before 1999 was not subject to many of the protection regulations that exist today, including the TCEQ's requirements for TSS removal, special design and inspection of sewage collection systems, and EAA's prohibitions on USTs in the RZ. Despite the existing level of development that covers 57% of the RSA, some of which dates to the 1960's, the aquifer produces high quality water.

The proposed project and future actions would increase the development in the RSA by approximately 13 percent. Approximately 70 percent of the RSA is expected to be developed by 2045. Unlike the existing development, all future development, and any redevelopment, would be subject to the current TCEQ regulations.

### **3.2.5 Step 5 – Mitigation of Cumulative Effects**

Mitigation activities for direct impacts would be implemented with the proposed action. These include voluntary measures and regulatory requirements including:

- implementing a Contractor Waste and Materials Management Plan to prevent spills of sanitary waste and hazardous materials,
- expanding the spill containment capacity of the facility,
- complying with the TCEQ's Construction General Permit (CGP) to prevent pollution during construction, and
- complying with the TCEQ's Edwards Aquifer Rules including the requirements of a Water Pollution Abatement Plan (WPAP) to control pollutants during both the construction and post-construction phases.

The regulations of several agencies protect and maintain water resources in the project area including the EAA, TCEQ, EPA, and USACE. Compliance with these regulations would minimize the cumulative effects of the proposed project and future actions. The degree of protection afforded is dependent upon the degree of compliance with these regulatory programs. Actions that promote compliance with these regulations would help minimize cumulative impacts. Continued water quality monitoring by agencies such as the EAA is

important to recognize trends and inform water quality regulators of the status of the resource and identify the need, if any for revisions to environmental protection requirements.

## **4.0 CONCLUSIONS**

This analysis considered federally listed species and water resources, identified specific RSA boundaries and appropriate temporal boundaries for the analysis, and discussed the health of these resources and relevant trends. Direct and potential indirect impacts were summarized for each sensitive resource. Past, present, and reasonably foreseeable future actions were identified through research, interviews, and cartographic analysis. The construction of the proposed project was considered in conjunction with these other actions to consider cumulative impacts. This analysis provided detailed information about sensitive resources within the RSAs for the Loop 1604 project and described the regulatory controls that have evolved over time to help protect these resources.

### **4.1 FEDERALLY LISTED SPECIES**

Minimization of impacts to sensitive resources would be coordinated through the USFWS and achieved through specific design measures and BMPs implemented for the proposed project, and similar requirements would be applicable to developers throughout a large portion of the RSA, especially where construction is proposed over the RZ of the Edwards Aquifer. The Edwards Aquifer rules helping mitigate impacts over all the zones in the RSA, including RZ, CZ, and TZ, but the rules are most stringent in the RZ. Mitigation measures are required for impacts to endangered species habitat, and the Southern Edwards Plateau Habitat Conservation Plan provides a framework in which some projects can comply with the ESA. The larger municipalities with jurisdiction within the RSA all have land-development code requirements and plans for their future land use and transportation networks that generally reflect a common commitment to sustainable development. The conservation entities charged with protecting endangered species and sensitive resources have plans in place to continue to protect sensitive habitats.

Direct impacts that would be caused by the proposed project would be limited in part by the implementation of extensive BMPs before, during, and after construction. Given the contribution the proposed project would make toward induced development in the AOI, within the context of the continuing development trends, the proposed project may result in adverse indirect impacts to sensitive karst invertebrate species. The proposed project may incrementally contribute to cumulative effects on threatened and endangered species. However, project impacts would not act as a tipping point to significantly affect the overall health of these resources due to the avoidance, minimization, and mitigation measures that

TxDOT is proposing in coordination with the USFWS. While the project could result in take of individuals of listed species and result in the destruction of karst features containing habitat for federally listed species, the proposed mitigation measures and combination of state, federal, and local regulations will mitigate many of the impacts of the project and any induced growth that occurs as a result of the project. The project is unlikely to jeopardize the continued existence of any listed karst invertebrate species.

## 4.2 GROUNDWATER

The proposed project involves the redevelopment of approximately 1,550 acres out of 118,330 acres of development that is expected to be present in the RSA by 2045. The project's contribution to the cumulative effects is approximately 1.3 percent. No adverse cumulative impacts to Edwards Aquifer groundwater quantity or quality are expected based on the current conditions, trends, and regulatory control over the RSA.

## 5.0 REFERENCES

Alamo Area Metropolitan Planning Organization (AAMPO). 2018. Traffic Analysis Zone—with MPO-related layers (2015, 2025, 2035, 2045) UPDATED.

<http://www.alamoareampo.org/TDM/data.html>.

Bexar County Appraisal District (BCAD). 2018. GIS Public Data.

City of Helotes. 2009. Master Plan for the City of Helotes, Texas. [https://www.helotes-tx.gov/assets/uploads/general/Master\\_Plan\\_1.pdf](https://www.helotes-tx.gov/assets/uploads/general/Master_Plan_1.pdf).

City of Live Oak. 2019. Comprehensive Plan 2022.

<https://www.liveoaktx.net/departments/planning-and-zoning-commission/city-comprehensive-plan#city-comprehensive-plan>.

City of San Antonio. 2010. Sector Plans—North Sector.

<https://www.sanantonio.gov/Portals/0/Files/Planning/NPUD/NorthSectorPlan2010.pdf>.

City of San Antonio. 2019. SA Corridors Strategic Framework Plan.

<https://www.sanantonio.gov/Portals/0/Files/Planning/Resources/SACorridors/StrategicFrameworkPlan.pdf>.

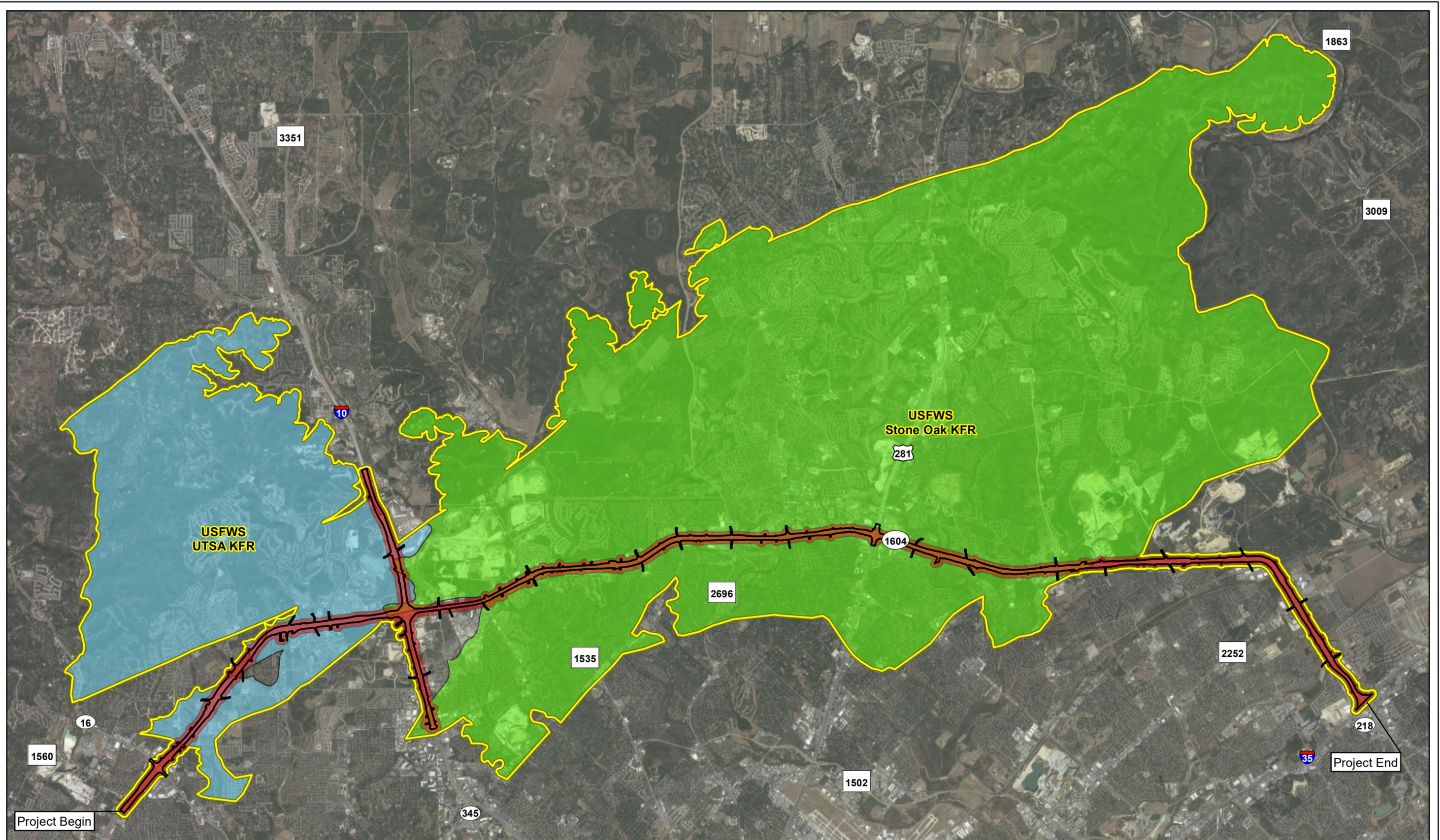
City of Shavano Park. 2018. Town Plan.

<http://cms.revize.com/revize/shavanopark/Town%20Projects/181127%20-%20Town%20Plan%202018%20FINAL%20FINAL.pdf>.

- Council on Environmental Quality. 40 Code of Federal Regulations (CFR) Part 1508.  
[https://ceq.doe.gov/ceq\\_regulations/regulations.html](https://ceq.doe.gov/ceq_regulations/regulations.html).
- Endangered Species Act. 1973. ESA; Title 16 United State Code, 1531–1544.
- Federal Highway Administration. 2003. *FHWA Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process*.  
<https://www.environment.fhwa.dot.gov/guidebook/qaimpact.asp>. Accessed February 2020.
- Matthews, C. 2020. Report for Archeological Survey: CSJs: 2452-02-083, 2452-03-113, 2452-03-087; Loop 1604 from SH 16 to I-35, Bexar County, San Antonio District; Antiquities Permit No. 9294.
- San Antonio River Authority (SARA). 2019. Bexar Current Land Use. <http://exploresara-sara-tx.opendata.arcgis.com/datasets/bexar-current-land-use-2017>.
- San Antonio Water System (SAWS). 2020. Land Acquisition Program.  
[https://www.saws.org/protecting-our-environment/water-resource-compliance-protection/aquifer\\_protection/acquisition/](https://www.saws.org/protecting-our-environment/water-resource-compliance-protection/aquifer_protection/acquisition/)
- Texas Department of Transportation (TxDOT). 2020a. Indirect Impacts Technical Report. Loop 1604 from I-35 to SH 16.
- TxDOT. 2020b. Groundwater Resources Technical Report. Loop 1604 from I-35 to SH 16.
- Texas Department of Transportation, Environmental Affairs Division (TxDOT ENV). 2014. Risk Assessment for Cumulative Impacts. <http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/720-02-ra.docx>.
- TxDOT ENV. 2019. Cumulative Impacts Analysis Guidelines.  
<http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/720-03-gui.pdf>.
- Texas Historical Commission (THC). 2020. Texas Archeological Sites Atlas Data Sets. Texas Historical Commission and the Texas Archeological Research Laboratory.  
<http://nueces.thc.state.tx.us>.
- U.S. Census Bureau. 2000. 2000 Census Summary File 1. Total Population.
- U.S. Census Bureau. 2010. 2010 Census Summary File 1. Total Population.
- United States Fish and Wildlife Service (USFWS). 2000. Endangered and threatened wildlife and plants; final rule to list nine Bexar County, Texas invertebrate species as endangered. Federal Register Vol. 65, No. 248: 81419-81433.

- USFWS. 2011. Bexar County Karst Invertebrate Recovery Plan. U. S. Fish and Wildlife Service, Albuquerque, New Mexico. August 2011. 167 pp.
- USFWS. 2012. Endangered and threatened wildlife and plants; designation of critical habitat for nine Bexar County, TX invertebrates. Federal Register Vol. 77, No. 30: 8450-8523.
- USFWS. 2019. Madla Cave Meshweaver (*Cicurina madla*) 5-year Review: Summary and Evaluation. U. S. Fish and Wildlife Service, Austin, Texas. September 2019. 41 pp.
- Veni, George. 1994. Geologic controls on cave development and the distribution of endemic cave fauna in the San Antonio, Texas, region. Report for Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service, Austin, Texas, George Veni and Associates, San Antonio, Texas, 99 pp.
- Veni, George. 2002. Delineation of Hydrogeologic Areas and Zones for the Management and Recovery of Endangered Karst Invertebrate Species in Bexar County, Texas. Prepared for U.S. Fish and Wildlife Service, Austin, Texas, George Veni and Associates, San Antonio, Texas, 75 pp.

## Appendix A: Figures



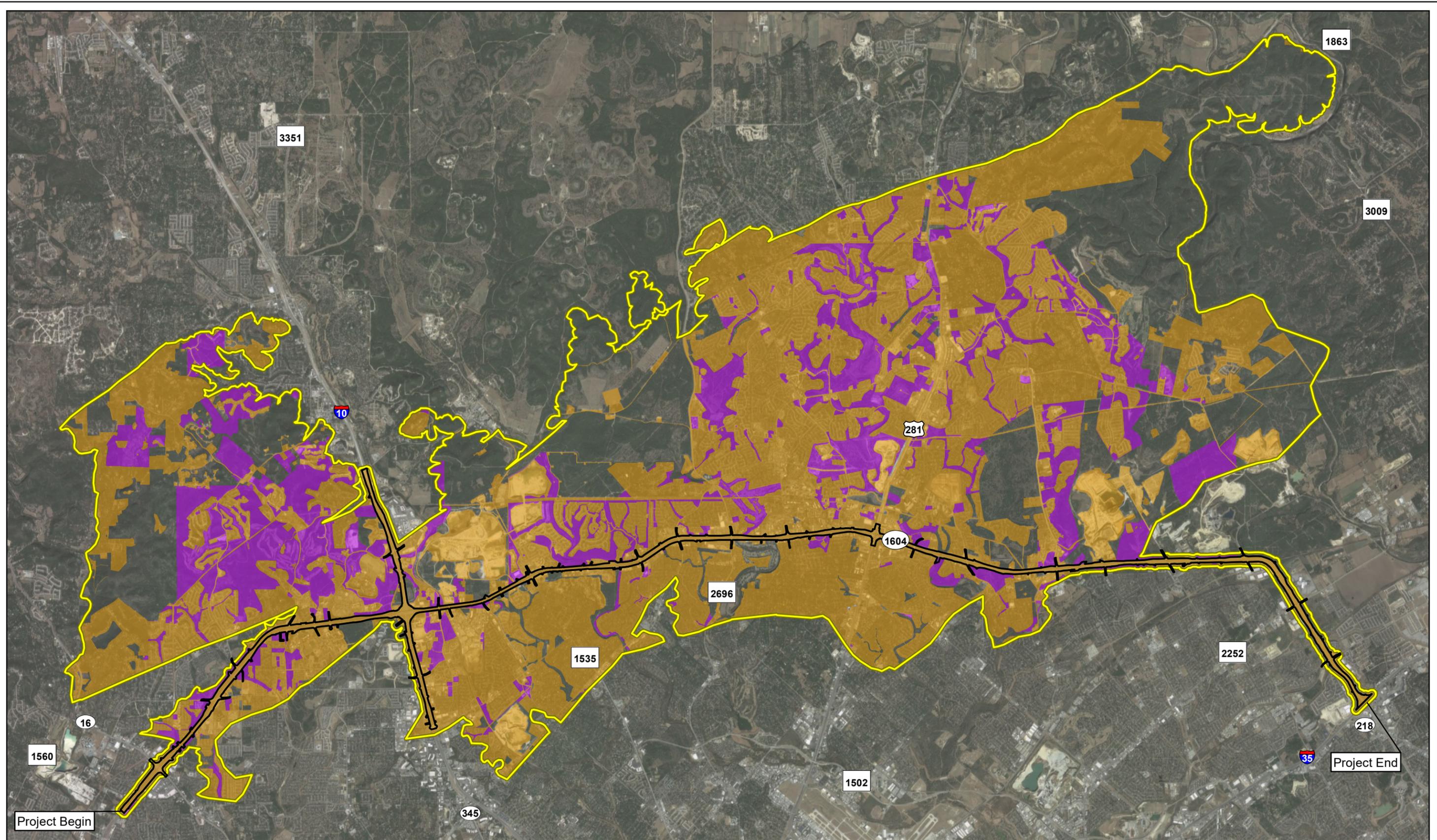
**Figure 1. Resource Study Area (RSA) for Federally Listed Species**

Loop 1604: SH 16 to I-35

- |                                  |                                   |  |
|----------------------------------|-----------------------------------|--|
| Project Location                 | <b>RSA Components</b>             | USFWS Stone Oak Karst Fauna Region (KFR) |
| RSA for Federally Listed Species | Biological Assessment Action Area | USFWS UTSA Karst Fauna Region (KFR)      |

Data Sources:  
USFWS (2019), Zara (2019)  
Aerial Source: Google (2018)

	CSJs: 2452-02-083, 2452-03-113, 2452-03-087, 0072-08-144	
	0 1.5 Miles 1 in = 1.5 miles	Scale: 1:95,040
	0 2 Kilometers	Date: 7/8/2020

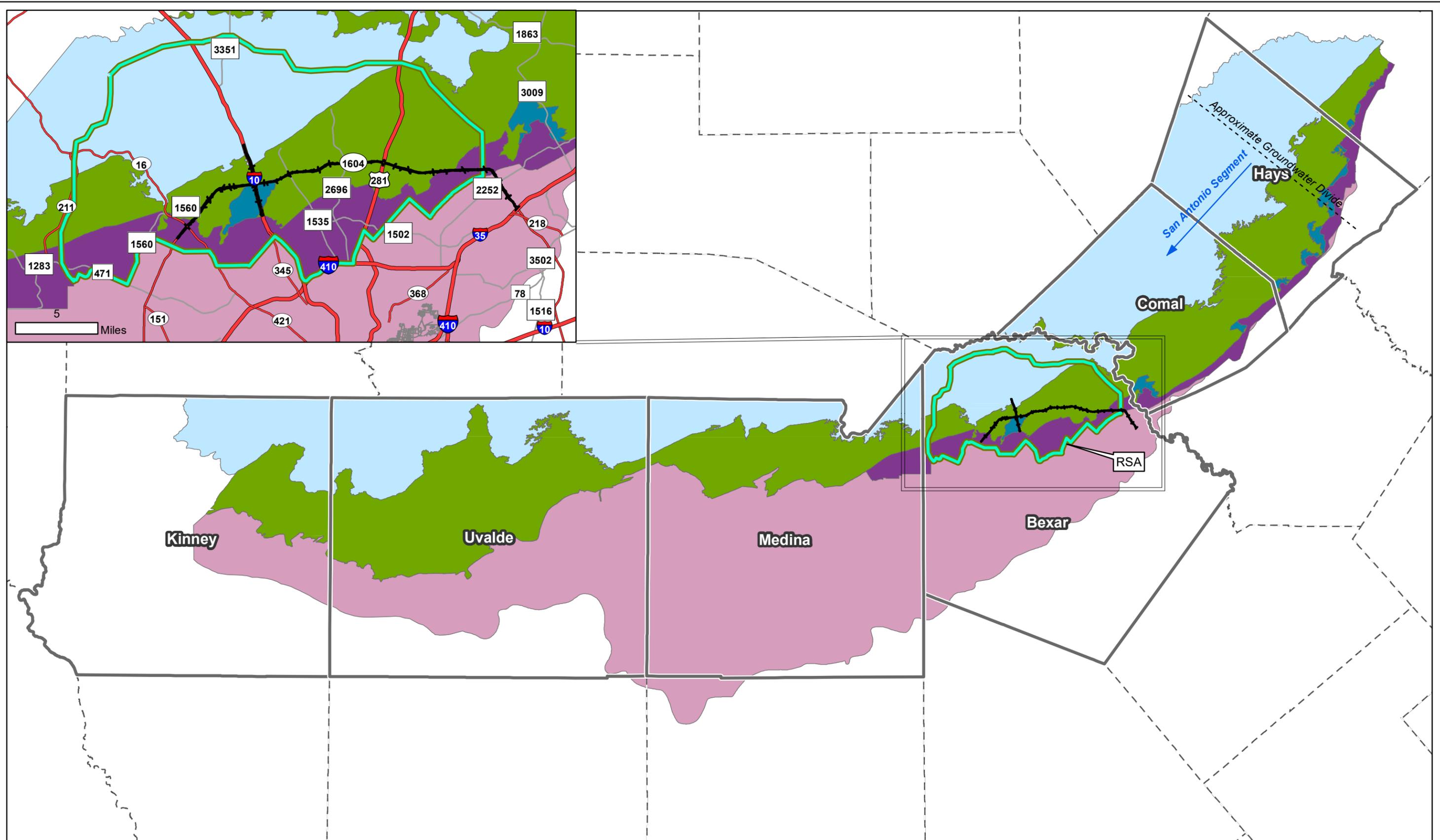


**Figure 2. Past, Present, and Reasonably Foreseeable Future Actions in the RSA for Federally Listed Species**

Loop 1604: SH 16 to I-35

- Project Location
- RSA for Federally Listed Species
- Current Development
- Future Development

	CSJs: 2452-02-083, 2452-03-113, 2452-03-087, 0072-08-144	
0      1.5 Miles      1 in = 1.5 miles 0      2 Kilometers      Scale: 1:95,040 Date: 7/8/2020		



**Figure 3. Resource Study Area (RSA) for Groundwater**

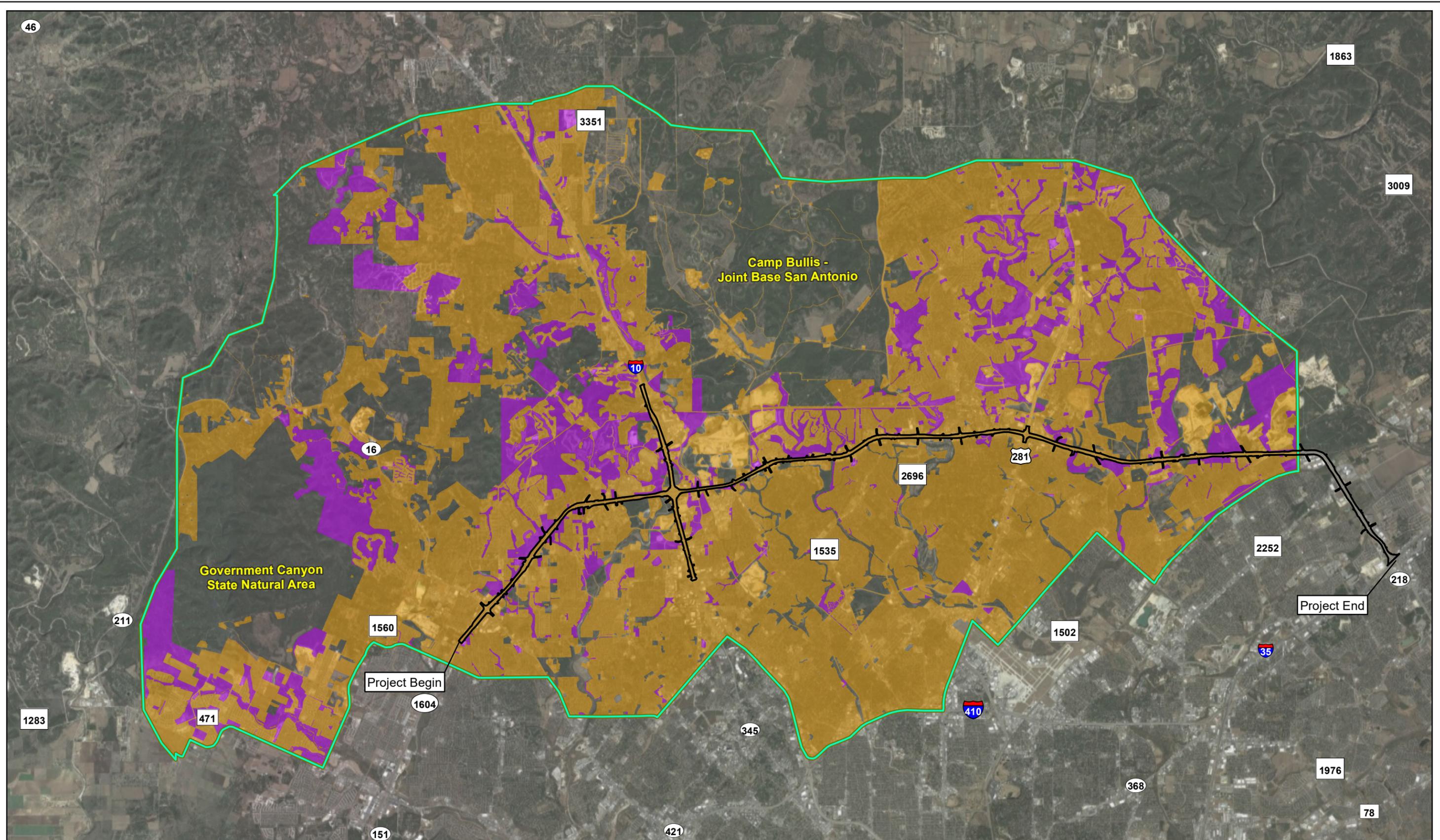
Loop 1604: SH 16 to I-35

-  Project Location
-  RSA for Groundwater
-  Counties
-  Edwards Aquifer Contributing
-  Edwards Aquifer Contributing Zone within the Transition Zone
-  Edwards Aquifer Recharge
-  Edwards Aquifer Transition
-  Edwards Aquifer Artesian

CSJs: 2452-02-083, 2452-03-113, 2452-03-087, 0072-08-144

0 12 Miles 1 in = 12 miles  
0 15 Kilometers Scale: 1:760,320  
Date: 7/8/2020

Data Sources: SWCA (2020), TCEQ (2005)



**Figure 4. Past, Present, and Reasonably Foreseeable Future Actions in the RSA for Groundwater**

Loop 1604: SH 16 to I-35

- Project Location
- Current Development
- RSA for Groundwater
- Future Development

Data Sources:  
 COSA (2020), SARA (2019)  
 Aerial Source: Google (2018)

	CSJs: 2452-02-083, 2452-03-113, 2452-03-087, 0072-08-144	
	0 2 Miles 0 2.5 Kilometers	1 in = 2 miles Scale: 1:126,720 Date: 7/8/2020

## Appendix B: Future Developments

**Table B-1: Master Development Plans (MDPs)**

Date Accepted	Engineer	Developer	TotalAcres	Completed
3/4/2005	MW Cude	Armadillo Construct	112.701403	No
5/19/2011	Briones	HJ Enterprises LP	70.419237	No
3/29/2005	MBC Engineers	DF Land Co. LP	4.001591	No
10/11/1996	BROWN ENGINEERING	ENCINO PARK J.V.	74.587687	No
6/20/2007	Moy Civil Engineers	Zuniga Dev Inc	166.280343	No
2/26/1996	ACES	JOE-ELI, LTD	123.026529	No
8/23/1994	Pape Dawson	Camp Bullis Ltd	42.865768	No
5/29/1998	PAPE-DAWSON ENGINEER	SUMMERLIN PROPERTIES	360.242288	No
4/8/2003	PAPE-DAWSON ENGINEER	SHAVANO-ROGERS RANCH	1596.140431	No
7/12/1996	Brown	HRS Partnership	28.168311	No
2/6/2009	Matkin Hoover	Anaqua Springs Ranch	179.618956	No
8/24/1999	Dixie Watkins	Alamo Cement	3116.478267	No
2/6/2009	Pape Dawson	Sivage Investments	329.376263	No
11/9/2016	KFW ENGINEERS	KB HOME	140.711658	No
5/15/1992	MBC	Deerfield Land Ltd	67.796241	No
12/7/2005	Pape Dawson	LARRY IRVIN	176.528729	No
10/9/2012	MW CUDE	AZTX PROPERTIES LTD	446.844794	No
11/14/1996	PAPE-DAWSON ENGINEER	BRAD GALO	1416.344933	No
8/13/2014	Pape Dawson	ONE KR VENTURE	1507.228267	No
11/16/2011	Pape Dawson	HELOTES 150, LTD	150.782763	No
11/13/1984	VICKREY & ASSOC.	SRC, INC.	1844.529369	No
6/4/2008	M.W. Cude Engineers	Richland Properties	405.960515	No
7/28/2000	FISHER ENGINEERING	ROBERT D. TIPS	114.568459	No
11/19/2002	PAPE-DAWSON ENGINEER	LYNX DEV. GROUP	51.864338	No
6/8/1998	Pape Dawson	SIXTEEN-0-FOUR 100	69.923695	No
4/3/1996	W.F. CASTELLA	Aspen Homes	29.409607	No
5/22/2012	Pape Dawson	DR Horton	149.936044	No
1/20/1995	VICKREY & ASSOC, INC	UMBELL INC.	305.439264	No
11/22/1993	Vickery & Assoc	Arcadia Realty Corp	33.432138	No
10/3/2001	PAPE-DAWSON ENGINEER	IRON HORSE LIMITED	1228.791858	No
10/18/2016	COURSEN-KOEHLER	BABCOCK RD 165, LTD	166.280429	No
8/13/2013	COURSEN-KOEHLER	CAPITAL FORESIGHT LP	14.636036	No
7/7/1995	W.F. CASTELLA	Entex Construction	25.602988	No
7/22/2014	CUDE ENGINEERS	FAIR OAKS MOSAIC TBY	29.68734	No
2/11/2000	MBC	Lancaster Dev Co	90.96464	No
3/17/1995	MBC	Vise NW LC	22.095238	No
8/20/2012	COURSEN-KOEHLER ENG	Green Land Ventures	184.024766	No
11/4/2009	Pape Dawson	Woodside Home	92.06884	No
2/24/1997	KAUFMAN BROAD	NONE IDENTIFIED	259.051878	No
7/13/2000	PAPE-DAWSON ENGINEER	GARRETT BROTHERS	164.465982	No
5/21/2004	Pape Dawson	Laredo 281 Ltd	116.998217	No
5/11/2006	Pape Dawson	Trey Marsh	129.889311	No
3/26/2012	Pape Dawson	Laredo OFR Ltd	176.568996	No
5/23/2000	Brown Engineering	Corner of the Market	77.484364	No
8/14/2014	KFW ENGINEERS	H.T. STONE OAK L.P	114.585908	No

12/20/1996	Pape Dawson	Denton Development	601.072601	No
11/9/2015	PAPE-DAWSON ENGINEER	ALLEN ANDREW HOLDING	516.254068	No
9/20/2005	MW Cude	Michael Buchmeier	104.960928	No
1/9/2004	Moy Civil Eng	Continental Homes	93.231613	No
5/16/1984	M.W. CUDE & ASSOC	JOHN CAMPBEL & ASSOC	112.595779	No
8/14/2017	MBC	ARQUITECTO MISSION	265.013754	No
2/7/2007	Vickery & Assoc	KB HOME LONE STAR	206.304555	No
8/29/2005	PAPE-DAWSON ENGINEER	ONE KR VENTURE, LP.	1610.688942	No
5/20/2014	M.W. CUDE ENGINEERS	LDK REALTY INVEST	17.649328	No
10/1/2010	ACES	LDR LTD JOINT VENTUR	263.922979	No
10/31/1997	Ruiz & Assoc	Koonte/McCombs LLC	45.403503	No
7/24/2012	MBC	CROSSWINDS I PARTNER	229.08335	No
10/25/2007	Briones	HJ Enterprises LP	70.419295	No
7/23/2013	PAPE-DAWSON ENGINEER	SHAVANO-ROGERS RANCH	1839.698402	No
9/17/2014	PAPE-DAWSON ENGINEER	RICK PIERCE	78.076157	No
9/4/2014	PAPE-DAWSON ENGINEER	GALLERIA VENTURES	268.667753	No
7/9/1999	PAPE-DAWSON ENGINEER	281 CANYON PARTNERS	521.490536	No
1/23/1998	Harry Jewitt Assoc	Alfred Rodriguez	10.588801	No
6/6/2011	Pape Dawson	Steubing Ran Lim Pt	384.431943	No
7/26/1996	Brown	River City Assoc	72.77702	No
12/23/1994	Pape Dawson	Gillfield Devlop	87.650618	No
7/12/1996	Brown	Schoenfeld Materials	45.689234	No
12/19/2005	ACES	Loyd Denton	52.654655	No
1/13/1986	Albert Fernandez	Uptmore	336.553974	No
11/21/1997	Sunbelt Engineers	United Western Dev	50.971207	No
1/20/1995	MW Cude	Lincoln Park Ltd	69.066916	No
2/10/1998	ACES	J McCulloch III	506.030386	No
10/20/2010	MTR ENGINEERS	Borgfeld Partners	189.433905	No
9/28/2004	PAPE-DAWSON ENGINEER	GARRETT BROTHERS	164.46592	No
6/18/2001	Pape Dawson	Bitterblue Inc	1179.135118	No
9/9/2005	CARTER BURGESS	JSL DEVELOPMENT CO.	675.655578	No
2/28/2001	Pape Dawson	Laredo Sonoma	633.211434	No
3/15/1985	MBC	SITTERLE & CO.	118.475964	No
6/17/2005	M.W. CUDE ENGINEER	Centex Real Estate	129.06413	No
11/13/2014	PAPE-DAWSON ENGINEER	SHANNON LIVINGSTON	732.090503	No
3/11/2010	ACES	Newton Bulverede Ltd	30.224687	No
11/8/1991	CDS	Allen Bass	16.074955	No
8/26/1996	DIXIE WATKINS III	LLOYD A DENTON JR	1783.337094	No
9/6/1996	VICKREY & ASSOC, INC	KMA PROPERTIES	153.857765	No
8/19/2008	Carter & Burges	BP Hwy 10 SA Ltd	414.307227	No
5/23/2000	GRAY-JANSING & ASSOC	Thomas Dreiss	1321.927547	No
10/30/2012	MBC Engineers	TUSCAN OAKS, SA, LTD	112.768601	No
8/22/2005	Sherfey Engineering	VMH Developers	27.288679	No
1/20/2004	Pape Dawson	DENTON DEVELOPMENT	860.262785	No
3/28/2011	MATKIN HOOVER	ANAQUA SPRINGS RANCH	929.079721	No
5/25/1993	Vickery & Assoc	Cencor Realty	123.43776	No
8/13/2014	KFW ENGINEERING	SHAGGY DEVELOPMENT	521.744273	No

10/7/1994	Cude	Richland Properties	275.833794	No
12/10/2010	Moy Civil Engineers	Green Land Ventures	184.022901	No
1/23/1984	WENDALL DAVIS	DENTON DEVELOPMENT	2346.458632	No
11/14/2003	PAPE-DAWSON ENGINEER	HAUSMAN BANDERA PART	69.554928	No
10/24/2004	PAPE-DAWSON ENGINEER	CHAMPIONS EQUESTRIAN	516.01639	No
11/1/1987	SEDA CONSULTING ENGI	NONE IDENTIFIED	6004.501411	No
4/16/2001	Brown	Kaufman & Broad	136.177781	No
1/13/2014	JONES & CARTER, INC	SOUTHERLAND PALMIRA	334.858605	No
12/2/2003	MBC	LONGOVER LLC.	191.363064	No
11/8/1985	SEDA ENGINEERS INC	BANDERA 163 JNT VENT	351.886954	No
7/16/2012	Pape Dawson	Intco Dominion	160.720173	No
10/20/2014	PAPE-DAWSON ENGINEER	SLF IV/LEGACY NWSA	235.532568	No
6/2/2000	PAPE-DAWSON ENGINEER	F.C.S. FISCHER, LTD	61.313306	No
5/5/1993	HALLENBERGER ENG.	JERBO SAN ANN, LTD	527.062375	No
11/29/2000	W.F. CASTELLA	Gordon Hartman	34.175988	No
11/7/1985	Rosin, Kroesche Eng.	Wilson Dev. Corp.	80.879058	No
6/4/1996	PAPE-DAWSON ENGINEER	DENTON DEVELOPMENT	442.693261	No
7/19/2005	BRIONES CONSULTING	HUNTLEIGH PARK INC	83.0438	No
6/29/1983	PAPE-DAWSON ENGINEER	DOMINION VILLAGE	1253.283565	No
8/21/2000	Brown	Pulte Homes	27.298917	No
10/14/1994	MBC	Cinco Encinos LC	23.76992	No
12/5/2013	PAPE-DAWSON ENGINEER	FORESTAR REAL ESTATE	2904.522884	No
3/6/1995	ACES	SENDERO RANCH LTD	639.492631	No
5/21/2012	MTR Engineers	Pecan Creek Parkway	218.441082	No
12/2/2003	M.W. CUDE ENGINEER	Centex Real Estate	129.06354	No
1/9/2009	JONES & CARTER, INC	PETROS DEVELOPMENT	334.857977	No
3/13/2005	DENHAM-RAMONES	CONTINENTAL HOMES	104.289368	No
9/25/2007	CARTER BURGESS	JSL Development	731.017445	No
1/13/2004	Denham Ramones	Centex Homes	96.746478	No
12/19/2000	W.F. CASTELLA	Gordon Hartman	37.515872	No
3/15/1985	Vickrey & Assoc	Vance Jackson JV	132.410546	No
7/12/2010	PAPE DAWSON	Interpark Assoc	69.985038	No
5/24/2004	Pape-Dawson	Harrison Worldwide	32.267387	No
8/29/1994	MBC	LDR LTD JOINT VENTUR	263.900568	No
11/6/2012	PAPE-DAWSON ENGINEER	FORESTAR REAL ESTATE	2904.522936	No
4/3/1998	Pape Dawson	DENTON DEVELOPMENT	190.215382	No
4/12/2004	MW Cude	EVANS ACRES, LTD.	104.961976	No
4/1/1985	Pape Dawson	Jesse Baker	395.76849	No
1/11/1995	PAPE-DAWSON ENGINEER	LA CANTERA DEV. CO.	1644.938316	No
3/22/1996	MBC	RICHARD THOMPSON	9.636406	No
11/22/1993	Pape Dawson	NOT LISTED	26.724938	No
3/16/2000	GRAY JANSING & ASSOC	Thomas Dreiss	323.513147	No
6/12/1998	W.F.Castella	Pulte Homes	36.692546	No
5/9/1997	Dolan Contractors	Brown	159.668544	No
5/7/1999	Overby & Descamps	Connell-Baron Inc	51.083883	No
5/11/1992	MBC	San Pedro North Ltd	153.166319	No
4/27/1998	PAPE-DAWSON ENGINEER	CANYON VALLEY, LTD.	1973.353363	No

3/9/2007	TCB/AECOM	McMillin TX Dev	68.906419	No
2/28/2001	Pape Dawson	Concord Corp	168.099941	No
7/3/1996	ACES	THOMAS E. DREISS	171.682637	No
12/20/1996	DIXIE WATKINS III	STUEBING-BITTERBLUE	501.328079	No
6/28/2007	Pape Dawson		718.712381	No
11/26/1985	Pape Dawson	CASTLE HILLS FOREST	172.704427	No
5/27/2009	PAPE DAWSON	Tradesmann LLC	79.798931	No
6/15/1993	PAPE-DAWSON ENGINEER		50.532219	No
8/9/2004	MBC	Inwood Heights LC	54.183238	No
9/14/2006	PAPE-DAWSON ENGINEER	BITTERBLUE	309.586089	No
7/30/1999	W.F.Castella	Continental Homes	87.278557	No
8/28/2001	Overby & Descamps	BURDICK/KELLER, LLC	27.26643	No
9/22/2008	Pape Dawson	Laredo Boerne Stage	267.116674	No
9/15/2009	Pape Dawson	Bitterblue	27.851095	No
8/25/2008	Pape Dawson	Michael Moretti	33.474277	No
9/13/1996	MBC	ALEX HALFF	20.133049	No
5/3/1984	Bell & Calle Inc	Neely Investment Co	61.166079	No
3/22/2004	PAPE-DAWSON ENGINEER	RH OF TEXAS	51.864477	No
5/4/2012	PAPE-DAWSON ENGINEER	BITTERBLUE	399.548269	No
1/20/1995	PAPE-DAWSON ENGINEER	<Null>	2402.485592	No
1/12/2000	PAPE-DAWSON ENGINEER	Peter Schinker	13.322182	No
11/5/2008	Pape Dawson	KB Home	150.362872	No
5/18/1992	RAYCO	<Null>	191.628397	No
12/18/1998	MBC ENGINEERS	SAGE WESTERN CO.	46.844407	No
4/4/2014	COURSEN-KOEHLER	CAPITAL FORESIGHT LP	28.924401	No
6/16/2004	Pape Dawson	HPK VENTURES	860.103342	No
4/26/2005	Pape Dawson	BITTERBLUE, INC	389.196816	No
8/31/1994	Hallenberger	Big Springs Lmtd	270.656029	No
5/7/2007	Kimley-Horn	POST OAK DEVELOPMENT	129.271388	No
5/9/1996	Vickrey & Assoc	Patton Ventures	44.104617	No
7/30/2015	CUDE ENGINEERS	MOSAIC LAND DEV	44.412083	No
2/7/2003	MW Cude	EVANS ACRES, LTD.	104.961549	No
5/18/2009	PAPE-DAWSON ENGINEER	STUEBING RANCH LTD	642.045923	No
2/20/2015	PAPE-DAWSON ENGINEER	MCMILLIN TEXAS DEV	69.05352	No
4/27/1998	HALLENBERGER ENG.	JERBO SAN ANN, LTD	527.067456	No
1/23/1987	Hallenberger	Interurban Prop	59.412005	No
7/20/1984	Flores & Co	Great Western Corp	123.002847	No
5/4/2001	Vickrey & Assoc	Kaufman & Broad	399.862724	No
9/30/1994	MBC	Inwood Heights LC	29.965146	No
10/17/2001	Overby Descamps	CONNELL BARRON, INC	95.055793	No
4/12/1996	W.F.Castella	Hartman Enterprises	23.734547	No
2/8/2010	Vickrey & Associates	Gruopo Triana Ltd	198.410636	No
9/27/1985	PAPE-DAWSON ENGINEER	CROWN SUMMITS	944.974325	No
4/5/2001	Pape Dawson	Centex Real Estate	75.34748	No
5/30/2002	Ruiz & Assoc	Koonte/McCombs LLC	45.406482	No
2/22/1989	Ellison Industries	Brown Engineering	386.085339	No
3/31/2008	Denham Ramones	Schneider et Al	127.27945	No

1/25/2008	Carter & Burges	BP Hwy 10 SA Ltd	416.488522	No
8/14/2006	Denham-Ramones	Centex Homes	206.423722	No
2/22/2008	Pape Dawson	Intco Dominion	160.720203	No
6/4/2003	MBC	SHAVANO CREEK LTD	263.92311	No
7/11/1989	PAPE-DAWSON ENGINEER	CROWN SUMMITS	302.318023	No
6/7/2012	PAPE-DAWSON ENGINEER	McMILLIN TX DEV.	68.54453	No
10/21/2013	ISRO ENGINEERING	R/A DOMINION DEV.	46.909604	No
9/15/2008	MOY CIVIL ENGINEERS	Borgfeld Partners	189.494294	No
12/29/1993	DYE & ASSOCIATES	SUTTON COMPANY	211.06381	No
10/2/1998	W.F. CASTELLA	MASONWOOD DEV	129.308673	No
8/27/2004	Denham Ramones	Centex Homes	118.873647	No
11/14/1996	Vickery & Assoc	Corporate Realty	126.921931	No
4/19/2011	Pape Dawson	Sivage Investments	329.37626	No
8/7/2012	PAPE-DAWSON ENGINEER	SHAGGY DEVELOPMENT	521.687378	No
12/20/2004	Pape Dawson	Pulte Homes	156.808683	No
6/18/2001	W.F. CASTELLA & ASSO	TIMELINE DEVELOPMENT	521.71246	No
3/28/2016	K LOVE ENGINEERING	NISSI LAND HOLDINGS	860.035325	No
12/6/1996	Pape Dawson	Thompson Realty	54.660202	No
3/9/2005	W.C. CASTELLA	GORDON HARTMAN ENT.	68.544695	No
7/8/2005	Denham Ramones	Centex Homes	96.738103	No
11/13/1984	Groves & Associates	Entex Construction	32.45488	No
1/22/1993	DIXIE WATKINS III	LDR LTD JOINT VENTUR	263.925987	No
7/2/2013	CIVIL LAND GROUP LLC	S.A. HARDY OAKS L.P.	144.740825	No
7/3/1998	M.W. CUDE ENGINEER	Kaufman & Broad	100.007751	No
8/28/2006	ACES	Prue Rd Ltd	17.866848	No
5/23/2016	PAPE-DAWSON ENGINEER	WS-SAS DEVELOPMENT	179.561843	No
4/1/2013	Pape Dawson	Tuscany Heights	34.690925	No
5/5/1993	Dye Assoc	The Sutton Co	148.467477	No
6/20/1997	MBC	Santikos Investments	19.161543	No
10/19/2010	Briones	HJ Enterprises, L.P.	70.419334	No
2/24/2006	Briones	HJ Enterprises LP	70.419339	No
10/23/2007	PAPE-DAWSON ENGINEER	281 CANYON PARTNERS	516.009298	No
3/27/2006	Pape Dawson	Pulte Homes	156.810725	No
7/7/2000	Pape Dawson	Centex Real Estate	75.347151	No
1/18/1995	Pape Dawson	Keith Bruce	21.769492	No
3/2/2004	Carter Burgess	Pulte Homes	37.703333	No
2/13/2012	M.W. CUDE ENGINEERS	Monte Cristo Develo	102.659165	No
6/7/2006	PAPE-DAWSON ENGINEER	Rick Pierce	112.950597	No
1/16/2015	IDS ENGINEERING	281 OVERLOOK PARTNER	83.652922	No
1/28/2011	Coursen Koehler	Capital Foresight LD	51.864113	No
7/17/2008	Brown Engineering	Post River Sundance	250.429712	No
12/2/2003	Pape Dawson	Laredo Sonoma	522.657161	No
1/20/1995	MBC ENGINEER	PHILIP BARSHOP & CO.	14.242509	No
8/16/2004	Pape Dawson	McMILLIN TEXAS DEV	860.280286	No
8/6/2007	Pape Dawson	Steubing Farm LP	235.428271	No
6/20/2007	Pape Dawson	KB Home	150.388705	No
2/19/1999	Overby Descamps	Connell Barron Inc	219.551162	No

3/22/2004	M.W. CUDE ENGINEER	Centex Real Estate	129.063846	No
2/27/2012	MBC	OAKS OF BULVERDE, LP	16.2902	No
1/14/2008	MW Cude	McMillin Texas Dev	74.47963	No
10/18/1983	Pape-Dawson	Les Heinen	69.62554	No
11/9/2004	Pape Dawson	THOMAS ENTERPRISES	683.324315	No
7/28/2010	Denham-Ramones	Centex Homes	206.424233	No
11/21/2011	Pape-Dawson	Jennic, Ltd	32.267357	No
9/3/1999	KAUFMAN-BROAD	Kaufman & Broad	96.179524	No
10/30/2000	PAPE-DAWSON ENGINEER	ENCINO LAND ASSOC.	154.930477	No
6/11/2007	MBC & ASSOC.	DALE SCHUPARRA	23.895381	No
6/2/2000	PAPE-DAWSON ENGINEER	Santikos Investments	96.044517	No
1/20/1995	PAPE-DAWSON ENGINEER	<Null>	850.364095	No
12/23/2008	Pape Dawson	Napa Oaks SA Ltd	163.287769	No
11/14/2005	Vickery & Assoc	KB Home Ltd	39.950844	No
1/19/1995	Hallenberger Eng	Harry Preble Jr	43.753067	No
8/28/2006	Pape Dawson	BITTERBLUE	145.045402	No
2/13/2003	PAPE-DAWSON ENGINEER	F.C.S. FISCHER, LTD	61.314829	No
3/21/2000	Pape Dawson	Douglas Miller	267.02026	No
9/6/1996	Vickery & Assoc	KMA Properties	7.129624	No
12/9/2009	Pape Dawson	HM Stonewall Est	185.084045	No
7/8/2005	PAPE-DAWSON ENGINEER	RICK PIERCE	78.072496	No
3/5/2004	PAPE-DAWSON ENGINEER	ABG DEVELOPMENT	521.73683	No
9/4/2007	Pape Dawson	Trey Marsh	129.890097	No
2/25/1985	Vickrey & Assoc	Lee Developement	287.299088	No
12/29/1987	MBC	BITTERS/BLANCO LTD	251.710344	No
1/31/2007	Sherfey Engineering	VMH Developers	27.288669	No
3/1/2016	PAPE-DAWSON ENGINEER	BASS PROPERTIES, L.P	26.477845	No
9/26/1997	Pape Dawson	Newland Development	150.029556	No
3/14/1984	Vickery & Assoc	Great America Co	28.756568	No
12/29/1999	M.W. CUDE	CHAMPIONS RIDGE, LTD	662.861891	No
8/23/2010	CEC	Bul-tex Development	67.879559	No
5/2/2005	W.F. CASTELLA	The Sanditen	67.8786	No
5/29/1984	Pape Dawson	Afton Development Co	64.000749	No
10/16/2003	MW Cude	NISD	150.015258	No
6/4/2008	M.W. CUDE	Big Springs Ltd	270.655605	No
8/13/1999	W.F. Castella	Sterling Pacific	200.739656	No
6/21/2011	PAPE-DAWSON ENGINEER	SHAGGY DEVELOPMENT	521.690443	No
3/18/2009	ACES	Prue Rd Ltd	34.348933	No
4/30/2014	VICKREY & ASSOCIATES	KB HOME LONE STAR	78.854094	No
10/6/1994	M.W. Cude Engineers	Richland Properties	405.954895	No
9/5/1997	W.F. CASTELLA	Laredo Encino Ltd	752.940049	No
5/7/2003	M.W. CUDE	FC PROPERTIES ONE	662.846536	No
4/29/1994	MBC	Brightwood Farms Ltd	32.407927	No
3/6/2006	PAPE-DAWSON ENGINEER	BITTERBLUE	309.581317	No
3/22/1996	Hallenberger	Bradfield	13.142237	No
10/25/1996	MBC	Lumberman's Invest	45.731233	No
12/18/2006	Denham Ramones	Centex Homes	118.865372	No

12/27/1995	Pape Dawson	JC-EB Ltd	87.949541	No
9/10/1997	ACES	SENDERO RANCH LTD	639.531377	No
10/3/1994	BROWN ENGINEERING	RIVER CITY ASSOC.	628.317871	No
3/11/2005	PAPE-DAWSON ENGINEER	BITTERBLUE	281.86576	No
3/6/1995	HALLENBERGER ENG	KASHE GROUP INC.	1973.359687	No
11/12/2004	MW Cude	Hausman Rd Partners	59.488041	No
7/3/2001	PAPE-DAWSON ENGINEER	281 CANYON PARTNERS	516.010646	No
10/19/2001	Pape Dawson	DENTON DEVELOPMENT	389.19648	No
11/7/1985	Rosin, Kroesche Eng.	Wilson Dev. Corp.	154.854238	No
12/12/1997	MW Cude	Bateson Trust	58.458665	No
1/18/1995	Pape Dawson	NEISD	82.628742	No
3/6/2006	PAPE-DAWSON ENGINEER	THOMAS E DREISS	403.219641	No
4/6/2004	WF Castella	Gordon Hartman	30.696266	No
2/27/2007	MW Cude	McMillin Texas Dev	74.479648	No
7/24/2013	CUDE ENGINEERS	TIVOLI S.A., LLC	164.465921	No
10/24/2006	Carter & Burges	BP Hwy 10 SA Ltd	414.304262	No
6/25/2012	JONES & CARTER, INC	SOUTHERLAND PALMIRA	334.845538	No
5/26/2004	Pape Dawson	Laredo Sonoma	127.343876	No
11/17/2005	Pape-Dawson	F.C.S FISCHER, LTD	87.949179	No
11/16/1993	M.W. CUDE	RICHLAND PROPERTIES	644.623899	No
8/1/2005	W.F. CASTELLA	Holford Group	144.740919	No
1/22/2002	M.W. CUDE	CHAMPIONS RIDGE, LTD	662.859377	No
8/22/1997	PAPE-DAWSON ENGINEER	THE AMEND GROUP	229.707094	No
4/7/1989	Bolner & Assoc	Patric Floris	36.310894	No
12/31/2008	Pape Dawson	Trey Marsh	130.95445	No
11/9/2015	PAPE-DAWSON ENGINEER	BITTERBLUE	399.551103	No
12/11/2000	W.F. CASTELLA	Bluffview Partners	28.837821	No
2/14/1984	Tri-Tecj Eng	Ellison Industries	194.339794	No
3/20/2009	Vickrey & Associates	Gruopo Triana Ltd	198.410519	No
12/14/2011	Pape Dawson	Trey Marsh	127.894552	No
2/2/1990	Wendell Davis & Asso	Denton Dev Co	497.019951	No
1/28/1999	PAPE-DAWSON ENGINEER	SUMMERLIN PROPERTIES	359.935752	No
12/8/1994	MBC	Lancaster Asset	8.894109	No
11/13/2012	Vickrey & Assoc	Kaufman & Broad	399.852335	No
6/5/1985	HALLENBERGER/TELFORD	NONE IDENTIFIED	1345.253082	No
7/26/1996	Pape Dawson	Folsom Companies	42.520279	No
3/22/2007	Carter & Burgess	Baruch Properties	94.709427	No
11/10/2010	MBC	Napa Oaks SA Ltd	163.285765	No
8/4/2009	HAGG ENGINEERING	Shannon Living. Co.	698.977104	No
9/6/1999	Pape Dawson	Medallion Ltd	52.897177	No
6/8/2010	BURY & PARTNERS	TDC RIM OVERLOOK	718.729259	No
6/27/2013	Pape Dawson	IH-10 PARTNERS, LTD	145.044242	No
12/8/2005	MW Cude	Armadillo Construct	112.700817	No
10/31/2007	Pape Dawson	Intco Dominion	160.720907	No
1/7/2000	Pape Dawson	DENTON DEVELOPMENT	388.764931	No
12/27/1988	Vickery & Assoc	RPM JV	3.717379	No
12/21/2015	KFW ENGINEERS	PEOPLES VERDES RANCH	214.90517	No

8/18/2014	PAPE-DAWSON ENGINEER	KARTA REAL ESTATE LP	382.997995	No
1/29/1999	Brown Engineering	Corner of the Market	77.48488	No
9/17/2015	CUDE ENGINEERS	MERITAGE HOMES, TX	17.649328	No
1/8/2001	MW Cude	Champions Ridge Ltd	165.385465	No
10/6/2000	W.F. CASTELLA	Evans Acres Ltd	34.630552	No
3/31/2003	Pape Dawson	Indian Springs Ltd	1497.120871	No
10/5/2007	Pape Dawson	McMILLIN TEXAS DEV	860.289692	No
8/25/2003	Pape Dawson	DANCING RABBIT DEV	600.302392	No
6/21/1999	Brown Engineering	D Green Land Co	110.268363	No
8/18/2005	KIMLEY-HORN & ASSOC	685 CEDAR CREEK, LTD	730.571074	No
8/13/2004	Pape Dawson	Indian Springs Ltd	1497.128539	No
1/5/2011	Briones	HJ Enterprises LP	70.419278	No
12/23/2002	Pape Dawson	Laredo Sonoma	127.339785	No
8/19/2009	Pape Dawson	Centex Real Estates	196.770991	No
5/5/1995	Vickrey & Assoc	KMA Properties	153.85417	No
6/4/1996	Vickery & Assoc	Wolverine Equities	21.398718	No
7/26/1996	Brown	HRS Partnership	22.001178	No
4/6/2009	PAPE-DAWSON ENGINEER	ENCINO LAND ASSOC.	154.930799	No
7/2/2010	PAPE DAWSON	Mabe Canyon Ranch	510.64001	No
3/26/2008	Pape Dawson	IH-10 PARTNERS, LTD	145.044188	No
5/30/1997	HALLENBERGER ENG.	JERBO SAN ANN, LTD	520.389192	No
2/11/1994	PAPE-DAWSON ENGINEER	DENTON DEV. CORP	964.470927	No
6/26/2003	Pape Dawson	DENTON DEVELOPMENT	389.196299	No
7/26/1996	Brown	HRS Partnership	20.151295	No
9/16/2008	Briones	HJ Enterprises LP	70.419281	No
3/19/2007	Moy Civil Engineers	Green Land Ventures	183.860395	No
10/9/2012	Denham-Ramones	Centex Homes	206.423014	No
7/7/2005	Moy Civil Engineers	Green Land Ventures	96.702434	No
1/10/1984	TRAVIS-BRAUN & ASSOC	HUNTLEIGH PARK INC	83.044137	No
5/9/1996	Pape-Dawson	Blanco Dev Part LTD	118.095772	No
2/12/2007	PAPE-DAWSON ENGINEER	Big Springs Ltd	270.656146	No
1/12/2009	Kimley-Horn	Baruch Properties	224.933792	No
6/30/1994	PAPE-DAWSON ENGINEER	FINESIVER, LTD	407.55313	No
2/26/1996	PAPE-DAWSON ENGINEER	HAUSMAN BANDERA PART	69.557766	No
9/6/2001	Pape Dawson	Dominion Garden	19.733688	No
12/2/1994	MW CUDE	AZTX PROPERTIES LTD	446.84548	No
9/6/1994	Pape Dawson	Reitmeyer Investment	27.266338	No
1/11/2007	Pape Dawson	Laredo OFR Ltd	176.356028	No
5/12/2006	Pape Dawson	THOMAS ENTERPRISES	683.314262	No
5/15/2009	BURY + PARTNERS	IH-10 1604 PARTNERS	83.685877	No
3/11/1993	MBC	LEE-1604 N. ONE,LTD	522.174715	No
10/24/2003	PAPE-DAWSON ENGINEER	281 CANYON PARTNERS	515.993359	No
9/9/2003	MW Cude	Armadillo Construct	112.702602	No
12/26/2008	Pape Dawson	Bulverde Market LP	130.262442	No
6/25/2001	Pape Dawson	J.A. Hanna Company	165.657975	No
1/4/2006	Denham Ramones	RH of Texas LP	81.352959	No
10/27/2011	COURSEN-KOEHLER	CAPITAL FORESIGHT LD	15.343702	No

11/16/2005	BROWN ENGINEERING	ANAQUA SPRINGS RANCH	678.818047	No
1/18/1995	Brown	Snecker & Assoc	32.013576	No
10/5/2010	Pape Dawson	Bitter Blue Inc	14.409407	No
11/28/2001	PAPE-DAWSON ENGINEER	Koonte/McCombs LLC	41.196807	No
3/25/2011	KIMLEY-HORN & ASSOC	LENNAR HOMES, TX	728.208965	No
7/16/2007	Pape Dawson	HELOTES 150, LTD	150.782764	No
6/30/2008	MBC	RAD INVESTMENTS INC	9.124511	No
10/19/2005	BURY PARTNERS	DBI INC.	96.260523	No
6/19/2008	ACES	Newton Bulverede Ltd	30.22443	No
6/14/2006	PAPE-DAWSON ENGINEER	SHAVANO-ROGERS RANCH	1853.374236	No
6/2/2004	GE Reaves Engineer	Coker United Method	33.286081	No
11/5/2015	JONES & CARTER, INC	SOUTHERLAND CANYONS	334.860043	No
1/19/1995	Pape Dawson	Sam Miller	14.802558	No
11/28/1983	MBC Engineers	Jesus Rodriguez	46.555705	No
2/24/1997	Vickery & Assoc	MJ Property	99.038332	No
3/30/2006	Vickery & Assoc	LORENZO TRIANA	206.30704	No
10/2/1998	Vickrey & Assoc	Charles Midkiff	318.466688	No
8/30/2016	MTR ENGINEERS	SA HIGHLAND ESTATES	189.436919	No
11/1/2004	BROWN ENGINEERING	Anaqua Springs Ranch	180.904095	No
6/25/2004	Pape Dawson	Centex Real Estates	193.193524	No
5/11/1999	PAPE-DAWSON ENGINEER	LA CANTERA DEV. CO.	1644.93001	No
4/27/1993	Rayco	Rayco	173.433189	No
11/30/1992	Pape Dawson	Denton Development	96.439505	No
2/26/1986	ELLISON INDUSTRIES	Ray Ellison Homes	375.174573	No
11/7/2006	Brown Engineering	Post River Sundance	250.426704	No
10/21/1985	WENDELL DAVIS	WALLACH ROGERS	263.922765	No
11/7/1997	ALAMO CONSULTING	DANA GREEN	150.667906	No
12/10/2012	PAPE-DAWSON ENGINEER	PULTE HOMES OF TEXAS	50.941932	No
1/26/2007	Pape Dawson	Thomas Enterprises	117.243602	No
12/20/1996	BROWN	RIVER CITY ASSOC.	628.320574	No
2/7/2014	KFW ENGINEERS	VICKERY MOSAIC TBY	26.152399	No
11/4/2014	MW CUDE	REMUDA 530, L.P	446.841512	No
7/20/2001	ACES	THOMAS E. DREISS	434.987876	No
12/20/1996	DIXIE WATKINS III	LLOYD A. DENTON JR.	1784.031075	No
3/21/2007	M.W. CUDE	FC PROPERTIES ONE	662.858457	No
2/25/1988	Pape-Dawson Engineer	H. Kyle Seale	1285.742591	No
1/23/2014	MBC Engineers	TUSCAN OAKS, SA, LTD	79.72548	No
12/19/2014	ISRO ENGINEERING	R/A DOMINION DEV.	46.911219	No
6/21/1996	RayCo LTD	SIX STAR PROPERTIES	81.166933	No
6/10/1985	PI ENGINEERING, INC.	DR JOSEPH DEGASPERI	4.032612	No
1/25/1994	MBC Engineers	HALLMARK-GHORMLEY	133.070146	No
9/15/2003	Carter Burgess	Pulte Homes	61.626664	No
3/28/2003	PAPE-DAWSON ENGINEER	TRAUTMANN DEV.	36.319072	No
9/29/1992	Ford Egeining	RJ BLANCO RD JOINT	353.267256	No
3/3/1995	PAPE-DAWSON ENGINEER	BOERNE STG. JOINT	551.600923	No
9/8/2005	MBC Engineers	Lee Hagan	112.769339	No
1/20/1995	PAPE-DAWSON ENGINEER	NELL SMITH	736.490749	No

1/31/2002	Pape Dawson	Bitterblue Inc	1179.238279	No
9/19/1983	Hallenberger	Stone Oak Inc	4498.238217	No
4/20/2012	M.W. CUDE	STONE OAK H.C., LLC	129.028423	No
10/6/2016	M.W. CUDE ENGINEERS	PULTE HOMES OF TX	241.881821	No
8/26/2002	Brown Engineering	Kaufman & Broad	25.590811	No
8/12/2015	PAPE-DAWSON ENGINEER	BLB PLUS, LLC	57.067521	No
5/31/2005	PAPE-DAWSON ENGINEER	H.M. DOMINION RIDGE	382.998108	No
5/25/2007	Denham-Ramones	Centex Homes	206.423225	No
6/30/1986	Pape Dawson	CLAYPOOL PROPERTIES	238.255727	No
1/9/2002	BROWN ENGINEERING	GREEN LAND VENTURES	143.680319	No
12/23/2009	Pape Dawson	Steubing Ran Lim Pt	384.433062	No
9/1/2017	<Null>	<Null>	569.773529	No
1/19/2018	PAPE-DAWSON ENGINEER	STEUBING RANCH LTD	639.791371	No
8/9/2017	<Null>	<Null>	133.106658	No
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<Null>	Pape Dawson	ONE KR VENTURE	132.652543	No
<Null>	IDS ENGINEERING	281 OVERLOOK PARTNER	81.509945	No
<Null>	<Null>	<Null>	11.13799	No
8/24/1999	Dixie Watkins	Alamo Cement	0.039256	No

<b>Table B-2: Preliminary Plats</b>	
PlatNumber	PlatName
1911800410	Davis Ranch Subdivision Unit 4A_4B
1910200005	Rise Recovery
2018000578	Valley Ranch Unit 24B
1910200072	Inverness Unit 4 Lot 25 and 27
2018000521	River Rock Ranch Unit 5 P.U.D.
1910200056	Blanco Heights North Park
1911800344	Culebra 271 Unit 1
1911800159	Prescott Oaks, Unit 3
1911800329	Trinity Subdivision
1911800364	Cantera Hills Unit - 4a
2018000144	Blackbuck Ranch Phase 1 Unit 1A PUD
2017000505	Waterwheel Unit 1 Phase 1
1911800502	North Hills Village Unit 3
1811800098	Kallison Ranch Phase 1, Unit 6
1910200039	Bulverde MarketPlace D5 MPCD
1911800053	Galm Road HS - Access Roadway #2
2018000432	Waterwheel Unit 4B
1911800010	Seaside Consolidation #1
1911800249	Woller Road
2017000095	Nooner's Blanco
2018000013	Valley Ranch Unit 2D
2017000485	Northwind 281
2018000410	Waterwheel Unit 4B Collector
2018000323	Salvatore's
1911800338	Canyon Pass Apartments
2018000326	Kallison Windgate
2018000492	Langdon - Unit 2
1911800323	PHUOC Hue Temple
1911800456	Novaland 1 Subdivision
1913100002	Highgate Drive Amend
1811800102	Tacara Stone Oak VI
1910200019	Woods of Shavano UT-20
2018000494	Langdon - Unit 3
1911800317	Pecan Springs Unit 1
1910200073	Kallison Ranch Phase 1 Unit 5B
1811800056	CHC Norhwest Campus
2018000551	Waterwheel Collector Crossing
1911800272	Davis Ranch Subdivision Unit 5G
2016000556	Cooter Browns UTSA
2018000113	Schotts Alamo Ranch
1910200036	Oakland Estates Amending
1911800197	Wood Knoll
1911800145	BlackBuck Ranch Phase 2, Unit-5 PUD
2018000611	Fisher Tract Unit 3B
2018000584	Pineapple School Camp Bullis

1911800203	Nardis Gun Club at Rolling Oaks
2018000455	Cibolo Canyon U7D
1911800237	Overlook Town Center Unit 2
2018000443	Stillwater Ranch Unit 31
2017000041	Wortham Oaks Unit 5B & 16
2017000317	Life Point Church
1811800115	Langdon Unit 7
1911800389	Tree Save
2018000197	Valley Ranch Unit 9
1911800116	Heritage Oaks Animal Hospital
1911800198	District 4 Fire and Rescue
1911800354	Cypress Trails
2017000189	Shavano West Amending
1811800024	Bulverde/Overlook 2 Acre
1911800071	Valley Ranch Units 15 and 16
2017000219	Robinson Subdivision
2018000007	Dominion/The Crescent
1911800094	Via La Cantera
2018000411	Waterwheel Park Collector
1911800438	Culebra - 1560 Alamo Pkwy IV
2017000369	Ridge Chase at De Zavala
1911800052	Davis Ranch Subdivision, Unit 4C
2018000153	Pinnacle Montessori of Babcock
1911800307	Lime Stone Ranch Commercial
1911800412	Campanas Phase 7B
2018000172	Lucchese Village South (PUD)
2017000393	Rolling Village I
2016000317	Stillwaterwater Ranch Unit 30
2017000508	Northrock Church
2018000591	Woodstone Apartments
2018000181	Cielo Ranch Unit 7
2017000368	Khalil. I. Subdivision
1911800263	Galm Road High School
1911800289	O Village
1911800036	Westpointe North Commons Phase
1911800377	Ridge at Nacogdoches
1911800473	Roca Pass
2018000491	Langdon - Unit 1
2017000056	Elephant Heart 2 MPCD Subdivision
1811800031	Huebner Rd-Hardy Oak Blvd-MPCD
1910200049	Bloomfield Hills
1911800375	Bander Tezel Commercial Subdivision
2018000531	Davis Ranch Phase 1, Unit 3D
2017000284	Bee Clean #6
1911800254	Diamond Shine 2
1911800164	Studium Pointe Subdivision
2017000351	The Dominion Phase 4D PUD

1911800111	Waterwheel Subdivision Unit 6A
2015000246	Canyon View Subdivision Unit 2 PUD
1910200048	Lakeside Acres
1810200010	Blackbuck Ranch Phase 1, Unit 5 PUD Amending
2018000042	Napa Oaks, Unit - 6B
2018000049	Rustic Lane
2017000265	The Chateaux at the Dominion
2018000362	Alturas at Dominion Lots 36_37
1911800149	Valley Ranch-Unit 23
2017000398	Bulverde Road Business Park Phase III
1911800186	Cielo Ranch Unit 10
1911800150	Anaqua Springs Ranch Unit 8
1911800022	Valley Ranch Units 24C & 24D
2018000058	Chase Hill Village
2017000274	Stillwater Ranch Unit 24
2017000108	Braun Road Storage
1911800144	Blackbuck Ranch Phase 2, Unit 4
2018000244	URO Property
2017000607	Inverness Unit 1B Lots 64 & 65.
2018000247	Braun Landings Subdivision
2017000591	Lisbon Subdivision
1911800327	Market Ridge - Phase 3
2017000479	Mentis San Antonio
1910200062	North Star Hills Unit 1
1910200059	Blackbuck Ranch Phase 1 Unit 6
2017000300	University Commons PH 1
2016000322	Stillwater Ranch Unit 31
2018000365	Terra Falls Planned Unit Development Subdivision
2017000346	Cresta Bella Unit 4B
1811800004	Davis Ranch Unit 3A_3B
1811800107	Stone Oak 281
1811800078	Overlook Town Center, Unit 1
1911800072	Sienna Subdivision Phase 4
1811800135	Valley Ranch Units 20 & 21
1911800244	Fischer Tract Unit 3C-1
1911800348	Huenber HTeaO
1911800363	District 9 Senior Center
2018000390	Studium Pointe P.U.D. Unit 1
1911800025	Cielo Ranch Unit 5
1911800217	Enclave at Whitby
1910200054	Inverness Unit 1
2017000183	Hill Country Plaza
1911800369	Bulverde/Overlook 2 Acre
2018000370	Wilderness Oak Center Phase IV
1911800007	Kallison Ranch Phase 1, Road E
2018000171	Lucchese Village East
1911800076	Valley Ranch Unit 17

2018000380	KW Huebner
2017000070	Northpoint Subdivision
2016000494	Creekside Court (P.U.D.)
2017000198	Valley Ranch Unit 13B
2018000332	Lucchese Village Fairview
1910200061	Life Family Church
1911800233	Messina
1911800056	Valley Ranch Unit 13B
2017000139	CST #1860
2018000481	Pecan Springs Ranch Unit 3
2017000516	Mirabel, Unit - 3
1911800209	Classen Classics
1911800034	University Village Spec Building
1911800409	QT 4009
1911800188	Freiling MOB
2018000223	Sarfani Plaza
1911800193	Cibolo Canyons Town Center
1911800074	Vantage at O'Connor
1910200070	Stone Oak Center at Knights Cross 3
2018000207	Pecan Creek Ranch Unit 2
1811800109	Babcock Terrace
1911800121	Cielo Ranch, Units 6 and 9
1910200003	Vistas of Sonterra
1911800099	Valley Ranch Unit 19
1811800063	The Casinos At Prue Crossing Subdivision
1811800086	District North 11.50 Acre Tract
1910200038	The Ridge Central
1911800268	Camp Buck
2018000408	Kallison Ranch Phase 1 Road D
1911800182	South Rim Unit 11
1911800199	Davis Ranch Subdivision, Unit 4F
2017000136	Waterford Park Unit 3A & 5A
2017000232	Babcock Ridge
2018000142	TPOA Park
2018000167	Sundance Ranch Unit 2A
1911800020	Raymond Russell Park Subdivision
1910200033	Collin Canyon
1911800014	Kallison Ranch Middle School
2018000501	Cielo Villas
1911800170	Waterford Park, Unit 6
2018000407	Cornerstone 1604 at Stone Oak
2018000442	Stillwaterwater Ranch Unit 30
2016000377	Donald Barfield
2018000341	BlachHawk 1
1911800413	The Rim Unit 7
2017000515	Lim Korean School Subdivision
1911800488	Lots 73A 73B and 73C Anaqua Springs Ranch Unit 7

1911800346	Cooper Subdivision Unit 4A
1911800039	Valley Ranch Unit 22
1811800054	P.C.H.A.S. Whitby Campus
2018000222	Valley Ranch Unit 24A
2018000412	Waterwheel Unit 4A
1911800442	Pecan Springs Unit 2
1911800228	Room To Go IH10
2018000271	South Rim Unit - 10 MPCD
1911800227	The Rim Unit 17
2018000120	Shoppes At Wilderness Oak
1911800086	Cantera Hills Unit 2
2018000445	Two Creeks Commercial
1810200014	Hausman Hill Subdivision
1911800084	Cibolo Canyons - Parcel B
2018000104	Cresta Bella Unit 9B Enclave
2018000505	Lucchese Village
2017000577	Pinnacle Plaza
1911800367	Nardis Subdivision
2018000082	Stonewall Estates - Unit 1A, P.U.D.
2015000559	University Hills Unit 6-A/HNB
2017000571	Cibolo Canyon - Unit 7a
2017000468	Silver Lining Estates Enclave
2018000511	Blackbuck Ranch Phase 2 Unit 3
2017000469	Mission Stone Life Center
2018000147	Kallison Ranch Phase 1 Unit 2D
1911800497	Cresta Bella Unit 9B
1811800075	Encino Heights
1910200052	Stallion Ridge
2017000290	Monteverde Unit 1 Phase 2 Enclave
2017000273	Schumacher Connector Road
2017000602	Blackbuck Ranch Phase 1 Unit 7 PUD
1911899328	Silver Lining Estates Enclave
1911800134	Anaqua Springs Unit 6C-1
1911800075	Sienna Subdivision Phase 5 & 6
1910200258	Rise Recovery Mossrock
2018000205	Fischer Tract Unit 2B
2018000403	McGrath Subdivision
2018000592	Canyons At Scenic Loop, Unit 6A P.U.D. Lot 5
2018000533	Hooten Tract Unit 1A
2018000509	Ranch View
1910200071	District North 1625 Acre Tract
1911800081	Valley Ranch Unit 18
1911800112	Kenley Place Office Bldg.
2018000510	Blackbuck Ranch Phase 2, Unit-2

<b>Table B-3: Recorded Plats</b>			
PlatNumber	PlatName	RecordationDate	Engineer
2017000356	Eagle's Landing	7/27/2018	MTR
2017000594	Wortham Oaks Unit 15	4/22/2019	KFW
2016000216	Davis Saddle Trail	5/18/2018	Villagomez
2018000389	Gue Properties, LLC	9/13/2019	Pape Dawson
2017000236	Ricardo Sanchez	6/1/2018	Terrazas
2016000361	Culebra - 1560 @ Alamo Parkway	4/30/2018	Pape Dawson
2016000469	Ranch View U10	10/8/2017	Denham Ramones
1911800136	Hawk Springs	9/27/2019	Mendez
2018000170	Stone Oak Center	3/22/2018	MHR
2018000372	Blackbuck Ranch Phase 1 Units 1 and 5	9/27/2019	Jones Carter
2017000239	Beckwith - Vance Jackson	11/17/2017	Pape Dawson
2017000007	Dominion Retail	9/1/2017	KFW
2016000237	Stone Oak 13 Acres	7/7/2017	Cude
2018000532	Davis Ranch Subdivision Unit 3F	10/4/2019	Cude
1811800110	Marketplace Expansion MPCD	6/28/2019	MBC
2017000120	Shavano Ranch ROad Phase III	2/9/2018	Pape Dawson
1811800003	HEB SA 23 Subdivision	5/17/2019	Pape Dawson
2017000214	DeZavala 10	6/9/2017	Richter
2017000467	Bulverde/Overlook SWC	12/1/2017	Pape Dawson
2018000181	Heritage Oaks at Inwood Amending	12/30/2018	Pape Dawson
2017000347	Cresta Bella Unit 6A1	9/15/2017	CAW
2017000416	Indian Springs Estate NW U 7	3/22/2019	Cude
2018000146	Kallison Ranch Phase 1 U 2C	2/28/2019	KFW
2018000326	Kallison Windgate	10/5/2018	CEC
2018000127	The Row at Moss Rock	9/14/2018	Big Red Dog
2017000608	Tumlinson Estates Subdivision	9/27/2019	C&W
2018000107	The Legacy	3/9/2018	Stantec
2017000559	North Park Subaru	2/2/2018	KFW
2018000131	EKHLA	9/14/2018	Pape Dawson
2018000183	Dolce Vita at Cibolo Canyons	4/12/2019	Pape Dawson
2018000270	Market Ridge 2	6/14/2019	Vickery
2018000284	Steubing Farm Unit 4	1/11/2019	Pape Dawson
1810200010	Blackbuck Ranch Ph1 Unit 5	6/28/2019	Jones Carter
1911800038	Creekside at Lookout	8/16/2019	Pape Dawson
2016000569	Valley Ranch Unit 12B	5/25/2018	Pape Dawson
2018000022	Inverness Unit 4 Lots 14 and 15	11/1/2019	Pape Dawson
1911800024	University Village A-Loft	11/8/2019	Pape Dawson
2017000593	Waterford Park Unit 5B	9/27/2019	KFW
2017000601	Blackbuck ranch Phase 1 Unit 6	6/8/2018	Jones Carter
2018000430	Valley Ranch Subdivision Unit 5B	11/8/2019	CEC
2018000017	Carnoustie at Meisner	3/16/2018	MBC
2018000353	Cibolo Canyon Unit 9B	9/6/2019	Pape Dawson
2017000457	Heron at Cresta Bella	7/13/2018	CAW
1911800183	Aura Stone Oak	11/5/2019	Pape Dawson
1811800066	Willow Oak Drive	11/8/2019	MBC

2017000376	Ranchland Commercial II	1/26/2018	Pape Dawson
2016000417	Cantera Manor	5/10/2019	Pape Dawson
2018000603	Headricks Subdivision	3/22/2019	Maverick
1911800264	Family Endeavors	8/16/2019	Pape Dawson
2018000213	Hardy Oak MF	8/9/2019	Pape Dawson
2016000617	CCW Braun Heights Commercial	7/13/2018	Texas Landmark
1911800008	Dominion Heights Phase 1A	8/22/2019	Pape Dawson
2016000411	The Park at Crown Ridge	12/15/2017	MHR
2016000445	Melissa Ann	12/15/2017	Modeco
2016000507	Bulverde Marketplace Development II	6/8/2018	MBC
2017000493	Living Spaces	2/5/2018	Pape Dawson
2016000348	La Cantera Heights South	4/6/2018	Pape Dawson
1811800024	Bulverde/Overlook 2 Acre	6/7/2019	Pape Dawson
1811800069	Sienna Subdivision Phase 2 and 3	10/4/2019	Pape Dawson
1910200014	Blackbuck Ranch Phase 1 Unit 2	10/4/2019	Jones Carter
2017000187	The Canyons att Scenic Loop U6B	4/21/2017	Jones Carter
2017000552	A S Osceola Bluff	8/30/2019	SGC
2017000195	Valley Ranch U 13A	2/15/2019	Pape Dawson
1811800079	Chase Hill Multi Family	5/24/2019	Pape Dawsom
2017000223	Intech Office	2/22/2019	Pape Dawson
2018000467	Stone Oak Bible Church	9/6/2019	Pape Dawson
2016000321	Stillwater Ranch U 23	8/4/2017	Pape Dawson
1811800026	District North Office	9/6/2019	Pape Dawson
2017000515	Lim Korean School	5/4/2018	CDS Muery
2018000136	Radii Group No 1	4/30/2018	Dye
1911800054	Coronado Subdivision Unit 2	9/20/2019	KFW
2018000395	Waterford Park Unit 8A	11/1/2019	KFW
1911800185	La Cantera 1604 Retail	11/22/2019	Pape Dawson
2017000533	Shavano LDR	5/9/2018	KFW
2017000398	Bulverde Road Business Park PhIII	9/1/2017	Flores
2016000266	Mehar Gardens	9/14/2018	MHR
1910200022	The Legends ath the Dominion	8/2/2019	Seda
2018000549	HEB 1604 at Bandera	2/19/2019	Stantec
2017000514	Waterwheel Unit 1 Phase 2	10/19/2018	CEC
2015000561	Napa Oaks Commercial	8/17/2018	KFW
2018000005	Blackbuck Ranch Ph1 Unit 1	12/8/2017	Jones Carter
2017000004	BDSP - O'Conner & 1604	3/24/2017	Pape Dawson
2018000402	Davis Ranch Subdivision Unit 4E	9/20/2019	Cude
2017000054	Kallison Windgte Subdivision	12/8/2017	CEC
2016000429	Remuda Ranch North U9	6/16/2017	Cude
2017000506	Waterwheel Unit 2 Phase 1	10/19/2018	CEC
2017000437	Nancy & Heliodoro Torres	6/1/2018	KLove
1910200012	South Rim Unit 7	8/16/2019	Pape Dawson
2016000144	Pinnacle Oaks	10/6/2017	Pape Dawson
1811800046	Hope Church Subdivison	5/10/2019	Jones Carter
2016000085	Ranch View Unit 3	2/2/2018	Pape Dawson
2017000259	Kallison Ranch Phase 1 Unit 5A	3/16/2018	KFW

2015000413	Talise De Culebra Unit 6A	8/31/2018	Pape Dawson
2018000214	Presidio Commercial	4/29/2019	Stantec
2017000526	Belair Townhomes	8/31/2018	Bernal
2017000027	Carmen Height	3/22/2018	KFW
2016000490	Brandeis Apartments	2/23/2018	MBC
2017000021	Pic-N-Pac #17	10/10/2018	KFW
2017000449	Tuscan Oaks Kam Parcel IV	1/5/2018	MBC
2016000453	Mirabel Unit 4	4/24/2019	Pape Dawson
2017000524	Blackbuck Ranch Phase 1 Unit 5	3/16/2018	Jones Carter
2017000322	Valley Ranch Unit 7B	5/25/2018	Pape Dawson
2017000226	The Legends at the Dominion	4/21/2017	ADA Consulting
2018000320	Fischer Tract Unit 3A	6/21/2019	Pape Dawson
2017000232	Babcock Ridge	4/2/2018	KFW
2016000436	Canterra Hills, Unit-1	8/11/2017	Pape Dawson
1811800124	Prescott Oaks Unit 2	10/9/2019	Cude
2017000160	Lookout Commercial	4/21/2017	Pape Dawson
2018000294	River Rock Ranch	1/25/2019	Coursen Koehler
2016000086	Ranch View Unit 2	1/26/2018	Pape Dawson
2018000221	Cielo Ranch Unit 2 Subdivision	5/10/2019	Cude
2016000607	Culebra - 1560 @ Alamo Pkwy111	11/17/2017	Gomez Garcia
2018000067	Davis Ranch Unit 2	12/11/2018	Cude
2017000565	Wood Land Manor U3	4/30/2018	KLove
2016000585	Steubing Farm Tract 2	5/26/2017	Pape Dawson
2017000316	Shavano Highlands Unit 4	7/9/2018	Pape Dawson
2017000389	Guinee Tract	6/8/2018	Pape Dawson
2016000356	Vista Colina Apartments	8/11/2017	MBC
2017000186	The Corner at Parliament Square	1/19/2018	Bowman
2016000543	Lucchese Village	9/29/2017	Pape Dawson
2017000359	Boulders at canyon Springs U 2	7/28/2017	Pape Dawson
2017000355	The Canyons at Scenic Loop U4	8/25/2017	Matkin Hoover
2017000530	Classen Steubing Unit 1 MPCD	1/26/2018	Pape Dawson
2017000289	Kallison Ranch Phase 1 Road C	3/9/2018	KFW
1811800134	Starbucks at University Village	8/18/2019	Pape Dawson
2015000515	Solea Stone Oak	9/6/2019	Kimley Horn
2016000354	Campanas Phase 6 Enclave	5/26/2017	Pape Dawson
2018000094	Oakland Estaes Heights	9/21/2018	Kimley Horn
2018000041	Church Unlimited	6/14/2019	Stantec
2016000324	Valley Ranch U2C	9/22/2017	Denham Ramones
2016000420	Mountain View Villas	11/3/2017	South Texas
2016000306	Indian Springs Estates NW U6	10/27/2017	Cude
2017000576	Esparza Residence BSL	10/27/2017	MBC
2018000003	Inverness Unit 1 Lot 69	12/8/2017	Pape Dawson
2016000441	North Pointe U4B-1	2/2/2018	Pape Dawson
1911800102	HB Subdivision	7/8/2019	Kimley Horn
2017000456	Cresta Bella Unit 6B	7/2/2019	CAW
2017000436	Encino Park Vet Clinic	11/2/2017	KLove
2018000069	Merlin/Brimhall Acres redux	5/17/2019	Gomez Garcia

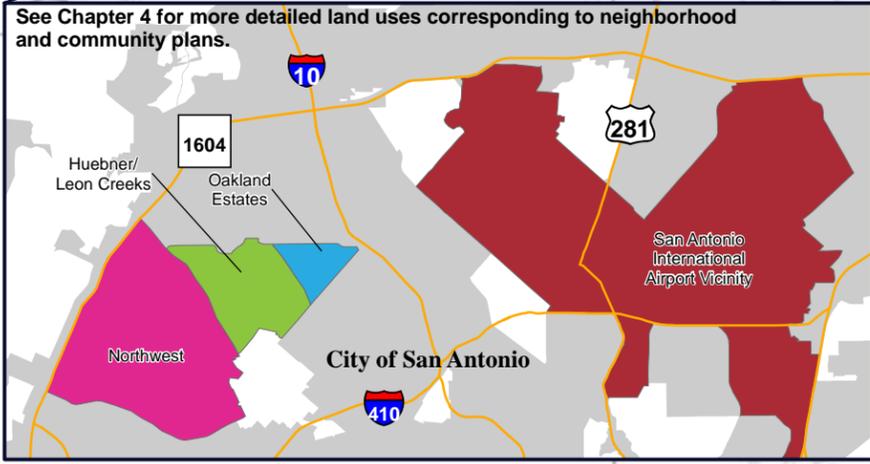
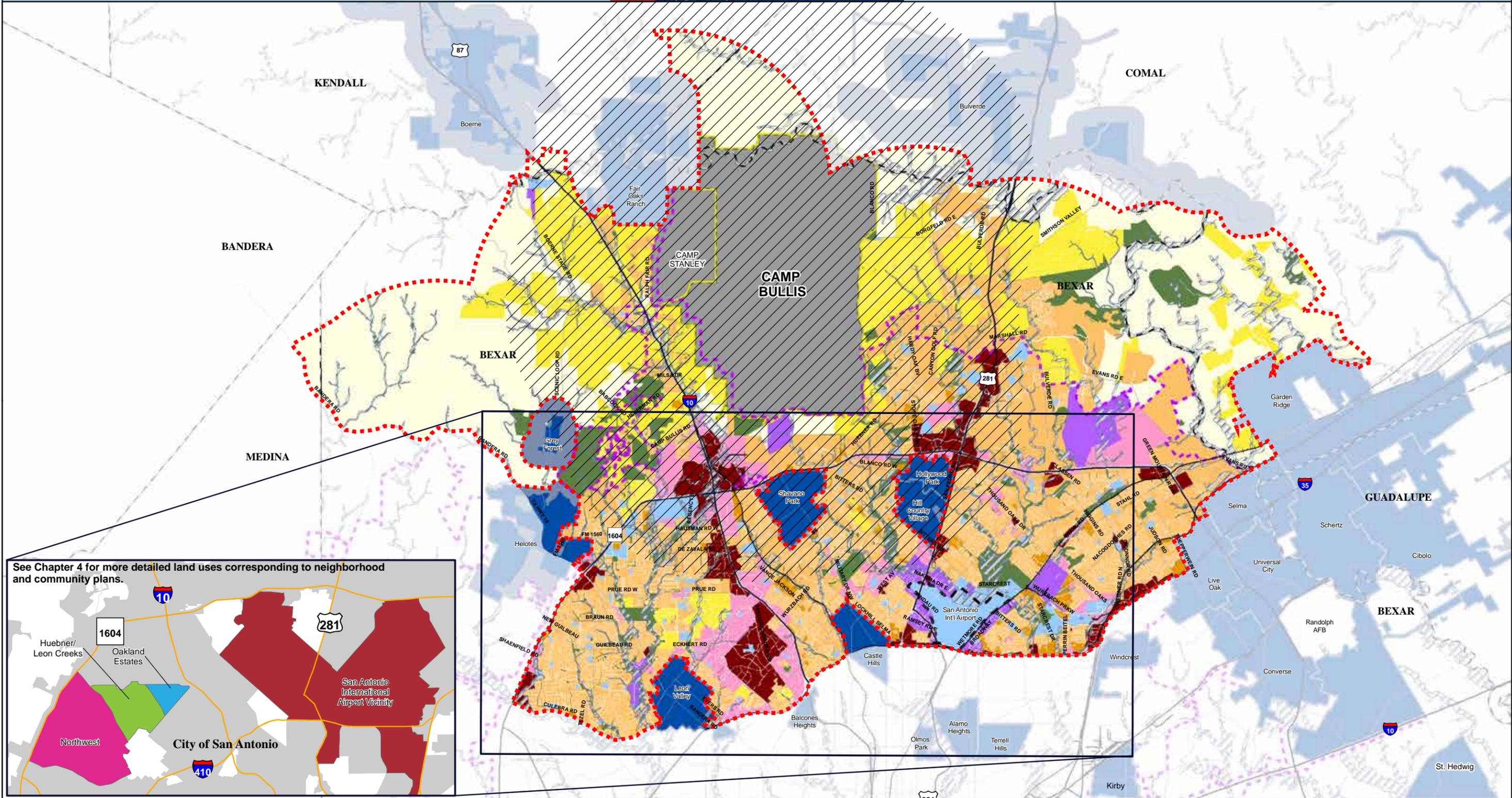
2016000311	Stonehawk	9/7/2018	Pape Dawson
2017000377	Fallbrook Unit 7A	3/22/2019	Pape Dawson
2017000064	Blackbuck Ranch Phase 1 Unit 3 Enclave	5/19/2017	Jones Carter
2018000011	Dominion Phase 1	10/12/2018	Pape Dawson
2018000472	One Adriana	10/5/2018	UP
2016000461	Morales Addition	1/19/2018	Elizondo
2017000185	Remda Ranch South U 5	2/8/2019	Cude
2018000568	The Canyons at Scenic Loop Unit 6B	11/15/2019	GE Reaves
1910200027	La Scala Subdivision	8/2/2019	Seda
2018000415	Great Hearts - Prue	4/22/2019	Pape Dawson
2018000100	Davis Ranch Unit 3	3/22/2019	Cude
2016000495	Fischer Tract U1A	2/20/2018	KFW
2018000358	Las Palapas TPC	2/15/2019	KLove
1911800134	Anaqua Springs U6C-1	12/6/2019	Matking Hoover
2013000552	Royal Oak estates Unit 2	3/16/2018	Pape Dawson
2016000580	Landing at French Creek	7/28/2017	KFW
2018000302	Cielo Ranch Subdivision Unit 4	9/20/2019	Cude
2018000248	Rogers 1604 Unit 2	5/4/2018	Pape Dawson
2012000114	Fairview Acres Unit 2	1/4/2019	Matkin Hoover
2017000463	Hausman Grove	1/26/2018	Pape Dawson
1811800006	SJC Romanian Orthodox Church	10/4/2019	Dye
2018000427	Kallison Ranch Phase 1 Unit 5B	8/21/2019	KFW
2016000571	Mansions MPCD	10/26/2018	MBC
2017000605	Tavern Oaks	5/18/2018	Flores
2017000460	Tuscany Heights Unit 3	12/15/2017	Pape Dawson
2015000558	Dominion Ph 8B	2/3/2017	Pape Dawson
2018000089	Forest Crest Lot 48 & 49	4/30/2018	Matkin Hoover
2018000293	Waterwheel Unit 3 Subdivision	3/19/2019	CEC
2017000300	Univeristy Commons Ph 1	9/15/2017	Stantec
1910200056	Blanco Heights North Park	12/6/2019	Moy
1910200008	Embassy North Subdivision Unit 5C	4/29/2019	MBC
2016000524	Tribute Ranch Unit 1	6/7/2017	Pape Dawson
1910200013	Blackburn Ranch Phase 1 Unit 6	8/2/2019	Jones Carter
2018000158	Olmos Creek	7/13/2018	KLove
2018000096	Parkway Centrl 2	4/25/2018	Stantec
2017000192	La Cantera West Ridge II (Enclave)	4/27/2017	Pape Dawson
2017000129	Monteverde Unit 2 Phase 3	7/19/2019	Pape Dawson
2017000313	Sigma Proton	1/11/2019	MBC
1811800030	Campanas Phase 7A/7C	9/13/2019	Pape Dawson
2016000168	Tacara Commercial IV	7/20/2018	MBC
1813100001	Green Spring Valley Vacate	11/26/2018	Cude
2016000544	Ranch View Unit 9B	12/8/2017	Pape Dawson
2018000227	Cielo Rancg Subdivision Unit 3	5/17/2019	Cude
2014000520	Inverness Unit 2	8/2/2019	Pape Dawson
2015000431	Wurzbach Shopping Center	8/7/2018	Doucet & Associates
1811800083	Circle K	3/15/2019	Pape Dawson
2017000309	Dominion Crossing Lot 11	5/26/2017	Pape Dawson

2016000189	Waterford Park Unit 7	2/23/2018	KFW
2017000557	Sienna Subdivision Phase 1	9/14/2018	Pape Dawson
2017000048	Truevine Braun	10/13/2017	Richter
2017000542	Churchill Estates Unit 4A	3/16/2018	Cross Branch
2017000504	Talise De Culebra Unit 7A	8/23/2019	Pape Dawson
2017000446	Technology Park Unit 13A	11/17/2017	KFW
2014000412	Wilderness Oaks Center Phase IIA & III	8/31/2018	Bury
2018000504	Lincoln Ramon Subdivision	5/10/2019	Seda
2018000206	Fischer Tract Unit 2A-1	5/20/2019	Pape Dawson
2016000516	DeZavala Business Park Replat B	9/8/2017	KFW
2018000348	Leon Springs Car Wash	3/22/2019	Matkin Hoover
1911800116	Heritage Oaks Animal Hospital	10/18/2019	Klove
2017000329	Kallison Ranch Phase 1 Unit 11C	3/8/2019	KFW
2018000561	Sikora Care at Crownridge	4/22/2019	GE Reaves
2017000272	11 AC Schumacher MF Site 1	12/13/2017	Pape Dawson
2018000596	Belair Duplex	1/4/2019	Jerry D Wilkie Jr
2016000419	Wortham Oaks Unit 18 & 19	5/11/2018	KFW
2017000122	Vista Bella Unit 3 Enclave	2/9/2018	Pape Dawson
2016000435	Stone Oak Storage	9/27/2017	Big Red Dog
2017000171	Two Creeks Unit 13B & 17	6/29/2018	Pape Dawson
2016000320	Davis Ranch U1	11/21/2017	Cude
1911800075	Sienna Ph. 5 & 6	10/4/2019	Pape Dawson
2016000192	4.38 Acre Babcock Rd - Commercial	12/1/2017	CAW
2018000612	Resort Oarkway Extension 2	9/6/2019	Pape Dawson
2018000178	Midway on Babcock	7/12/2019	Pape Dawson
2017000205	Huebner Rd - Hardy Oak Blvd	9/15/2017	Pape Dawson
2017000331	SRI SHIRDA SAI BABA Temple	8/10/2018	Bexar
2018000306	Davis Ranch Unit 4	3/22/2019	Cude
2018000218	Rialto Village Multifamily	8/24/2018	Big Red Dog
2017000600	Blackburn Ranch Phase 2 Unit 1	4/9/2019	Jones Carter
2018000371	Blackbuck Ranch Phase 1 Unit 2	8/24/2018	Jones Carter
2016000447	DeZavala Corners	9/29/2017	KFW
2018000579	CnP-SA	3/15/2019	Terra
2016000253	Secopsa USA	2/23/2018	Gomez Garcia
2018000148	Yuretich Harmony Hollow	9/14/2018	GE Reaves
2018000129	Blackbuck Ranch Phase 1 Unit 4	3/9/2018	Jones Carter
2018000466	Culebra and Galm Addition	1/18/2019	Spooner & Associates
2016000498	Ultra 20/10 Replat	9/29/2017	Pape Dawson
2017000178	Bandera Biering	1/26/2018	Moy
2017000344	Devonshire Parish Sub U 3A	8/11/2017	M&S
2017000478	Terra Bella 4A Lot 166 & Lot 181	10/6/2017	Pape Dawson
2018000081	Cibolo Canyon U8 Ph2 Enclave	8/2/2019	Pape Dawson
2017000415	Washington Way	10/19/2018	Civil Tech
2018000448	RBFCU - Inwood Unit 1	3/29/2019	Pape Dawson
2017000082	Terramont Village	9/8/2017	MBC
2017000086	Village on the Green	1/26/2018	Matkin Hoover
2016000545	Ranch View Unit 9A	3/29/2019	Pape Dawson

2018000360	Culebra Creek Apartments	4/5/2019	CDS Muery
2018000366	Ridge Creek Unit 3	11/1/2019	Pape Dawson
2018000387	The Crest at Elm Creek Subdivision	3/22/2019	MTR
2017000233	Rock & Brew	9/21/2018	MBC
2018000459	Los Caballero's Subdivision II	1/25/2019	KFW
2016000598	Monteverde U 2 Ph 2	8/4/2017	Pape Dawson
2018000010	Trailwood Subdivision	9/7/2018	Ruiz
2018000558	LIV Wilderness Oak	9/13/2019	Pape Dawson
2016000316	Stillwater Ranch U 29	8/4/2017	Pape Dawson
2017000466	Overlook/Loop 1604 NWC	12/1/2017	Pape Dawson
2017000044	Vista Ridge Integration	1/4/2018	Pape Dawson
2015000557	Reserve of Lost Creek U3B PhII	5/26/2017	Cude
2017000518	Shavano Highlands Unit 5	5/3/2019	Pape Dawson
2014000497	La Cantera Heights North (Enclave)	12/14/2018	Pape Dawson
2016000285	Pecan Springs Ranch Unit 2	1/5/2018	Kimley Horn
2017000083	Lockhill Estates III	8/11/2017	Torres
2013000208	Coker United Methodist Church	1/22/2018	Pape Dawson
2015000223	Shavano Retail Center Phase 3	7/13/2018	Pape Dawson
2017000551	Planned Unit Development	11/3/2017	MBC
2016000588	Tribute Ranch Unit 2	10/19/2017	Cude
1911800173	Bandera - Spanish Oaks Subdivision II	11/22/2019	KFW
2018000189	Oakland Estates	7/27/2018	Celco
1911800074	Vantage at O'Connor	10/8/2019	MBC
2018000361	Batchelor Subdivion	9/20/2019	Jones Carter
2017000225	Amending Plat Establishing	7/28/2017	UP
2018000220	Swiftwater - West Ave	6/22/2018	Pape Dawson
2018000064	Cielo Ranch Subd Unit 1	1/11/2019	Cude
2017000091	Fiesta Trails Unit 4A	7/20/2018	Pape Dawson
2017000254	Valley Ranch Unit 7A	2/23/2018	Pape Dawson
2017000507	Talise De Culebra Unit 7B	8/23/2019	Pape Dawson
1910200032	HEB - 1604 at Bandera	9/20/2019	Stantec
2017000419	Lockhill Estates U1	10/13/2017	Dye
1911800230	Ridgewood Park MOB	9/20/2019	Pape Dawson
2015000144	One Dominion Place Lot 133	8/17/2018	SIA
1911800072	Sienna Ph4	11/22/2019	Pape Dawson
2016000162	Fallbrook Unit 5 Enclave	2/2/2018	Pape Dawson
2016000407	Biltmore at University Heights	7/14/2017	KLove
2017000158	Heuermann LBO Commercial	12/15/2017	Jones Carter
1810200012	Waterford Park Unit 7	9/6/2019	KFW
2017000333	Wortham Oaks	8/24/2018	MTR
2017000336	KDW Medical Center	10/6/2017	GE Reaves
2016000565	Kallison Ranch Ph1 U2B-1	7/14/2017	KFW
2016000246	Coronado Unit 2	7/27/2018	KFW
2016000517	SATTA Eckhart Subdivision	11/17/2017	SNG
1910200011	Tacara Stone Oak TP	5/3/2019	MBC
2016000019	Valley Ranch U4B	5/26/2017	Denham Ramones
2015000489	Pomona Park	8/4/2017	KFW

2017000484	Larkspur Drive	3/22/2018	MBC
2017000583	Elm Creek Crossing	11/3/2017	CDS Muery
2017000458	Cresta Bella U5	9/5/2017	CAW
2016000080	Ranch View Unit 4	2/2/2018	Pape Dawson
2018000296	Cresta Bella Unit 5	8/10/2018	CAW
2018000441	Davis Ranch Subdivision Unit 3C	10/4/2019	Cude
2017000418	Amending number 160349 Marshall 281	8/18/2017	Jones Carter
2016000538	Valley Ranch U8B	2/23/2018	CEC
2018000056	Tribute at the Rim	7/27/2018	Pape Dawson
2018000007	Ariel & Liza Galvan	5/11/2018	Civil Tech
2016000328	Key Storage #49	9/15/2017	Pape Dawson
2016000578	Valley Ranch Unit 3A	12/8/2017	Pape Dawson
2017000369	Ridge Chase at De Zavala	8/18/2017	KFW
1910200030	O'Connor & 1604	11/15/2019	Pape Dawson
2017000111	BBVFD Station No 3	9/14/2018	Pape Dawson
2018000256	Forum at Wurzbach	6/21/2019	MHR
2016000586	Lucy's Doggy Daycare -1604	3/2/2018	Villagomez
2017000477	Thousand Oaks Park Subdivision	4/12/2019	Dye
2018000004	Blackbuck Ranch Ph1 Unit 2	1/26/2018	Jones Carter
2018000452	6.00 Acre Blanco Parliament Tract	2/13/2019	Pape Dawson
2016000477	Valley Ranch U12A	2/2/2018	Pape Dawson
2017000295	Cibolo Canyon Unit 8 Phase 1	6/15/2018	Pape Dawson
1910200049	Bloomfield Hills	12/6/2019	KFW
2016000620	Arion Coker Commercial II	2/9/2018	MBC
2017000166	MCECC Addition	2/15/2019	MHR
2018000374	Blanco Heights North Park	12/21/2018	Moy
2018000373	University Heights at Silicon	2/8/2019	KLove
2018000349	Hubbard Subdivision	4/12/2019	GE Reaves
2015000414	Talise De Culebra Unit 6B-6C	4/6/2018	Pape Dawson
1811800048	Anaqua Springs Ranch Unit 7	8/30/2019	Matkin Hoover
1911800010	Seaside Consolidation #1	8/16/2019	Pape Dawson
2018000076	Valley Ranch Unit 14	11/1/2019	Pape Dawson
2017000310	DRH Office Tract	9/21/2018	Pape Dawson
2018000225	FCC 4	8/31/2017	Villagomez
2018000431	Valley Ranch Subdivision Unit 6A	11/8/2019	CEC
2017000401	Espuela Business Park	2/15/2019	KLove
2016000548	Parkway Central 1	9/1/2017	Stantec
2018000257	Blackbuck Ranch Phase 1 Unit 8	3/13/2019	Jones Carter
2018000461	North Hills Village Unit 1	9/7/2018	Maverick
2016000519	Waterford Park Unit 4	4/12/2019	KFW
2017000058	Fischer Tract Unit 1B	6/1/2018	KFW
2017000402	Blackbuck Ranch PH 1 U 1	8/18/2017	Jones Carter
2016000442	Sendero 281 North	5/4/2018	MBC
2018000457	Barkaritaville	4/29/2019	KFW
2015000374	Shavano Ranch Road Phase 1	2/9/2018	Pape Dawson
2018000168	Prescott Oaks Unit 1	1/25/2019	Cude

## Appendix C: Planning Documents



A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries.

source: Bexar County, Comal County, Kendall County / 2010; TNRIS / 2009  
 FLU\_20100722\_RGR.pdf

**Future Land Use**

- Natural
- Country
- Rural Estate
- Suburban
- General Urban
- Civic
- Military Influence Overlay Area\*
- Mixed Use
- Regional
- Specialized
- Military

**Neighborhood and Community Plan**

- Huebner/ Leon Creeks
- Northwest
- Oakland Estates
- San Antonio International Airport Vicinity

\*Note: subject to recommended compatible uses  
 \*\*Note: refer to the adopted land use plans for these areas

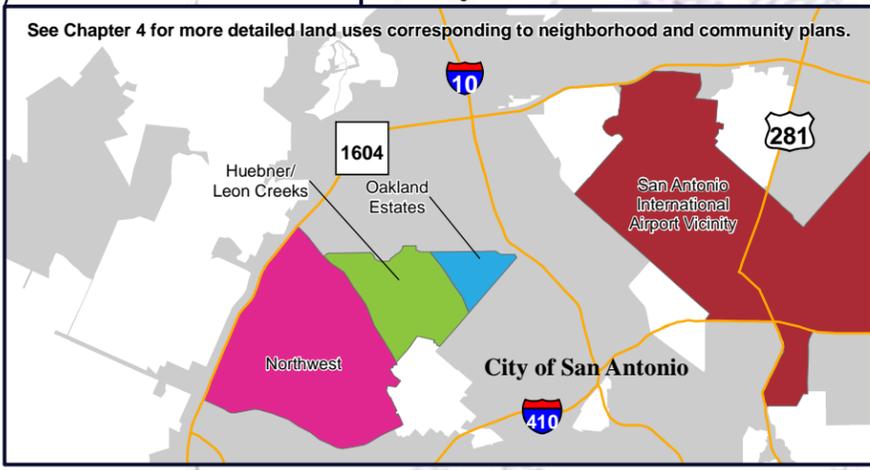
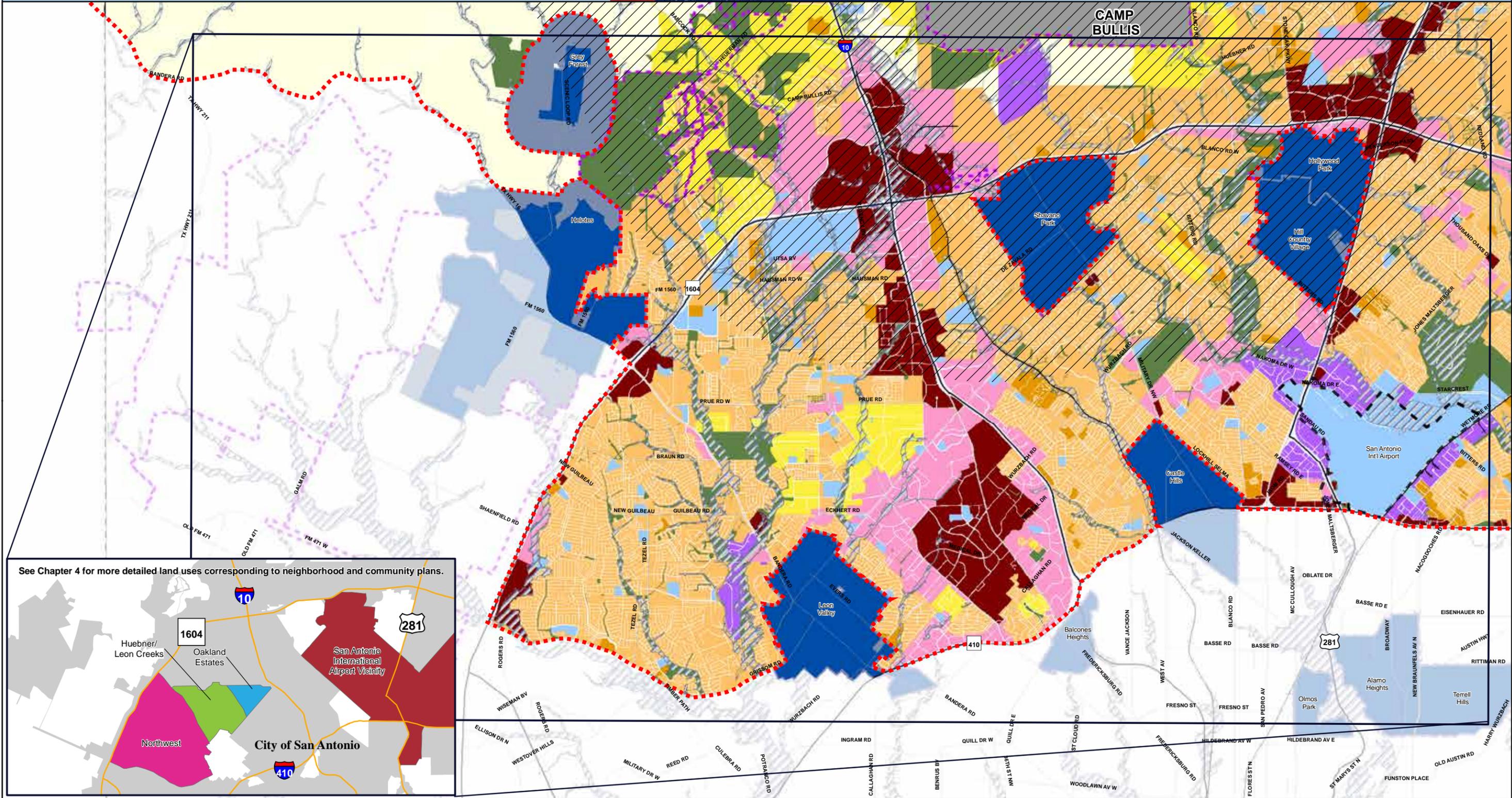
**Other Features**

- Floodplain
- North Sector Planning Area
- San Antonio
- Incorporated City
- Incorporated City ETJ
- County
- Airport
- Highway
- Major Road
- Railroad



Figure 3-4: Southwest Quadrant - North Sector Land Use Plan

11 x 17 Back



A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries.

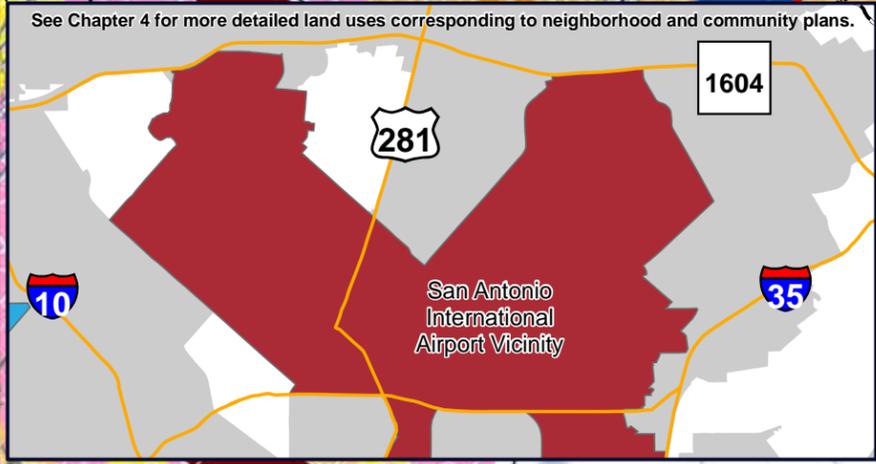
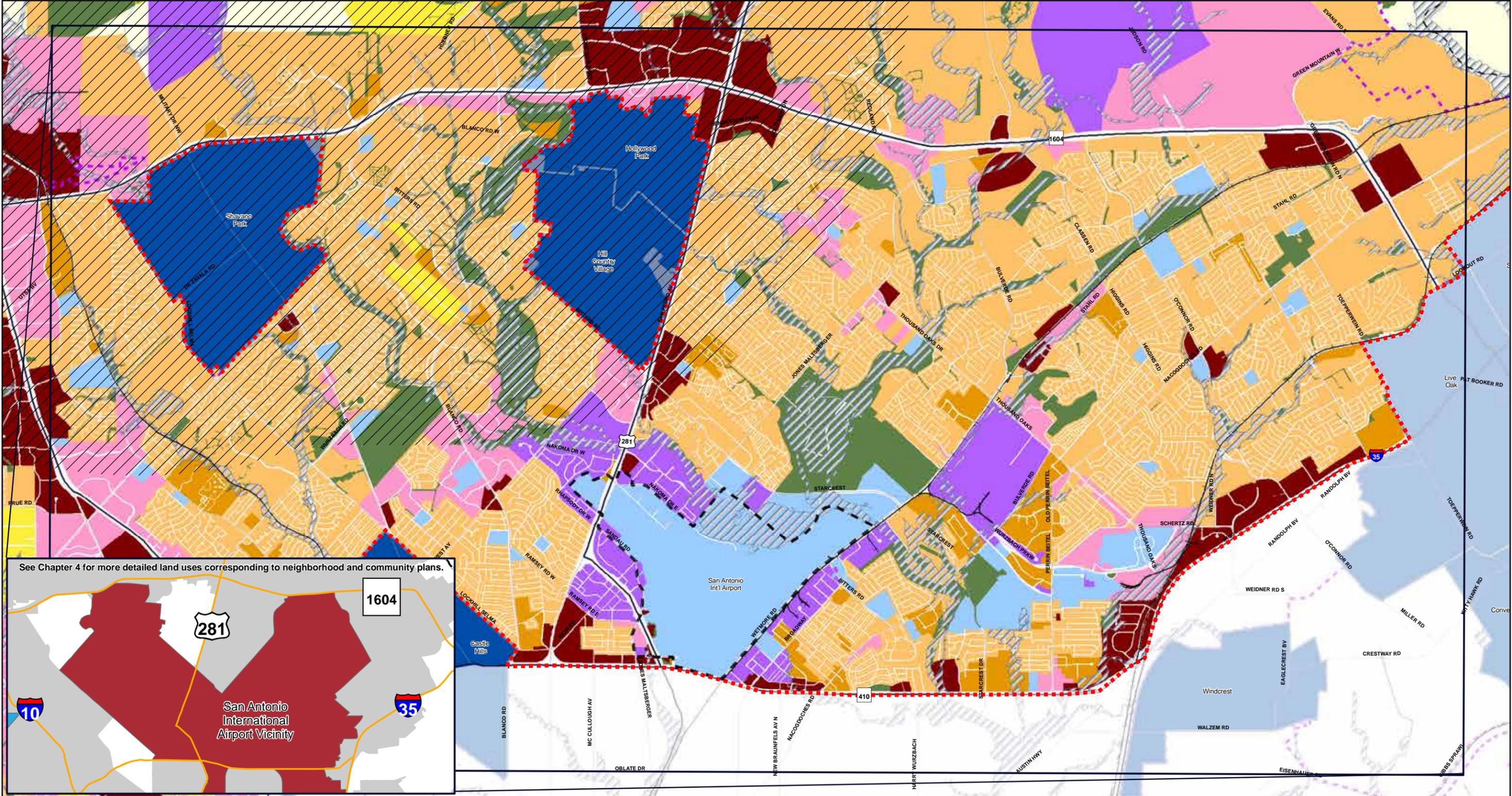
<p><b>Future Land Use</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4F81BD; border: 1px solid black; margin-right: 5px;"></span> Natural</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFF2CC; border: 1px solid black; margin-right: 5px;"></span> Country</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFF2CC; border: 1px solid black; margin-right: 5px;"></span> Rural Estate</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFDAB9; border: 1px solid black; margin-right: 5px;"></span> Suburban</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFDAB9; border: 1px solid black; margin-right: 5px;"></span> General Urban</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></span> Civic</li> </ul>	<p><b>Neighborhood and Community Plan</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black; margin-right: 5px;"></span> Huebner/ Leon Creeks</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FF69B4; border: 1px solid black; margin-right: 5px;"></span> Northwest</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #6495ED; border: 1px solid black; margin-right: 5px;"></span> Oakland Estates</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8B0000; border: 1px solid black; margin-right: 5px;"></span> San Antonio International Airport Vicinity</li> </ul>	<p><b>Other Features</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ADD8E6; border: 1px solid black; margin-right: 5px;"></span> Floodplain</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px dashed red; margin-right: 5px;"></span> North Sector Planning Area</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px dashed purple; margin-right: 5px;"></span> San Antonio</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4F81BD; border: 1px solid black; margin-right: 5px;"></span> Incorporated City</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4F81BD; border: 1px solid black; margin-right: 5px;"></span> Incorporated City ETJ</li> </ul>	<p><b>Infrastructure</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> County</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Airport</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Highway</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Major Road</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black; margin-right: 5px;"></span> Railroad</li> </ul>
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\*Note: subject to recommended compatible uses  
 \*\*Note: refer to the adopted land use plans for these areas

**Southwest Quadrant - North Sector Land Use Plan**

Figure 3-5: Southeast Quadrant - North Sector Land Use Plan

11 x 17 Back

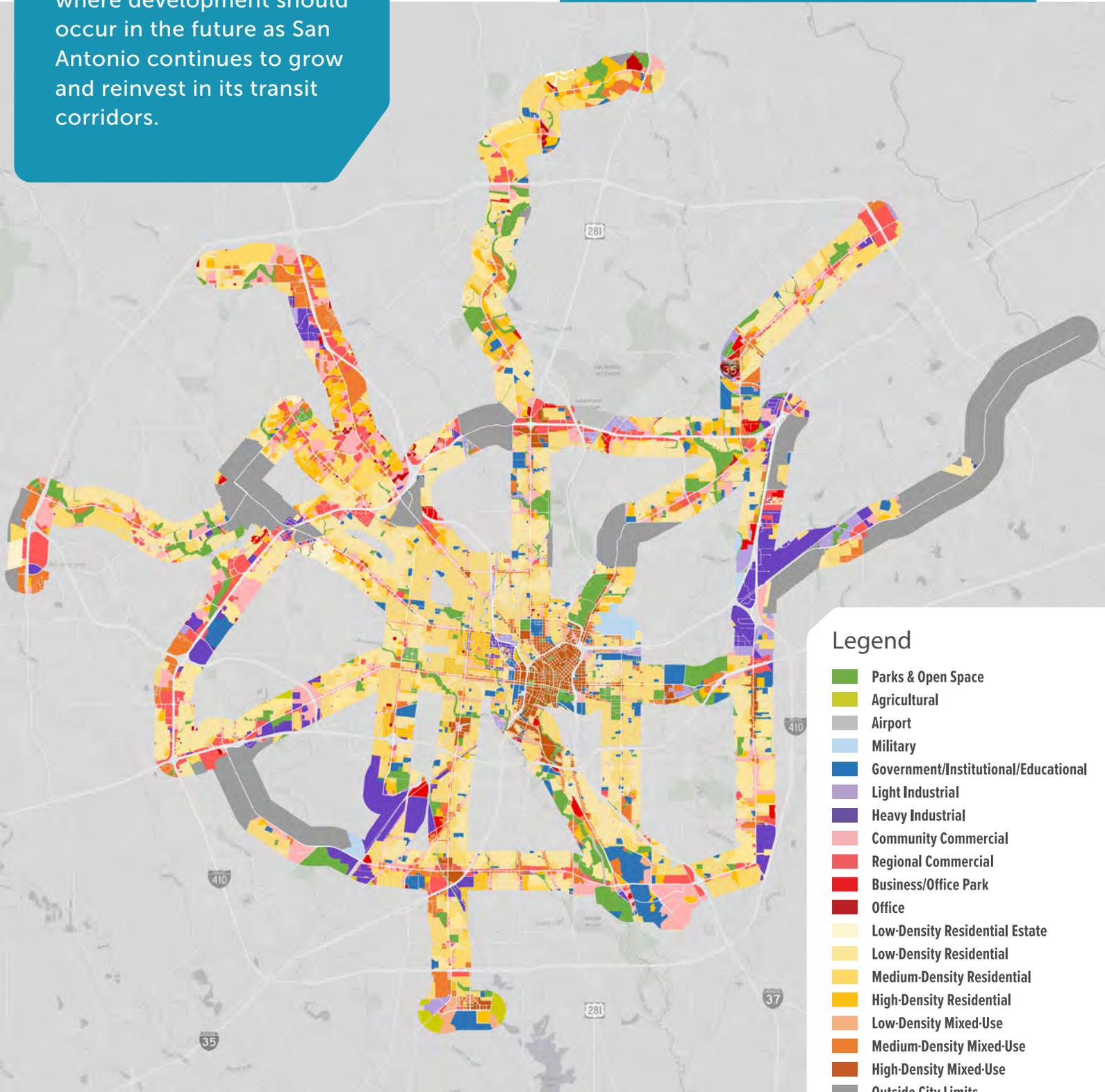


<p>A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries.</p> <p>source: Bexar County, Comal County, Kendall County / 2010; TNRIS / 2009                  FLU_SE_20100722_RGR.pdf</p>	<p><b>Future Land Use</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4F81BD; border: 1px solid black;"></span> Natural</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFF2CC; border: 1px solid black;"></span> Country</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFD700; border: 1px solid black;"></span> Rural Estate</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFC080; border: 1px solid black;"></span> Suburban</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FF8C00; border: 1px solid black;"></span> General Urban</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ADD8E6; border: 1px solid black;"></span> Civic</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFD700; border: 1px dashed black;"></span> junk</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FFC080; border: 1px dashed black;"></span> Military Influence Overlay Area*</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FF69B4; border: 1px solid black;"></span> Mixed Use</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8B0000; border: 1px solid black;"></span> Regional</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8A2BE2; border: 1px solid black;"></span> Specialized</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black;"></span> Military</li> </ul>	<p><b>Neighborhood and Community Plan</b></p> <ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #90EE90; border: 1px solid black;"></span> Huebner/ Leon Creeks</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #FF69B4; border: 1px solid black;"></span> Northwest</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4682B4; border: 1px solid black;"></span> Oakland Estates</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8B0000; border: 1px solid black;"></span> San Antonio International Airport Vicinity</li> </ul> <p>*Note: subject to recommended compatible uses                  **Note: refer to the adopted land use plans for these areas</p>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #ADD8E6; border: 1px solid black;"></span> Floodplain</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px dashed red;"></span> North Sector Planning Area</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px dashed purple;"></span> San Antonio</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #4682B4; border: 1px solid black;"></span> Incorporated City</li> <li><span style="display: inline-block; width: 15px; height: 10px; background-color: #8A2BE2; border: 1px solid black;"></span> Incorporated City ETJ</li> </ul>	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 10px; border: 1px solid black;"></span> County</li> <li><span style="display: inline-block; width: 15px; height: 10px; border: 2px solid black;"></span> Airport</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 2px solid black;"></span> Highway</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 2px solid black;"></span> Major Road</li> <li><span style="display: inline-block; width: 15px; height: 10px; border-bottom: 2px solid black;"></span> Railroad</li> </ul>
	<p>0 0.5 1 Mile</p>			<p><b>3-5</b></p>	

# FUTURE LAND USE

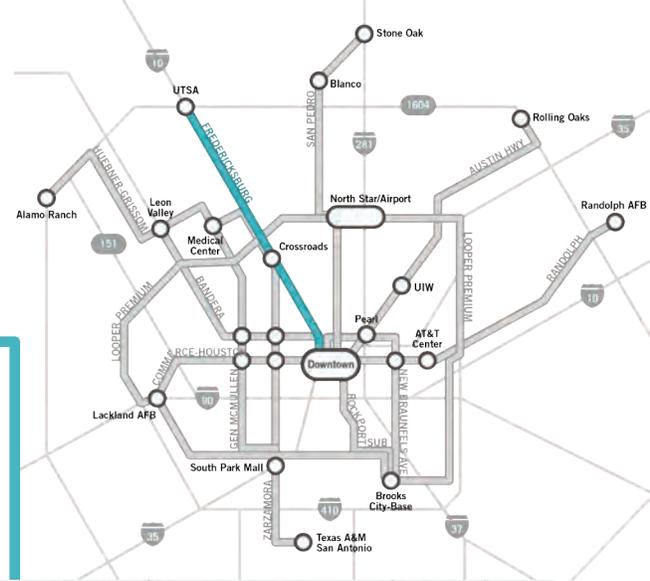
The future land use map is a guide for how and where development should occur in the future as San Antonio continues to grow and reinvest in its transit corridors.

# FUTURE LAND USE



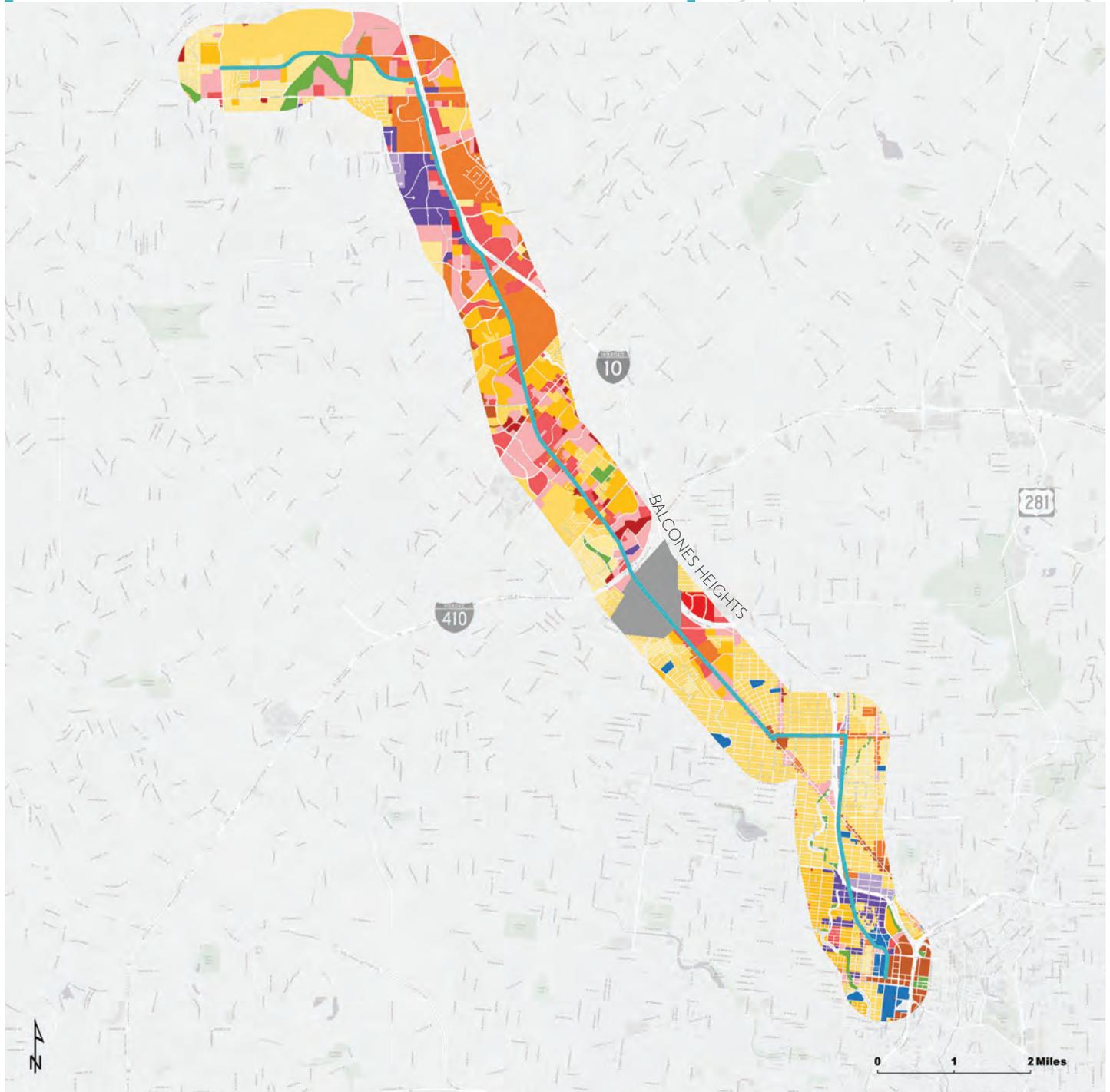
# FREDERICKSBURG

## OPTIMIZED LAND USE



### Legend

- |  |                                |                            |
|--|--------------------------------|----------------------------|
| Parks & Open Space                       | Light Industrial               | Low-Density Residential    |
| Agricultural                             | Heavy Industrial               | Medium-Density Residential |
| Airport                                  | Community Commercial           | High-Density Residential   |
| Military                                 | Regional Commercial            | Low-Density Mixed-Use      |
| Government/Institutional/<br>Educational | Business/Office Park           | Medium-Density Mixed-Use   |
|  | Office                         | High-Density Mixed-Use     |
|  | Low-Density Residential Estate | Outside City Limits        |



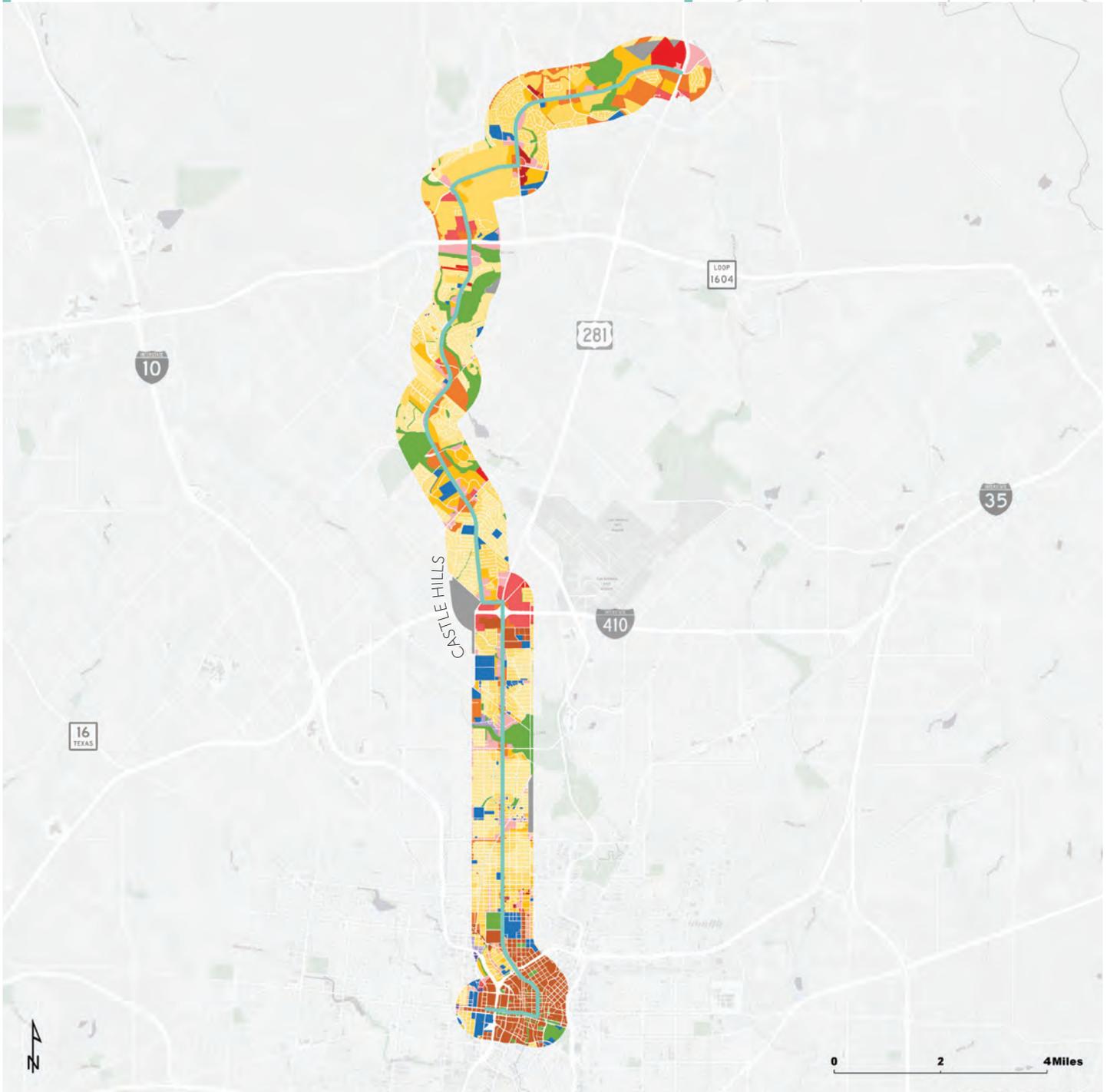
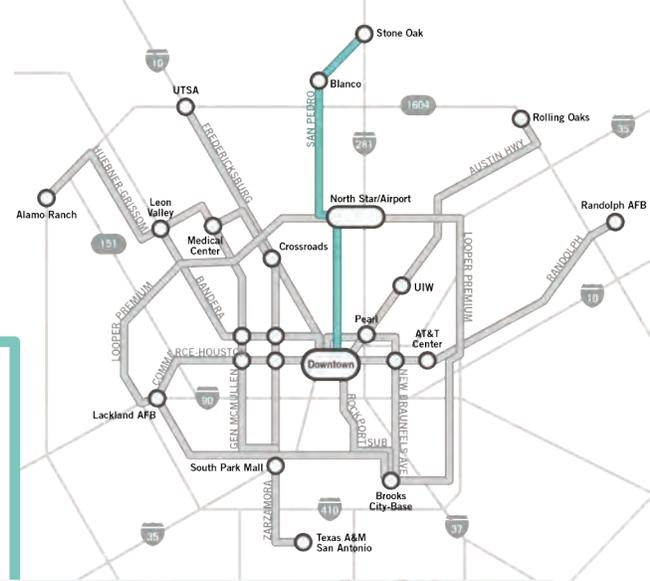
SA Corridors:

# SAN PEDRO

## OPTIMIZED LAND USE

### Legend

- |  |  |  |
|--|--|--|
|  Parks & Open Space                       |  Light Industrial               |  Low-Density Residential    |
|  Agricultural                             |  Heavy Industrial               |  Medium-Density Residential |
|  Airport                                  |  Community Commercial           |  High-Density Residential   |
|  Military                                 |  Regional Commercial            |  Low-Density Mixed-Use      |
|  Government/Institutional/<br>Educational |  Business/Office Park           |  Medium-Density Mixed-Use   |
|  |  Office                         |  High-Density Mixed-Use     |
|  |  Low-Density Residential Estate |  Outside City Limits        |



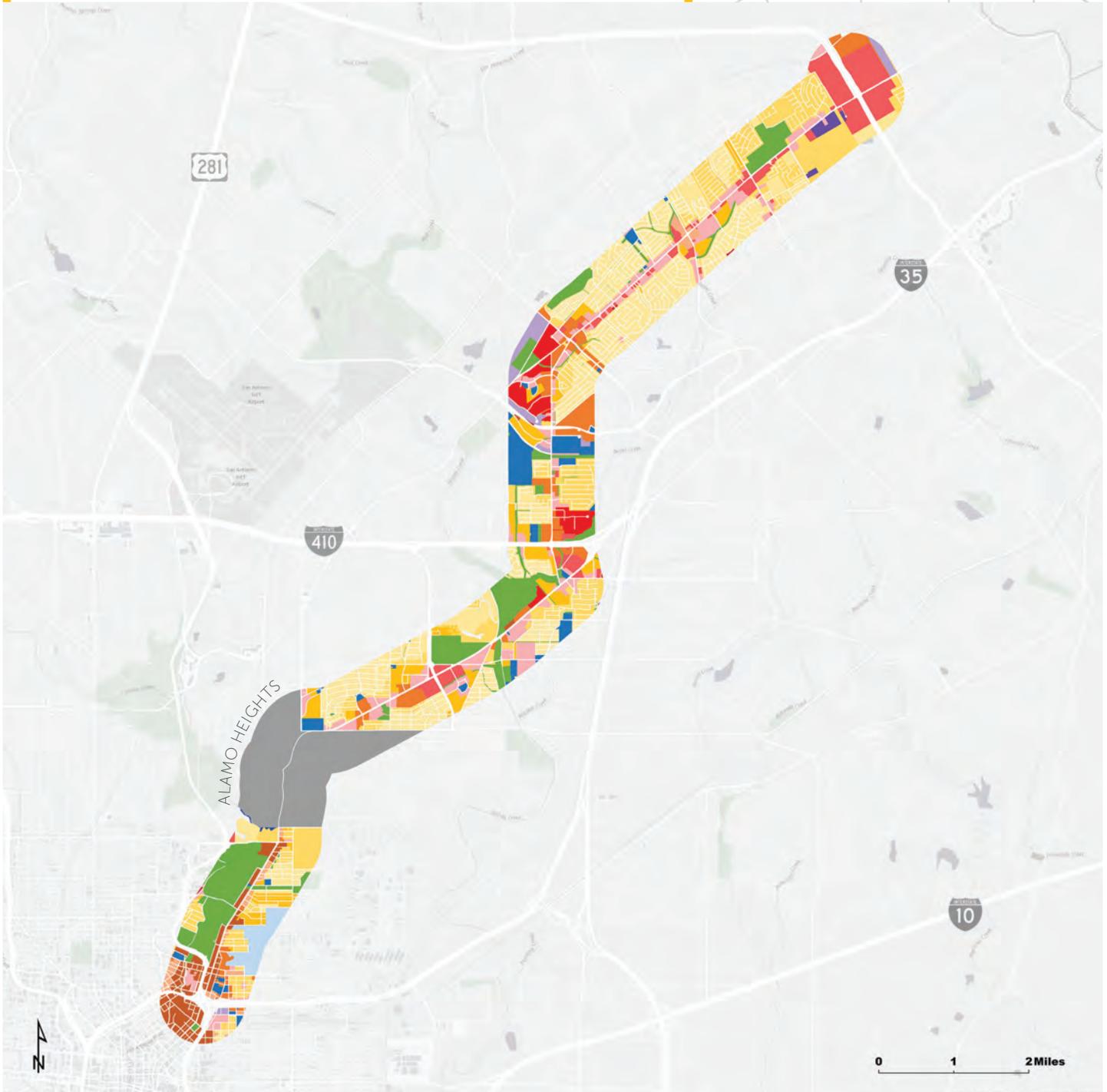
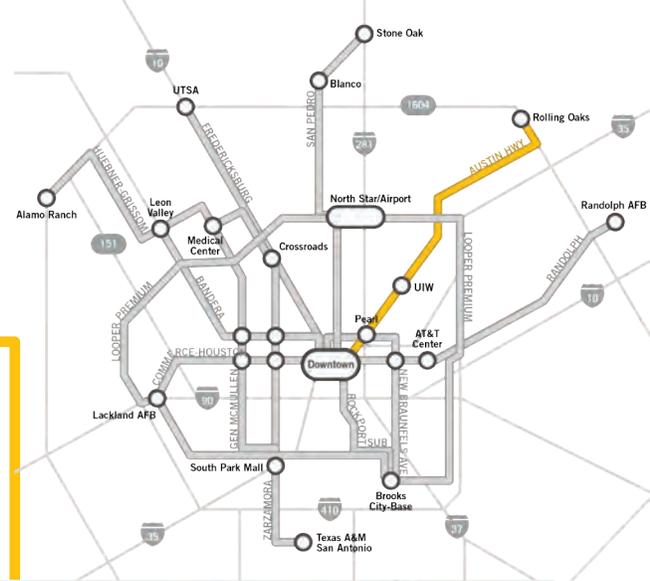
SA Corridors:

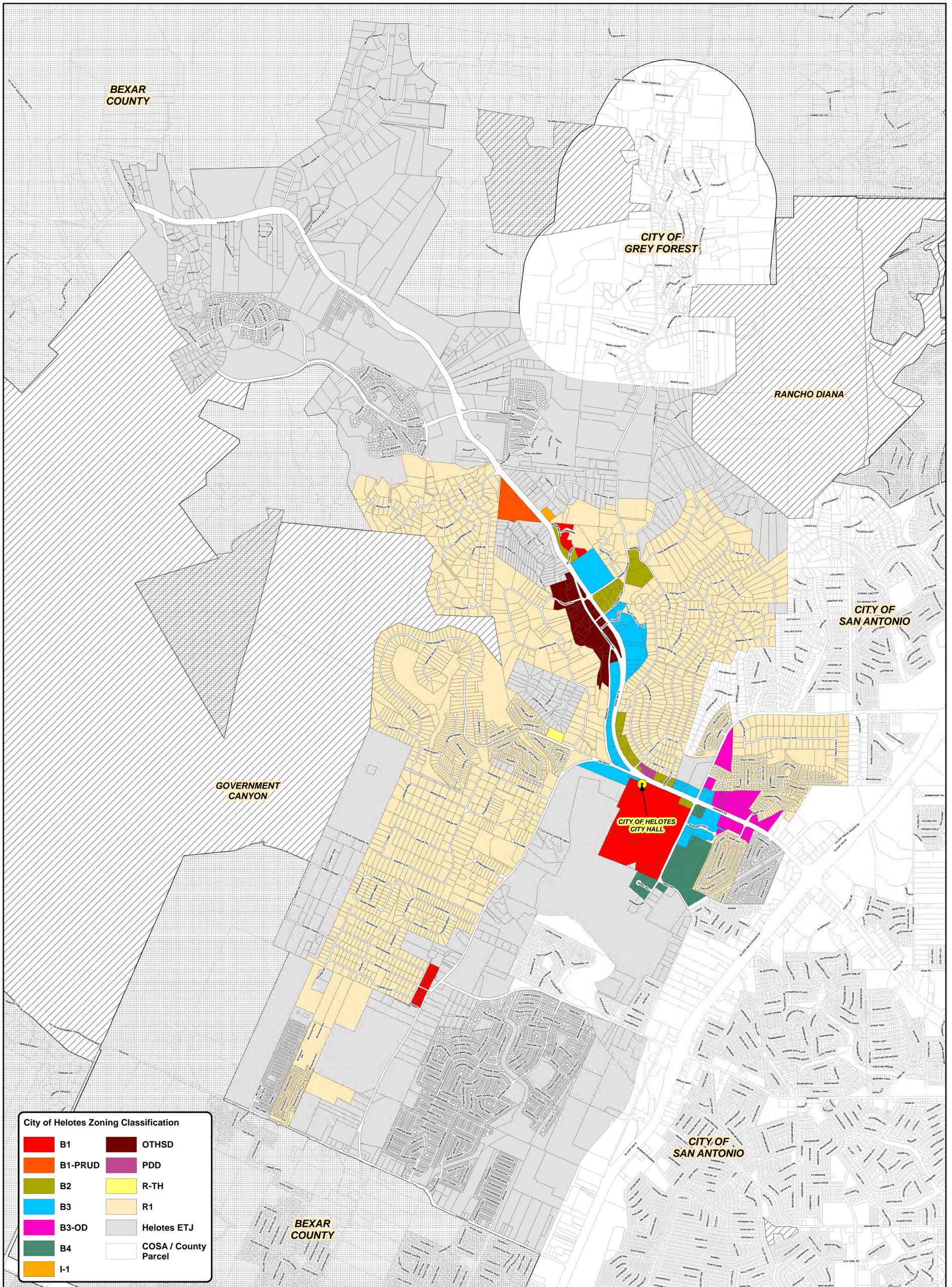
# AUSTIN HIGHWAY

## OPTIMIZED LAND USE

### Legend

- |  |  |  |
|--|--|--|
|  Parks & Open Space                   |  Light Industrial               |  Low-Density Residential    |
|  Agricultural                         |  Heavy Industrial               |  Medium-Density Residential |
|  Airport                              |  Community Commercial           |  High-Density Residential   |
|  Military                             |  Regional Commercial            |  Low-Density Mixed-Use      |
|  Government/Institutional/Educational |  Business/Office Park           |  Medium-Density Mixed-Use   |
|  |  Office                         |  High-Density Mixed-Use     |
|  |  Low-Density Residential Estate |  Outside City Limits        |





**Legend**

- City of Helotes - City Hall Location
- CoSA/State Park Area
- Parcels 2016 selection
- Bexar County

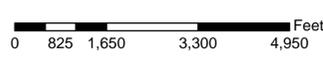
Note: Parcel data was acquired through the Bexar County Appraisal District and is current as of January 2013. City and ETJ limit data was acquired from the City of San Antonio GIS Department and is current as of the date of this map.

Disclaimer: This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.



## CITY OF HELOTES ZONING MAP

12951 Bandera Road  
Helotes, Texas 78023  
Phone: 210-695-8877  
Fax: 210-695-2123



1 inch = 1,650 feet  
Date Revised: 7/17/2018



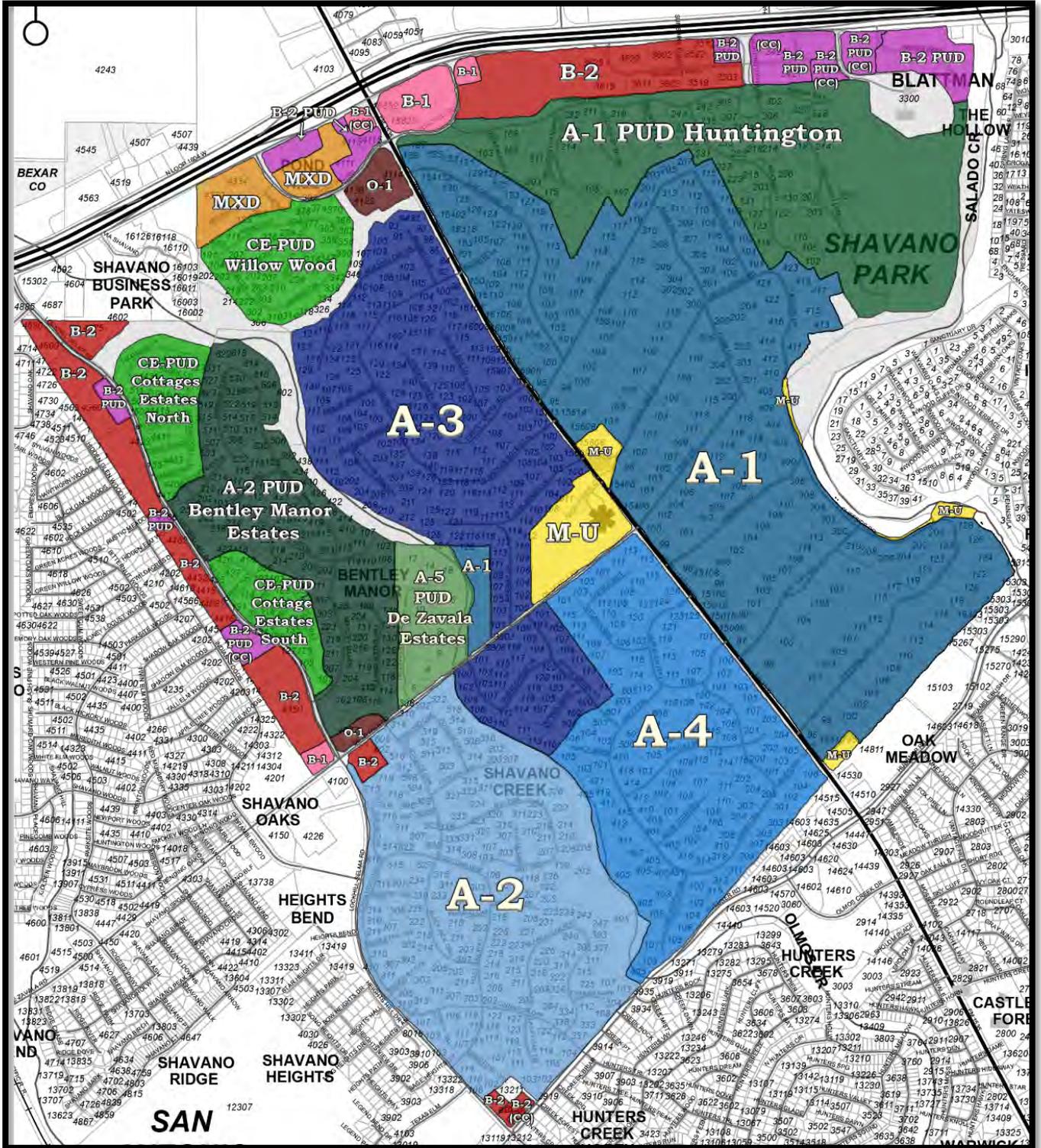




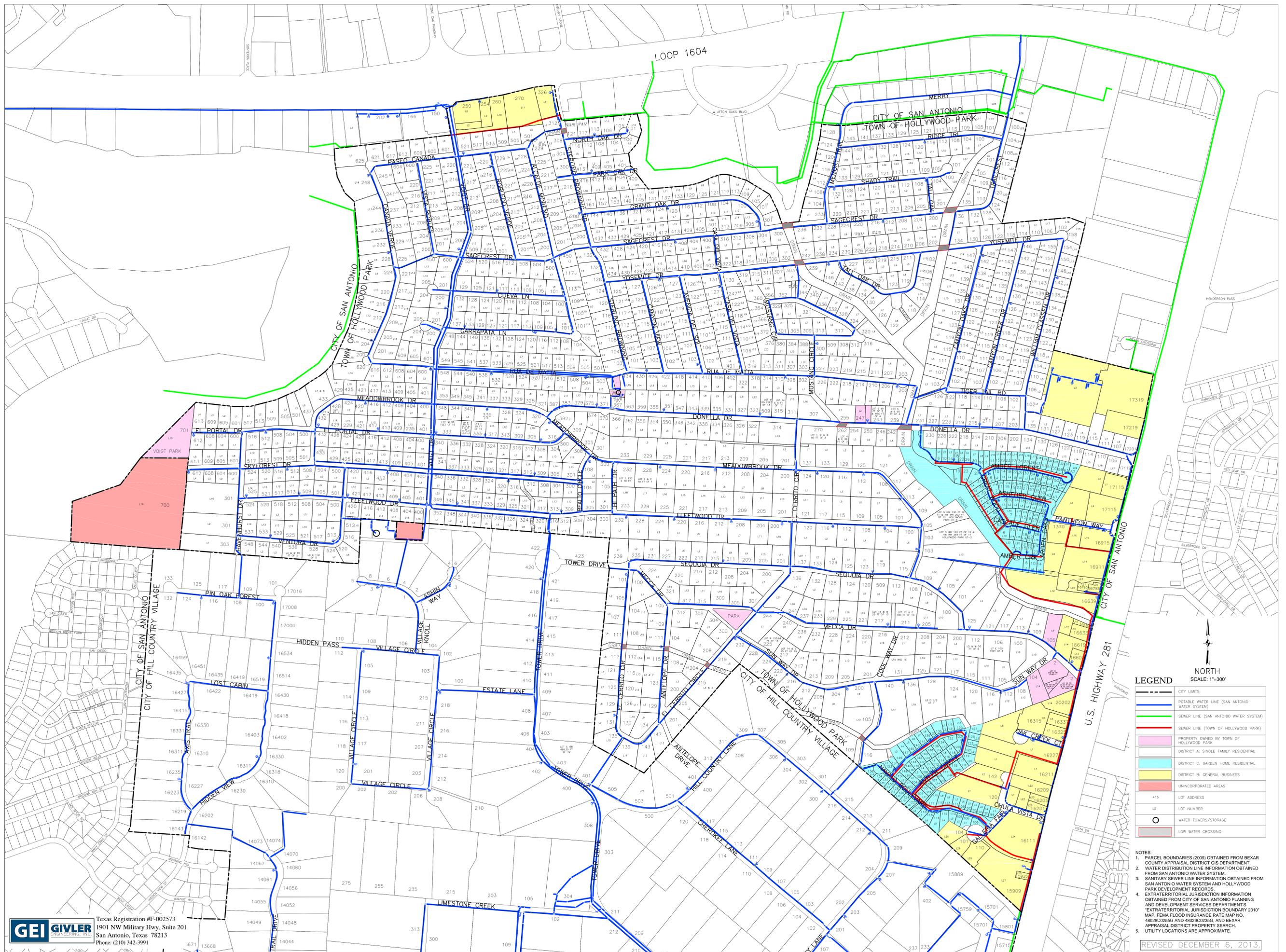
engineers | architects | surveyors

TBPE FIRM NO. F-366  
8918 Tesoro Drive, Suite 401  
San Antonio, TX 78217  
Phone: 210-822-2232  
www.LNVINC.com

# Zoning Map



Note: A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries.



**GEI GIVLER**  
 Texas Registration #F-002573  
 1901 NW Military Hwy, Suite 201  
 San Antonio, Texas 78213  
 Phone: (210) 342-3991

**LEGEND**

(Black dashed line)	CITY LIMITS
(Blue line)	POTABLE WATER LINE (SAN ANTONIO WATER SYSTEM)
(Green line)	SEWER LINE (SAN ANTONIO WATER SYSTEM)
(Red line)	SEWER LINE (TOWN OF HOLLYWOOD PARK)
(Pink fill)	PROPERTY OWNED BY TOWN OF HOLLYWOOD PARK
(Light blue fill)	DISTRICT A: SINGLE FAMILY RESIDENTIAL
(Yellow fill)	DISTRICT B: GENERAL BUSINESS
(Light blue fill)	DISTRICT C: GARDEN HOME RESIDENTIAL
(Red fill)	DISTRICT D: UNINCORPORATED AREAS
(Small square)	415 LOT ADDRESS
(Small square)	15 LOT NUMBER
(Circle)	WATER TOWERS/STORAGE
(Red outline)	LOW WATER CROSSING

- NOTES:**
1. PARCEL BOUNDARIES (2009) OBTAINED FROM BEVAR COUNTY APPRAISAL DISTRICT GIS DEPARTMENT.
  2. WATER DISTRIBUTION LINE INFORMATION OBTAINED FROM SAN ANTONIO WATER SYSTEM.
  3. SANITARY SEWER LINE INFORMATION OBTAINED FROM SAN ANTONIO WATER SYSTEM AND HOLLYWOOD PARK DEVELOPMENT RECORDS.
  4. EXTRATERRITORIAL JURISDICTION INFORMATION OBTAINED FROM CITY OF SAN ANTONIO PLANNING AND DEVELOPMENT SERVICES DEPARTMENT'S "EXTRATERRITORIAL JURISDICTION BOUNDARY 2010" MAP, FEMA FLOOD INSURANCE RATE MAP NO. 4802C0265 AND 4802C0266, AND BEVAR APPRAISAL DISTRICT PROPERTY SEARCH.
  5. UTILITY LOCATIONS ARE APPROXIMATE.

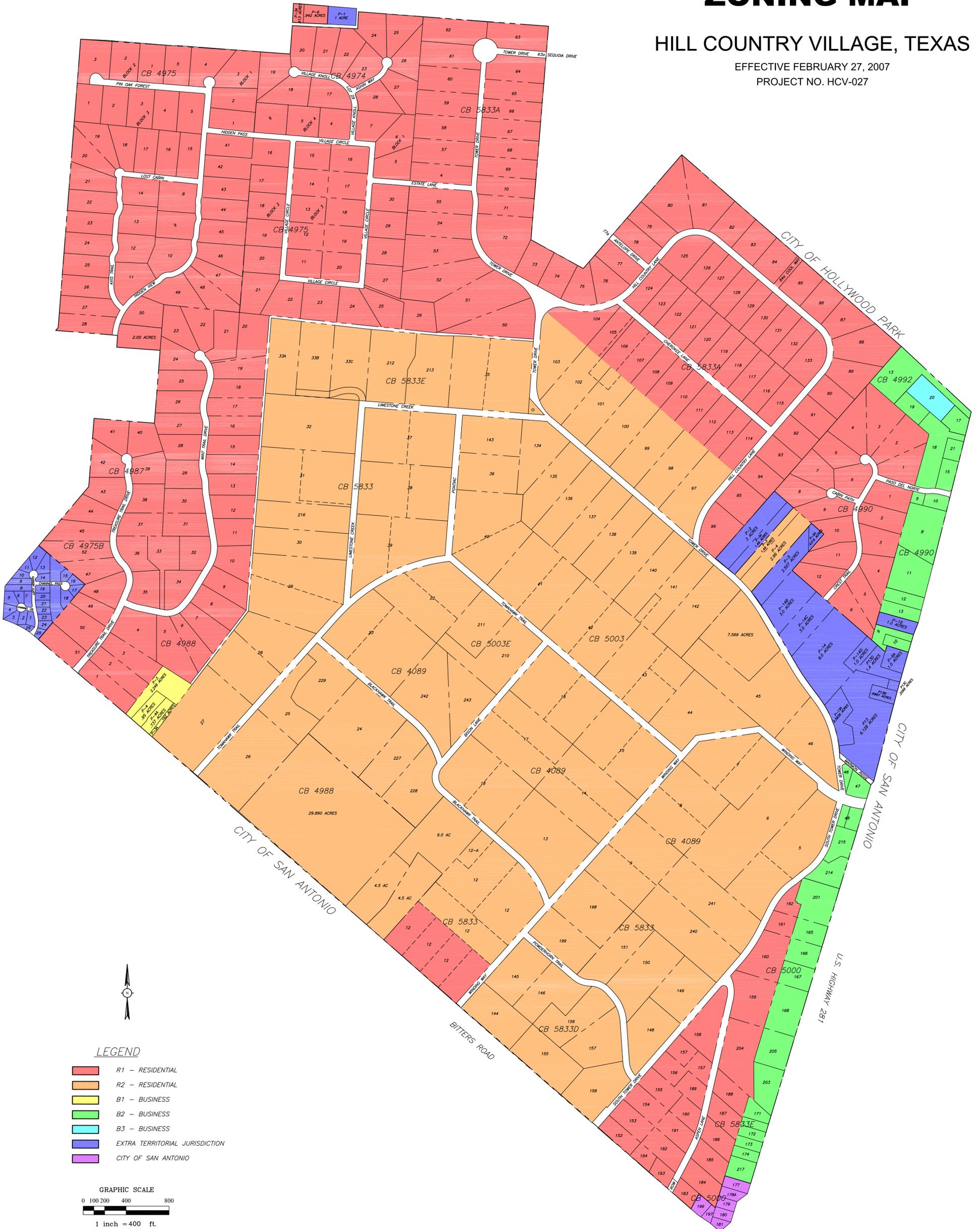
REVISED DECEMBER 6, 2013.

# TOWN OF HOLLYWOOD PARK, TEXAS

# ZONING MAP

## HILL COUNTRY VILLAGE, TEXAS

EFFECTIVE FEBRUARY 27, 2007  
PROJECT NO. HCV-027



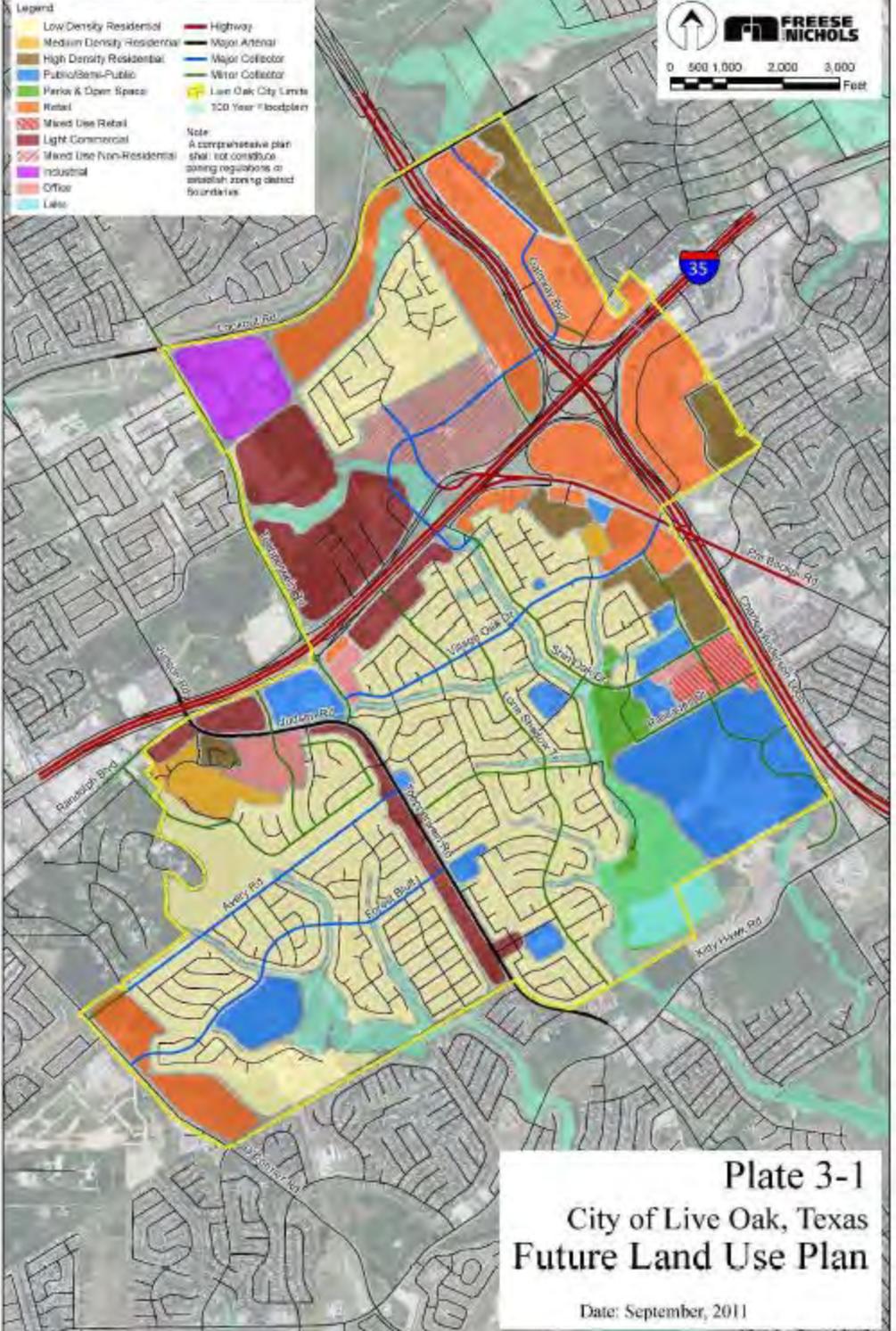
**Givler Engineering, Inc.**

2161 N.W. Military Highway, Suite 114  
San Antonio, Texas 78213  
Phone: (210) 342-3991  
Fax: (210) 342-6065

- Legend**
- Low Density Residential
  - Medium Density Residential
  - High Density Residential
  - Public/semi-Public
  - Parks & Open Space
  - Retail
  - Mixed Use Retail
  - Light Commercial
  - Mixed Use Non-Residential
  - Industrial
  - Office
  - Lake
  - Highway
  - Major Arterial
  - Major Collector
  - Minor Collector
  - Low Oak City Limits
  - 100 Year Floodplain
- Note:**  
A comprehensive plan shall not constitute zoning regulations or establish zoning district boundaries.



0 500 1,000 2,000 3,000 Feet



**Plate 3-1**  
**City of Live Oak, Texas**  
**Future Land Use Plan**  
 Date: September, 2011

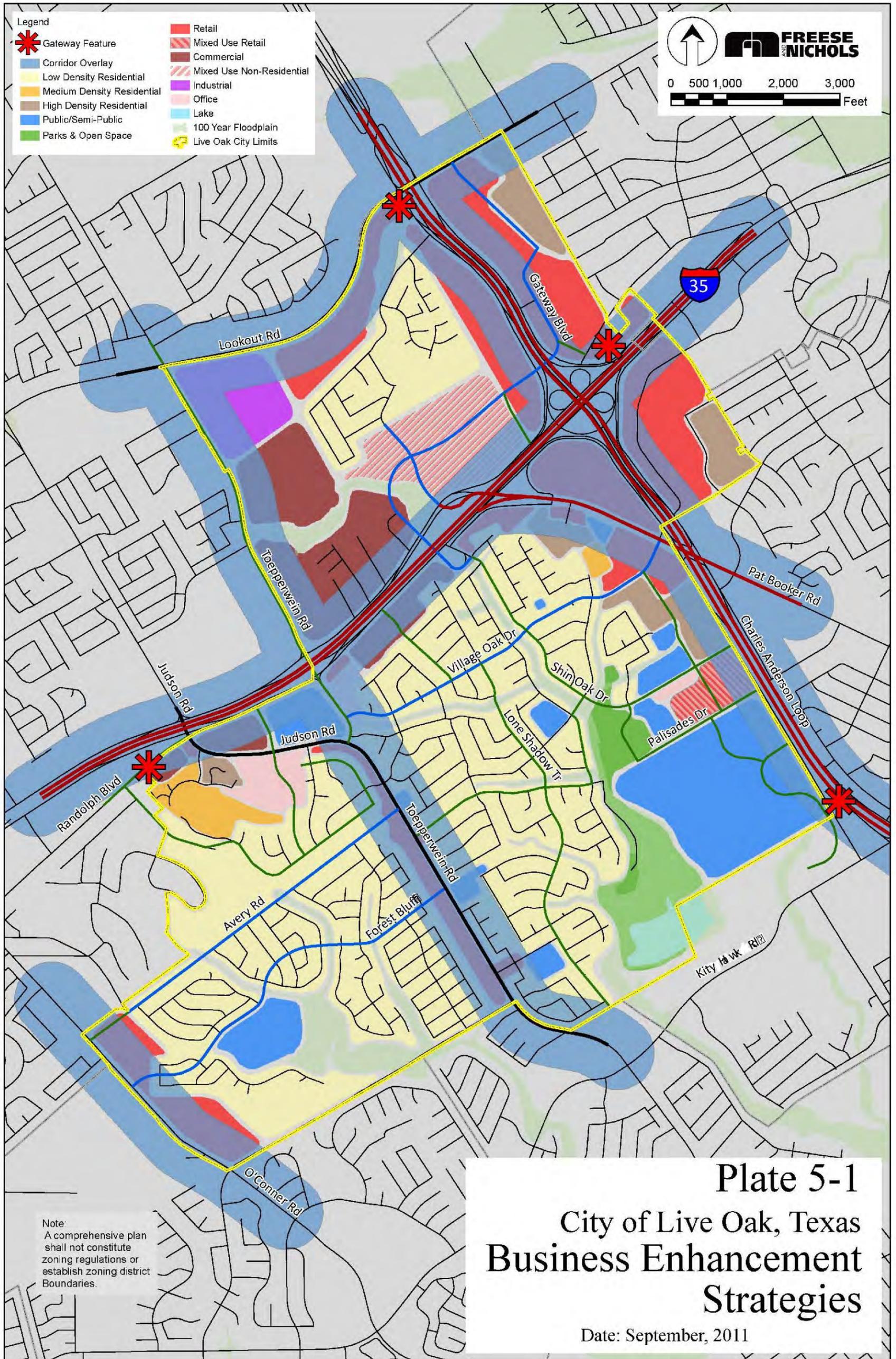
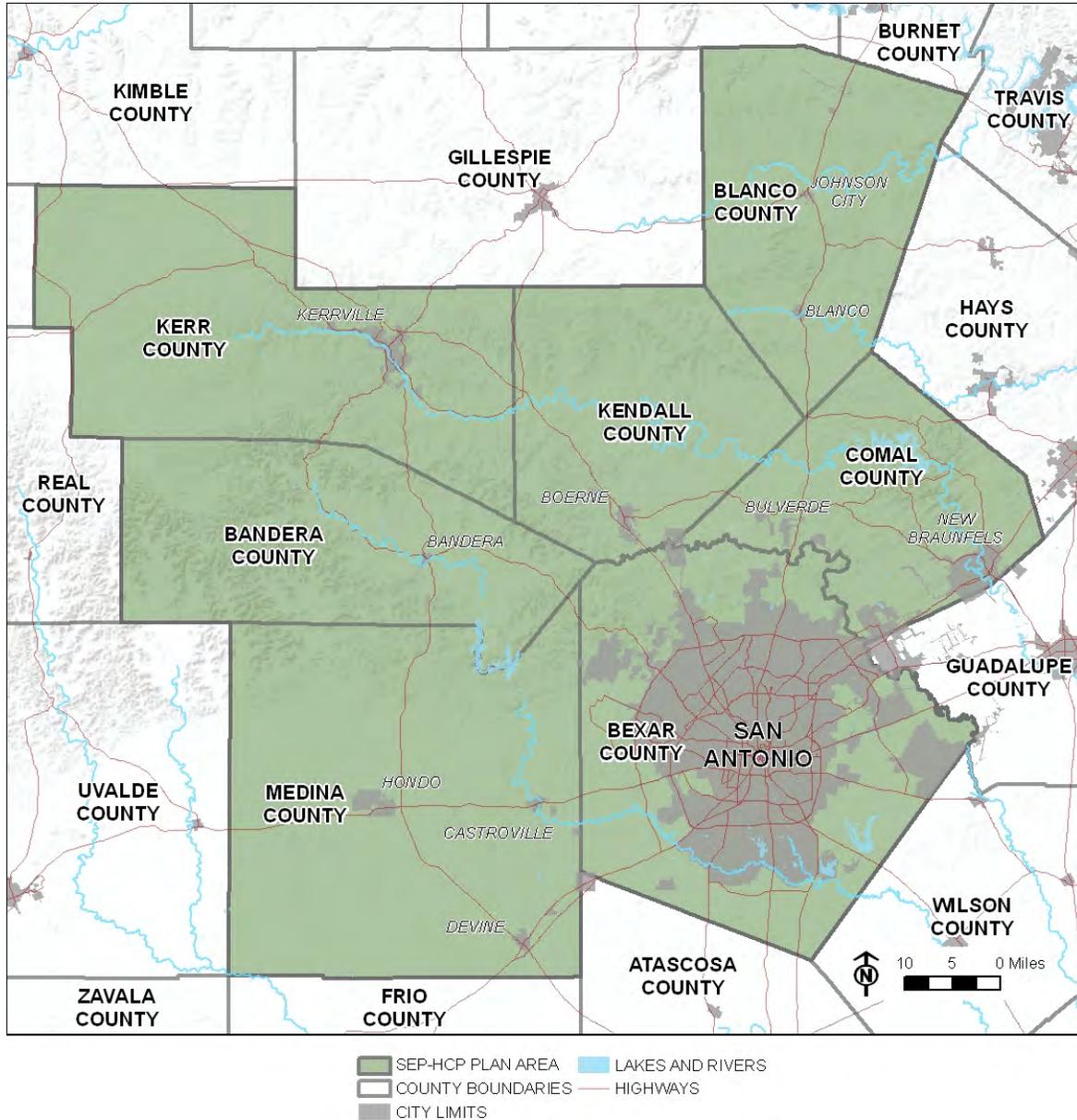




FIGURE 1. SEP-HCP Plan Area.



### 1.1 NEED AND PURPOSE FOR THE PLAN

The greater San Antonio area is positioned at the southeastern edge of the Edwards Plateau ecoregion in Texas. This ecoregion supports several federally threatened or endangered species that occupy a variety of habitats, including mature woodlands, early-growth shrublands, and subterranean caves. The natural resources of the Edwards Plateau have also been a significant attraction for human