# Cumulative Impacts Analysis Technical Report

OAK HILL PARKWAY

U.S. Highway 290 (US 290) / State Highway (SH)
71 West from State Loop 1 (Mopac) to Ranch-to-Market (RM) 1826 and
SH 71 to Silvermine Drive
Travis County, Texas
CSJ # 0113-08-060 and 0700-03-077

November 2017

Texas Department of Transportation

CENTRAL TEXAS Regional Mobility Authority

*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 16, 2014, and executed by FHWA and TxDOT.*

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# 1. Introduction

## 1.1 Background

The Texas Department of Transportation (TxDOT) and the Central Texas Regional Mobility Authority (CTRMA) are considering mobility improvements to U.S. Highway (US) 290 / State Highway (SH) 71 West through Oak Hill (the Oak Hill Parkway). The project corridor extends along US 290 from State Loop 1 (Loop 1 or Mopac) to Ranch-to-Market Road (RM) 1826 for a distance of approximately 6.15 miles with a transition to the west. The project also includes the interchange on SH 71 from US 290 to Silvermine Drive, a distance of approximately 1.31 miles. The proposed project corridor is within the City of Austin in Travis County, Texas. The project includes the proposed locations of two water quality detention ponds: the first along SH 71 north of Covered Bridge Drive and the second between SH 71 and Old Bee Caves Road across from Sunset Ridge. The existing bridge over Williamson Creek and several culverts and/or drainage structures would be replaced or rehabilitated to accommodate the additional roadway width and new alignment. The existing right-of-way ranges from 90 to 260 feet wide and the proposed right-of-way would range from approximately 150 to 600 feet wide. The project location is shown on **Figure 1** in **Attachment A**. Refer to **Section 1.4** for detailed descriptions of the proposed design alternatives.

This technical report assesses the potential for cumulative impacts associated with the proposed Oak Hill Parkway project. It provides definitions of direct, indirect, and cumulative impacts and also summarizes the TxDOT guidance utilized to determine the magnitude of potential cumulative impacts.

## 1.2 Project History

The proposed project evolved from efforts that began in the mid 1980's. The proposed improvements were originally considered and approved in a Final Environmental Impact Statement (EIS) Record of Decision (ROD), which covered improvements to US 290/SH 71 from RM 1826 to Farm-to-Market Road (FM) 973. Since the issuance of the ROD in 1988, partial construction of the original project (between Joe Tanner Lane and Riverside Drive) has been completed and changes in adjacent land use, state and federal species listings, funding mechanisms, and public input have resulted in a new proposed design concept for this project. The original Final EIS has been re-evaluated four times and a Biological Opinion for effects to federally-listed species within the initial project area was issued by the U.S Fish and Wildlife Service (USFWS) in 2006 (USFWS, 2006). Environmental and traffic-related studies and reports, as well as public involvement activities have continued since the issuance of the 1988 ROD. In 2012, a Notice of Intent (NOI) was published

in both the Texas and Federal Registers announcing TxDOT's intent to prepare a new EIS for the US 290/ SH 71 Oak Hill Parkway project.

## 1.3 Existing Facility

Currently, the US 290/SH 71 facility consists of a six-lane urban freeway section with two- to four-lane frontage roads from Mopac to just west of Old Fredericksburg Road. Direct connector ramps connect US 290/SH 71 to the Mopac main lanes. Between Old Fredericksburg Road and Joe Tanner Lane, US 290/SH 71 transitions from a freeway/frontage road facility to a four- and five-lane urban highway; this urban highway section continues to just east of the SH 71 junction. Between SH 71 and RM 1826, the existing US 290 roadway consists of four 11-foot travel lanes with intermittent 14-foot center turn lanes and shoulders ranging from 2 to 4 feet in width. The existing SH 71 accommodates four 12-foot travel lanes, two 8-foot shoulders, and a 14-foot continuous center turn lane.

Dual left-turn and right-turn lanes exist on US 290 at Convict Hill Road, the Austin Community College Driveway, the Speedy Stop, Oak Hill United Methodist Church, and RM 1826. Innovative improvements called continuous flow intersections (CFI) were constructed on US 290 at William Cannon Drive and SH 71, as well as a median U-turn at Joe Tanner Lane. The CFI was constructed in one direction at SH 71 and in two directions at William Cannon Drive.

## 1.4 Build Alternatives

Two design alternatives (*Alternatives A* and *C*) will be advanced through schematic development and environmental analysis as the proposed build options for the Oak Hill Parkway project. The *No Build Alternative* will also be carried forward. For purposes of this report, the geographic area covered by the combined alternative alignments is considered the project area since there are only slight differences between the overall alignments of the build alternatives. The project area includes the location of two proposed stormwater detention ponds: the first along SH 71 north of Covered Bridge Drive and the second between SH 71 and Old Bee Caves Road across from Sunset Ridge. Both alternatives would incorporate culverts, vegetative filter strips, and bioretention ponds within the proposed or existing right-of-way. New right-of-way and easements are expected for both design alternatives.

### 1.4.1 Alternative A

*Alternative A* is a conventional controlled-access highway with frontage roads. New construction for roadway improvements would begin just east of Joe Tanner Lane where the existing main lanes transition to an urban highway. With *Alternative A*, the main lanes would be elevated over William Cannon Drive and the westbound main

lanes and frontage road would be located north of Williamson Creek. The main lanes would be depressed under SH 71 and direct connectors would be provided, connecting eastbound SH 71 with US 290 and westbound US 290 with SH 71. Main lanes would vary from four lanes in each direction near William Cannon Drive to a two-lane transition near the western project extent. The main lanes of the proposed project would be toll lanes. Grade-separated intersections would be constructed at Convict Hill Road, RM 1826, Scenic Brook Drive, and Circle Drive (S. View Road). Main lanes would generally be 12 feet wide with 10-foot-wide shoulders. Texas turnarounds, which allow vehicles traveling on a frontage road to U-turn onto the opposite frontage road, would be constructed on US 290 frontage roads at Scenic Brook Drive, RM 1826, Convict Hill Drive, and William Cannon Drive.

Along SH 71, the direct connector ramps would extend past Scenic Brook Drive where the main lanes would then transition to a five-lane (three lanes northbound, two lanes southbound) rural highway with Texas turnarounds. Bicycle and pedestrian facilities would be provided via a shared-use path (SUP) and/or sidewalks along the entire project length.

*Alternative A* would require the acquisition of approximately 74.58 acres of new right-of-way, which would include acreages for the two stormwater detention ponds. Approximately 4.08 acres of temporary construction easements and 0.21 acres of SUP are currently proposed for this alternative.

### 1.4.2 Alternative C

*Alternative C* is a conventional controlled-access highway with frontage roads. Construction of roadway improvements would begin just east of Joe Tanner Lane where the existing main lanes transition to an urban highway. With *Alternative C*, the main lanes would be elevated over William Cannon Drive with eastbound and westbound main lanes located north of Williamson Creek. The frontage roads would be along the existing highway. The main lanes would remain elevated over the intersection with SH 71. West of SH 71, *Alternatives A* and *C* share the same design, and grade-separated intersections would be constructed at Convict Hill Road, RM 1826, Scenic Brook Drive and Circle Drive (S. View Road). The main lanes of the proposed project would be toll lanes. Direct connectors would allow drivers to access westbound SH 71 and eastbound US 290. US 290 would generally consist of two to four 12-foot lanes with 10-foot shoulders in each direction. Texas turnarounds would be constructed on US 290 frontage roads at Scenic Brook Drive, RM 1826, and Convict Hill Road.

Along SH 71, the direct connector ramps would extend past Scenic Brook Drive where the main lanes would transition to a five-lane (three lanes northbound, two

lanes southbound) rural highway with Texas turnarounds. Bicycle and pedestrian facilities would be provided via a SUP and/or sidewalks along the entire project length.

*Alternative C* would require the acquisition of approximately 75.19 acres of new right-of-way, which would include acreages for the two stormwater detention ponds. Approximately 4.12 acres of temporary construction easements and 0.21 acres of SUP are currently proposed for this alternative.

### 1.4.3 No Build Alternative

Consistent with the requirements of the National Environmental Policy Act (NEPA) and Federal Highway Administration (FHWA) guidelines, this analysis considers an alternative that assesses environmental effects if the proposed project were not built. This alternative, called the *No Build Alternative*, includes the routine maintenance and improvements of the existing roads in the study area and the currently programmed, committed, and funded roadway projects. While the *No Build Alternative* does not meet the project needs, it provides a baseline condition to compare and measure the effects of all both build alternatives.

## 2. Summary of Scoping Activities Completed

For the cumulative effects analysis, the scoping process is intended to focus the analysis on significant issues that will produce a meaningful cumulative effects study and factor into the environmental documentation decision. Scoping for the Oak Hill Parkway project, including cumulative effects, was conducted via the following methods:

- Regular coordination among the study team and the project's sponsors and stakeholders
- Agency stakeholder meetings
- Public involvement through public information meetings
- Information obtained from the indirect impacts questionnaire sent to local agencies and organizations (the questionnaire and a summary of the responses received are documented under separate cover in the *Indirect Impacts Analysis Technical Report*)

The public and agency stakeholder meetings were used to introduce the project to the general public and agencies and to solicit comments and input on the project as it progressed. The public and agency stakeholder meetings that have been held to date are shown in **Table 1**.

All resources were considered with the same level of scrutiny in technical studies. From an agency standpoint, these meetings have documented that key resources for investigation of potential indirect and/or cumulative impacts are associated with water quality and aquifer-dependent species associated with the Barton Springs portion of the Edwards Aquifer. Past studies have been consulted and extensive data collection has taken place to ascertain connections between the proposed project and other actions in the context of the health of the particular resource. Particular attention has been paid to resources protected by legislation or resource management plans and ecologically important resources. These resources and issues are primary considerations in this technical report.

| Table 1: Public and Agency Stakeholder Meetings | |
|---|---|
| **Meeting Type** | **Date** |
| Oak Hill Envisioning Mobility Workshop | 8/29/2012 |
| Public and Agency Scoping Meeting | 11/15/2012 |
| Technical Working Group Meeting | 12/17/2012 |
| Environmental Workgroup Meeting | 1/31/2013 |
| Design Workgroup Meeting | 2/19/2013 |
| Oak Hill Parkway EIS Work Session with City of Austin | 3/1/2013 |
| Oak Hill Parkway Bike/Pedestrian Workshop | 3/19/2013 |
| Oak Hill Parkway Design Concept Preview Meeting | 5/16/2013 |
| Oak Hill Parkway Public Open House | 5/23/2013 |
| Evaluation Workgroup Meeting | 9/30/2013 |
| Oak Hill Parkway Public Open House | 10/22/2013 |
| Finance Workshop | 3/22/2014 |
| Oak Hill Parkway Public Open House | 6/17/2014 |
| Stakeholder Workgroup Meeting | 8/26/2014 |
| Context Sensitive Solutions (CSS) Workshop #1 | 10/09/2014 |
| Oak Hill Parkway Public Open House | 1/20/2015 |
| Bicycle and Pedestrian Workshop | 2/17/2015 |
| Oak Hill Parkway City of Austin Coordination Meeting | 2/27/2015 |
| Context Sensitive Solutions (CSS) Workshop #2 | 4/7/2015 |
| Water Quality Workshop | 8/25/2015 |
| Oak Hill Parkway Public Open House | 10/29/2015 |
| Agency Meeting | 12/14/2015 |
| Stakeholder Meeting | 4/13/2016 |
| Informational Booths | 4/23–4/24 and 4/30/2016 |
| Stakeholder Meeting | 6/8/2016 |
| Environmental Workshop | 6/23/2016 |
| Project Update Workshop | 5/23/2017 |
| Project Update Workshop | 7/25/2017 |

Source: Cox|McLain Environmental Consulting (CMEC), 2017.

## 3. Guidance

The Oak Hill Parkway EIS describes the proposed project and its potential direct effects on the environment. 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 CEQ, indirect effects are "caused by an action and occur later in time or farther removed in distance, but are still reasonably foreseeable. The indirect impacts of the proposed project were assessed in the *Indirect Impacts*

*Analysis Technical Report.* This technical report builds on the direct and indirect impacts analyses.

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." (NEPA, 40 CFR § 1508.7).

The approach for conducting the cumulative impacts analysis for the Oak Hill Parkway project 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, 2014) and *Cumulative Impacts Analysis Guidelines* (TxDOT, 2016). The TxDOT guidance references previous cumulative impacts analysis guidance issued by AASHTO while seeking "to provide a balance between a systematic methodology and scalable application" (TxDOT, 2016).

Guidance regarding cumulative impacts analysis was published in 2011 and updated in 2016 by the American Association of State Highway and Transportation Officials (AASHTO). The AASHTO *Practitioners Handbook – 12 Assessing Indirect Effects and Cumulative Impacts under NEPA* (AASHTO, 2016) emphasizes the following key tasks:

(1) Describe Resource Conditions and Trends

(2) Summarize Effects of the Proposed Action on Key Resources

(3) Describe Other Actions and Their Effects on Key Resources

(4) Estimate Combined Effects on Key Resources

(5) Consider Minimization and Mitigation

Although AASHTO guidance helped inform this analysis, the TxDOT guidance (TxDOT, 2016) dictated the steps followed in subsequent sections. The two documents include very similar information. It should be noted that guidance documents use different terms, including "cumulative impacts" (AASHTO, 2016) and "cumulative effects" (TxDOT, 2016). For the purposes of this analysis, both terms are used and the meaning is the same.

# 4. Cumulative Impacts Analysis

As stated previously, cumulative impacts can result from "individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.7, 1978). 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.

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. The analysis then inventories past, present, and reasonably foreseeable 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. Analysis performed using GIS, aerial photography, and other data sources is typically engaged at this stage to quantify and assess past, present, and reasonably foreseeable development, in conjunction with the known indirect impacts related to the proposed project.

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 reasonably 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. Relevant, reasonable mitigation measures must be identified, even if they are outside the jurisdiction of TxDOT, or are unlikely to be implemented. 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.

The evaluation of cumulative impacts discussed in this document follows TxDOT's *Cumulative Impacts Analysis Guidelines* (TxDOT, 2016). According to TxDOT's 2016 Guidance, the five steps of a cumulative effects analysis for a TxDOT project include:

(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; and

(5) Mitigation of cumulative effects.

A screening table (**Table 2**) was prepared to summarize the direct and indirect impacts of the proposed project. This table was used to determine which resources warrant further study in the cumulative impacts analysis.

## 4.1 Step 1: Resource Study Area, Conditions, and Trends

### 4.1.1 Resources Analyzed for Cumulative Effects

According to TxDOT's Cumulative Impacts Analysis Guidelines (TxDOT, 2016), if a project does not cause direct or indirect impacts on a resource, it will not contribute to a cumulative impact on that resource. **Table 2** describes direct and indirect impacts (including encroachment-alteration effects) for each resource category and indicates whether the resource is in poor or declining health or at risk. This analysis focuses on those resources substantially impacted by the project and those resources that are currently in poor or declining health or at risk, even if project impacts (either direct or indirect) are relatively small. The topics of greenhouse gas emissions and climate change will be addressed in a separate section of the EIS document. Land use is not assessed, but past, present, and reasonably foreseeable future projects are included in the analysis with reference to existing land use, transportation, and comprehensive plans that provide context for potential cumulative effects.

| Table 2: Resources Analyzed for Cumulative Impacts Analysis | | | | | |
|---|---|---|---|---|---|
| **Resource** | **Direct Impacts** | **What encroachment-alteration effects are anticipated, if any?** | **Will the resource be indirectly impacted by potential induced growth?** | **Is the resource in poor or declining health?** | **Resource included in the cumulative effects analysis?** |
| Waters of the U.S., including Wetlands | The Oak Hill Parkway Project has the potential to impact one wetland and eight streams. Impacts to these waters would occur from extending existing culverts, placing fill for concrete aprons and/or rock rip rap at bridges, and placing temporary fills during construction. Exact fill types and amounts will be determined once design is finalized and, if necessary, would be permitted with a Nationwide Permit from the United States Army Corps of Engineers (USACE). Mitigation for these impacts would also be determined, if necessary, and calculated based on amount and type of impact to each jurisdictional water. | Anticipated fill impacts to waters of the U.S., including wetlands, would generally be limited to the project footprint. Temporary and permanent impacts to waters of the U.S. are not expected to disrupt any natural processes in the project area. The construction of any of the proposed alternatives would have limited encroachment-alteration effects because of the existing dense urbanization of the proposed project area and the incorporation of water quality best management practices. | Formal wetland delineations have not been conducted within all of the areas of potential development; however, if it was determined that the wetlands and waters are Waters of the U.S., then they would be protected by Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1251 et. Seq, Section 404). | No. The USACE effectively regulates the discharge of dredged and fill material into waters of the U.S., including wetlands, under Section 404 of the CWA. | No |
| Floodplains | There are 71.77 acres of Federal Emergency Management Agency (FEMA)-mapped floodplains within the project area. The proposed project would impact between 69.42 and 69.66 acres of FEMA-mapped floodplains, depending on the alternative selected. Impacts to floodplains would be minimized by using Best Management Practices (BMPs) during both construction and operation of the proposed project. The proposed project would disturb over 5 acres of earth. A Stormwater Pollution Prevention Plan (SW3P) would be implemented. Stormwater runoff would be addressed through compliance with the Texas Pollutant Discharge Elimination System (TPDES) and Edwards Aquifer Protection Program. The proposed project would span the ordinary high water mark (OHWM) of Williamson Creek. It is anticipated that bridge support structures (e.g., piers, abutments) could be designed to avoid causing an increase in the base flood elevation that would violate applicable floodplain regulations. Many of the other crossings are culverted and may require modification. Coordination with the local floodplain administrator would be required. | The proposed project would result in encroachment-alteration effects within a regulatory floodplain. The proposed project would increase impermeable surfaces and have the potential to indirectly affect sediment and pollutant loading in the flood hazard areas as mapped by FEMA. However, floodplain management regulations and design standards would require that the project be designed so as not to alter base flood elevations and not cause adverse flood impacts to upstream or downstream properties. | Approximately 1.3 percent of currently undeveloped land in the area of influence (AOI) (1,148 acres) is within the 100-year floodplain. | No. Future construction within the 100-year floodplain would be in compliance with appropriate permitting and general land use policies. | No |

| Table 2: Resources Analyzed for Cumulative Impacts Analysis | | | | | |
|---|---|---|---|---|---|
| **Resource** | **Direct Impacts** | **What encroachment-alteration effects are anticipated, if any?** | **Will the resource be indirectly impacted by potential induced growth?** | **Is the resource in poor or declining health?** | **Resource included in the cumulative effects analysis?** |
| Water Quality – Surface Water and Groundwater | Construction-phase contamination would be prevented by adherence to environmental commitments such as BMPs outlined in the SW3P and Water Pollution and Abatement Plan. Post-construction total suspended solids (TSS) levels in treated stormwater would be lower than "background" loads of stormwater runoff from areas similar to the existing right-of-way (the *No Build Alternative*) through the use of stormwater detention ponds and vegetative filter strips. The proposed robust BMPs would also address other roadway-associated pollutants, such as heavy metals, nutrients, and hydrocarbons.<br><br>During the operation phase, it is likely that new BMP implementation under either *Alternative A* or *Alternative C* would result in an improvement to water quality leaving the project area through surface runoff or overland flow when compared to current conditions. | The construction of any of the proposed alternatives would have limited encroachment-alteration effects to surface water quality due to the existing dense urbanization of the proposed project area and the incorporation of water quality best management practices.<br><br>Encroachment-alteration effects to groundwater quality could occur primarily due to increased impervious cover or removal of vegetation that results in increased runoff and altered recharge (flow and quality) to the aquifer. Placement of the roadway could encroach on the surface or subsurface drainage areas of previously unknown adjacent caves/karst features, altering the hydrologic regimes in those features. | Future development within the AOI would cause an increase in impervious cover that could increase pollutants entering receiving waters during storm events. The Barton Springs segment of the Edwards Aquifer has unique hydrogeology that has produced a high-quality water source that is also vulnerable to contamination. The aquifer also provides habitat for karst and aquifer-dependent species that are sensitive due to their specific habitat needs. Groundwater quality could be impacted by stormwater-borne contaminants that could enter the Aquifer from induced development that could occur on approximately 10,192 acres of developable land in the AOI. The 569 acres (6 percent) of developable land in the AOI that are in the Edwards Aquifer Recharge Zone would have higher potential for contamination of groundwater, as well as the strictest requirements for complying with the Edwards Aquifer Rules for water quality protection. | Yes. Stormwater runoff from the western end of the project area could enter Slaughter Creek, which has been identified by the Texas Commission on Environmental Quality (TCEQ) as an impaired assessment unit. During construction, exposed soil could runoff into streams and increase turbidity and sediment loading downstream.<br><br>The Barton Springs segment of the Edwards Aquifer is valuable because it supplies drinking water for approximately 60,000 people in Travis and Hays counties and provides habitat for a number of threatened or endangered aquatic species (Hunt et al., 2012b).<br><br>The presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water over the past few decades signify the potential effects of growing regional urbanization on aquifer water quality. Urbanization has been identified as one of the most significant sources of water quality degradation. | Yes |
| Federally Listed Threatened/Endangered Species | The Barton Springs salamander (*Eurycea sosorum*) and Austin blind salamander (*Eurycea waterlooensis*) are not known to occur within the limits of the project area. Both species have been recorded from spring outlets at Barton Springs in Zilker Park, approximately 2 miles northeast of the US 290/Mopac interchange. An additional confirmed location for the Barton Springs salamander has been recorded at an unnamed well along FM 1626 in South Austin, which establishes the potential for this species to occur throughout a much wider subterranean range than previously thought.<br><br>Although the Oak Hill Parkway project occurs partially within the South Travis County karst faunal region, the nearest record of occurrence for a listed karst invertebrate is | Encroachment-alteration effects could occur as a result of habitat loss due to increased development in the area, an increase in edge habitat, or an increase in impervious cover limiting recharge to the Edwards Aquifer.<br><br>Both the Barton Springs and Austin blind salamanders are entirely dependent on the Edwards Aquifer. Changes to the aquifer as a result of decreased recharge or an increase in pollutants in stormwater runoff (stemming from increased impervious cover in the Recharge Zone) may affect, but is not likely to adversely affect, these species. | The USFWS Information for Planning and Conservation species list identifies a number of threatened or endangered species that could potentially be present within the AOI. The project is located within the Edwards Aquifer Recharge Zone and project runoff could contribute to water quality impacts downstream of the project location. Recharge from lower Williamson Creek has been documented by dye trace studies to flow to the Barton Springs complex, which is occupied habitat for the Barton Springs salamander and Austin blind salamander (BSEACD, 2014). | Yes; however, the Endangered Species Act (ESA) affords protection for federally listed threatened and endangered species and their habitats. The USFWS maintains lists of potential occurrence for listed species in each Texas county. All development, whether public or privately funded, is subject to these federal regulations. | Yes |

| Table 2: Resources Analyzed for Cumulative Impacts Analysis | | | | | |
|---|---|---|---|---|---|
| **Resource** | **Direct Impacts** | **What encroachment-alteration effects are anticipated, if any?** | **Will the resource be indirectly impacted by potential induced growth?** | **Is the resource in poor or declining health?** | **Resource included in the cumulative effects analysis?** |
| | located more than 2-miles north of the eastern project terminus. A Geologic Assessment was conducted for areas of the project which occur over the Recharge Zone of the Edwards Aquifer (Rahe, 2009). Several sensitive recharge features were identified; however, no features exhibited habitat characteristics required for listed karst invertebrates.<br><br>Several other federally-listed species are known to occur in Travis County; however, no suitable habitat was identified during field investigation for species other than the salamanders and karst invertebrates, as discussed above. | | | | |
| Vegetation and Wildlife (including state-listed species) | Impacts to vegetation and wildlife would be minimized through initial project design considerations and through the avoidance and minimization of vegetation removal. Construction activities would disturb only that which is necessary to construct the proposed project. The removal of native vegetation would be avoided to the greatest extent practicable and best management practices would be utilized to avoid impacts to migratory and nesting birds within the project area during construction activities. In response to public comments, landscaping enhancements such as tree plantings, tree relocation, and native seeding will be incorporated into the post-construction design as voluntary measures to offset the impacts of tree removal.<br><br>No suitable habitat was identified during field investigation for any state-listed species that are not already federally listed. Suitable habitat was observed for 22 other SGCNs during field investigation. Required clearing or other construction-related activities may directly impact animals or plants that reside on or adjacent to the project right-of-way. Heavy machinery could kill small, low-mobility animals or could cause soil compaction, impacting animals that live underground. | Encroachment-alteration effects stemming from the proposed project could result in additional loss and fragmentation of vegetation and habitat types on developable lands within the study area. Development in general encroaches on vegetation, and reductions in vegetation typically equate to reduced wildlife habitat. For this project, however, impacts to habitat would be limited to the area of direct impact which is generally already developed and no encroachment-alteration effects are expected. | The areas of potential development are vegetated to varying degrees and provide wildlife habitat. The Texas Parks and Wildlife Department (TPWD) maintains lists of potential occurrence for listed species in each Texas county. The TPWD annotated list identifies a number of state-listed species that could potentially be present within the AOI. | No. State regulations prohibit harm to individuals of state-listed species. All development, whether public or privately funded, is subject to these state regulations. Although there is no regulatory protection for SGCNs or habitat, BMPs would be in place to minimize harm to individuals and removal of vegetation would minimized to the amount necessary for the proposed project. Approximately 50,000 acres of land within the City of Austin is protected from future development and would provide habitat for both state-listed species and SGCNs. This acreage includes Balcones Canyonlands Preserve and Water Quality Protection Lands. | No |

| Table 2: Resources Analyzed for Cumulative Impacts Analysis | | | | | |
|---|---|---|---|---|---|
| **Resource** | **Direct Impacts** | **What encroachment-alteration effects are anticipated, if any?** | **Will the resource be indirectly impacted by potential induced growth?** | **Is the resource in poor or declining health?** | **Resource included in the cumulative effects analysis?** |
| Air Quality | The proposed project is consistent with the CAMPO 2040 RTP and the 2017-2020 Transportation Improvement Program (TIP). Local concentrations of carbon monoxide are not expected to exceed national standards at any time. Under Build Alternatives A and C, emissions of total Mobile Source Air Toxics (MSAT) are predicted to decrease by 70 percent from 2015 to 2040. | Encroachment-alteration effects were evaluated in the traffic air quality analysis and quantitative MSAT analysis. | No induced growth impacts to air quality are anticipated. | No; the proposed project is located in Travis County, which is designated as attainment or unclassified for all National Ambient Air Quality Standards (NAAQS). The proposed project is not subject to transportation conformity. | No |
| Community Resources (includes businesses and residences) | Alternative A is expected to result in one residential and two business displacements due to right-of-way acquisition, and two business displacements due to removal of access. Alternative C is expected to displace one residence and two businesses (the same as described for Alternative A). The number of parcels from which additional right-of-way would be needed varies from 80 to 87 parcels, depending on the build alternative selected. The majority of property acquisitions associated with the Oak Hill Parkway project would allow the remaining portions of the impacted parcels to continue to function as they currently do. Noise analyses have indicated that noise impacts would result from the proposed project; proposed noise abatement in the form of proposed noise barriers have been identified for Alternatives A and C. | Some businesses may be affected that are currently utilizing TxDOT's existing right-of-way for parking and access. The elimination of access and available parking may cause the eventual loss of business in these locations. | Yes; property values could be influenced by future development. Additional tax revenue would be generated by potential induced development. | No; direct impacts are limited, plus the large number of community resources located within the project area were not documented to be in poor or declining health in the community impacts assessment technical report. | No |
| Neighborhoods | The proposed project would add capacity to the existing facility. The proposed project would not serve to divide any of the existing neighborhoods or further divide the community. Access to some portions of the facility may change with implementation of the proposed project; however, the construction would be expected to reduce travel times for commuters within the adjacent neighborhoods and reduce cut-through traffic along local roadways. | Reduced congestion and improved conditions on US 290 and SH 71 would likely make neighborhoods along this corridor beyond adjacent properties more desirable and could have the effect of increasing property values. Note that many other factors in addition to transportation mobility contribute to a property's value. The proposed project is not expected to result in adverse encroachment-alteration effects on neighborhoods and communities. | It is likely that new neighborhoods will continue to be developed along the corridor and out to points west and north of the Oak Hill Parkway corridor, regardless of whether or not the improvements are constructed.<br>Changes to access and travel patterns could occur in neighborhoods within the AOI. Planning experts from the jurisdictions within the AOI do not expect the proposed project to influence the amount or rate of development within their jurisdictions, given the area's existing high rate of growth. No substantial impacts to neighborhoods resulting from induced growth associated with the proposed project are anticipated. | No; the many organized neighborhoods located within the project area are not considered to be in poor or declining health according to the community impacts assessment technical report. | No |

**Table 2: Resources Analyzed for Cumulative Impacts Analysis**

| Resource | Direct Impacts | What encroachment-alteration effects are anticipated, if any? | Will the resource be indirectly impacted by potential induced growth? | Is the resource in poor or declining health? | Resource included in the cumulative effects analysis? |
|---|---|---|---|---|---|
| Environmental Justice (EJ) | The two businesses and one residence that could potentially be displaced by Alternatives A and C, in addition to two business displacements associated with Alternative A due to removal of access, are not located in an EJ area. As the proposed improvements would not bisect existing neighborhoods, and would generally occur near the existing roadway, community cohesion impacts would not be expected. The main impacts to EJ populations would occur during construction and would not be disproportionately high and adverse.<br><br>The EJ population would realize the benefits of the additional travel lanes, shared-use paths and sidewalks – all of which are components of the proposed project. Capital Metro buses would be able to travel toll-free on the Oak Hill Parkway, enabling more reliable transit in the US 290 corridor for all transit riders (EJ and non-EJ). The proposed project would benefit EJ and non-EJ populations alike, increasing mobility within the project limits for drivers and transit users. | No encroachment-alteration effects would be expected as the proposed project would not change access to or create a barrier within the project corridor. Encroachment-alteration effects would not be expected on other socioeconomic resources in the project area including neighborhoods and communities, employment and economic activity, or public facilities that could subject EJ communities to disproportionately high and adverse effects. | Additional toll lanes could indirectly affect this resource. The main lanes of the proposed project would be toll lanes. Tolling has the potential to disproportionately impact low-income populations because a low-income person would have to use a larger percentage of his or her income to pay tolls when compared to the general population, given the same level of use. The Capital Area Metropolitan Planning Organization (CAMPO) uses demographic data compiled by traffic analysis zones (TAZ) to identify EJ areas throughout their six-county planning area (which encompasses the AOI of the proposed project). There are no CAMPO-identified EJ areas within the AOI of the proposed project. | Yes; EJ populations are comprised of vulnerable populations, including minorities and low-income persons. EJ is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means no group of people should bear a disproportionate share of the negative environmental consequences resulting from the proposed improvements. Executive Order 12898 and Title VI provide protections for environmental justice populations that have been historically vulnerable to environmental and health hazards resulting from public programs, policies, and activities. Data collected for the community impacts assessment technical report indicated the presence of EJ populations is low for the proposed project's Census profile areas. | No; however, the CAMPO 2040 Regional Tolling Analysis (CAMPO 2016) includes the proposed project and concludes that implementation of the 2040 planned transportation system (including all planned toll projects) would not cause disproportionately high and adverse impacts on any minority or low-income populations as per EO 12898 regarding EJ. No regional mitigation measures are proposed at this time. Refer to **Section 4.6** and **Attachment D** for more information related to the CAMPO 2040 Regional Tolling Analysis. |
| Historic-Age Properties | Four historic-age resources within the Area of Potential Effects (APE) are recommended eligible for National Register of Historic Places (NRHP) listing. One potential historic district has also been identified. The proposed project would have no direct effects and no adverse indirect effects on any of the NRHP-eligible resources and historic districts. | No encroachment-alteration effects are anticipated as a result of the proposed project. | No formal surveys have been conducted to date throughout the full extent of the areas of potential development. There appear to be a limited number of standing structures on these relatively undeveloped parcels, based on a review of aerial imagery. | Resources that are 50 years of age or older are considered historic-age. NRHP listed or eligible historic resources are protected by State and Federal regulations for publicly funded projects. However, no State or Federal regulations protect cultural resources for privately-funded projects. | No |
| Archeological Resources | Six archeological sites are within the proposed project's APE. These sites have either not been recommended for State Antiquities Landmark (SAL)/NRHP designation or have been declared ineligible for SAL/NRHP designation. | No encroachment-alteration effects are anticipated as a result of the proposed project. | No formal surveys have been conducted to date throughout the full extent of the areas of potential development. Preliminary consultation with TxDOT-developed Potential Archeological Liability Maps (PALM) indicates generally low to moderate potential for archeological impacts for these areas. | The Antiquities Code of Texas requires notification (to the Texas Historical Commission) if public agencies sponsor ground-disturbing activity on public land. NRHP-listed or eligible archeological resources are protected by state and federal regulations (Section 106 of the National Historic Preservation Act) for publicly-funded projects. However, these state and federal regulations do not apply to privately-funded projects. | No |

Source: CMEC, 2017.

As shown in **Table 2**, the resources/issues for which the proposed project may potentially have cumulative impacts are water quality (surface water and groundwater) and federally listed threatened/ endangered species for which more information is provided below.

### 4.1.2 Resource Study Areas, Current Conditions, and Trends

Cumulative effects are considered within a spatial geographic area referred to as a Resource Study Area (RSA). For each resource evaluated in the cumulative effects analysis, an RSA appropriate to that resource has been established using the criteria in TxDOT's *Cumulative Impacts Analysis Guidelines* (TxDOT, 2016) and relevant studies (TxDOT, 2015).

#### 4.1.2.1 Federally Listed Threatened and Endangered Species—Barton Springs Salamander and Austin Blind Salamander

**Resource Study Area**

Water quality degradation is identified as a threat to both the Austin blind salamander and the Barton Springs salamander (USFWS, 2013). The geographic RSA for cumulative impacts to the Austin blind salamander and the Barton Springs salamander is considered to be the area of the Barton Springs segment of the Edwards Aquifer which provides the subterranean habitat and feeds the spring habitat that both species occupy. The RSA encompasses approximately 258,039 acres. The southern boundary of the RSA represents the groundwater divide between the Barton Springs segment of the Edwards Aquifer and the San Antonio segment (**Figure 2** in **Attachment A**). The northern boundary of the RSA represents the northern boundary of the Barton Springs segment and the TCEQ Contributing Zone of the Edwards Aquifer. This area is located in Travis and Hays counties and includes areas of the Edwards Aquifer Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone.

The temporal RSA for cumulative impacts to these two salamander species is considered to be 1978 through 2040. 1978 is the year the Barton Springs salamander, the first endangered salamander species identified in the Barton Springs segment of the Edwards Aquifer, was recognized as a distinct species from other central Texas salamander species. 2040 is the horizon year of CAMPO's current long-range transportation plan.

### *Current Conditions*

Until recently, both the Barton Springs salamander and the Austin blind salamander were presumed to be endemic to the Barton Springs Complex; however, recent genetic analysis of salamanders collected at several locations in southwestern Travis County and northern Hays County that discharge water to the Barton Springs Segment of the Edwards Aquifer may suggest otherwise (Chippendale, 2014). Of the four collection sites (Cold Springs, Spillar Ranch Spring, Taylor Spring, and Blowing Sink Cave), two locations (Cold Springs and Blowing Sink Cave) are indirectly associated with the Oak Hill Parkway project area. Cold Springs is notable because the project area is located within the Cold Springs groundwater basin and dye trace studies have shown flow paths linking Williamson Creek to this location (Hauwert et al., 2004). Similarly, Blowing Sink Cave is located approximately 3.8 miles south of the Mopac/US 290 interchange and flow paths to Barton Springs have been mapped (Hauwert et al., 2004). This cave is located within the Slaughter Creek watershed. Stormwater runoff leaving the west end of the project area and draining into Devil's Pen Creek may contribute to recharge in this area. Additionally, in 2015, a single Barton Springs Salamander was identified from a sampling well on FM 1626, approximately 9.5 miles south of the Barton Springs Complex (TXNDD, 2016). This most recent observation confirms that the habitat for this species is not limited to the Barton Springs Complex and likely extends through the subterranean aquifer system, although the extent of the habitat is unknown. For this analysis, the discussion of the Barton Springs salamander will focus on the known populations at Barton Springs. The Austin blind salamander, thought to be a primarily subterranean species, is only known from the outlets of the Barton Springs complex (USFWS, 2013). Cumulative impacts to these species will be considered within the context of the geographic RSA.

Urbanization and declines in water quality and quantity in the aquifer are cited by the USFWS as the primary threats to the species (USFWS, 2013). Water quality is influenced by an assortment of parameters, such as amount of impervious cover, TSS, total organic carbon, dissolved pollutants (such as heavy metals and petroleum hydrocarbons), nutrients, dissolved oxygen, and chemicals such as pesticides and herbicides. All of these have been identified by the USFWS as factors that influence the survival of aquifer-dependent salamanders. There has been substantial urbanization and development over the Barton Springs Zones since the listing of the Barton Springs salamander in 1997. A recent study estimated an almost 1,400-acre increase in impervious cover for the Williamson Creek watershed from 1991 to 2008 (Sung et al., 2013; Barrett, 2016). It is widely accepted that an increase in impervious cover can generate an increased volume and velocity of stormwater runoff, which can have a detrimental effect on water resources if not properly controlled. Stormwater runoff can negatively affect water quality when it contains

urban pollutants such as those constituents associated with highway runoff (e.g. TSS, zinc, and other heavy metals) (Sung et al., 2013; Barrett, 2016).

Barton Springs salamander populations seem to fluctuate around an equilibrium level in response to drought and flood periods and experience density-dependent population growth, which is a positive indicator of population viability (Bendik and Turner, 2011).

A study by Gillespie states that the Barton Springs salamander

> "employs a 'storage effect' type life history strategy in which a few long-lived females capable of sperm storage, high fecundity, and prolonged survival in subterranean habitat during adverse surface conditions may be sufficient to sustain population sizes observed in this study. In addition, oviposition [the process of laying eggs] may be triggered by low flow conditions followed by bouts of high rainfall which drives water temperature down, and juveniles may use subterranean habitat as a thermal refuge for growth and development. As climate change threatens to increase climatic variability in central Texas, analysis of population trends as more data is collected will be crucial for determining how (the Barton Springs salamander) responds to such changes in the coming years (Gillespie, 2011)."

Monthly surveys for the Barton Springs salamanders began at Barton Springs in 1993. Starting in 1998, surveys were also conducted for the Austin blind salamander. Based on the data presented in the City of Austin's amended Habitat Conservation Plan, it appears that the two species' populations have been fluctuating around equilibrium levels (COA, 2013a).

### *Trends*

Regulatory History

The Barton Springs salamander was listed as a federally endangered species on April 30, 1997. The Austin blind salamander was listed as a federally endangered species on September 19, 2013. No specific critical habitat was defined for the Barton Springs salamander (USFWS, 1997). Approximately 120 acres of critical habitat has been designated for the Austin blind salamander (USFWS, 2013) as shown in **Figure 2** in **Attachment A**.

A recovery plan for the Barton Springs salamander was published in September 2005. The plan established recovery and delisting criteria for the species, which included:

1) Protecting the Barton Springs watershed (the above and belowground limits of which are encompassed by the RSA) in order to maintain adequate water quality

2) Developing a plan to respond to spills of hazardous materials within the Barton Springs watershed

3) Implementing a management plan for the Barton Springs watershed

4) Establishing a captive breeding program for the Barton Springs salamander (USFWS, 2005)

In January 2016, the 2005 Barton Springs Salamander Recovery Plan was amended to include the Austin Blind salamander. According to the USFWS, the greatest threat to the survival of the Austin blind salamander as a species is degradation of habitat through the decline of water quality and quantity in the Edwards Aquifer (USFWS, 2013).

The Barton Springs/Edwards Aquifer Conservation District (BSEACD) published a Draft Habitat Conservation Plan (HCP) and Preliminary Draft EIS (PDEIS) that addressed both the Barton Springs salamander and the Austin blind salamander (BSEACD, 2007). The purpose of the Draft HCP was to protect and conserve the two species of salamanders and their habitat associated with the Barton Springs/Edwards Aquifer system so that the USFWS could issue a permit for the incidental take of both species related to human utilization of the Barton Springs segment of the Edwards Aquifer. The purpose of the PDEIS was to evaluate three groundwater management alternatives and their impacts on the two salamander species and their habitats. The Draft HCP and PDEIS were submitted to USFWS in August of 2007. USFWS returned comments on the Draft HCP in November of 2008. In 2014, the BSEACD Board approved the final Draft HCP and submitted the permit application to USFWS for the District's groundwater management plan (BSEACD, 2014). As of February 2017, final approval from USFWS is pending.

The City of Austin salamander biologists revised and expanded Austin's Habitat Conservation Plan (HCP) for Barton Springs in July 2013 after a two-year process involving citizen input and extensive coordination with the USFWS. The current incidental take permit from the USFWS was issued in September 2013 and will expire in 2033 (COA, 2013a, 2017a). This permit allows for the incidental take of both species at Barton Springs in order to maintain the pools of the Barton Springs

complex for ecological, conservation, and recreational purposes. Several habitat enhancement/reconstruction projects are described in the HCP to reverse anthropogenic habitat modifications within the Barton Springs complex that have resulted in loss and fragmentation of surface habitat within the springs. Under the HCP, Eliza Springs and Old Mill Springs will remain fenced off and closed to the public to protect the salamander habitat at both sites. Parthenia Springs (Barton Springs Pool) and Upper Barton Springs will both remain open to the public. Disturbance to salamanders from recreational use of Parthenia Springs and Upper Barton Springs is thought to be short term and minimal, affecting individual salamanders as opposed to the entire population (COA, 2013a).

In addition to the protections listed above for the salamanders, there are several federal, state, and municipal-level protections in place for surface and groundwater quality and quantity that may provide indirect protection to both species of salamander by protecting water quality. Examples of these measures include acquisition by the City of Austin of approximately 29,825 acres of Water Quality Protection Lands (WQPLs), 27,739 of which fall within the RSA, and 20,164 acres of Balcones Canyonlands Preserve (BCP) properties; 4,508 acres of which fall within the RSA. Both of these measures serve to protect groundwater quality in the Edwards Aquifer and, by extension, Barton Springs.

Barton Springs Salamander

The Barton Springs salamander was first collected from Barton Springs Pool (i.e., Parthenia Spring) in 1946. However, it was not recognized as a distinct species until 1978 when Dr. Samuel Sweet published a paper differentiating the Barton Springs salamander from other central Texas salamander species based on its restricted distribution and unique morphological and skeletal characteristics. The species was formally described in 1993 with an adult male collected from Barton Springs Pool in 1992 used as the holotype (USFWS, 1997).

The Barton Springs salamander was described as occurring in the “dozens or hundreds” among sunken leaves in Eliza Pool when it was described in the 1970s (USFWS, 1997). However, formal collection of population data for this species began in 1993 when the City of Austin began conducting salamander abundance and density surveys (COA, 2013a). Monthly surveys began in Parthenia Spring in 1993, followed by additional monthly surveys in Eliza and Old Mill Springs in 1995 and monthly surveys in Upper Barton Spring beginning in 1997. Abundance of the Barton Springs salamander has varied on a site-specific basis from zero to 1,234 salamanders with densities ranging from zero to 1.5 per square foot. The highest abundance of salamanders in the perennial spring sites occurred from April to June of 2008. Analysis of data from Parthenia and Eliza springs from 2004 to 2011 by the

City of Austin does not indicate any significant increase or decrease in the population size of the Barton Springs salamander at these two sites.

This suggests that the population in each spring fluctuated slightly around average sizes during this time period. While this data is encouraging and suggests that Barton Springs salamanders have the potential to persist, the analysis is based on 61 and 71 data points from Parthenia and Eliza Springs, respectively, over a seven-year period. The small amount of data over a relatively short period of time may not provide for a robust enough analysis to determine the long-term viability of this species at these two sites (COA, 2013a).

Because the species is neotenic and spends its entire life in the water, the Barton Springs salamander is highly dependent on the water quality of the Barton Springs segment of the Edwards Aquifer which feeds Barton Springs. There have been past instances when water quality has negatively impacted Barton Springs salamanders. Within a six-month period in 2002, 17 Barton Springs salamanders were found in Upper Barton Springs and two at Sunken Garden Springs with bubbles of gas occurring throughout their bodies. Three more salamanders were found in February and March of 2003 in Upper Barton Springs with bubbles of gas in their bodies. This condition is referred to as “gas bubble trauma” and is a condition in which bubbles below the surface of the body and inside the cardiovascular system produce lesions and necrotic tissue that can lead to secondary infections. It is believed that this condition is caused by supersaturated water, or water that has dissolved atmospheric gasses in concentrations greater than 100 percent. Supersaturation is when a solution, in this case water, contains more of a dissolved material than would normally be possible under normal conditions. An example of this would be carbonated water, which is a supersaturation of water with carbon dioxide gas. During the time when affected salamanders were found in the Barton Springs complex, supersaturation percentages were above 110 percent at all four of the springs. Of the 19 salamanders that were found to be afflicted by the condition in 2002, 12 died. Some evidence suggests that pollutants found in stormwater runoff entering the aquifer from urban areas could adversely affect an organism’s tolerance for supersaturated conditions, making them more susceptible to illness and death (USFWS, 2005).

The contamination of Parthenia Springs by the improper use of chlorine to clean the pool in 1992 resulted in a fish kill within the spring. Though no dead salamanders were found as a result of the chlorine contamination, only 10 to 15 salamanders were observed in a subsequent survey; the observed salamanders were all located within a 5-square-meter (54-square-foot) radius around the outflow of Parthenia

Springs (USFWS, 1997). This was a relatively low survey result for the population of salamanders in Parthenia Springs.

The Edwards Aquifer is one of the most permeable and productive limestone aquifers in the United States (EAA, 2016). The aquifer is especially susceptible to contamination due to its karst topography, which facilitates rapid transmittal of potential contaminants over long distances once in the limestone aquifer (Small et al., 1996).

Studies have shown that impervious cover within a watershed should generally not exceed 15 percent to prevent damage to the watershed and aquatic ecosystems therein (CRWR, 1995). For sensitive watersheds, there should be an impervious cover percentage of no greater than 10 percent to prevent damage to sensitive stream ecosystems (USFWS, 2005). Approximately 85 percent of recharge to the Edwards Aquifer comes from six streams located within the Recharge Zone (Slade et al., 1986). Of these, Williamson Creek, its tributaries, and Devil's Pen Creek (a tributary to Slaughter Creek) occur within the Oak Hill Parkway project area. Recharge from lower Williamson Creek has been documented by dye trace studies to flow to the Barton Springs complex (BSEACD, 2017a; Smith et al., 2005). The largest and most stable populations of Barton Springs salamanders are within Parthenia Springs and Eliza Springs. As of 2000, impervious cover percentages in the watersheds within the study area were as follows:

- Williamson Creek: 16 percent
- Slaughter Creek: 7 percent
- Barton Creel: 6 percent (USFWS, 2005)

A review of impervious cover was completed by Blanton & Associates in 2014 based on 2012 imagery source from the United States Department of Agriculture (USDA) National Agricultural Imagery Program (NAIP). The impervious cover data was updated in 2017 by Cox|McLain Environmental Consulting (CMEC) based on 2016 aerial Google Earth imagery. Impervious cover percentages on the watersheds within the study area were as follows:

- Williamson: 32 percent
- Slaughter Creek: 20 percent
- Barton Creek: 9 percent

Continued development of impervious cover within watersheds that provide recharge to the portions of the aquifer that sustain salamander habitat within the Barton Springs complex could have a negative impact on the Barton Springs salamander.

A recent report by Barrett (2016) evaluated the results of over 20 years of water quality data, including roadway runoff constituents (TSS and zinc), at Barton Springs. Barrett's report also examined the effectiveness of typical BMPs that are frequently used to treat stormwater runoff under City of Austin regulations and the TCEQ Edwards Aquifer Rules. He concluded that these BMPs are successful at removing pollutants from highway runoff, and cited the findings of historical water quality data collected by the City of Austin and the U.S. Geological Service (USGS) at Barton Springs. Of particular importance to highway runoff are TSS, zinc, and copper, all of which have been stable or decreasing at Barton Springs over the last 20 years despite the increased urbanization over the Barton Springs Zone (Barrett, 2016).

Austin Blind Salamander

The Austin blind salamander was not recognized as a distinct species from the Barton Springs salamander until 1998. Therefore, information regarding this species is more limited than information for the Barton Springs salamander (COA, 2013a). It was officially described in 2001 (USFWS, 2013).

In May 2004, the USFWS received a petition to list the Austin blind salamander (along with 224 other species) under the ESA. In August 2012, the USFWS published a proposed rule to list the Austin blind salamander as endangered. The Austin blind salamander was listed as endangered in September of 2013 (USFWS, 2013).

Population trends for Austin blind salamanders are difficult to track as the species is believed to primarily reside in subterranean habitat within the aquifer. Furthermore, as this species was only recently identified, there are few studies focusing on this species. However, the City of Austin has included the species in its monthly abundance and density surveys of salamanders at the Barton Springs complex since 1998. The Austin blind salamander has been found in three of the four springs in the Barton Springs complex, but has not been observed in Upper Barton Springs. Typically, anywhere from 6 to 12 Austin blind salamanders are observed per site, per year for a total of 530 different observations for all sites between 1998 and 2010 (COA, 2013a). Further analysis of the data is difficult as it occurs over a limited period of time with a relatively small number of observations. It is unclear at this time whether there are any significant population trends for this species. However, according to one study, the Barton Springs salamander may have a "storage effect" life history strategy in which a few long-lived females capable of sperm storage, high fecundity, and prolonged survival in subterranean habitat during adverse surface

conditions may be sufficient to sustain viable population sizes (Gillespie, 2011). Therefore, it may be possible that the Austin blind salamander has a cyclical population size that can decrease dramatically in times of stress then rebound from the few remaining individuals when conditions improve.

As with the Barton Springs salamander, the Austin blind salamander is neotenic and spends the entirety of its life within the water of Barton Springs or the Edwards Aquifer. It is therefore highly dependent on the water quality of the aquifer. However, unlike the Barton Springs salamander, the Austin blind salamander has never been observed to be affected by gas bubble trauma (USFWS, 2005). The species had not yet been identified in 1992 when an accidental chlorine contamination of Parthenia Springs led to an apparent decline in the number of Barton Springs salamanders observed immediately following the incident (USFWS, 1997); therefore, it is unknown if this species was similarly affected.

The Austin blind salamander is only known to occur in Barton Springs. As discussed in the Barton Springs salamander trends section above, groundwater recharge from lower Williamson Creek has been documented by dye trace studies to flow to the Barton Springs complex (BSEACD, 2017a; Smith et al., 2005). It is therefore likely that impacts to groundwater quality in the study area could have the same potential to impact the Austin blind salamander as they would the Barton Springs salamander (COA, 2013a; USFWS, 2005).

#### 4.1.2.2 Groundwater

*Resource Study Area*

The geographic RSA for cumulative impacts to groundwater associated with the proposed project is considered to be the area of the Barton Springs segment of the Edwards Aquifer that is regulated by the TCEQ or the BSEACD. The RSA encompasses approximately 258,039 acres. The southern boundary of the RSA represents the groundwater divide between the Barton Springs and the San Antonio segments of the Edwards Aquifer (**Figure 3** in **Attachment A**). The northern boundary of the RSA represents the northern boundary of the Barton Springs segment and the TCEQ Contributing Zone of the Edwards Aquifer. This area is located in Travis and Hays counties and includes areas of the Edwards Aquifer Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone.

The temporal RSA for groundwater begins with 1970, which is the year that Edwards Aquifer water quality regulations took effect. The temporal RSA for groundwater extends through 2040 (the horizon year of CAMPO's current long-range transportation plan).

### *Current Conditions*

The Edwards Aquifer is one of the major aquifer systems in Texas, and the Barton Springs segment serves as either a sole source or a primary source of drinking water for approximately 60,000 people in Travis and Hays counties (Hunt et al., 2012b). The unique hydrogeology of the aquifer has produced a water source that is high quality, but also vulnerable to contamination. In addition, the aquifer provides habitat for a number of threatened or endangered aquatic and karst species, including the Barton Springs salamander and the Austin blind salamander.

Within the Barton Springs segment of the Edwards Aquifer, four distinct zones are present: Contributing Zone, Recharge Zone, Transition Zone, and Contributing Zone within the Transition Zone. Surface water quality is an important factor that can influence groundwater quality in this area. Surface water quality is addressed in **Section 4.1.2.3** of this report**.** The watersheds in the study area have been traced to multiple groundwater flow paths, including Cold Springs, Slaughter and the Manchaca flow routes. These flow routes have been linked to discharge at Cold Springs, and Main, Eliza, and Old Mill Springs of the Barton Springs complex (BSEACD, 2014). Barton Springs in south Austin is the most well-known outlet of the Barton Springs segment of the Edwards Aquifer. Water quality at the springs is of interest for two reasons: the springs system supplies a 750-footlong swimming pool visited by more than 450,000 people each year (COA, 2009), and provides habitat for the Barton Springs salamander and Austin blind salamander. Barton Springs is located approximately 4 miles northeast of the study area.

Within the Barton Springs segment of the Edwards Aquifer, the City of Austin owns or controls over 27,700 acres that are designated WQPLs (COA, 2017a; Thuesen, 2013). These lands were purchased using funds from two utility bonds approved in 1998 and are managed to provide optimal water yield and to protect both water quality and quantity recharging in these areas (Lady Bird Johnson Wildflower Center [LBJWC], 2010). The WQPLs are located within the Barton Springs segment Recharge and Contributing Zones; currently over 23 percent of the Recharge Zone and over 7 percent of the Contributing Zone within the Barton Springs segment of the Edwards Aquifer are protected through the WQPL program (Thuesen, 2013).

Approximately 4,500 acres of land within the groundwater RSA are designated for protection as a part of the BCP. The BCP is set aside for endangered species habitat as required in the Balcones Canyonlands Conservation Plan (BCCP), a habitat conservation plan developed by the City of Austin, the Lower Colorado River Authority (LCRA) and Travis County for the acquisition of a regional permit allowing incidental take of covered species. Species covered under the BCCP include the Golden-cheeked Warbler, Black-capped Vireo, and six endangered karst invertebrates (Tooth

Cave pseudoscorpion, Tooth Cave spider, Bee Creek harvestman, Bone Cave harvestman, Tooth Cave ground beetle, and Kretschmarr Cave mold beetle). The preserve is also designed to protect 27 species of concern, including 25 karst invertebrates and 2 plants. The preservation of BCP lands positively influences water quality because the land is protected from development or degradation.

### *Trends*

Regulatory History

Due to the importance of the Edwards Aquifer as a water source for a growing population, various regulations have been established to conserve water supply and protect water quality within this resource. Historically, the framework for groundwater rights in Texas has been the common law "Rule of Capture." Groundwater was not legislated in Texas until the passage of the Texas Underground Water Conservation Act in 1949, which allowed for the establishment of groundwater conservation districts (Brown, 2006; TCEQ, 2017).

In 1959, the Edwards Underground Water District was formed to supply maps and to assist licensing authorities. The first regulations for protecting the quality of water in the Edwards Aquifer were not issued until 1970 (TCEQ, 2017). These rules regulated development, including underground storage tanks, aboveground storage tanks, and sewer lines, over portions of the aquifer in Kinney, Uvalde, Medina, Bexar, Comal, and Hays counties (TCEQ, 2017). Throughout the 1970s and 1980s, additional water quality regulations were established, including requirements for water quality protection measures (30 TAC Chapter 213) which would lead to the establishment of, and requirements for water-pollution abatement plans (WPAPs) and geologic assessments, and the introduction of fees for reviews and inspections (TCEQ, 2017). Construction activities in portions of Williamson County were first regulated in 1986; construction in portions of Travis County became regulated in 1990 (TCEQ, 2017).

Groundwater water quality protections were codified in 1996 in Title 30 of the Texas Administrative Code (TAC) §213 and are known as the "Edwards Aquifer Rules" (TCEQ, 2011). These regulations provided protection from development activities that could harm the aquifer, including residential, commercial, and industrial construction activities that are located on the Recharge and Transition Zones. Requirements included the submittal of a WPAP and a geologic assessment, and focused on regulating new construction activities that have the potential to pollute the Edwards Aquifer and hydrologically connected surface streams (TCEQ, 2011). Significant rule changes in 1999 brought the Contributing Zone into regulation under the Edwards Rules, and added a design performance standard for permanent BMPs (TCEQ, 2017). Currently, the Contributing Zone, Recharge Zone, Transition Zone, and

Contributing Zone within the Transition Zone of the Barton Springs segment of the Edwards Aquifer are regulated by TCEQ rules in Travis and Hays counties. Rules relevant to both the Transition Zone and the Contributing Zone apply in areas designated Contributing Zone within the Transition Zone (TCEQ, 2011). The TCEQ has also issued guidance regarding optional enhanced water quality measures and BMPs designed to protect aquatic and karst threatened and endangered species.

The Safe Drinking Water Act of 1974 allowed the U.S. Environmental Protection Act (EPA) to issue drinking water regulations that apply to all public water systems. These regulations set standards for maximum concentrations of constituents and provided rules for sampling of public water systems. The 1996 amendments to the Act provided new and stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection. The City of Austin has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. These ordinances include requirements for setbacks, impervious cover limits, and various other water quality protection measures; additional information is provided in Section 4.5.2.

In 1987, the BSEACD was established as a groundwater conservation district for the Barton Springs segment of the Edwards Aquifer (BSEACD, 2017b). The BSEACD was created with the directive to conserve, protect, and enhance the groundwater resources in its jurisdictional area. The jurisdictional area of the BSEACD includes the Recharge and Transition Zones of the Barton Springs segment of the Edwards Aquifer, as well as additional area east of the Transition Zone in Travis, Hays, and Caldwell counties. The BSEACD regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2017b). The drought management program allows the BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevations at an observation well.

Due to the connection between surface water and groundwater, additional regulations that protect surface water quality also affect groundwater quality. These regulations are discussed in Section 4.5.3.

*Groundwater Quality*

Results of water quality studies of Barton Springs are good indicators of the health of discharge from the Barton Springs segment of the Edwards Aquifer. While Barton Springs generally has high-quality water, concern regarding water quality is warranted

due to the vulnerability of karst aquifers to contamination and the rapid urbanization in the area (Small et al., 1996; Sharp, 2010).

An early study of groundwater quality in Travis County found that groundwater was of overall good quality, but recommended establishing a network of water-quality observation wells (Brune and Duffin, 1983). Slade et al. (1986) studied water quality in streams, wells, and springs in the Barton Springs segment and concluded that "the quality of water in the Edwards Aquifer is generally very good" and that "no regional contamination problems have been identified by this water-quality sampling program." This and subsequent studies analyzed a variety of constituents, including nutrients, physicochemical properties, indicator bacteria, major ions, trace elements, hydrocarbons, and pesticides.

The City of Austin and surrounding areas have grown rapidly since the early 1980s, and the City of Austin has monitored the aquifer and Barton Springs to determine the effects of urbanization on water quality. In 2000, City of Austin staff analyzed water quality sampling data taken between 1975 and 1999. These data indicated a statistically significant change in specific conductance, sulfate, turbidity, total organic carbon, and dissolved oxygen--all of which were linked by the researchers to increased urbanization (Turner, 2000). However, it should be noted that significant trends were not observed in other constituents that are commonly considered pollutants, such as nutrients or TSS. A later study of water quality over time at Barton Springs and other, related springs found similar trends of decreasing dissolved oxygen and increasing conductivity over time (Herrington and Hiers, 2010). This study also measured increases in nitrate concentrations; the trends related to dissolved oxygen and nitrates were of particular concern due to the potential for impacts on both the Barton Springs salamander and aesthetic impairments in the swimming pool (Herrington and Hiers, 2010).

In 2003, in response to concerns following an *Austin American-Statesman* article about the quality of water at Barton Springs, the City of Austin closed the Barton Springs Pool and sought a health consultation from the U.S. Department of Health and Human Services (DHHS). DHHS evaluated 12 years of data collected by USGS, City of Austin, LCRA, and TCEQ, and assessed the public health risk associated with human exposure to the 27 potential contaminants identified in the data. DHHS concluded that there was no information to support the contention that swimming every day in Barton Springs Pool would result in adverse health effects and that swimming in Barton Springs Pool posed no apparent public health hazard (U.S. DHHS 2003). A study conducted by TCEQ and EPA in the same year found that sediments from Barton Springs Pool were not toxic and that pollutants were present at levels typical of urban waterbodies (TCEQ, 2003).

Barton Springs Pool is often closed after storm events for maintenance and cleaning. Rainfall has been observed to influence both the quantity and quality of discharge at Barton Springs. A USGS study found that, under stormflow conditions, concentrations of nitrate and several major ions decreased, likely due to the dilution of these constituents (Mahler et al., 2006). In contract, "concentrations of other constituents, including TSS, potassium, and herbicide and insecticide components, were found to increase following storm events" (Mahler et al., 2006). During a wetter-than-normal period (September 2009–March 2010), increased levels of nitrogen and major ions and decreased densities of bacteria were observed in Barton Springs discharge (Mahler et al., 2011a). These values were correlated with conditions in recharging streams, demonstrating the influence of streamflow and climatic conditions on Barton Springs water quality.

During the early 2000s, anthropogenic contaminants, including atrazine (an herbicide), chloroform (a drinking-water disinfection by-product), and tetrachloroethene (a solvent), were recorded in low concentrations at Barton Springs (Mahler et al., 2006). Routine sampling also identified the frequent occurrence of three other herbicide compounds – DEA (an atrazine degradate), prometon, and simazine – and potassium (associated with fertilizer). However, routine sampling did not reveal insecticide or fungicide compounds. Trace metals associated with both human-derived and natural sources were also detected. All of these constituents were detected at levels well below drinking water standards (Mahler et al., 2006). However, this study demonstrated the influence of water quality in recharging streams on water quality at Barton Springs, even during non-stormflow conditions.

More recent studies have characterized concentrations of nitrate and wastewater compounds in the Barton Springs segment and their potential relation to wastewater sources in the Contributing Zone. Nitrate concentrations in Barton Springs and the five streams that provide most of its recharge were much higher during 2008–2010 than earlier, in the 1990–2008 period, based on USGS data (Mahler et al., 2011b). This nitrate is likely biogenic nitrogen (from human or animal waste, or both), and septic systems and land-applied treated wastewater effluent are likely sources contributing nitrate to the recharging streams (USGS, 2011). Elevated nitrate concentrations likely resulted in part from the transition from dry to wet conditions in fall 2009, but similar transitions also occurred during 1990-2008, indicating that increased nitrogen loading associated with population growth was likely also a contributing factor (Garner and Mahler, 2007; USGS, 2011). Excessive levels of nitrates and other wastewater compounds can cause algal blooms, which can decrease dissolved oxygen levels and threaten other aquatic species (USGS, 2011). Since the population over the Barton Springs Contributing and Recharge Zones is projected to double between 2010 and 2035, the direct discharge of treated

wastewater into Contributing Zone streams is anticipated (USGS, 2011). Currently, at least one permit has been issued for direct discharges of wastewater in the Bear Creek watershed (USGS, 2011).

The City of Austin has acquired over 27,700 acres as designated WQPLs since 1998, and is continuing to purchase land that may benefit groundwater quality. In 2012, Austin voters approved Bond Proposition 13, which provided $30,000,000 to the City to fund the purchase of land in the Barton Springs segment Contributing and Recharge Zones, the arrangement of conservation easements to protect water quality, and the preservation of open space in perpetuity (COA, 2017a). Tracts of land targeted for purchase or easement may include those that would protect aquifer recharge waters, preserve water quality, preserve critical baseflows and provide a contiguous buffer where tracts are located next to land with existing protection and other public land (COA, 2017a).

Despite the overall good water quality of Barton Springs, the presence of anthropogenic contaminants and changes in physicochemical properties of aquifer water detected by researchers over the past few decades signify the potential effects of growing regional urbanization on aquifer water quality. Urbanization has been identified as one of the most significant sources of water quality degradation that can affect the future survival of central Texas salamanders (USFWS, 2013). Specific constituents that could affect salamanders or their habitat include polycyclic aromatic hydrocarbons (which originate from petroleum products or atmospheric deposition), pesticides, and nutrients, as well as changes in water chemistry (including conductivity, salinity, and dissolved oxygen) (USFWS, 2013). Monitoring of water quality in the Barton Springs segment of the Edwards Aquifer is ongoing by the BSEACD, USGS, and the City of Austin. As the proposed project would occur in the Recharge and Transition Zones of the Barton Springs segment, the cumulative impacts of the project on this sensitive resource and on listed salamander species will be evaluated.

*Groundwater Quantity*

The Barton Springs segment of the Edwards Aquifer provides water for a variety of uses including industrial, agricultural, municipal, recreation, and private wells. These uses collectively account for the discharge component of the aquifer's water budget. As discussed above, recharge occurs predominantly in stream channels, and is therefore heavily influenced by contributing streams. Water levels in the aquifer have been monitored with increasing regularity since the mid-1800s, and springflow discharging from Barton Springs has been measured continuously since 1917 (Scanlon et al., 2001; Hunt et al., 2012b). Increased interest in the availability of water in the aquifer arose during the seven-year drought of the 1950s, during which

record low springflow was recorded at Barton Springs (Brune and Duffin, 1983). More recent trends in groundwater quantity are discussed in the remainder of this section.

Springflow discharging from Barton Springs is often used to evaluate the overall water levels of the Barton Springs segment of the Edwards Aquifer, and is closely monitored by a number of agencies. The long-term average springflow at Barton Springs is 53 cubic feet per second (cfs) (Scanlon et al., 2001; Hauwert et al., 2004). Mahler et al. (2006) and the City of Austin define low flow as below 40 cfs; the BSEACD declares Alarm Stage Drought when the 10-day average of Barton Springs is equal to or below 38 cfs (Hunt et al., 2012a). Critical Stage Drought is declared when the 10-day average is equal to or below 20 cfs.

Fluctuations in water level in the Barton Springs segment of the Edwards Aquifer represent changes in storage due to hydrologic stresses (Hunt and Smith, 2006). These fluctuations are due to a combination of seasonal and long-term (months to years) climatic changes that influence recharge via precipitation and anthropogenic changes in recharge and discharge rates (Hunt and Smith, 2006; Mahler et al., 2006). Water levels are generally lowest during extended periods of drought (Brune and Duffin, 1983), as was observed during the severe drought conditions in 2011. During this period, the Austin area received only 33 percent of its average annual precipitation total, and diminished streamflow led to reduced recharge, lowering water levels in the aquifer and decreasing springflow at Barton Springs to Critical Stage Drought levels (Hunt et al., 2012a).

Recharge and discharge rates to the aquifer are influenced by a variety of anthropogenic factors. Pumpage removes water from the aquifer and can decrease discharge rates at springs, while recharge may be decreased by (1) increasing pumpage capturing groundwater upstream of contributing streams, (2) increasing temperatures and evapotranspiration rates, thereby reducing recharge, and (3) land-use practices that increase rates of evapotranspiration (Hunt et al. 2012b). In 1983, Brune and Duffin found that groundwater discharge (the sum of springflow and groundwater pumpage) was approximately equal to average annual recharge. However, more recent studies performed by the BSEACD have demonstrated the need for a reduction in pumpage from the Barton Springs segment of the Edwards Aquifer during periods of extreme drought to protect water wells from going dry and to maintain the quantity and quality of flow at Barton Springs (Smith and Hunt, 2004). Smith and Hunt (2004) used groundwater models to predict that, with projected pumping and a recurrence of drought-of-record conditions, springflow at Barton Springs would be greatly diminished or stopped. Additionally, under these conditions, as many as 19 percent of all water supply wells in the District could be

negatively impacted and the potential for saline water to flow into the freshwater aquifer would increase (Smith and Hunt, 2004).

The contribution of recent recharge to spring discharge has been the subject of numerous recent studies. Mahler et al. (2006) reported that recharge water contributed from 0 to 55 percent of spring discharge during non-stormflow conditions, while Mahler et al. (2011b) found that stream recharge contributed about 80 percent of Barton Springs discharge during a wetter-than-normal period. The rate of groundwater flow within the Recharge and Transition Zones has been studied using dye trace simulations. One study found an average travel time of five to eight days from injection sites to Barton Springs (Hauwert, 2012), while other studies have found that water is discharged at Barton Springs within two to four days of dye injection (BSEACD, 2003; Hunt et al., 2013). Groundwater flow rates are correlated to springflow rates, and vary under differing climatic conditions (BSEACD, 2003).

A review of historical precipitation and hydrological data from Central Texas suggests that a change to a wetter climate has occurred since the 1960s (Hunt et al., 2012b). This shift has correlated to an increase in streamflows and springflows at Barton Creek during the past 60 years, indicating increased water within the Edwards Aquifer over this time period (Hunt et al., 2012b). At the same time, base flow, which is the portion of stream flow that is not runoff and results from deep subsurface flow and delayed shallow subsurface flow, has decreased and variation in flow rates has increased. These factors have resulted in relatively little change to total discharge at Barton Springs over time (Hunt et al., 2012). Moreover, base flow declines are directly related to increased pumping from the aquifer and pumping from the Barton Springs segment has increased dramatically in recent years, from less than 2,000 acre-feet per year in 1970 to approximately 5,700 acre-feet per year in the mid-2000s (Brune and Duffin, 1983; Hunt et al., 2012b). Future water use is difficult to project because of unpredictable weather conditions and the potential for alternative water supply scenarios. However, it is projected that water levels within the Edwards Aquifer may decline in response to intensification of future pumpage and potential future drought conditions associated with a changing climate (Scanlon et al., 2001). Due to the complicated relationship between climate factors, the hydrology of the Edwards Aquifer, and limited predictability, the BSEACD has started to evaluate alternative sources of water for the growing population of central Texas (Smith et al., 2013).

#### 4.1.2.3 Surface Water

***Resource Study Area***

The geographic RSA for cumulative effects to surface water is based on the boundaries of the 12-digit hydrologic unit code (HUC) watersheds that intersect the

proposed project as delineated by the USGS. These watersheds include Lake Austin–Town Lake, Slaughter Creek–Onion Creek, and Williamson Creek–Onion Creek watersheds and cover approximately 92,551 acres. The watershed boundaries were selected for the RSA because all surface water runoff in the project area would be contained within the geological features that define the boundaries of these watersheds (**Figure 4** in **Attachment A**).

The earliest temporal boundary for the surface water RSA dates from 1979 (the earliest point at which water quality sampling data collected by the TCEQ is available). The future temporal horizon is 2040 (the horizon year of the long-range transportation plan, *CAMPO 2040 Regional Transportation Plan*). Historical water quality data within the RSA are presented below in order to define the health of the resource and establish historical trends. Surface water and groundwater quality are closely related within karst landscapes, and threats to one can quickly affect the other, as well as potentially affecting the two federally endangered species of salamander found within Edwards Aquifer that depend on water quality to survive.

Onion Creek is a common drainage for two of the three watersheds in the RSA. The Slaughter Creek–Onion Creek and Williamson Creek–Onion Creek watersheds both contain segments of Onion Creek, which are named based on the major tributaries that join each segment. The Lake Austin–Town Lake watershed does not include a segment of Onion Creek.

The Slaughter Creek–Onion Creek watershed encompasses 28,351 acres. Onion Creek flows into this watershed immediately below its confluence with Bear Creek and flows out of this watershed shortly after being joined from the south by Rinard Creek and from the north by Slaughter Creek. Onion Creek flows from the RSA in a northeasterly direction toward its confluence with the Colorado River approximately 10 linear miles away. Slaughter Creek flows from the northern part of the Slaughter Creek–Onion Creek watershed in a southeasterly direction toward its confluence with Onion Creek, draining approximately 70 percent of the watershed. Rinard Creek drains approximately 20 percent of the watershed at the southernmost portion of the watershed. Major creeks in the watershed include Slaughter Creek and three of its tributaries. In total, approximately 103 linear miles of creeks lie within this watershed. The City of Austin (including its Full Purpose Jurisdiction and the 2-mile Extra Territorial Jurisdiction [ETJ]) and the Village of San Leanna boundaries encompass 100 percent of the watershed. Approximately 12,733 acres (45 percent) are under City of Austin Full Purpose Jurisdiction.

The Williamson Creek–Onion Creek watershed lies to the north of the Slaughter Creek-Onion Creek watershed. The Williamson Creek-Onion Creek watershed encompasses approximately 30,086 acres. Approximately 92 linear miles of creeks

lie within this watershed. Onion Creek flows into this watershed just north of its confluence with Slaughter Creek and flows out of this watershed shortly after being joined by Williamson Creek. Williamson Creek flows from the northwestern part of the watershed in a southeasterly direction toward its confluence with Onion Creek. The cities of Austin (Full Purpose Jurisdiction, 2-mile ETJ, 5-mile ETJ, and Limited Purpose Jurisdiction) Bee Cave (Full Purpose Jurisdiction and ETJ), and West Lake Hills (Full Purpose Jurisdiction and ETJ) cover the watershed.

The Lake Austin–Town Lake watershed encompasses approximately 34,114 acres. Approximately 170 linear miles of creeks lie within this watershed. Jurisdictions in the Lake Austin-Town Lake watershed include the cities of Austin (Full Purpose Jurisdiction, 2-mile ETJ, 5-mile ETJ, and Limited Purpose Jurisdiction), Bee Cave (Full Purpose Jurisdiction and ETJ), and West Lake Hills (Full Purpose Jurisdiction and ETJ).

### *Current Conditions*

The City of Austin Department of Watershed Protection, the LCRA, TCEQ, and USGS, among others, monitor water quality in locations throughout the study area. Each entity reports their findings in various ways including the LCRA Water Quality Index, the TCEQ Integrated Report for Surface Water Quality, and the City of Austin Environmental Integrity Index.

TCEQ's Integrated Report is published every other year and includes the Section 303(d) list, which is an EPA-mandated list of waterbodies that are categorized as "impaired" when they do not meet pre-determined water quality standards. Impairment is determined in relation to beneficial uses that each waterbody segment is expected to provide, and sampling protocols vary, in part, by the assigned uses. In 2014, Segment 1043 (Lake Austin from Quinlan Park upstream to Mansfield Dam) was included on the Section 303(d) list for depressed dissolved oxygen. Segment 1403K (Taylor Slough South from the confluence of Lake Austin to the headwaters near South Meadow Circle within the Lake Austin–Town Lake watershed) was included on the 2014 Section 303(d) list for bacteria. Segment 1427 (Onion Creek from the confluence with the Colorado River in Travis County to the most upstream crossing of FM 165 in Blanco County) was listed as impaired for sulfate. Segment 1427A (Slaughter Creek) was listed as impaired relative to the macrobenthic community. The macrobenthic community is made up of species of aquatic organisms such as insects, mollusks, and other invertebrates (e.g. worms, leeches, etc.) which are visible to the un-aided eye (macro-) and live out some or all of their lives at the bottom (benthos) of the waterbody. The types and number of species present are indicators of water quality, and the community is sampled because of its usefulness in indicating a waterbody's capability to support the Aquatic Life Use category. The macrobenthic community is susceptible to a wide array of stressors

including man-made pollutants and natural weather patterns such as flood and drought.

The City of Austin Watershed Protection Department samples water quality parameters in 49 watersheds within the City of Austin's planning area to compile an Environmental Integrity Index (EII). The Watershed Protection Department recognizes slightly different watershed delineations than those represented in the RSA. Most notably, the Lake Austin–Town Creek watershed identified on the Surface Water Quality RSA map (**Figure 4**) is comprised of a number of subwatersheds included in the City of Austin's EII reporting data: Barton Creek, Eanes Creek, Bee Creek, Johnson Creek, Lake Austin, Taylor Slough South, Taylor Slough North, Dry Creek North, and Shoal Creek. Every other year the monitoring results are scored and assigned relative values. In addition to individual parameter scores, an overall EII score is assigned. Data are collected for dissolved oxygen, pH, conductivity, ammonia, nitrate, ortho-phosphates, TSS, turbidity, *E. coli*, benthic macroinvertebrates, and diatoms. The scores are ranked "Very Bad," "Bad," "Poor," "Marginal," "Fair," "Good," "Very Good," and "Excellent." **Table 3** provides a summary of the most recent scores for the watersheds or subwatersheds within the RSA.

**Table 3: City of Austin Environmental Integrity Index Scores**

| Watershed | EII Score (Year) | Rating |
|---|---|---|
| Slaughter Creek | 77 (2014) | Very Good |
| Williamson Creek | 70 (2013) | Good |
| Barton Creek | 79 (2013) | Very Good |
| Eanes Creek | 43 (2014) | Marginal |
| Bee Creek | 76 (2014) | Very Good |
| Johnson Creek | 52 (2013) | Fair |
| Taylor Slough South | 57 (2014) | Fair |
| Taylor Slough North | 74 (2014) | Good |
| Dry Creek North | 72 (2014) | Good |
| Shoal Creek | 59 (2013) | Fair |

Source: City of Austin Environmental Integrity Index, 2017 (COA, 2017b).

### *Trends*

Regulatory History

The City of Austin has passed a number of watershed ordinances that outline protection criteria for the water supply and environmentally sensitive watersheds within the City of Austin for local government and private citizens. These ordinances are superseded by the State of Texas laws governing transportation projects; therefore, the ordinances do not apply to TxDOT projects. The first of these, the Lake Austin Watershed Ordinance, was adopted in 1980 and included provisions

addressing impervious cover limits, water quality and quantity structural controls, and a requirement for an erosion/sedimentation control plan prior to subdivision application approval (COA, 1980). Subsequent ordinances added provisions for stream set-back requirements, a water quality zone to remain free of most development types, protection of watersheds that do not provide drinking water, and the designation and protection of critical environmental features (COA, 2013b). The Save Our Springs (SOS) Ordinance, which was adopted in 1992, required non-degradation and limited impervious cover to 15 percent for all development in the Recharge Zone, 20 percent for development in the Barton Creek portion of the Contributing Zone, and 25 percent for development in the remaining portions of the Contributing Zone in Williamson, Slaughter, Bear, Little Bear, and Onion Creeks, to be calculated on a net site area basis (COA, 2013b). The most recent watershed protection ordinance was passed in 2013; this ordinance aimed to improve creek and floodplain protection, prevent unsustainable public expense on drainage systems, simplify development regulations where possible, and minimize the impact on the ability to develop land (COA, 2017c).

Within the Barton Springs segment of the Edwards Aquifer, the City of Austin owns or controls development rights on over 27,700 acres that are designated WQPLs (COA, 2017a). These lands were purchased using funds from two utility bonds approved in 1998 and are managed to provide optimal water yield and to protect both water quality and quantity recharging into these areas (LBJWC, 2010). Additional bonds were passed in November 2012 (Proposition 13: Open Space and Watershed Protection). These lands are permanently protected from urbanization to preserve pervious cover and current hydrologic conditions. Several measures are listed in §13-7-36.4 of the SOS Ordinance that pertain to impervious cover limitations and construction within Critical Water Quality Zones (CWQZ) and Water Quality Transition Zones (WQTZ). A CWQZ is established along each waterway classified under City of Austin Land Development Code (LDC) §25-8-91 (Waterway Classifications). The boundaries of a CWQZ may coincide with the boundaries of the 100-year floodplain, except under certain circumstances. A WQTZ is established adjacent and parallel to the outer boundary of each CWQZ. The width of a WQTZ is 100 feet for a minor waterway, 200 feet for an intermediate waterway, and 300 feet for a major waterway (LDC §25- 8-93).

Surface Water Quality and Quantity

The Texas Integrated Report of Surface Water Quality (i.e., 303(d) listed waters) describes the status of Texas' natural waters based on historical data and evaluates the quality of surface waters against the Texas Surface Water Quality Standards. Available impaired waterbody listings from within the RSA show that, in the past,

causes of impairment have been varied. However, during most recent reporting cycles four segments within the RSA have been listed on the 303(d) list: Lake Austin for depressed dissolved oxygen (listed in 1996); Taylor Slough South for bacteria (listed in 2002); Onion Creek for sulfate (listed in 2014); and Slaughter Creek for impaired macrobenthic communities (listed in 2002).

The City of Austin's EII program was designed to monitor and assess the chemical, biological, and physical integrity of Austin's surface waters over time. Water chemistry, biological, and physical surveys are conducted and compiled on a two-year basis to track the status of Austin's watersheds. **Table 4** provides a summary of the EII scores for all watersheds within the RSA. In general, lower integrity scores are typically associated with urbanized areas due to intense development that did not have progressive environmental rules (COA, 2016). For the watersheds within the RSA, the EII scores have remained relatively stable, with five watersheds increasing or unchanged, and five watersheds reporting slightly reduced scores.

**Table 4: Historic City of Austin Environmental Integrity Index Scores**

| Watershed | 2000/ 2001 | 2003/ 2004 | 2006/ 2007 | 2009/ 2010 | 2011/ 2012 | 2013/ 2014 |
|---|---|---|---|---|---|---|
| Slaughter Creek | 75 | 65 | 77 | 79 | 70 | 77 |
| Williamson Creek | 70 | 69 | 67 | 62 | 55 | 70 |
| Barton Creek | 77 | 87 | 75 | 77 | 77 | 79 |
| Eanes Creek | 61 | 68 | 60 | 66 | 67 | 43 |
| Bee Creek | 78 | 75 | 81 | 80 | 79 | 76 |
| Johnson Creek | 53 | 56 | 47 | 51 | 36 | 52 |
| Taylor Slough South | 60 | 56 | 60 | 60 | 59 | 57 |
| Taylor Slough North | 61 | 61 | 62 | 69 | 68 | 74 |
| Dry Creek North | 69 | 64 | 63 | 68 | 72 | 72 |
| Shoal Creek | 60 | 54 | 55 | 63 | 57 | 59 |

Source: City of Austin Environmental Integrity Index, 2017 (COA, 2017b).

Although not specifically addressed in the City of Austin's EII reports or the TCEQ's 303(d) list, surface water quality may be impacted by roadway-associated pollution as a result of highway maintenance, accidental spills, and vehicle use. Routine maintenance activities introduce pollutants such as pesticides, paint, and herbicides

to the roadside environment. Accidental spills that range from small leaks, to loss of fluids during crashes, to tanker truck spills can introduce pollutants as well. Vehicle use also generates a number of pollutants. The processes that control the build-up of these pollutants and the processes that control their removal from the roadway have been well studied in an effort to address highway-associated pollution loads in receiving surface waters. Due to the direct connection between surface water and groundwater in Central Texas, the discussion in **Sections 4.1.2.1** and **4.1.2.2**, are relevant to the surface water quality discussion herein. In particular, Barrett's (2016) analysis of 20 years of water quality data, including roadway runoff constituents concluded that BMPs are successful at removing pollutants from highway runoff, and cited the findings of historical water quality data collected by the City of Austin and the USGS at Barton Springs. The combination of robust data collection from the City's watershed protection department, USGS, and other researchers, provides the data to support long-term monitoring of surface water quality in response to increasing urbanization in the RSA.

Water quantity is highly variable in the study area and can change significantly in a short time period. Streams outside of aquifer recharge zones typically receive water from the water table and are therefore more likely to sustain a base flow between rain events. Stream segments that flow through the aquifer recharge zone can lose a considerable portion of their flow to swallets. Factors that influence the quantity of water in streams include weather (rain/drought) conditions and land use patterns. Impervious cover often concentrates overland flow to channelized or natural stream areas, which can cause increased flow volume and velocity. The extent to which BMPs appropriate for urban areas, such as detention ponds and "grow zones" of vegetation next to creeks, are used varies widely and is based on the regulations set by local governments.

## 4.2 Step 2: Direct and Indirect Effects on Each Resource from the Proposed Project

### 4.2.1 Federally Listed Threatened and Endangered Species—Barton Springs Salamander and Austin Blind Salamander

The proposed project may affect, but is not likely to affect, the Barton Springs and Austin blind salamanders. There is no known suitable habitat for either the Barton Springs salamander or the Austin blind salamander within the project study area. Therefore, no direct impacts to either species from the proposed project are anticipated.

As discussed in the *Indirect Impacts Technical Report*, indirect impacts are not expected to occur to Barton Springs or Austin blind salamanders from the proposed

project. The proposed project area includes portions of the Edwards Aquifer Recharge and Contributing Zones. Recharge from lower Williamson Creek has been documented by dye trace studies to flow to the Barton Springs complex. Potential impacts to groundwater resources are discussed in more detail in **Section 4.2.1.2** of this report. BMPs would be incorporated into the project to prevent potentially contaminated runoff from entering the Edwards Aquifer. To mitigate for the increase of impervious cover within the project area and to ensure protection of downstream resources (including salamanders), BMPs would be applied to reduce the intensity of stormwater runoff and amount of roadway pollutants entering Williamson and Slaughter Creeks. In 2007, the TCEQ published a set of voluntary Optional Enhanced Measures (OEMs) as an appendix to their guidance document, *Complying with the Edwards Aquifer Rules: Technical Guidance on Best Management Practices* (TCEQ, 2005; TCEQ, 2007a). These measures provide a suite of options that can be used to enhance water quality by committing to construction, post-construction, and maintenance phase BMPs. According to the TCEQ's *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer Report (Revised) – Appendix A to RG-348* (TCEQ, 2005; TCEQ, 2007a) the USFWS concurred with the TCEQ's "no effect" determination for aquifer species for projects that adopt the OEMs. Although that document does not address the Austin blind salamander, due to similarities in life history and habitat (USFWS, 2015), it is assumed that the OEMs would be effective for this species as well.

There are approximately 10,192 acres of undeveloped, developable land (not already platted or planned for development) within the 85,281-acre AOI of the project analysed for indirect impacts. Developments on these lands would adhere to the Edwards Aquifer Rules and TCEQ requirements as discussed in **Section 4.5**. Furthermore, any developments with the potential to impact the groundwater habitat of the protected salamander species could be subject to regulation under the Endangered Species Act. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected as a result of the project. Reasonably foreseeable projects undertaken within the 258,039-acre RSA would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs or Austin blind salamanders or their habitat.

### 4.2.2 Water Quality – Groundwater

Potential consequences of the proposed project may include the potential for runoff from the project site to affect the Barton Springs segment of the Edwards Aquifer through surface water drainage and groundwater recharge. Potential effects to

groundwater resources include short-term potential for pollutants in stormwater runoff from the construction site to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; long-term potential for pollutants in stormwater runoff from the completed roadway, including from spills, to reach the Barton Springs segment of the Edwards Aquifer through surface drainage and groundwater recharge; and potential for reductions in recharge to the Edwards Aquifer resulting from increases in impervious cover.

Erosion and sedimentation during construction of the roadway could have short-term, adverse effects on receiving waters in the RSA. Due to the potential for recharge to the Edwards Aquifer from the project area and areas downstream, BMPs would be utilized to prevent or reduce the pollution of runoff from the project area, including minimizing impacts to water quality as a result of erosion and sedimentation.

The proposed project would add impervious cover to the watersheds in the study area. Implementation of *Alternative A* or *C* would add approximately 166 acres of impervious cover, of which 87 acres (52 percent) would be added within the Recharge Zone. The addition of impervious cover would potentially increase runoff and slightly reduce recharge to the Barton Springs segment of the Edwards Aquifer. Highway stormwater runoff may contain a wide variety of possible pollutants potentially impacting surface and groundwater resources, including metals, solids, nutrients, bacteria, herbicides, and hydrocarbons such as fuel oils and gasoline (Barrett et al., 1995). BMP options continue to evolve and improve and would reduce adverse water quality impacts from stormwater runoff.

As previously mentioned, there are approximately 10,192 acres of undeveloped, developable land (not already platted or planned for development) within the AOI of the project. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would constrain the amount of induced growth possible in the AOI. Several local planning experts maintain that development will continue to occur in the area regardless of whether the proposed project is constructed.

Induced growth could have some effect on water resources because induced development would result in increased impervious cover, which could in turn have an effect on water quality. However, the proposed project would not have a substantial adverse effect on water quality in the AOI because of the high percentage of managed areas and the implementation of regulations and BMPs.

Development projects that do occur within the AOI would have to comply with the relevant land development code for projects within city limits and ETJ boundaries, where applicable (see **Figure 5** in **Attachment A**). Areas outside municipal limits

would be subject to state and federal laws. Substantial indirect impacts are not anticipated to occur to groundwater quality due to the limited potential for induced development and the existing regulatory processes in place to avoid potential adverse impacts to groundwater quality.

### 4.2.3 Water Quality – Surface Water

The project area is located in the Colorado River basin and crosses the Slaughter Creek, Williamson Creek, and Barton Creek watersheds. Surface and groundwater resources associated with the Oak Hill Parkway may be impacted as a result of the proposed project. Placement of the roadway could encroach on the surface or subsurface drainage areas of unknown adjacent caves/sensitive recharge features, altering the hydrologic regime in those features.

Proposed water quality protection measures and BMPs to be utilized under either build alternative would remove at least 80 percent of the incremental increase in TSS that results from the project's addition of impervious cover in the Edwards Aquifer Recharge Zone, in compliance with the TCEQ's Edwards Aquifer Rules. In addition, the proposed water control facilities for both alternatives are anticipated to exceed the total TSS removal required by TCEQ. The potential for pollutants in stormwater runoff from the construction site and completed roadway to enter the aquifer and the potential for changes in recharge rates to the aquifer resulting from increases in impervious cover would be minor. Impacts would be minimized by the use of robust BMPs during roadway construction and operation. These BMPs include multiple levels of water quality treatment measures, bioretention ponds, vegetative filter strips, and a hazmat trap at Williamson Creek. During construction, project activities would be guided by an Environmental Compliance Management Plan which would include protocols designed to avoid environmental impacts. Stormwater runoff would also be treated by BMPs over the Recharge and Contributing Zone.

Impacts to surface waters in the project area would also be minimized using BMPs during both construction and operation of the proposed project. More than five acres of earth would be disturbed as a result of either build alternative, requiring preparation and implementation of a SW3P for the project. Stormwater runoff would be addressed through compliance with the TPDES and Edwards Aquifer Protection Plan. Any impacts to jurisdictional waters would comply with Section 404 of the CWA and would be permitted accordingly using a Nationwide Permit 14 with or without a Preconstruction Notification.

Approximately 10,192 acres of undeveloped land within the AOI could be subject to development in the foreseeable future. Factors such as the large amount of land protected from development and local regulations that limit impervious cover would

constrain the amount of induced growth possible in the AOI. With regard to potential indirect effects on water quality resulting from potential development by others in the AOI, regulations are in place and applicable to proposed developments to minimize impacts to the resource. These include TCEQ regulations requiring preparation of SW3Ps and WPAPs, including use of BMPs in addition to the City of Austin drainage/water quality requirements. USACE Section 404 provisions of the CWA govern activities that would affect waters of the U.S. and wetlands, regardless of who proposes the development activity. Individual developers would be responsible for complying with these regulations. Substantial indirect impacts are not anticipated to occur to surface water quality due to the limited potential for induced development and the existing regulatory processes in place to avoid potential adverse impacts to surface water quality.

## 4.3 Step 3: Other Actions – Past, Present, and Reasonably Foreseeable – and Their Effect on Each Resource

According to TxDOT's 2016 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 2016, FHWA 2003). A combined RSA, which encompasses each of the resource-specific RSAs, was used to obtain information about past, present, and reasonably foreseeable future projects. **Figure 5** in **Attachment A** shows the jurisdictions that fall within the combined RSA. The combined RSA is used from here forward in the analysis because it encompasses the other RSAs and allows for more efficient discussion of other actions, possible cumulative effects, and mitigating factors. In addition to researching various published documents and plans, a simple questionnaire explaining the project and requesting information about other actions was distributed to several entities including the cities of Austin, Bear Creek, Bee Cave, Dripping Springs, and Sunset Valley, as well as Hays and Travis counties.

One overarching trend that provides a backdrop for resource-specific analysis is population growth in the jurisdictions within the combined RSA. **Table 5** shows historical and current population in the combined RSA and **Table 6** shows projected population in the combined RSA. Both tables indicate substantial population growth. The cities of Kyle, Buda, and Bee Cave grew by especially large percentages in recent decades. Travis County more than doubled its population between 1990 and 2015, while Hays County's population more than tripled. Future population projections show that the cities of Kyle, Buda, and Sunset Valley, and Hays County overall, are expected to increase more than 100 percent between 2010 and 2040.

| Table 5: Current and Historic Population in Combined Resource Study Area | | | | | |
|---|---|---|---|---|---|
| City or County | Total Population by Year | | | | Percent Change from 1990 - 2015 |
| | 1990 | 2000 | 2010 | 2015 | |
| City of Austin | 472,020 | 656,562 | 790,390 | 931,830 | 97.4 |
| City of Kyle | 3,325 | 5,314 | 28,016 | 35,733 | 974.7 |
| City of Buda | 498 | 597 | 1,795 | 13,705 | 2,652.0 |
| Mountain City | 377 | 671 | 648 | 659 | 74.8 |
| Westlake Hills | 1,488 | 2,166 | 2,542 | 3,317 | 122.9 |
| City of Sunset Valley | 327 | 365 | 749 | 698 | 113.5 |
| City of Dripping Springs | 1,033 | 1,548 | 1,788 | 2,483 | 140.4 |
| Village of Bear Creek | Prior to incorporation* | 360 | 382 | 388 | N/A |
| City of Rollingwood | 1,388 | 1,403 | 1,412 | 1,543 | 11.2 |
| City of Bee Cave | 241 | 656 | 3,925 | 6,292 | 2,510.8 |
| Village of San Leanna | 325 | 384 | 497 | 536 | 64.9 |
| City of Hays | 251 | 233 | 217 | 221 | (12.0) |
| Travis County | 576,407 | 812,280 | 1,024,266 | 1,176,558 | 104.1 |
| Hays County | 65,614 | 97,589 | 157,107 | 194,739 | 196.8 |

Sources: Texas State Library and Archives Commission, 2017; U.S. Census Bureau, 1990–2010. * Census information is unavailable for unincorporated communities.

| Table 6: Projected Population in Combined Resource Study Area | | | | | |
|---|---|---|---|---|---|
| City or County | Total Population by Year | | | | Percent Change from 2010 - 2040 |
| | 2010 | 2020 | 2030 | 2040 | |
| City of Austin | 790,390 | 976,418 | 1,153,977 | 1,330,492 | 68.3 |
| City of Kyle | 28,016 | 50,808 | 77,050 | 92,000 | 228.4 |
| City of Buda | 7,295 | 11,489 | 16,316 | 22,195 | 204.2 |
| Mountain City | 648 | 689 | 753 | 830 | 28.1 |
| Westlake Hills | 3,063 | 3,699 | 3,699 | 3,699 | 20.8 |
| City of Sunset Valley | 749 | 1,134 | 1,480 | 1,806 | 141.1 |
| City of Dripping Springs | 1,788 | 2,031 | 2,311 | 2,652 | 48.3 |
| Village of Bear Creek | 382 | NA* | NA* | NA* | NA* |
| City of Rollingwood | 1,412 | 1,421 | 1,429 | 1,436 | 1.7 |
| City of Bee Cave | 3,925 | 4,470 | 5,473 | 6,165 | 57.1 |
| Village of San Leanna | 497 | NA* | NA* | NA* | NA* |
| City of Hays | 217 | NA* | NA* | NA* | NA* |
| Travis County | 1,024,266 | 1,273,260 | 1,508,642 | 1,738,860 | 69.3 |
| Hays County | 157,107 | 238,862 | 313,792 | 398,384 | 153.6 |

Sources: U.S. Census Bureau, 2010; Texas Water Development Board 2016 Regional Water Plan, 2017
*Note that the Texas Water Development Board does not provide population projections for Bear Creek.

**Figure 6** in **Attachment A** depicts past projects by development year according to the Development Services/GIS departments for Hays and Travis counties. In all, within the combined RSA, over 27,000 acres have been developed since 1970 in Hays County and over 40,000 acres have been developed between 1970 and 2014 in Travis County. **Tables B-1** (Hays County) and **B-2** (Travis County) in **Attachment B** list these subdivision developments and their acreages. Note that this is a snapshot in time and may not depict all past development projects in Hays or Travis counties within this RSA.

Given the pattern of continued population growth that has occurred in and around the project area, numerous transportation facilities and housing developments are planned within the areas encompassed by the combined RSA. The City of Austin tracks emerging development projects in its development jurisdiction. **Table B-3** in **Attachment B** lists and describes the emerging projects in the City of Austin within the combined RSA. Additional information about emerging/planned projects within the combined RSA was provided by staff from the cities of Austin, Drippings Springs and Bee Cave during communications that took place in 2016-2017. The emerging and planned projects for Austin, Dripping Springs, and Bee Cave are depicted on

**Figure 6** in **Attachment A** along with the historic subdivision development data for Travis and Hays counties.

**Table 7** lists all of the planned developments in Dripping Springs and Bee Cave and some of the larger emerging projects in Austin within the combined RSA. **Table 7** also includes information about planned transportation projects within the combined RSA. This is a partial list of planned projects as of March 2017. See also **Attachment C** which includes transportation, land use, and other planning maps from various jurisdictions. These maps demonstrate that development is tracked as best as possible by the various planning entities within these jurisdictions, who also have some degree of land development oversight and control.

**Table 7: Planned Projects in the Combined Resource Study Area**

| Project Location | Description |
|---|---|
| **TRANSPORTATION PROJECTS** | |
| Interstate Highway (IH) 35 from SH 45 SE to SH 45 N | IH 35 Improvements Projects |
| US 290 W from RM 165 to Nutty Brown Road/Travis County line | Enhance roadway; widen roadway from 4 lanes to 6 lanes between RM 12 and Nutty Brown Road |
| SH 45SW from Loop 1 to FM 1626 | Construction of a 4-lane tolled freeway; shared use path where feasible |
| SH 45SW from FM 1626 to IH 35 | Environmental and preliminary engineering analysis for a new freeway |
| RM 150 from RM 12 to FM 3237 | Widen roadway from 2 lanes to 4 lanes |
| Loop 1 from Cesar Chavez to Slaughter | 2 Express Lanes in each direction |
| RM 967 from RM 1826 to IH 35 | Widen roadway from 2 lanes to 4 lanes |
| FM 1626 from SH 45SW to IH 35 | Widen roadway from 2 lanes to 6 lanes |
| FM 2770/Jack C. Hays Trail from RM 967 to RM 150 | Widen roadway from 2 lanes to 4 lanes |
| RM 1826 from US 290W to RM 150 | Widen roadway from 2 lanes to 4 lanes |
| Creek Road/CR 190 from FM 165 to US 290 | Enhance roadway |
| Darden Hill Road/CR 162 from FM 150 to RM 1826 | Enhance roadway |
| Elder Hill Road/CR 170 from RM 12 to FM 150 | Enhance roadway |
| Garlic Creek Parkway from SH 45S to RM 967 | Construct new roadway |
| Goforth Street/CR 228 from RM 967 to IH 35 | Enhance roadway |
| Nutty Brown Road/CR 163 from US 290 to RM 1826 | Widen roadway from 2 lanes to 4 lanes |
| Old San Antonio Road from Travis County Line to Cabelas Drive | Enhance roadway |
| Pursley Road/Creek Road/CR 198 from FM 165 to Mt Gainor Road | Enhance roadway |
| Dripping Springs North US 290 | Construct new roadway |

| Table 7: Planned Projects in the Combined Resource Study Area | |
|---|---|
| **Project Location** | **Description** |
| Bypass from US 290 W to US 290 East | |
| Roger Hanks Extension from US 290 W to RM 12 | Construct new roadway |
| Dripping Springs Southeast Bypass from RM 12 to US 290 E | Construct new roadway |
| Escarpment Boulevard from SH 45 to FM 150 north of FM 3237 | Construct new roadway |
| Dripping Springs Southwest Bypass/FM 150 from US 290 W to RM 12 | Construct new roadway |
| **DEVELOPMENT PROJECTS** | |
| Bee Cave – Village Green | Mixed Use – 5 acres |
| Bee Cave – Bee Cave Territory Subdivision at Spanish Oaks | Mixed Use – 4 acres |
| Bee Cave – Spanish Oaks Hillside | Subdivision expansion – 64 residential lots, 100 acres |
| Dripping Springs – Anarene | New subdivision – 1,710 residential lots, 1,692 acres |
| Dripping Springs – Butler Ranch | New subdivision – 90 residential lots, 152 acres |
| Dripping Springs – Founders Ridge | New subdivision – 202 residential lots, 107 acres |
| Dripping Springs – Driftwood | New subdivision – 150 residential lots, 453 acres |
| Dripping Springs – Headwaters | New subdivision – 1,000 residential lots, 1,504 acres |
| Dripping Springs – Ledgestone | New subdivision – 242 residential lots, 198 acres |
| Dripping Springs – Parten Ranch | New subdivision – 575 residential lots, 533 acres |
| Austin – Avana | New subdivision – 800 residential lots, 1,020 acres |
| Austin – Avana Phase 2 | New subdivision – 229 residential lots, 149 acres |
| Austin – Rancho Garza | Mixed Use – 35 acres |
| Austin – 1300 Dittmar | New subdivision – 233 residential units, 42 acres |
| Austin – Greyrock Ridge | Subdivision expansion – 387 residential lots, 177 acres |
| Austin – Estancia Hill Country | Mixed use – 1,550 multifamily units; 750,000 SF industrial; 905,000 SF office; 405,000 SF retail; 737 residential lots; 600 acres |

Sources: Hays County Transportation Plan (adopted January 2013; amended March and June 2013)
City of Buda Transportation Master Plan Update (February 2013)
CAMPO 2040 Plan (May 2015)
City of Austin Emerging Projects (Peacock, 2017; COA, 2017d)
Communications with City of Dripping Springs staff, 2016-2017 (Coneway, 2017)
Communications with City of Bee Cave staff, 2016 (Perez, 2017)

In addition to the information gathered through questionnaires and interviews for the RSA described above, online research was conducted to identify some of the numerous transportation, land use, and conservation plans that have some overlap with the RSA. **Attachment C** includes maps of planned transportation projects and future land use plans from the various political jurisdictions that fall partially within the RSA. These plans indicate that entities in the RSA are anticipating additional growth and are planning for it in terms of infrastructure, capital improvements, zoning, and future land use plans. These plans reflect the communities' goals and

visions for the future, and provide a visual reference for where various jurisdictions would apply their land development codes and subdivision development requirements, including environmental controls. In addition, maps are included that specifically represent conservation goals, such as those from the Capital Area Council of Governments (CAPCOG) Greenprint for Growth, which was a multijurisdictional visioning process for participating central Texas counties. Maps in **Attachment C** include:

- *Imagine Austin Susceptibility to Change Map*
- *Bee Cave Future Land Use Plan and Thoroughfare Plan*
- *Buda 2030 Comprehensive Plan – Future Land Development Plan*
- *Buda 2030 Comprehensive Plan – Zoning Districts Map*
- *Buda Transportation Master Plan Map*
- *CAMPO 2040 Road Projects with Centers*
- *Dripping Springs - Conceptual Future Land Use Map from Comprehensive Plan*
- *Dripping Springs Potential Development Map*
- *Dripping Springs Zoning Map*
- *Dripping Springs Transportation Plan Map*
- *Hays County Transportation Plan Map*
- *Kyle Future Land Use Map from the Kyle Comprehensive Plan*
- *Kyle Zoning Map*
- *Kyle Transportation Master Plan*
- *Travis County Growth Guidance Concepts Map*
- *CAPCOG Greenprint for Growth Regional Overall Conservation Opportunities*

## 4.4 Step 4: The Overall Effects of the Proposed Project Combined with Other Actions

### 4.4.1 Methodology

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

### 4.4.2 Barton Springs and Austin Blind Salamander

The proposed project may affect, but is not likely to adversely affect, the Barton Springs or Austin blind salamander. The Barton Springs and Austin blind salamanders are not known to occur within the limits of the project area. Both species are known to occur within the Barton Springs segment of the Edwards Aquifer. Although no direct effects to salamanders are anticipated, indirect effects on these species due to water quality impacts are considered due to the location of the project over the Recharge Zone and due to the project's location in the Barton Springs Segment of the Edwards Aquifer. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected to occur as a result of the project. Reasonably foreseeable projects undertaken within the RSA would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs or Austin blind salamanders or their habitat.

The geographic RSA for the salamanders covers approximately 258,039 acres. Within that area there are currently 23,104 acres (or 9 percent of the RSA) of impervious cover as compared to 234,935 acres of land that are still potentially permeable to groundwater. Of the impervious cover, 11,956 acres are located over the Edwards Aquifer Contributing Zone, 656 acres are located over the Edwards Aquifer Contributing Zone within the Transition Zone, 6,986 acres are located over the Edwards Aquifer Recharge Zone, and 3,506 acres are located over the Edwards Aquifer Transition Zone. An analysis of past trends of impervious cover is summarized in **Table 7**. The incremental effects from the proposed project to these species are negligible in the context of the overall cumulative effects of the reasonably foreseeable future projects assessed in this document.

### 4.4.3 Water Quality – Groundwater

Stormwater runoff and streams crossing the Recharge Zone are the main sources of recharge to the Edwards Aquifer. Consequently, the quality of these waters is directly related to the quality of water entering the aquifer. As development in the RSA continues, the potential for degradation of stormwater increases with an increase in impervious surface and additional point source pollutant sources (e.g., septic systems, industrial facilities, accidental spills, and underground storage tanks). As a result, the potential for degradation of the Edwards Aquifer exists as well. As discussed earlier, groundwater sampling has confirmed the relatively high quality of water in the Edwards Aquifer. However, the detection of anthropogenic contaminants

in some of the samples indicates the susceptibility of the aquifer to development and urbanization on the Recharge Zone and Contributing Zone (Mahler et al., 2006).

The proposed project would add a total of approximately 166 acres of impervious cover, of which 87 acres (52 percent) would be added over the Recharge Zone of the Edwards Aquifer. Research has shown a strong correlation between the imperviousness of a watershed and the health of its receiving streams. In a review of water quality literature, Schueler (1994) concluded that the research, conducted in many geographical areas, concentrating on many different variables, and employing widely different methods, has yielded a surprisingly similar conclusion-- stream degradation occurs at relatively low levels of imperviousness (10 to 20 percent). Past activities have resulted in the development of and changing land uses in the watersheds within the RSA. The extent of past growth is evident through an assessment of impervious cover in each watershed within the Groundwater Quality RSA in the years 1970, 1990, 2012, and 2016.[1] **Table 8** provides information about the level of development in each watershed in the Groundwater Quality RSA as indicated by the percent of impervious cover. **Figure 7** in **Attachment A** presents the extent of impervious cover mapped in the years 1970, 1990, 2012, and 2016.

As shown in **Table 8**, total impervious cover in the Groundwater Quality RSA has increased from approximately 1.9 percent in 1970 to 9.0 percent in 2016. Between 1970 and 2016, impervious cover increased by 10.8 percent within the Recharge Zone, 15.7 percent within the Transition Zone, 19.4 percent within the Contributing Zone within the Transition Zone, and 5.0 percent within the Contributing Zone of the Edwards Aquifer. Impervious cover increased between 1970 and 2016 within each of the watersheds within the Groundwater Quality RSA, with the greatest percent increase occurring in the Williamson Creek watershed where impervious cover increased from 7.0 percent in 1970 to 32.2 percent in 2016.

As the trend for growth in the Austin area continues, the trend for increased impervious cover in the watersheds in the RSA is expected to continue. The various land use plans identified in **Section 4.3** indicate that the municipalities within the RSA anticipate future development, along with the preservation of open space. As discussed earlier, the correlation between increased impervious cover and decreased surface water quality is strong. However, with current regulatory measures

[1] The 1970 dataset included aerial imagery from Texas Natural Resources Information System (TNRIS) from 1970 and was supplemented with USGS data from 1973 and TNRIS data from 1974 for areas where 1970 aerial imagery was not available. The 1990 dataset included aerial imagery from TNRIS from 1990 and 1991. The 2012 dataset included aerial imagery from the USDA National Agriculture Imagery Program. The 2016 dataset included aerial imagery from Google Earth.

and future planning efforts to protect water quality, future development would be less likely to adversely affect surface and groundwater quality when compared to the past.

## Table 8: Impervious Cover within the Groundwater Resource Study Area

| Watershed | Contributing Zone | | | Recharge Zone | | | Transition Zone | | | Contributing Zone within Transition Zone | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total Acreage | Impervious Acreage | Impervious Acreage/ Total Acreage (%) | Total Acreage | Impervious Acreage | Impervious Acreage/ Total Acreage (%) | Total Acreage | Impervious Acreage | Impervious Acreage/ Total Acreage (%) | Total Acreage | Impervious Acreage | Impervious Acreage/ Total Acreage (%) | Total Acreage | Impervious Acreage | Impervious Acreage/ Total Acreage (%) |
| Barton Creek | | | | | | | | | | | | | | | |
| *1970* | 75,164 | 1,283 | 1.7% | 8,132 | 560 | 6.9% | 185 | 50 | 27.0% | 0 | 0 | n/a | 83,481 | 1,893 | 2.3% |
| *1990* | 75,164 | 2,974 | 4.0% | 8,132 | 1,442 | 17.7% | 185 | 56 | 30.3% | 0 | 0 | n/a | 83,481 | 4,472 | 5.4% |
| *2012* | 75,164 | 4,885 | 6.5% | 8,132 | 1,860 | 22.9% | 185 | 60 | 32.4% | 0 | 0 | n/a | 83,481 | 6,805 | 8.2% |
| *2016* | 75,164 | 5,554 | 7.4% | 8,132 | 2,088 | 25.7% | 185 | 67 | 36.2% | 0 | 0 | n/a | 83,481 | 7,709 | 9.2% |
| Williamson Creek | | | | | | | | | | | | | | | |
| *1970* | 4,982 | 339 | 6.8% | 6,173 | 155 | 2.5% | 2,710 | 463 | 17.1% | 161 | 28 | 17.4% | 14,026 | 985 | 7.0% |
| *1990* | 4,982 | 584 | 11.7% | 6,173 | 990 | 16.0% | 2,710 | 807 | 29.8% | 161 | 35 | 21.7% | 14,026 | 2,416 | 17.2% |
| *2012* | 4,982 | 1,133 | 22.7% | 6,173 | 1,900 | 30.8% | 2,710 | 920 | 33.9% | 161 | 45 | 28.0% | 14,026 | 3,998 | 28.5% |
| *2016* | 4,982 | 1,253 | 25.2% | 6,173 | 2,092 | 33.9% | 2,710 | 1,115 | 41.1% | 161 | 53 | 32.9% | 14,026 | 4513 | 32.2% |
| Slaughter Creek | | | | | | | | | | | | | | | |
| *1970* | 7,066 | 235 | 3.3% | 7,232 | 41 | 0.6% | 1,876 | 125 | 6.7% | 426 | 5 | 1.2% | 16,600 | 406 | 2.4% |
| *1990* | 7,066 | 458 | 6.5% | 7,232 | 411 | 5.7% | 1,876 | 326 | 17.4% | 426 | 76 | 17.8% | 16,600 | 1,271 | 7.7% |
| *2012* | 7,066 | 767 | 10.9% | 7,232 | 1,371 | 19.0% | 1,876 | 687 | 36.6% | 426 | 167 | 39.2% | 16,600 | 2,992 | 18.0% |
| *2016* | 7,066 | 852 | 12.1% | 7,232 | 1,577 | 21.8% | 1,876 | 740 | 39.4% | 426 | 181 | 42.5% | 16,600 | 3350 | 20.2% |
| Bear Creek | | | | | | | | | | | | | | | |
| *1970* | 13,027 | 80 | 0.6% | 15,955 | 79 | 0.5% | 2,662 | 71 | 2.7% | 460 | 1 | 0.2% | 32,104 | 231 | 0.7% |
| *1990* | 13,027 | 342 | 2.6% | 15,955 | 395 | 2.5% | 2,662 | 257 | 9.7% | 460 | 4 | 0.9% | 32,104 | 998 | 3.1% |
| *2012* | 13,027 | 1,307 | 10.0% | 15,955 | 559 | 3.5% | 2,662 | 368 | 13.8% | 460 | 176 | 38.3% | 32,104 | 2,410 | 7.5% |
| *2016* | 13,027 | 1,508 | 11.6% | 15,955 | 630 | 3.9% | 2,662 | 408 | 15.3% | 460 | 187 | 40.7% | 32,104 | 2733 | 8.5% |
| Onion Creek | | | | | | | | | | | | | | | |
| *1970* | 83,421 | 893 | 1.1% | 19,032 | 88 | 0.5% | 3,711 | 109 | 2.9% | 1,890 | 43 | 2.3% | 108,054 | 1,133 | 1.0% |
| *1990* | 83,421 | 1,548 | 1.9% | 19,032 | 203 | 1.1% | 3,711 | 229 | 6.2% | 1,890 | 176 | 9.3% | 108,054 | 2,156 | 2.0% |
| *2012* | 83,421 | 2,699 | 3.2% | 19,032 | 559 | 2.9% | 3,711 | 475 | 12.8% | 1,890 | 195 | 10.3% | 108,054 | 3,928 | 3.6% |
| *2016* | 83,421 | 2,789 | 3.3% | 19,032 | 583 | 3.1% | 3,711 | 552 | 14.9% | 1,890 | 231 | 12.2% | 108,054 | 4,155 | 3.8% |
| Town Lake-Colorado River | | | | | | | | | | | | | | | |
| *1970* | 0 | 0 | n/a | 33 | 10 | 29.9% | 845 | 270 | 31.9% | 0 | 0 | n/a | 878 | 280 | 31.9% |
| *1990* | 0 | 0 | n/a | 33 | 13 | 38.9% | 845 | 330 | 39.4% | 0 | 0 | n/a | 878 | 343 | 39.1% |
| *2012* | 0 | 0 | n/a | 33 | 14 | 42.4% | 845 | 333 | 39.4% | 0 | 0 | n/a | 878 | 347 | 39.5% |
| *2016* | 0 | 0 | n/a | 33 | 16 | 48.5% | 845 | 399 | 47.2% | 0 | 0 | n/a | 878 | 415 | 47.3% |
| Bunton Branch-Plum Creek | | | | | | | | | | | | | | | |
| *1970* | 0 | 0 | n/a | 0 | 0 | n/a | 2,869 | 91 | 3.2% | 25 | 4 | 16.0% | 2,894 | 95 | 3.3% |
| *1990* | 0 | 0 | n/a | 0 | 0 | n/a | 2,869 | 165 | 5.8% | 25 | 4 | 16.0% | 2,894 | 169 | 5.8% |
| *2012* | 0 | 0 | n/a | 0 | 0 | n/a | 2,869 | 219 | 7.6% | 25 | 4 | 16.0% | 2,894 | 223 | 7.7% |
| *2016* | 0 | 0 | n/a | 0 | 0 | n/a | 2,869 | 219 | 7.6% | 25 | 4 | 16.0% | 2,894 | 223 | 7.7% |
| **Total** | | | | | | | | | | | | | | | |
| ***1970*** | 183,660 | 2,830 | 1.5% | 56,557 | 933 | 1.6% | 14,858 | 1,179 | 7.9% | 2,962 | 81 | 2.7% | 258,037 | 5,023 | 1.9% |
| ***1990*** | 183,660 | 5,960 | 3.2% | 56,557 | 3,454 | 6.1% | 14,858 | 2,170 | 14.6% | 2,962 | 295 | 10.0% | 258,037 | 11,825 | 4.6% |
| ***2012*** | 183,660 | 10,791 | 5.9% | 56,557 | 6,263 | 11.1% | 14,858 | 3,062 | 20.6% | 2,962 | 587 | 19.8% | 258,037 | 20,703 | 8.0% |
| ***2016*** | 183,660 | 11,956 | 6.5% | 56,557 | 6,986 | 12.4% | 14,858 | 3,506 | 23.6% | 2,962 | 656 | 22.1% | 258,037 | 23,104 | 9.0% |

Source: Blanton (2014) for the years 1970, 1990, and 2012; CMEC (2017) for the 2016 data.

### 4.4.4 Water Quality – Surface Water

Some localized surface water and groundwater impacts would be anticipated to occur as a result of the project's construction. Increased impervious cover from the construction of the proposed roadway, in conjunction with possible induced development in the RSA, could result in some reduction in water quality over time in area watercourses. Impervious cover channels pollutants more directly into creeks without the water purification benefit provided by infiltration and overland flow across vegetated areas. Impervious cover would also have the potential to reduce recharge entering the Edwards Aquifer, which could affect sensitive species in the aquifer.

Approximately 170 linear miles of creeks flow through the Lake Austin–Town Lake watershed. Approximately 92 linear miles of creeks lie within the Williamson Creek–Onion Creek watershed and approximately 103 linear miles of creeks lie within the Slaughter Creek–Onion Creek watershed. Anticipated development within the RSA could adversely affect water quality throughout the RSA, but would be, in part, mitigated by several water quality protection regulations to be discussed in **Section 4.5**.

## 4.5 Step 5: Minimization and Mitigation of Cumulative Effects

### 4.5.1 Barton Springs and Austin Blind Salamander

The proposed project may affect, but is not likely to adversely affect, the Barton Springs or Austin blind salamander. The Barton Springs and Austin blind salamanders are not known to occur within the limits of the project area. Both species are known to occur within the Barton Springs segment of the Edwards Aquifer. Although no direct effects to salamanders are anticipated, indirect effects on these species due to water quality impacts are considered due to the location of the project over the Recharge Zone and due to the project's location in the Barton Springs Segment of the Edwards Aquifer. Through the use of BMPs, adherence to Edwards Aquifer rules through the preparation of a WPAP, and adherence to TPDES regulations through the preparation of a SW3P, significant indirect impacts to the Barton Springs and Austin blind salamanders are not expected as a result of the project.

Projects moving forward as a result of induced growth from the proposed project, and present or reasonably foreseeable projects (as discussed in **Section 4.3**), would be subject to regulation under the ESA if it is anticipated that they would impact either the Barton Springs or Austin blind salamanders or their habitat 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). The Barton Springs and Austin blind salamanders are not

species listed for protection under the BCCP or the Hays County HCP. However, land set aside for the BCCP protects groundwater quality in the Barton Springs segment of the Edwards Aquifer, which indirectly benefits the salamanders. Furthermore, the City of Austin has set aside more than 26,000 acres of WQPLs specifically to protect the water quality within the Edwards Aquifer, which will also indirectly benefit and protect the Austin blind and Barton Springs salamanders. These existing protections will help to mitigate for future effects to the listed salamander species. See the discussion in **Section 4.5.2** for further information on protections in place for groundwater quality.

### 4.5.2 Groundwater Resources

Mitigation for potential water quality impacts occurs in the form of regulations and ordinances. Two agencies—the TCEQ and the BSEACD—share responsibility for protecting the Barton Springs segment of the Edwards Aquifer. The individual and combined effect of these regulatory programs is to protect water quality and/or mitigate the adverse effects to water quality from development activities.

TCEQ regulations to protect the Edwards Aquifer are contained in the Edwards Aquifer Rules (30 TAC 213). These rules require developers who are planning to construct on the Recharge Zone or portions of the Contributing Zone of the Edwards Aquifer to prepare and submit an aquifer protection plan to the TCEQ for review and approval. The rules require the use of permanent stormwater BMPs that remove 80 percent of the incremental increase of TSS in runoff from the site. The rules do not require the use of permanent BMPs for single-family residential development that has 20 percent or less impervious cover. Additionally, the TCEQ has issued two optional guidance documents, *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer* (TCEQ, 2007a) and *Optional Enhanced Measures for the Protection of Water Quality in the Edwards Aquifer and Related Karst Features that May Be Habitat for Karst Dwelling Invertebrates* (TCEQ, 2007b). These documents provide optional enhanced water quality measures and BMPs for protecting the Edwards Aquifer that may be implemented in areas subject to the Edwards Aquifer Rules. The OEMs are consistent with the TCEQ's goal of non-degradation of groundwater quality and may be used to further protect the Edwards Aquifer, including public health and welfare, terrestrial and aquatic life, and the environment (TCEQ, 2007a; TCEQ, 2007b).

The TCEQ's Total Maximum Daily Load (TMDL) Program works to improve water quality in impaired or threatened water bodies in Texas. A TMDL defines an environmental target by determining the extent to which a certain pollutant must be reduced. TMDLs are developed for surface waters that are quality-limited due to a pollutant or adverse condition. Based on the environmental target in the TMDL, the state develops an implementation plan to mitigate sources of pollution within the

watershed and restore impaired uses. The Texas Water Quality Inventory and 303(d) List is an overview of the status of surface waters of the state, including concerns for public health, fitness for aquatic species and other wildlife, and specific pollutants and their possible sources. The 303(d) List, a subset of the Inventory, identifies waters that do not attain one or more standards for their use.

Water quality in wells and in the Edwards Aquifer is protected by the Safe Drinking Water Act of 1974 and the 1996 Amendments to the Act (Public Law 104-182)—laws that protect drinking water and provide source water protection. The 1996 Amendments provided new and stronger approaches to prevent contamination of drinking water, including a strong emphasis on source water protection. These rules required states to delineate source water areas of public water systems and assess the susceptibility of such source waters to contamination. The source water assessment results would then be used to implement source water protection programs. TCEQ's Source Water Protection Program (SWPP) was created by the 1996 Amendments to the Safe Drinking Water Act and set in motion a voluntary process by which local governments and suppliers of drinking water are encouraged to take proactive steps to protect local drinking water supplies before costly treatment enhancements are required. These supplies are defined primarily as water systems serving at least 15 connections or at least 25 persons at least 60 days per year.

The BSEACD, a groundwater conservation district with authority in the RSA, regulates wells within its jurisdiction, monitors the aquifer, and administers a drought management program that includes mandatory pumpage reductions based on drought stage (BSEACD, 2017a). The drought management program allows the BSEACD to maintain sustainable levels of groundwater extraction from the aquifer. Drought status is based on Barton Springs' discharge rate and water level elevation at an observation well.

The City of Austin has passed a number of watershed ordinances aimed at protecting the water supply and environmentally sensitive watersheds in the Austin area from water quality degradation. The Save Our Springs Ordinance, which was adopted in 1992, requires non-degradation and includes impervious cover limits of 15 percent for all development in the Recharge Zone, 20 percent for development in the Barton Creek portion of the Contributing Zone, and 25 percent for development in the remaining portions of the Contributing Zone in Williamson, Slaughter, Bear, Little Bear, and Onion Creeks (COA, 2013b). The most recent City of Austin ordinance was passed in 2013; this ordinance aimed to improve creek and floodplain protection, prevent unsustainable public expense on drainage systems, simplify development regulations where possible, and minimize the ordinance's impact on the ability to develop land (COA, 2013b). Another water quality protection mechanism regulated by

the City of Austin is the city's WQPL program; this program currently manages over 27,700 acres within the Contributing and Recharge Zones of the Barton Springs segment of the Edwards Aquifer. The preservation of these sensitive tracts of land will not only help preserve the quality and quantity of water entering the aquifer, it will preserve wildlife habitat and native vegetation.

Sections 404 and 401 of the Clean Water Act include provisions and responsibilities for water quality protection measures and protection of wetlands. For Section 404 permits issued by the USACE, TCEQ is authorized to certify that these permits meet the state's water quality standards. TCEQ carries out this responsibility under the Section 404 permitting program and can require the installation of temporary and permanent stormwater BMPs as part of the conditions of a Section 404 permit.

### 4.5.3 Surface Water

Existing regulations and programs, and BMP recommendations put forth by various agencies are set in place to promote and maintain water quality in the area. These will aid in acting as control measures for both surface waters and groundwater for future development projects within the RSA.

#### *Surface Water Regulations*

The EPA's National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the CWA, controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered by the TCEQ, as part of the TPDES. A NPDES permit may be required if wastewater is discharged into the stormwater system. The CWA established the basic structure for regulating discharges of pollutants into the waters of the U.S. In accordance with Section 404 of the CWA, the CFR defines jurisdictional waters as all waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including their tributaries and adjacent wetlands (40 CFR § 230.3). This includes streams exhibiting an OHWM, their adjacent wetlands, and other water bodies exhibiting a "significant nexus" with these waters (i.e., exerting a substantial effect on the chemical, physical, and biological integrity of those waters).

Section 404 of the CWA gives the USACE authority to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Impacts to waters of the U.S. could require USACE authorization. If a linear transportation project places less than 0.5 acre of fill into waters of the U.S., it would typically be authorized under Nationwide Permit 14 for Linear Transportation projects; impacts of 0.5 acre or more require an Individual Permit. Impacts authorized under Nationwide Permit 14 which

equal or exceed 0.1 acre require Pre-Construction Notification to the USACE. Impacts to wetlands (of any amount) would also require Pre-Construction Notification. Any future development project in the RSA would be required to comply with USACE regulations.

Floodplains are lowland areas adjacent to water bodies, which are inundated during flood events. Construction within a floodplain reduces its capacity for floodwater storage and infiltration, as well as its value as habitat. Under Executive Order 11988 Floodplain Management, the FEMA requires municipalities that participate in the National Flood Insurance Program to adopt floodplain ordinances that prohibit development in existing 100-year floodplain. Coordination with the local floodplain administrator may be required for any future developments.

In order to meet minimum control measures (MCM) set by the TCEQ, any project with construction on a TxDOT system within a municipal separate storm sewer system (MS4) area needs to submit an NOI to the proper TxDOT district. Part of the Phase I MS4 area that serves the City of Austin is within the RSA. Travis County is also an MS4. TxDOT utilizes various BMPs and programs to meet these MCMs; these are listed in **Table 9.**

**Table 9: Methods to Address Minimum Control Measures within an MS4 Area**

| TCEQ MCM | BMP Example | Implementation Plan |
|---|---|---|
| MS4 Maintenance Activities | Structural Control Maintenance | Inspect structural controls at least once per year. Schedule follow-up actions as necessary. |
| Post-construction Storm Water Control Measures | Permanent Structure | Inspect permanent structure control. |
| Illicit Discharge Detection and Elimination | Update Storm Sewer Outfall Map | Map and screen all outfalls in MS4 areas. |
| Pollution Prevention and Good Housekeeping | Waste Handling | Ensure proper disposal of litter and debris removed from roadways by litter collection and/or street sweeping. Ensure proper disposal of spoil materials removed during maintenance of drainage ditches and structural controls. |
| Construction Site and Storm Water Runoff | Compliance with the Construction General Permit (CGP) | Develop and implement plan to ensure compliance, and require contractors to comply with the CGP. |
| Public Education, Outreach, Involvement and Participation | Don't Mess with Texas Programs | Continue Don't Mess with Texas programs, which may include Adopt-a-Highway, Campus Cleanup, Road Touch, and trash-off efforts. |
| Monitoring and Screening Programs | Dry Weather Screening/Wet Weather Monitoring | Utilize Advanced Outfall Tracking System. Perform |

| Table 9: Methods to Address Minimum Control Measures within an MS4 Area | | |
|---|---|---|
| TCEQ MCM | BMP Example | Implementation Plan |
| | | representative monitoring event or participate in Regional Surfacewater Monitoring Program. |

Source: TxDOT, 2017.

*BMP Recommendations*

The proposed Oak Hill Parkway project would strictly adhere to the TCEQ standards for BMPs over the Edwards Aquifer and would commit to removing 80 percent of the incremental increase in TSS that results from the project's additions of impervious cover in the Edwards Aquifer Recharge Zone. Numerous other structural and non-structural BMPs are proposed for the current project and detailed in the *Water Quality Technical Report.*

According to the analysis summarized in **Table 8**, based on 2016 aerial imagery, approximately 23,104 acres of impervious cover, or 9.0 percent, exist in the groundwater RSA. Development by others may be proposed within the RSA.

TCEQ has several accepted permanent BMPs that reduce the effects that vegetation removal can have on the environment:

- Vegetative Filter Strips – Vegetated sections of land with low slopes designed to accept runoff as overland sheet flow.
- Grassy Swales – Vegetated channels that convey stormwater and remove pollutants by filtration through grass and infiltration through soil.

TxDOT has created vegetation management guidelines (TxDOT, 2013) in order to enhance environmental protections and mitigate erosion. Two levels of management are recommended for urban versus rural roadways, but additional measures are recommended for special circumstances, such as special habitat or threatened and endangered species. All recommendations from those guidelines would be followed along current and future TxDOT roadways in the RSA, including mowing restrictions, adding trees and shrubs along the right-of-way, and encouraging seed production.

TCEQ lists additional BMPs for construction and post-construction phases that future development projects would be required to consider. With implementation of the various BMPs, and anticipated compliance with requirements set by the numerous authorities that govern the areas within the RSA, it is unlikely that the proposed Oak Hill Parkway project would contribute to substantial adverse cumulative effects to water quality.

### *Various Municipal Codes Including Land Development Regulations*

As discussed in the *Indirect Impacts Technical Report*, proposed developments would be subject to various municipal land development codes that require environmental investigations or impose development restrictions such as impervious cover limits, in addition to county, state, and federal regulations that may apply.

## 4.6 Regional Tolling Analysis

Although the project area has low presence of EJ populations, the addition of toll lanes may have some impact on EJ populations in the region. The potential impact of this project in combination with other proposed toll facilities in the region was analyzed in the CAMPO 2040 *Regional Tolling Analysis* prepared in June 2016. The Regional Tolling Analysis is included as **Attachment D**, and is summarized in this section.

### 4.6.1 Methodology

The Regional Tolling Analysis evaluates potential effects of the 2040 CAMPO regional toll network on the EJ population. The analysis considers the potential impacts related to implementation of the regional toll system on EJ and non-EJ populations at the traffic analysis zone (TAZ) level of geography. EJ TAZs must meet one or more of the following thresholds:

- Low-income TAZs have at least 50 percent of the population earning less than 80 percent of the county median family income and/or have at least 25 percent of the population earning an income below the national poverty thresholds for a family of three ($17,373 in 2010 based on U.S. Census Bureau data).
- Minority TAZs have less than 50 percent of the population identifying themselves as “White, non-Hispanic” based on U.S. Census Bureau data.

CAMPO used the following data from the U.S. Census Bureau to identify EJ TAZs for the CAMPO 2040 Regional Transportation Plan:

- 2010 median family income levels
- 2010 poverty data
- 2010 race and ethnicity data

Regional traffic was modeled for three transportation network scenarios: 2010 (2010 roadway and transit facilities with 2010 demographics), 2040 Plan build-out, (all recommended roadway and transit facilities with year 2040 demographics) and

2040 priced facility no-build (in which all recommended transportation facilities in the 2040 Plan except proposed roadway facilities with any priced elements built after 2010 are included, with year 2040 demographics).

### 4.6.2 Conclusion of Analysis

A travel time analysis for EJ and non-EJ TAZs was performed based on the 2010, 2040, and 2040 no-build scenarios. The analysis did not identify any significant differences in travel times between EJ and non-EJ zones. The results indicate that trips from both EJ and non-EJ TAZs receive travel benefits under the 2040 network. The reduced congestion and improved travel efficiency under the 2040 network allows longer average trip lengths for residents of all TAZs when compared to the 2040 no-build network. The increase in average travel speed for trips from all TAZs was between 4.1 and 4.4 percent greater in the 2040 network than in the 2040 no-build network.

Implementation of the 2040 planned transportation system, including the regional toll network, would benefit the EJ population. The 2040 Plan expands travel options by increasing transit service and adding more bicycle and pedestrian facilities. The 2040 Plan also encourages mixed-use, transit-friendly growth in activity centers, which would provide more people with the opportunity to live near their work and reduce commute times and congestion. The 2040 system would be less car-dependent and travel opportunities would increase. Several activity centers are located in EJ areas, offering economic development and business opportunities.

## 5. Conclusions

This analysis considered Austin blind and Barton Springs salamanders, and their habitats, in addition to groundwater and surface water resources; discussed the health of these resources and relevant trends; and identified specific RSA boundaries and appropriate temporal boundaries for the analysis. 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 US 290/ SH 71 Oak Hill Parkway Project and described the extensive controls that have evolved over time to help protect these resources.

Minimization of impacts to sensitive resources would be 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

RSAs, especially where construction is proposed over the Recharge and Contributing Zones of the Edwards Aquifer. Mitigation measures are required for impacts to endangered species habitat, and there are HCPs in place in Hays County and Travis County (along with the City of Austin) that provide a framework in which developers 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. A large portion of land within the RSAs would be protected in perpetuity through conservation easements or WQPLs specifically acquired for that purpose.

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 conservation initiatives underway within the RSAs and the incremental contribution the proposed project would make toward induced development in the AOI, within the context of the continuing development trends, the proposed project is not anticipated to result in substantial adverse indirect impacts to sensitive resources. The proposed project may incrementally contribute to cumulative effects on water quality and threatened and endangered species, but project impacts would not act as a tipping point to significantly affect the overall health of these resources. Neither water quality nor threatened and endangered species are expected to be significantly affected by the combination of the project with other past, present, and reasonably foreseeable future actions.

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# Attachment A
# Figures

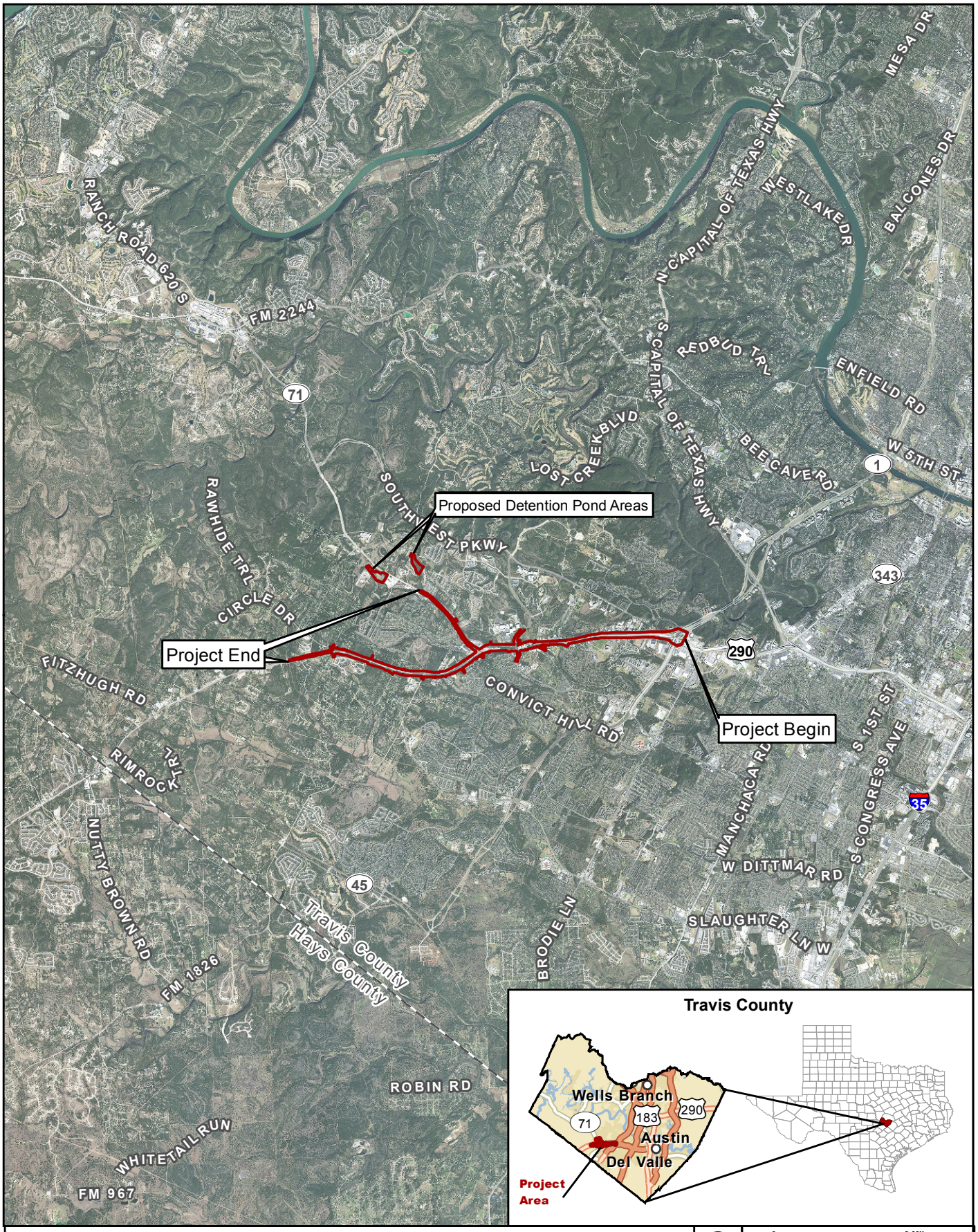


**Figure 1.** **Project Location (Aerial Base)**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Project Location

Basemap Source: TNRIS (2015)

0 2 Miles
0 3 Kilometers

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 2 miles |
| | Scale:1:126,720 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 12/6/2016 |

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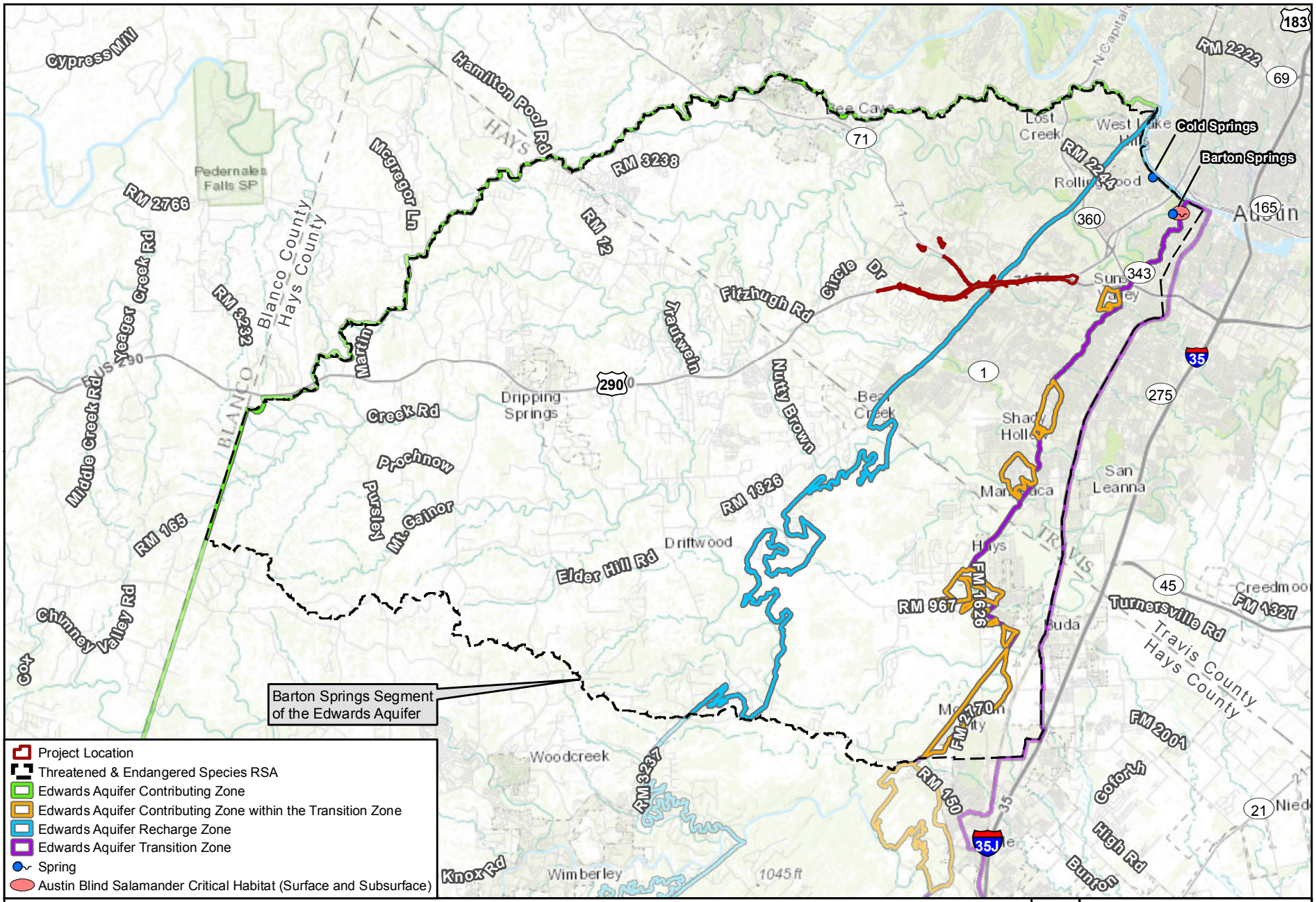


**Figure 2. Federally-Listed Threatened and Endangered Species RSA**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Data Source: TCEQ (2005), USFWS (2013)
Basemap Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 4 miles |
| | Scale: 1:253,440 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 2/17/2017 |

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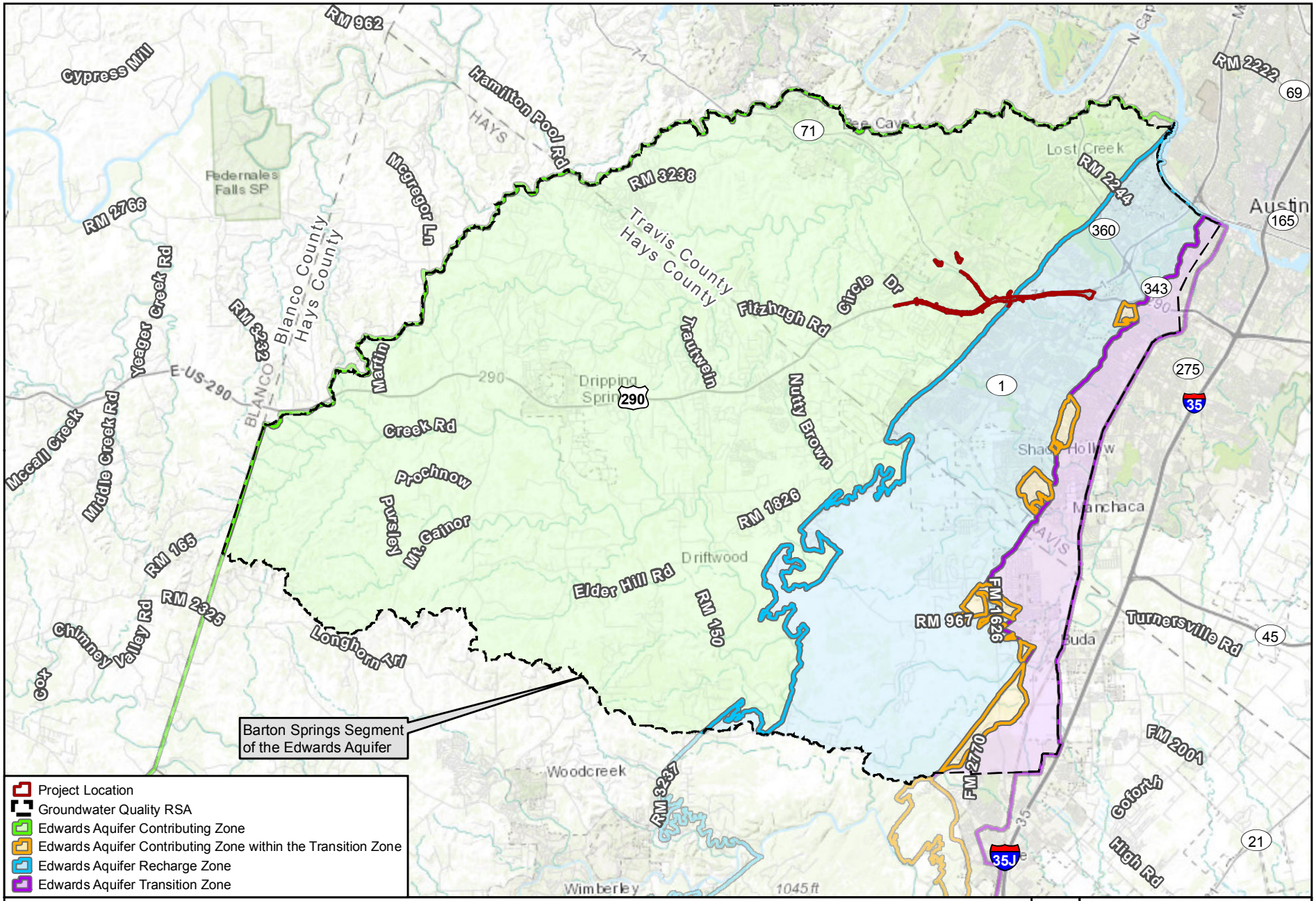


## Figure 3. Groundwater Quality RSA

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Data Source: TCEQ (2005)
Basemap Source: ESRI (2017)

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 4 miles |
| | Scale: 1:253,440 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 3/9/2017 |

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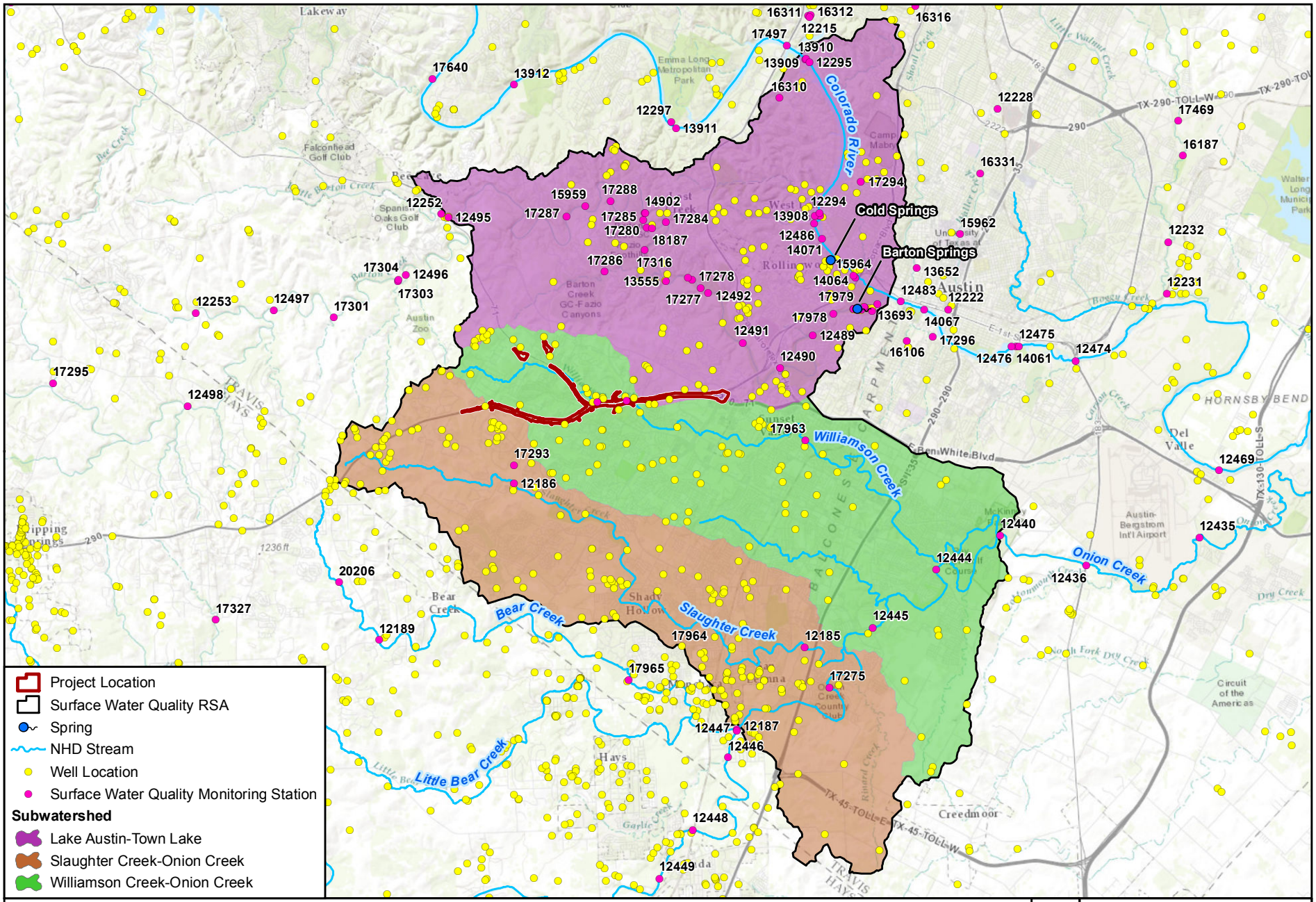


**Figure 4. Surface Water Quality RSA**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Data Sources: COA (2016), TCEQ (2017), NHD (2014), TWDB (2017), Basemap Source: ESRI (2017)

0 3 Miles
0 5 Kilometers

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 3 miles |
| | Scale: 1:190,080 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 3/9/2017 |

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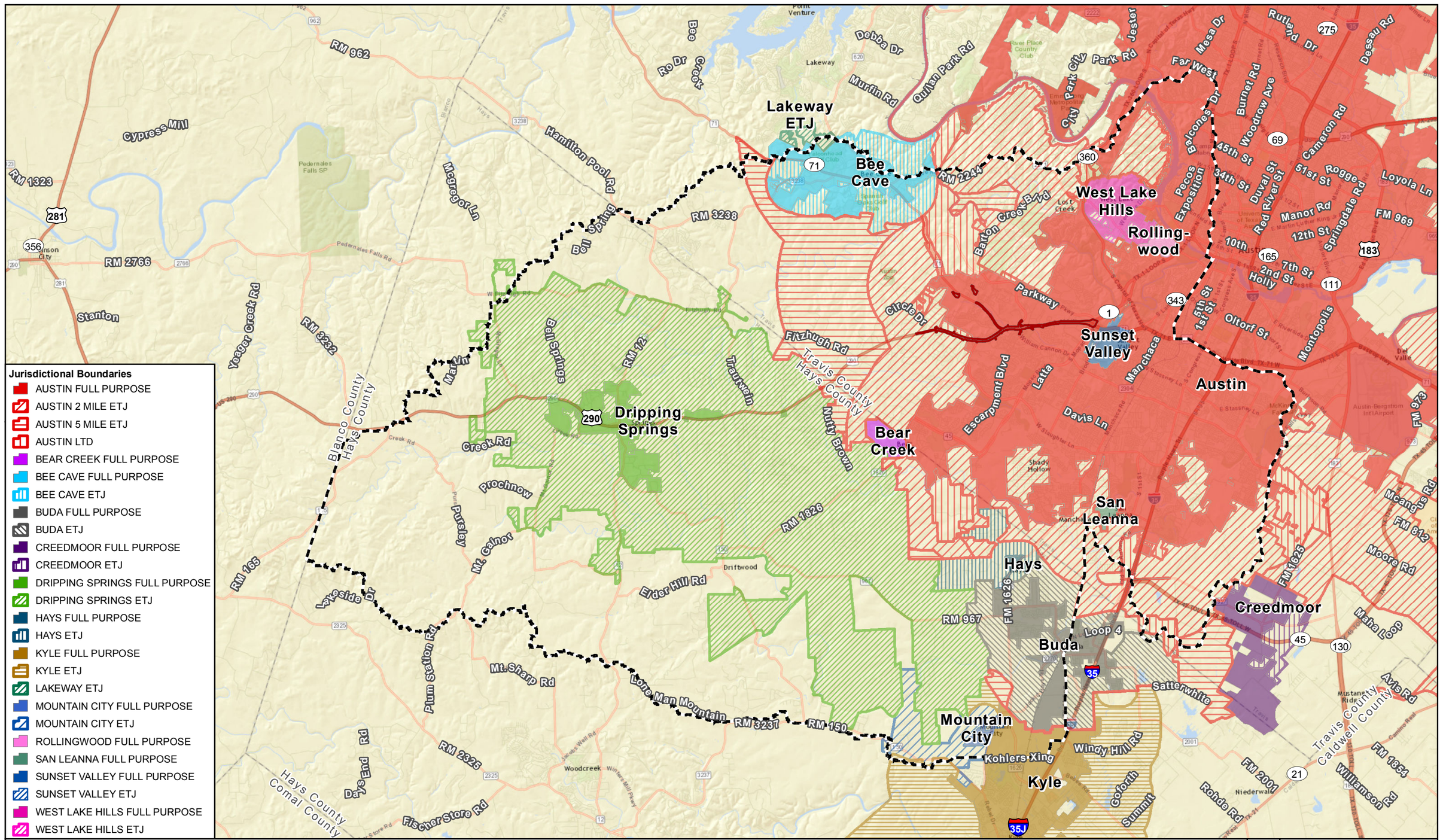


**Figure 5. Combined RSA**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Data Sources: CMEC (2016), City of Austin (2016)
Basemap Source: ESRI (2017)

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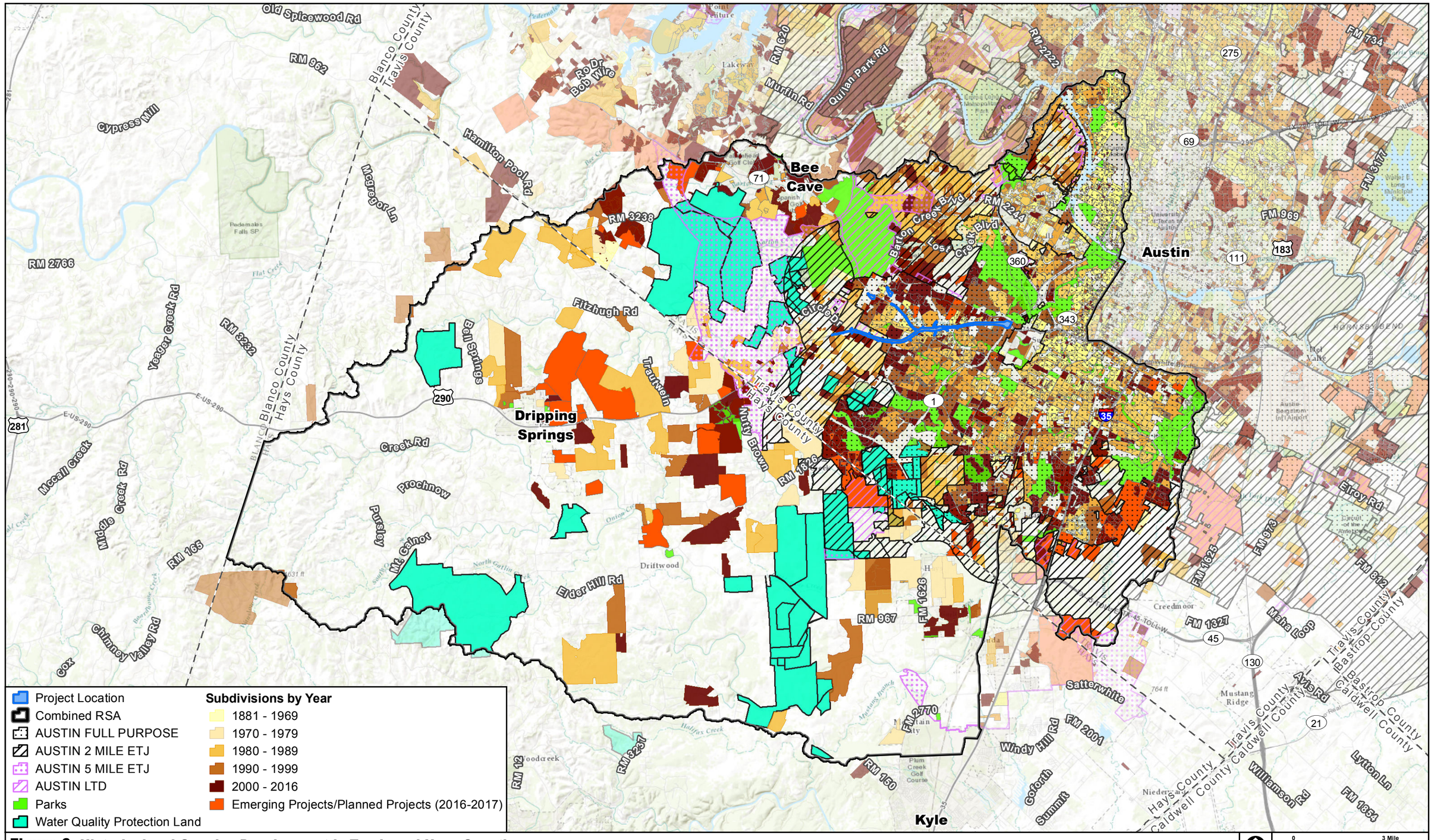


**Figure 6. Historical and Ongoing Development in Travis and Hays Counties**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Data Source: CAPGOG (2016), City of Austin (2013, 2016), City of Bee Cave (2016), City of Dripping Springs (2016), TCAD (2017)
Basemap Source: ESRI (2017)

0 3 Mile
0 5 Kilometers

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 3 miles |
| | Scale: 1:190,080 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 3/10/2017 |

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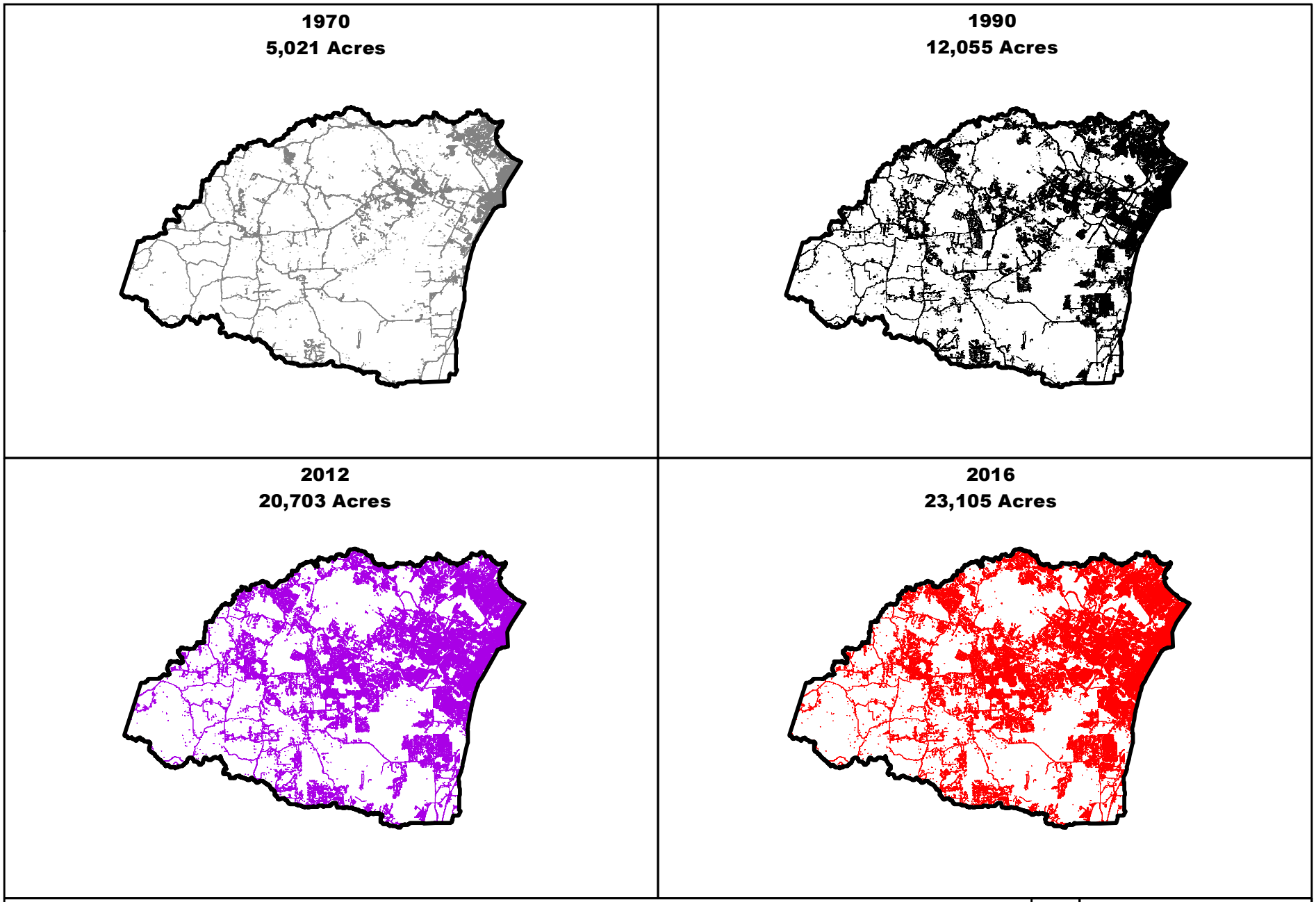



**Figure 7. Impervious Cover within Groundwater RSA**

**Oak Hill Parkway: US 290W from Mopac/Loop1 to west of Circle Drive and SH 71 from US 290W to Silvermine Drive**

Groundwater Quality RSA
1970 Impervious Cover
1990 Impervious Cover
2012 Impervious Cover
2016 Impervious Cover

Data Source: Blanton (2012), CMEC (2017)

0 10 Miles
0 16 Kilometers

| | |
|---|---|
| Prepared for: TxDOT | 1 in = 10 miles |
| | Scale: 1:633,574 |
| CSJ: 0013-08-060 and 0700-03-077 | Date: 3/10/2017 |

G:\Projects\TXDOT\US290\ICI_Figure 7_Impervious_Panel_20170310.mxd

# Attachment B
# Past, Present, and Reasonably Foreseeable Future Projects

## Attachment B-1

## Subdivision Developments in Hays County

| B-1: Past Subdivision Developments in Hays County | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Name** | **Lots** | **Acres** | **Year Platted** | **Name** | **Lots** | **Acres** | **Year Platted** |
| North Forty | 121 | 41 | 1973 | Bell Springs Ranches | 43 | 635 | 1991 |
| Douglas Estates | 51 | 435 | 1973 | Triple Creek Ranch | 56 | 135 | 1994 |
| Chaparral Park | 200 | 240 | 1973 | Madrone Ranch | 47 | 302 | 1994 |
| Big Country | 140 | 258 | 1974 | Polo Club | 93 | 152 | 1995 |
| Oxbow Trails | 78 | 174 | 1975 | Ruby Ranch | 177 | 1097 | 1995 |
| Leisurewoods | 300 | 352 | 1977 | Vista Grande | 49 | 230 | 1997 |
| Hays County Oaks | 360 | 871 | 1977 | Creek of Driftwood | 75 | 74 | 1997 |
| Bear Creek Oaks | 120 | 687 | 1977 | Woodland Estates | 58 | 127 | 1997 |
| Heritage Oaks | 233 | 556 | 1978 | Onion Creek Ranch | 76 | 423 | 1997 |
| Cimmaron Park | 328 | 194 | 1978 | Bradfield Village | 214 | 80 | 1998 |
| Southwest Territory | 105 | 124 | 1978 | Creekside Park | 170 | 83 | 1998 |
| Oak Springs | 47 | 155 | 1978 | Ashford Park | 115 | 37 | 1998 |
| Mountain City Oaks | 320 | 207 | 1978 | Hidden Springs Ranch | 50 | 174 | 1999 |
| Bear Creek Estates Sec 2 | 52 | 221 | 1979 | Sawyer Ranch | 48 | 280 | 1999 |
| Allegre | 43 | 61 | 1979 | La Ventana | 583 | 585 | 1999 |

| B-1: Past Subdivision Developments in Hays County | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Name** | **Lots** | **Acres** | **Year Platted** | **Name** | **Lots** | **Acres** | **Year Platted** |
| Monantial | | | | | | | |
| Sequoyah | 200 | 80 | 1980 | Copper Hills | 49 | 61 | 1999 |
| Goldenwood | 105 | 389 | 1981 | Springlake | 180 | 686 | 1999 |
| Rainbow Ranch | 104 | 1722 | 1981 | Elliot Ranch | 112 | 546 | 1999 |
| Bonita Vista | 144 | 65 | 1982 | Sierra West | 99 | 382 | 2000 |
| Sunset Canyon | 1175 | 1742 | 1983 | Arroyo Ranch | 129 | 142 | 2001 |
| Barton Creek Ranch | 96 | 283 | 1983 | The Preserve | 49 | 244 | 2001 |
| Goldenwood West | 98 | 218 | 1983 | Belterra | 500 | 991 | 2002 |
| Saddletree Ranch | 117 | 412 | 1984 | Cullen Country | 210 | 62 | 2003 |
| Oak Run West | 46 | 135 | 1984 | Rim Rock | 545 | 755 | 2003 |
| Heritage Country | 50 | 281 | 1984 | Stoneridge | 293 | 36 | 2004 |
| Westcave Estates | 320 | 270 | 1984 | Meadow Park | 100 | 44 | 2004 |
| Hills of Texas Estates | 120 | 153 | 1984 | Whispering Hollow | 128 | 222 | 2004 |
| Coves of Cimmaron | 270 | 177 | 1984 | Highpointe | 217 | 739 | 2005 |
| Hills of Texas | 120 | 39 | 1984 | Howard Ranch | 57 | 139 | 2005 |
| Crosshouse | 75 | 189 | 1985 | Meadows at Buda | 110 | 95 | 2005 |
| Oak Forest | 135 | 373 | 1985 | Preserve at La Ventana | 49 | 126 | 2005 |

| B-1: Past Subdivision Developments in Hays County | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Name** | **Lots** | **Acres** | **Year Platted** | **Name** | **Lots** | **Acres** | **Year Platted** |
| Meadow Oaks | 120 | 85 | 1985 | Reunion Ranch | 128 | 149 | 2005 |
| Friendship Ranch | 98 | 471 | 1986 | Rutherford West | 58 | 111 | 2005 |
| Harmon Hills | 63 | 382 | 1986 | Bush Ranch | 105 | 122 | 2006 |
| River Oaks Ranch | 88 | 1031 | 1987 | Garlic Creek West | 167 | 168 | 2007 |
| Driftwood Falls Estates | 63 | 66 | 1987 | Chama Trace | 46 | 98 | 2007 |
| Kirby Springs | 98 | 856 | 1989 | Elm Grove | 108 | 63 | 2007 |
| Meadow Creek Ranch | 75 | 243 | 1990 | Sunfield | 159 | 101 | 2008 |
| Hill Country Ranches | 226 | 2457 | 1990 | **Total Acres:** | | **27,193** | |

Source: Hays County Development Services Department, 2014.

## Attachment B-2

## Subdivision Developments in Travis County

**B-2: Past Subdivision Developments in Travis County**

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Manchaca | 11.31 | 1881 | Steiner Ranch Ph 1 Sec 1 | 60.07 | 1988 |
| Matthews Addition | 17.89 | 1904 | Paleface Park Ph 1 Sec C | 70.46 | 1989 |
| Town of Creedmoore | 32.99 | 1907 | Paleface Park Ph 1 Sec B | 212.14 | 1989 |
| Bruton Springs Subd | 161.20 | 1912 | Kinser-Wheeler | 36.90 | 1989 |
| Knollwood | 8.30 | 1953 | Estates Above Lost Creek Resub Lot 44 Blk B | 1.87 | 1989 |
| Panther Hollow No 1 | 13.59 | 1954 | Seven Oaks Sec 3 Ph 1 Amend | 27.05 | 1989 |
| Baldwin's Point Resub | 24.08 | 1954 | Ben Crenshaw Golf Course | 223.79 | 1989 |
| Lakeland Park | 22.69 | 1955 | Estates Above Lost Creek Sec 2 | 2.01 | 1989 |
| Manchaca Gardens | 30.40 | 1955 | Hills of Lost Creek Sec 4 PhA Am Lots 5-6 Ph A & Lot 26 Ph B | 1.51 | 1989 |
| Izaak Walton | 7.57 | 1956 | Ochs Acres | 0.96 | 1989 |
| Horseshoe Bend Estates | 19.74 | 1956 | Drummond Addn Amended | 12.62 | 1989 |
| Rio Vista Subd | 26.51 | 1956 | Mackie Subd | 8.05 | 1990 |
| Bowden | 8.42 | 1956 | Oak Run Estates Am Lots 51-53 | 4.15 | 1990 |
| Big Bee Creek Subd No 2 | 8.76 | 1956 | Ridge at Barton Creek | 40.16 | 1990 |
| Mrs. Rosa J. Spillman Estate | 36.68 | 1956 | Forest at Westlake | 27.32 | 1990 |
| S & S | 18.00 | 1958 | Kingston Subd | 1.00 | 1990 |
| Mooreland Addn | 36.69 | 1958 | Oak Hill Park Amended Lots 2 & 3 | 3.32 | 1991 |
| Austin Lake Estates Sec 3 | 62.32 | 1959 | Lewis Mountain Ranch Ph 2 | 46.04 | 1991 |
| Austin Lake Estates Sec 2 | 66.05 | 1959 | Summit at West Rim on Mount Larson | 102.41 | 1991 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Austin lake Estates Resub | 2.28 | 1959 | River Cove Subd | 22.66 | 1991 |
| Westwood Sec 1 | 15.68 | 1959 | Blackburn Subd | 4.97 | 1991 |
| Lange Addn | 14.45 | 1960 | Klassen Addn | 4.71 | 1991 |
| Westoak Resub | 8.52 | 1960 | River Terrace | 2.47 | 1991 |
| Westlake Highlands Sec 2 Blk A-E | 29.49 | 1960 | Robinson Addn | 7.38 | 1991 |
| Westlake Highlands Blk 1 & 2 | 12.07 | 1960 | Rose Hill Subd. | 9.94 | 1991 |
| Geneva Estates Sec 1 | 56.44 | 1961 | Slaughter Creek Acres Resub Lot 5 | 3.78 | 1991 |
| Rivercrest Addn Sec 1 | 22.84 | 1961 | Travis Settlement Sec 8 | 32.84 | 1992 |
| Austin Lake Hills Sec 3 | 68.85 | 1961 | Graef Road Estates | 195.02 | 1992 |
| Austin Lake Hills Sec 1 | 101.68 | 1961 | Shady Hollow West AISD No 1 | 45.69 | 1992 |
| Austin Lake Hills Sec 2 | 118.44 | 1961 | John W. Woodruff Subd | 14.23 | 1992 |
| Westwood Sec 2 | 22.01 | 1961 | Lewis Mountain Ranch Ph 3 | 36.68 | 1992 |
| Barton Springs Estates Resub Lot 20 | 2.25 | 1962 | Dominion Hill | 37.86 | 1992 |
| Lake Oak Estates No 2 | 70.24 | 1962 | Barton Creek Club Driving Range | 12.94 | 1992 |
| Cardinal Hills Estates Unit 2 | 55.56 | 1962 | Stauch Subd. | 0.34 | 1992 |
| Cardinal Hills Estates Unit 1 | 65.09 | 1962 | Ravine Ph 1 | 27.31 | 1992 |
| Lake Oak Estates Sec 1 | 44.21 | 1962 | Davenport West Tr D Sec 1 Rob Roy Ph 3 | 68.49 | 1992 |
| Silver Spur Ranchettes Sec 2 | 137.27 | 1962 | Canyon Oaks | 14.61 | 1992 |
| Bothmer Addn | 6.83 | 1962 | J Hoover Mackin Addn | 2.49 | 1992 |
| Rockwood Subd | 20.04 | 1963 | Aqua Monte Sec 2 Amend Lots 9 & 10 | 4.47 | 1992 |
| Lago Villa | 5.29 | 1963 | Burson Subd | 9.94 | 1992 |
| Manana West | 6.52 | 1963 | Boyer Acres | 4.05 | 1992 |
| Westwood Sec 3 | 12.42 | 1963 | Diamond Sky Subd | 55.08 | 1992 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Wynnrock Estates Sec 1 | 76.90 | 1963 | River Place Sec 3B | 8.69 | 1992 |
| Charles A. Garner Subd | 2.91 | 1963 | River Place Sec 3A | 1.83 | 1992 |
| George Milton, Jr. Subd | 6.42 | 1963 | Barton Creek Preserve Ph 1 | 19.67 | 1992 |
| Aqua Verde Resub Lots L & M Blk G | 0.19 | 1963 | St Stephens School | 245.33 | 1992 |
| Westoak Sec 3 | 15.90 | 1964 | Austin Lake Estates Sec 2 Amended | 2.12 | 1992 |
| Westlake Highlands Blk 2A | 3.16 | 1964 | Rocky Creek Estates Sec 2 | 70.50 | 1993 |
| Lake Ridge Estates Sec 1 | 26.53 | 1964 | Cravatt Subd | 4.73 | 1993 |
| Lake Austin Village | 7.21 | 1964 | Ridge at Thomas Springs Amend Lots 8-9 | 1.46 | 1993 |
| Perkins Valley | 14.77 | 1964 | Willard Estates | 3.71 | 1993 |
| Sutherland Subd No 1 | 4.16 | 1964 | Grape Creek Estates South | 20.72 | 1993 |
| Aqua Verde | 31.13 | 1965 | Lookout Point | 21.33 | 1993 |
| Westlake Highlands Blk 3 Amend Lots 3 & 4 | 9.51 | 1965 | Donna Glen Addn | 3.27 | 1993 |
| RN Goeth Subd | 0.62 | 1965 | Flying H Farms | 9.55 | 1993 |
| Westlake Highlands Sec 4 | 0.63 | 1965 | McTeer Acres | 4.10 | 1993 |
| Aqua Monte Sec 2 | 24.24 | 1965 | Lewis Mountain Ranch Ph 4 | 63.70 | 1993 |
| Aqua Monte | 23.75 | 1965 | Patterson Place Sec 1 | 44.49 | 1993 |
| Rolling Hills West | 37.64 | 1965 | Barton Creek Sec G Ph 1 | 88.46 | 1993 |
| Rivercrest Addn Sec 2 | 20.04 | 1965 | Lost Creek Sec 1 Amend Lots 14-15 | 1.14 | 1993 |
| Westoak Sec 2 Resub Lots 16-19 | 5.84 | 1965 | Hills of Lost Creek Sec 1 Resub Lot 2 | 0.59 | 1993 |
| Rivercrest Sec 2 Resub Lot 66 Blk A & Lot 21 Blk D | 0.46 | 1965 | Bridgeview Terrace | 10.04 | 1993 |
| Akres Bonitos | 1.89 | 1965 | Rob Roy on the Lake Sec 1 Amended Lots 14 & 18 | 2.91 | 1993 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Westlake Highlands Sec 2 Resub Lots 11-14 | 1.97 | 1966 | Knight/Bash Subd | 1.43 | 1993 |
| Ridgecrest Subd | 2.06 | 1966 | Ravine Ph 2 | 2.03 | 1993 |
| Westlake Highlands Lot 1 Blk 4 | 0.57 | 1966 | Paddock at Commons Ford | 35.72 | 1993 |
| Westlake Highlands Sec 5 Ph 2 Revised | 7.82 | 1966 | VP Acres | 12.01 | 1993 |
| Hidden Hills Sec 1 | 31.11 | 1966 | River Place Sec 3 Am Lot 11 Blk H | 0.28 | 1993 |
| Big Bee Creek | 36.89 | 1966 | Loma Graciosa Subd Resub Lot 7 | 7.05 | 1993 |
| Big Bee Creek Subd No 2 Resub | 4.62 | 1966 | Madrones Subd | 83.86 | 1993 |
| Windy Cove Subd | 9.66 | 1966 | Barton Creek Preserve Ph 2 | 20.82 | 1993 |
| Highland Creek Lake Subd Sec 1 | 56.28 | 1967 | Barton Creek Preserve Ph 3 | 57.08 | 1993 |
| Southview Estates | 96.36 | 1967 | Arrowhead Acres Addn | 23.84 | 1993 |
| Camelot Sec 1 | 29.63 | 1967 | Jackies Gymnastics Subd | 4.90 | 1993 |
| Westlake Highlands Blk 6 | 7.92 | 1967 | Crystal Mountain at Barton Creek Sec 2 1st resub am plat | 46.76 | 1993 |
| Lake Ridge Estates Sec 2 | 15.63 | 1967 | Falls at Barton Creek Sec E Blk B | 24.42 | 1993 |
| Southwest Gate Addn | 18.53 | 1967 | Harkins/Wittig Resub Westview Est Sec 3 Lot 24 | 18.21 | 1993 |
| Perkins Valley II | 9.87 | 1967 | Barton Creek Preserve Ph III | 72.01 | 1993 |
| Mountain Creek Lakes Sec 1 | 117.50 | 1968 | Barton Creek Preserve Ph III | 72.73 | 1993 |
| Pedernales Canyon Ranch Ph 1 | 471.36 | 1968 | Lucky Lake Ranch Ph 1 | 9.91 | 1994 |
| Hillside Springs | 24.52 | 1968 | Southwell Addn | 4.13 | 1994 |
| South View Estates Sec 2 | 66.79 | 1968 | Rob Roy on the Lake Sec 3 Resub Lot 70 B | 19.34 | 1994 |
| Sigler Subd | 2.39 | 1968 | Lake Shore Annex #3 | 0.58 | 1994 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Camelot Sec 2 | 22.68 | 1968 | Senna Hills Sec 2 | 61.02 | 1994 |
| Westlake Highlands Blk 3 Ph 2 | 1.80 | 1968 | River Terrace Sec II | 4.14 | 1994 |
| Lake Ridge Estates Sec 3 | 24.77 | 1968 | Tumbleweed Canyon | 14.97 | 1994 |
| Leigh Addn | 1.01 | 1968 | Kirchner Addn | 1.78 | 1994 |
| Freund Sleepy Hollow Lake Austin Subd | 5.61 | 1968 | River Place 7B | 30.29 | 1994 |
| Fulkerson Subd | 3.22 | 1968 | Overlook at River Place | 25.15 | 1994 |
| Perkins Valley Sec 4 | 7.67 | 1968 | Penn Subd | 1.14 | 1994 |
| Mopac/360 No. 1 | 20.31 | 1968 | River Pointe Am Lots 2 & 3 | 4.25 | 1994 |
| Rayford Subd | 3.07 | 1968 | Reese Acres | 0.06 | 1994 |
| Offer Subd | 2.98 | 1968 | Preserve at Barton Creek | 73.35 | 1994 |
| Valley Lake Hills Sec 1 | 95.56 | 1969 | Senna Hills Sec 1 | 11.97 | 1994 |
| Spring Valley Estates | 19.91 | 1969 | Barton Cove Sec 1 | 5.04 | 1994 |
| Blue Hills Estates | 87.25 | 1969 | Bosworth | 1.42 | 1995 |
| Camelot Sec 3 | 29.15 | 1969 | Oconomowoc West Sec 1 | 64.18 | 1995 |
| Westlake Highlands Blk 3 Ph 3 | 0.58 | 1969 | Oak Run West Resub Lots 34-35 | 14.21 | 1995 |
| High Oaks | 10.74 | 1969 | Shadowbye Acres | 3.47 | 1995 |
| Westlake Highlands Blk 3A | 4.70 | 1969 | Patterson Place on Crystal Creek | 26.01 | 1995 |
| Poole & Lane Subd | 5.85 | 1969 | Barton Creek Sec G Ph 1 Am Lot 30 & 31 Blk B | 89.91 | 1995 |
| Westlake Highlands Blk 3 | 2.22 | 1969 | Island on Westlake | 14.53 | 1995 |
| Lake Ridge Estates Sec 4 | 21.43 | 1969 | Davenport West Tr C Sec 3 St Stephens School | 104.66 | 1995 |
| Bruton Springs Reseb 50-51, 21 & 61 | 20.24 | 1969 | River Hills Amend | 19.90 | 1995 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Apache Shores Sec 2 | 217.08 | 1969 | Akumal Subd | 30.03 | 1995 |
| Gary Patterson Subd | 1.21 | 1969 | City View Subd | 1.21 | 1995 |
| Mystic Oak Estates | 53.90 | 1969 | Senna Hills Sec 1A Amend Lots 57-64 | 2.35 | 1995 |
| Southwest Gate Addn No 2 | 3.06 | 1969 | Senna Hills Sec 1A | 36.66 | 1995 |
| Capitol View Estates | 69.03 | 1969 | Seven Oaks Sec 2 Ph 2 | 45.83 | 1995 |
| Capitol View Estates Resub Lot 10, 11, 21, 22 & 23 | 23.07 | 1969 | Austin Lake Hills Sec 1 Resub | 2.00 | 1995 |
| Capitol View Estates Resub Lot 14 & 15 | 8.78 | 1969 | Manana West Sec 2 amended Plat Lots 9 & 10 | 10.30 | 1995 |
| Bar S Ranch Subd #2 | 4.48 | 1969 | Lake Pointe Ph 1A | 17.32 | 1995 |
| Bee Creek Hill Sec 1 | 16.38 | 1970 | Lake Pointe Ph 1B Replat Lot 21 Blk H | 2.27 | 1995 |
| Twin Lake Hills | 129.99 | 1970 | Lake Pointe Ph 1A Resub Lot 15 Blk R | 6.58 | 1995 |
| Bee Creek Hill Sec 2 (remainder) | 27.83 | 1970 | Lake Pointe Ph 1B | 51.34 | 1995 |
| Southern Hills Sec 1 | 13.89 | 1970 | Villas at River Place | 16.02 | 1995 |
| Westview Estates Blk C Amended | 9.30 | 1970 | Westminster Glen Ph 1A | 8.53 | 1995 |
| Geneva Estates Sec 1 Resub Lots 9-11 Blk A | 3.43 | 1970 | Panther Hollow East | 9.69 | 1995 |
| Westview Estates | 62.58 | 1970 | River Place Sec 10 | 10.77 | 1995 |
| Scenic Brook Estates Sec 1 | 27.42 | 1970 | River Place Sec 7C | 0.39 | 1995 |
| Hillside Springs Sec 2 | 40.70 | 1970 | Steiner Ranch Ph 1 Sec 3 | 33.52 | 1995 |
| Paisano Addn | 2.00 | 1970 | Illakee Subd | 4.96 | 1995 |
| Scenic View West Sec 2 | 4.12 | 1970 | Two Creeks Addn | 11.78 | 1995 |
| Westlake Madrones Sec 1 | 1.61 | 1970 | M.C. Graham Subd | 1.79 | 1995 |
| Cardinal Hills Estates Unit 7 | 110.78 | 1970 | Southwest Hills Sec 2 & 3 | 17.81 | 1995 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Cardinal Hills Estates Unit 6 | 47.82 | 1970 | Southwest Hills Sec 2 & 3 | 14.77 | 1995 |
| Cardinal Hills Estates Unit 11 | 101.07 | 1970 | Edwards Crossing Ph A Sec 1 | 1.06 | 1995 |
| Cardinal Hills Estates Unit 12 | 151.66 | 1970 | Barton Creek Sec K | 5.35 | 1995 |
| Apache Shores Sec 4 | 18.71 | 1970 | Hawthorn Ridge Subd | 10.61 | 1995 |
| W.E. Powell Subd | 6.50 | 1970 | Peak Lookout Place | 1.71 | 1995 |
| Slaughter Creek Acres Resub Lot 4 Blk C | 3.01 | 1970 | Ranchero Del L.A. | 8.89 | 1995 |
| Slaughter Creek Acres Resub Lot 6 Blk C | 1.55 | 1970 | Best Technologies Center | 69.37 | 1996 |
| Slaughter Creek Acres Resub Lot 7 Blk E | 3.55 | 1970 | Scenic Ridge | 38.36 | 1996 |
| Slaughter Creek Acres Resub Lot 5 Blk F | 3.39 | 1970 | Angelwylde Sec 1 | 20.34 | 1996 |
| Slaughter Creek Acres Resub Lot 4 Blk A | 4.92 | 1970 | Barton Creek Sec G Ph 2 | 74.98 | 1996 |
| Perkins Park Sec 1 | 13.83 | 1970 | Travis County MUD #4 Water Treatment Plant | 2.29 | 1996 |
| Slaughter Creek Acres Resub Lot 1,2 Blk E | 2.00 | 1970 | Lake Shore Addn Amended Lots 97 & 98 | 1.68 | 1996 |
| Slaughter Creek Acres | 15.44 | 1970 | Jack Ball Estates | 24.88 | 1996 |
| Valley View West | 10.91 | 1970 | Lake Pointe Ph 2 | 61.37 | 1996 |
| Inverness Point | 23.91 | 1970 | Lake Pointe Ph 1B Replat Lots 1-5 Blk Q | 1.89 | 1996 |
| Slaughter Creek Acres Resub Lot 6-7 Blk G | 5.14 | 1970 | Westcliff Sec 1A Am Lots 26 & 27 | 5.02 | 1996 |
| Slaughter Creek Acres | 3.42 | 1970 | Long Canyon 3A | 55.20 | 1996 |
| Hazy Hills Ranchettes Sec 1 | 186.93 | 1971 | River Place Sec 8 | 22.65 | 1996 |
| Bear Creek Park | 93.68 | 1971 | Steiner Ranch Ph 1 Sec 4A | 25.63 | 1996 |
| Onion Creek Meadows | 171.43 | 1971 | Steiner Ranch Ph 1 Sec 4B | 23.21 | 1996 |
| Village Oak West | 33.21 | 1971 | Lake Country Estates Sec 2 | 18.37 | 1996 |
| Granada Hills Amended Lots 3-8 Blk 3 | 165.33 | 1971 | Lake Country Estates Amend Lots 7-10 Blk | 7.15 | 1996 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| | | | B | | |
| Scenic Brook Estates Sec 1 Resub Lots 1-5 & 7-9 | 17.70 | 1971 | Flint Rock Estates | 8.73 | 1996 |
| Scenic Brook Estates Sec 1 Resub Lot 30 | 2.14 | 1971 | Barton Creek Preserve Ph 3 Am Lots 5 & 3A, 6A | 23.39 | 1996 |
| Scenic Brook Estates Sec 2 Re-Amended | 79.06 | 1971 | Glowka Acres Subd | 6.64 | 1996 |
| Scenic Brook Estates Sec 2 Re-Amended Resub Lot 7-11, 6 & 12 | 10.02 | 1971 | Home Tech Subd | 12.43 | 1996 |
| Wilkerson Estates | 65.08 | 1971 | Austin Motor Mile Inc Subd | 7.56 | 1996 |
| McCormick Addn | 1.02 | 1971 | Salgado's Acres | 3.92 | 1996 |
| Knollwood Resub Lot 24-26 | 2.69 | 1971 | Old Manchaca Subd | 6.85 | 1996 |
| Camelot Sec 3 Resub Lot 38-42 | 3.36 | 1971 | Thornton Subd | 0.33 | 1996 |
| Camelot Sec 4 | 7.01 | 1971 | Destiny Hills Sec 1 | 66.80 | 1997 |
| Canyon View West | 3.12 | 1971 | Southwest Territory Sec 3 Amended Lots 1,2,3 | 7.14 | 1997 |
| Scenic View West Sec 3 | 0.40 | 1971 | 1626 Park Addn | 20.14 | 1997 |
| Canyon View Estates | 8.04 | 1971 | Scenic Brook Estates Sec 1 Resub Lots 10-11 | 6.17 | 1997 |
| Westlake Highlands Blk 6A | 0.95 | 1971 | Estates of Lewis Mountain | 44.87 | 1997 |
| Westlake Highlands Blk 6A Resub Lots 3-4 | 0.79 | 1971 | Barton Creek Sec E Ph 1 | 27.99 | 1997 |
| Skyview Forest | 4.36 | 1971 | Palomino Ridge | 70.02 | 1997 |
| Smoky Ridge | 4.33 | 1971 | Gateway South Lot 2 at Barton Creek | 6.38 | 1997 |
| Price & Halton Addn | 3.03 | 1971 | Point at Barton Creek | 73.48 | 1997 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Apache Shores Sec 5 | 167.43 | 1971 | Terraces at Barton Creek | 19.45 | 1997 |
| Slaughter Creek Acres Resub Lot 1 Blk G | 3.24 | 1971 | Barton Creek North Rim | 60.67 | 1997 |
| Slaughter Creek Acres Resub Lot 1-2 Blk F | 7.81 | 1971 | Barton Creek Club Third Replat | 43.14 | 1997 |
| Slaughter Creek Acres Resub Lot 6 Blk E | 2.52 | 1971 | Governor's Hill at Barton Creek | 31.39 | 1997 |
| Chappell Addn | 6.60 | 1971 | Barton Creek ABC Midsection | 66.27 | 1997 |
| Slaughter Creek Acres Resub Lot 2 Blk C | 2.47 | 1971 | Westview on Lake Austin Ph C Sec 5 | 16.99 | 1997 |
| Slaughter Creek Acres Resub Lot 3 Blk C | 3.00 | 1971 | Summit Park Subd | 10.08 | 1997 |
| Slaughter Creek Acres Resub Lot 4 Blk E | 3.50 | 1971 | Lake Side Addn Resub Lot 27-28 | 3.00 | 1997 |
| Slaughter Creek Acres Resub Lot 4 Blk F | 4.99 | 1971 | Carriage Crossing Sec 2 | 21.63 | 1997 |
| Capitol View Estates Resub Lot 5 | 4.54 | 1971 | Senna Hills Sec 4 | 26.54 | 1997 |
| Penion Addn | 5.44 | 1971 | Senna Hills Sec 1B | 9.85 | 1997 |
| Slaughter Creek Acres Resub Lot 2 Blk G | 4.58 | 1971 | Aqua Monte Sec 2 Am Lot 5 Blk EE | 4.13 | 1997 |
| Slaughter Creek Acres Resub Lot 1-3 Blk A | 19.63 | 1971 | Austin Lake Estates Sec 1 | 90.08 | 1997 |
| Norde Addn | 5.02 | 1971 | Saratoga Point | 11.11 | 1997 |
| Slaughter Creek Acres Resub Lot 5 Blk E | 3.48 | 1971 | River Terrace III | 5.84 | 1997 |
| Slaughter Creek Acres Resub Lot 2 Blk D | 3.67 | 1971 | Lake Pointe Sec 3 Ph 1 | 11.22 | 1997 |
| Slaughter Creek Acres Resub Lot 8 | 2.80 | 1971 | Lake Pointe Sec 3 Ph 4 | 13.86 | 1997 |
| Rayford Subd #2 | 2.58 | 1971 | Lake Pointe Sec 5 | 34.58 | 1997 |
| Hamilton Hills | 131.39 | 1972 | Lake Pointe Ph 4A | 28.00 | 1997 |
| Long Branch Valley | 117.90 | 1972 | Lake Pointe Ph 4B | 6.30 | 1997 |
| Shady Hollow Addn | 56.77 | 1972 | River Place Sec 11 | 53.15 | 1997 |
| Twin Creek Park | 42.78 | 1972 | Glenlake 2A | 18.97 | 1997 |
| Arroyo Doble Sec 2 | 24.33 | 1972 | Stoneridge Place Subd | 5.19 | 1997 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Arroyo Doble | 15.20 | 1972 | Sandbird Subd Sec 2 Am Lot 1-3 | 3.00 | 1997 |
| Onion Creek Meadows Resub Lot 13-14 | 2.63 | 1972 | Steiner Ranch Ph 2 Sec 3A | 62.15 | 1997 |
| Granada Hills Amend Resub Lots 132-133 | 2.00 | 1972 | Steiner Ranch Ph 2 Sec 3B | 16.88 | 1997 |
| Westview Estates Sec 2 | 81.41 | 1972 | Steiner Ranch Ph 1 Sec 4C | 15.96 | 1997 |
| Isabel Addn | 1.91 | 1972 | Illakee II Subd | 9.27 | 1997 |
| Scenic Brook Estates Sec 1 Ph 2 | 50.67 | 1972 | Pawnee Peak Subd | 10.03 | 1997 |
| Scenic Brook Estates Sec 1 Resub Lot 13 | 2.07 | 1972 | Wild Cherry Subd | 9.74 | 1997 |
| Scenic Brook Estates Sec 1 Resub Lots 24-29 | 5.55 | 1972 | Crystal Mountain Executive Park | 4.87 | 1997 |
| Lost Creek Sec 1 | 75.66 | 1972 | Brazos-Colorado Subd | 9.66 | 1997 |
| Camelot Sec 2 Ph 2 | 4.19 | 1972 | Slaughter Creek Acres Resub Lot 5-6 Blk C | 1.99 | 1997 |
| Camelot Sec 1 Resub pt Lot 8 | 3.77 | 1972 | Rob Roy on the Creek Sec 7 Replat | 2.66 | 1997 |
| Knollwood Resub Lot 10-11 | 3.60 | 1972 | Westview on Lake Austin Ph C Sec 5 | 14.53 | 1997 |
| Knollwood Resub Lot 18-22 | 6.92 | 1972 | Barton Creek Sec J Ph 1 | 27.31 | 1997 |
| Knollwood C Resub Part Lot 1 | 4.25 | 1972 | Robie Acres, Second Amended plat | 5.01 | 1997 |
| Knollwood A | 0.89 | 1972 | C Bar Ranch Lakeview Acres Resub Pt Lot 1 | 0.77 | 1997 |
| Knollwood B | 1.01 | 1972 | Shady Hollow West | 59.52 | 1998 |
| Westlake Highlands Sec 6 | 12.74 | 1972 | Hill Country Ph 2A Am Lots 14 & 15 | 2.55 | 1998 |
| Scenic View West Sec 4 | 9.78 | 1972 | Michael Dale Subd | 6.81 | 1998 |
| Spence Addn | 7.72 | 1972 | Overlook at Lewis Mountain Sec 1 | 47.82 | 1998 |
| Wild Basin #2 | 0.41 | 1972 | Nassour Acres | 15.73 | 1998 |
| Lake Ridge Estates Sec 2A | 1.98 | 1972 | St Gabriel Catholic School | 31.37 | 1998 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Aqua Monte Sec 2 Resub Pt Blk E & D | 10.98 | 1972 | Barton Creek ABC West Ph 1 | 147.13 | 1998 |
| Hillside Vista | 7.90 | 1972 | Cabin Ridge Estates | 61.42 | 1998 |
| Rolling Hills West Sec 2 | 3.74 | 1972 | Westview on Lake Austin Ph C Sec 2 Replat | 43.84 | 1998 |
| Apache Shores Sec 6 | 112.55 | 1972 | High Oaks Amend Lots A & C | 4.18 | 1998 |
| Wilkerson Estates Resub Lot 12 | 7.47 | 1972 | Westview on Lake Austin Ph B Amend Lots 27 & 28 | 1.22 | 1998 |
| Wiley Pope Subd | 6.50 | 1972 | Buell-Rude Subd | 1.90 | 1998 |
| Capitol View Estates Resub Lot 4 | 4.51 | 1972 | Rockcliff Bend Subd | 2.99 | 1998 |
| Webers Hill | 5.76 | 1972 | Sterling Acres | 24.38 | 1998 |
| Sutherland Addn | 14.10 | 1972 | Werkenthin Sec 4 | 12.28 | 1998 |
| Lot 1-A Lane Addn | 2.49 | 1972 | Werkenthin Sec 2 | 9.34 | 1998 |
| Rolling Hills West Resub Lots 4-5 Blk E | 0.73 | 1972 | Werkenthin Sec 1 | 17.23 | 1998 |
| Hill Top Manor | 17.02 | 1972 | HA Reed Subd Resub Tr 1 | 6.25 | 1998 |
| Hill Top Manor | 2.12 | 1972 | Werkenthin Sec 3 Amend Lots 1-13 Blk D&F | 35.45 | 1998 |
| Hill Top Manor | 0.28 | 1972 | Werkenthin Sec 5 Amend Lots 40-43 Blk D | 22.46 | 1998 |
| Hazy Hills Ranchettes Sec 2 | 72.97 | 1973 | Werkenthin Sec 6 | 8.04 | 1998 |
| Lick Creek Ranch Ph 2 Sec 1 | 117.26 | 1973 | Oak Shores on Lake Austin Sec 4 | 13.28 | 1998 |
| Shady Hollow Addn Sec 2 Ph 1 | 94.30 | 1973 | Resaca Boulevard Street Dedication | 2.95 | 1998 |
| Twin Creek Park Sec 2 | 20.74 | 1973 | Lake Pointe Sec 3 Ph 2 | 8.28 | 1998 |
| Arroyo Doble Sec 3 | 16.49 | 1973 | Lake Pointe Ph 4C | 2.32 | 1998 |
| Westview Estates Sec 3 | 147.23 | 1973 | Lake Pointe Sec 3 Ph 5 | 7.02 | 1998 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Hudson Tract Resub | 1.05 | 1973 | Lake Pointe Ph 1E | 0.29 | 1998 |
| Sigler Subd #2 | 2.97 | 1973 | BHN Subd | 1.97 | 1998 |
| Camelot Sec 1 Resub Lot 1 | 2.37 | 1973 | River Place Sec 21 | 21.48 | 1998 |
| Camelot Sec 2 Resub Lot 22 | 2.04 | 1973 | River Place Sec 22 | 45.94 | 1998 |
| Camelot Sec 1 Resub Lot 9A | 3.60 | 1973 | River Place Sec 13 | 59.64 | 1998 |
| William J Darilek Subd | 2.75 | 1973 | River Place Sec 12 | 31.55 | 1998 |
| Camelot Sec 1 Resub Lot 15 | 1.07 | 1973 | Westminster Glen Ph 1D | 51.48 | 1998 |
| Camelot Sec 2 Resub Lot 21 | 1.00 | 1973 | Westminster Glen Ph 1E | 42.54 | 1998 |
| Westlake Highlands Sec 7 | 15.32 | 1973 | Westminster Glen Ph 1C | 25.03 | 1998 |
| RA House One | 1.12 | 1973 | Westminster Glen Ph 1B | 9.28 | 1998 |
| Westridge Estates | 41.74 | 1973 | Steiner Ranch Ph 1 Sec 5B | 24.26 | 1998 |
| Austin Lake Estates Sec 2 Resub Lots 9 & 10 Blk 7 | 0.63 | 1973 | Steiner Ranch Ph 1 Sec 5C | 44.38 | 1998 |
| Stone Subd Resub Lot 1 | 2.28 | 1973 | Riverfront Estates | 26.50 | 1998 |
| River Ridge | 49.70 | 1973 | Steiner Ranch Ph 1 Sec 4E | 37.12 | 1998 |
| Travis Oaks Trails | 41.00 | 1973 | Steiner Ranch Ph 2 Sec 3C | 23.97 | 1998 |
| Cardinal Hills Estates Unit 11 Rev Lot 23 | 4.06 | 1973 | Steiner Ranch Ph 2 Sec 3D | 17.82 | 1998 |
| Apache Shores Sec 7 | 109.68 | 1973 | Steiner Ranch Ph 1 Sec 5A | 22.72 | 1998 |
| Apache Shores Sec 7 Am Lot 57, 58 | 1.96 | 1973 | River Bend | 210.93 | 1998 |
| C&D Addn | 2.52 | 1973 | Apache Shores Sec 6 Am Lots 7-10 | 2.13 | 1998 |
| Appaloosa Run | 115.61 | 1973 | Palomino Ridge Amend Lots 9 & 10 | 10.50 | 1998 |
| High Road View | 1.26 | 1973 | 151 Acre Tract Subd | 137.34 | 1998 |
| Long Branch Valley Sec 2 | 85.67 | 1974 | Lake Shore Addn Resub Lot 80 | 11.11 | 1998 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Golden Lake Estates | 12.68 | 1974 | Madrone Ranch | 189.94 | 1999 |
| Kellywood Estates | 13.18 | 1974 | Barton Creek Sec J Ph 2 | 240.49 | 1999 |
| Arroyo Doble Estates Sec 1 | 56.30 | 1974 | Scenic Brook Estates Re-Amended Lots 2 & 3 | 3.34 | 1999 |
| Arroyo Doble Sec 2 Resub 8 & 17 Blk A | 4.05 | 1974 | Scenic Brook Estates Sec 2 Re-Am Resub Lot 39 | 3.33 | 1999 |
| Village Oak West Resub Lots 12 & 13 | 0.61 | 1974 | West Austin Athletic Club | 9.60 | 1999 |
| Glen-Ledge Park | 18.79 | 1974 | Barton Creek Sec G Ph 2 Resub Lots 51-54 Blk B | 2.22 | 1999 |
| Southwest Hills Addn | 18.67 | 1974 | Summit at West Rim on Mount Larson Blk D Sec 1 | 36.31 | 1999 |
| Mary Beth Gartner Addn | 2.00 | 1974 | Bishops Bend | 8.71 | 1999 |
| Hines & Bookout Subd | 1.66 | 1974 | Sendero Luminoso | 5.53 | 1999 |
| Barton Valley Resub Lot 7 | 7.29 | 1974 | Simmit at West Rim on Mount Larson Blk D Sec 4 | 1.51 | 1999 |
| Buie Subd | 1.69 | 1974 | Commons Ford Canyon | 19.43 | 1999 |
| Camelot Sec 5 | 10.84 | 1974 | Jacarandas at the Creek | 6.50 | 1999 |
| Barton Valley | 40.88 | 1974 | Fleecie Purnell Estate Subd | 46.45 | 1999 |
| Fortunes Valley | 28.85 | 1974 | Lake Pointe Sec 9 Amended Plat | 39.00 | 1999 |
| Barton Valley Resub Lot 6 | 5.49 | 1974 | Lake Pointe Sec 3 Ph 3 | 10.79 | 1999 |
| Camelot Sec 3 Resub Lot 57 | 3.85 | 1974 | Strawn Subd | 7.07 | 1999 |
| Casa Diablo | 2.44 | 1974 | Lake Pointe Sec 7 | 40.16 | 1999 |
| Woodlake Trails | 22.48 | 1974 | Lake Pointe Sec 4 | 12.76 | 1999 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| New Land | 1.00 | 1974 | Lake Pointe Ph 1C | 0.28 | 1999 |
| Anken Addn | 1.00 | 1974 | Lake Pointe Ph 1A Replat Lot 6 Blk O | 0.31 | 1999 |
| Manchaca Gardens Resub Lots 2-9 Blk B | 5.66 | 1974 | Lake Pointe Ph 1B Replat Lot 5 Blk O | 0.32 | 1999 |
| Slaughter Creek Acres Resub Lot 1 & Lot A Resub Lot 2 | 5.00 | 1974 | River Place Golf Course | 0.28 | 1999 |
| Slaughter Creek Corner | 3.78 | 1974 | River Place Golf Course | 202.79 | 1999 |
| Fred Lucksinger Subd | 11.78 | 1974 | River Place Sec 15 | 78.75 | 1999 |
| Ballard & Sons Inc Addn | 0.83 | 1974 | Westminster Glen Ph 1D Replat Lot 56-58 | 5.63 | 1999 |
| Rolling Hills West Sec 4 1st Resub Lots 4-5 | 0.77 | 1974 | Westminster Glen Ph 1C Replat Lots 18-20 | 4.01 | 1999 |
| Granada Hills Resub Lot 177 | 0.71 | 1974 | Westminster Glen Ph 1E Replat Lot 95-97 | 5.09 | 1999 |
| Arroyo Doble Sec 3 Resub 5 & 6 Blk B | 1.22 | 1975 | Westminster Glen Ph 1E Replat Lot 82-84 & 88-90 | 6.04 | 1999 |
| Knollwood Sec 2 Resub Part Lot 1,2,7 | 20.88 | 1975 | Coldwater Sec 4 Ph C | 1.49 | 1999 |
| Brewer & Grandinetti Resub | 0.99 | 1975 | River Place Sec 10 Am Lots 11-13 Blk A | 1.26 | 1999 |
| Westlake Highlands Sec 8 Amended | 27.15 | 1975 | Stoneridge Price Subd | 5.05 | 1999 |
| Camelot West | 4.43 | 1975 | John H. Carrell Subd | 3.00 | 1999 |
| Dittmar-Hanson Subd | 8.86 | 1975 | JLG Subd | 2.98 | 1999 |
| Granada Estates Sec 1 | 102.04 | 1975 | Flint Valley | 5.22 | 1999 |
| Westlake Highlands South Section | 2.64 | 1975 | Rob Roy West | 1.97 | 1999 |
| Crosswind | 116.62 | 1975 | Barrow's Lakeside Addn, Am Lot 2 | 3.12 | 1999 |
| Louie T Bailey Subd | 2.67 | 1975 | Simmons-Williams | 10.00 | 2000 |
| Lake Shore Addn Resub Lot 22 | 0.21 | 1975 | Paleface Park Ph 1 Sec C Resub Lots 9 | 17.63 | 2000 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| | | | &10 | | |
| Luciano Castro Subd | 19.27 | 1976 | Werkenthin Sec 1 Blk C Lots 1 & 2 Amd | 3.16 | 2000 |
| Arroyo Doble Sec 4 | 50.08 | 1976 | Werkenthin Sec 5 Blk F Lot 24 Amd | 1.05 | 2000 |
| Blue Hills Estates Resub | 6.03 | 1976 | Sonesh Estates | 59.56 | 2000 |
| Rawhide Ridge | 7.28 | 1976 | United Methodist Church Subd | 9.24 | 2000 |
| Appaloosa Run Resub Lots 35 & 36 | 39.95 | 1976 | Barton Creek Sec M | 181.49 | 2000 |
| Lost Creek Sec 2 | 124.38 | 1976 | Waldorf School | 19.45 | 2000 |
| Lost Creek Sec 2 Resub Lot 1 & 27 | 7.29 | 1976 | Southwest Hills Sec 4 | 27.09 | 2000 |
| Lake Side Addn Resub Pt Lot 47 | 6.71 | 1976 | Hazelhurst Subd | 77.34 | 2000 |
| Slow Turtle Subd | 20.18 | 1976 | Overlook at Lewis Mountain Sec 2 | 48.05 | 2000 |
| Wild Basin Wilderness | 7.16 | 1976 | Castle Ridge Acres | 4.03 | 2000 |
| Wild Basin #2 | 0.41 | 1976 | Lake Side Addn Am Lots 40-42, 45, 46, 49, 50, 53 & 54 | 59.16 | 2000 |
| Oestrick Addn | 4.58 | 1976 | Rivercrest Addn Sec 3 | 8.73 | 2000 |
| Gentry Estates | 5.74 | 1976 | Seven Oaks Sec 4 | 55.36 | 2000 |
| Austin World of Archery | 43.20 | 1976 | St Tropez Amended Lots 85A, 87A-B, 87E | 2.29 | 2000 |
| Boggy Creek Addn | 52.20 | 1976 | Summit at West Rim on Mount Larson Blk C | 4.65 | 2000 |
| Jerry Green Subd | 0.87 | 1976 | Senna Hills Sec 5B | 38.46 | 2000 |
| Wunneburger Estates I | 2.66 | 1977 | Tumbleweed Trail Estates Amend Lots 4 & 5 | 2.26 | 2000 |
| Kellywood Estates Sec 2 | 20.09 | 1977 | Werkenthin Sec 6 Amend Lots 35-38 | 2.65 | 2000 |
| Arroyo Doble Sec 2 Resub Lot 2-3 Blk D | 0.54 | 1977 | Werkenthin Sec 2 Amend Lots 11-22 | 8.01 | 2000 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Oak Hill Fire Dept Subd Lots 1&2 Ridge at Thomas Springs | 0.32 | 1977 | Porsch Subd | 8.01 | 2000 |
| Forest Park | 22.77 | 1977 | Seven Oaks Sec 5 | 232.77 | 2000 |
| Granada Estates Sec 1 Resub Lots 16 & 17 | 1.97 | 1977 | Lake Ridge Heights | 8.86 | 2000 |
| Camelot Sec 1 Resub Lot 12 | 2.90 | 1977 | Werkenthin Sec 2 Amend Lots 11-14 Blk C | 4.47 | 2000 |
| Barton Valley Resub Lot 11-13 & 15-17 | 36.89 | 1977 | Bruton Springs Subd Resub Lot 46 | 7.98 | 2000 |
| Camelot Sec 1 Resub Lot 13 | 2.40 | 1977 | Lake Pointe Sec 8 | 4.52 | 2000 |
| Hills of Lost Creek Sec 1 | 5.72 | 1977 | Lake Pointe Sec 10 | 40.87 | 2000 |
| Camelot Sec 2 Resub Lot 30 | 2.25 | 1977 | Coldwater Sec 1 Am Lots 1&2 | 29.95 | 2000 |
| Camelot West Sec 2 | 0.56 | 1977 | Angelwylde Sec 2 | 11.11 | 2000 |
| Baker Hills | 12.52 | 1977 | Angelwylde Sec 2 | 41.45 | 2000 |
| Westlake Highlands Sec 2A | 4.92 | 1977 | Hood-Davis | 5.26 | 2000 |
| Kellam Westlake Highlands | 0.50 | 1977 | Gaines Ranch Subd & Gaines Ranch Subd II | 15.62 | 2000 |
| Larry Jameson Subd | 7.67 | 1977 | Troy Dale Patterson Subd | 1.55 | 2000 |
| HA Reed Subd | 2.00 | 1977 | Illakee III Am Lots 1 & 2 | 7.31 | 2000 |
| Lake Ridge Estates Sec 2B | 1.00 | 1977 | Angelwylde Sec 3 | 15.21 | 2000 |
| Austin Lake Estates Sec 1 Resub Lot 1 & 24 | 0.52 | 1977 | Angelwylde Sec 3 | 21.52 | 2000 |
| Manana West Sec 2 | 11.17 | 1977 | Peyton Brooke at Rob Roy Replat | 3.40 | 2001 |
| Smoky Ridge Annex | 2.23 | 1977 | Bee Creek Commercial Center Sec 1 | 10.45 | 2001 |
| Atkinson-North Lot 4 Blk A Oak Shores on Lake Austin Sec 4 | 1.66 | 1977 | Tiburon Hills | 26.48 | 2001 |
| Barton Springs Estate Amended | 3.10 | 1977 | Roughin Hills | 9.83 | 2001 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Mountaintop Acres | 51.23 | 1977 | Lometa de la Luna | 8.30 | 2001 |
| Cherry Mountain Ph 2 | 21.06 | 1977 | Charles Bell Subd | 33.63 | 2001 |
| Malone Addn Sec 3 | 2.00 | 1977 | Scenic Brook Estates Sec 1 Amend Lots 19-21 | 2.62 | 2001 |
| Mount Addn | 0.78 | 1977 | Cedar Ridge Estates | 27.91 | 2001 |
| Wild Basin Oaks | 5.62 | 1977 | Terraces at Barton Creek Amend Lots 6-8 Blk A | 4.35 | 2001 |
| Vista Oaks Sec 1 | 34.63 | 1978 | Barton Creek Sec G Ph 2 Amend Lots 46-47 Blk B | 1.59 | 2001 |
| Long Branch Valley Sec 3 | 105.19 | 1978 | Tierra Madrones Amend Lot 4 & Lot 2 Blk A Gardns of Westlake | 3.92 | 2001 |
| Southwest Territory Sec 1 | 38.58 | 1978 | Rob Roy 360 | 16.82 | 2001 |
| Southwest Territory Sec 3 | 7.88 | 1978 | 6836 Bee Caves Business Park | 6.96 | 2001 |
| Pittman Addn | 3.91 | 1978 | Kugler Subd | 1.76 | 2001 |
| Thaxton Road Subd | 37.90 | 1978 | High Canyon Estates | 15.22 | 2001 |
| Larry L Vickers | 10.05 | 1978 | Seven Oaks Sec 2 Ph 2 Amend Lots 10 & 11 | 6.21 | 2001 |
| Arroyo Dobe Est Sec 1 Resub Lts 1-8 B, Lot 1 C, Lts 1-5 D | 43.38 | 1978 | Lake Pointe Sec 6 | 17.16 | 2001 |
| Verver Addn. | 1.42 | 1978 | River Place Sec 16 | 53.79 | 2001 |
| Arroyo Doble Sec 2 Resub 3A & 4 Blk D | 1.07 | 1978 | Steiner Ranch Ph 1 Sec 8 | 215.33 | 2001 |
| Granada Estates Sec 4 | 24.70 | 1978 | Steiner Ranch Ph 2 Sec 5 | 218.89 | 2001 |
| Granada Estates Sec 2 | 54.76 | 1978 | Enclave at Kollmeyer Springs Subd | 19.99 | 2001 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Hill Country Ph 1 | 3.16 | 1978 | 11505 Texas 71 Ph 1 | 166.81 | 2001 |
| Ridge at Thomas Springs | 31.84 | 1978 | Bluffs of Flintrock | 10.35 | 2002 |
| Glen at Thomas Springs | 24.80 | 1978 | Spillman Ranch Ph 1 Sec 5 | 17.53 | 2002 |
| Granada Estates Sec 3 | 35.37 | 1978 | Travis Settlement Business Park | 29.83 | 2002 |
| Granada Estates Sec 5 | 21.60 | 1978 | Laws Addition No.2 | 1.60 | 2002 |
| Smokey Mountain Oaks | 52.17 | 1978 | Travis Settlement Sec 3 Resub of Lots 177,178,179,181,182,18 | 13.18 | 2002 |
| Lost Creek Hilltop | 22.12 | 1978 | Travis Settlement Sec 3 Resub Lots 176 & 177 | 4.66 | 2002 |
| Lost Creek Blvd | 12.27 | 1978 | Frnka | 3.06 | 2002 |
| Hills of Lost Creek Sec 3 | 18.18 | 1978 | Valley Lake Hills Sec 1 Rev Lots 14 & 15 Block DD | 0.35 | 2002 |
| Lost Creek Sec 1 Resub Pt Lot 42 Blk 14 | 15.99 | 1978 | Davenport West - Block B Lot 33 &34 | 19.75 | 2002 |
| Valley at Lost Creek Ph 2 plus common area | 1.38 | 1978 | Flintrock at Hurst Creek Sec 8 Amended | 0.68 | 2002 |
| Bull Mountain Ph 1 | 13.57 | 1978 | Twin Lake Hills Replat Lots 60 & 61 | 0.47 | 2002 |
| Brooks Place | 0.85 | 1978 | Las Lomitas | 88.34 | 2002 |
| Rosalie K Rogers Subd | 0.72 | 1978 | Twin Lake Hills Replat of Lots 112 & 113 Blk PP | 0.41 | 2002 |
| FC Maseles Subd | 2.62 | 1978 | Twin Lake Hills, Replat Lots 33 & 34 | 0.59 | 2002 |
| Laguna Loma | 6.63 | 1978 | Harp Subd | 9.26 | 2002 |
| Rio Robles Sec 1 | 34.80 | 1978 | Cloyd Land | 4.88 | 2002 |
| Lake Ridge Estates Sec 2 Resub Lot 6-8 | 1.74 | 1978 | Barton Creek Sec H | 20.00 | 2002 |
| Deer Creek | 53.38 | 1978 | Foothills of Barton Creek | 87.20 | 2002 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Glenlake Ph 1 | 213.75 | 1978 | Davenport West Tr C3 Sec 2 Point at Rob Roy Am 9&10 | 5.67 | 2002 |
| Milstead Addn | 1.34 | 1978 | Birdlip Subd | 42.92 | 2002 |
| Round Mountain Sec 2 | 1.07 | 1978 | Seven Oaks Sec 2 Ph 2 Amend Lots 2 & 3 Blk B | 5.93 | 2002 |
| Majestic Hills Ranchettes 2 | 17.57 | 1978 | River Place Sec 26 | 70.75 | 2002 |
| Southland Oaks Sec 1 | 55.60 | 1978 | Westminster Glen Ph 3 | 88.34 | 2002 |
| Slaughter Creek Acres Resub Lot 3 Blk B | 2.99 | 1978 | Gomillion's Subd | 8.27 | 2002 |
| Slaughter Creek Acres Dorsey Resu Lot 3 Blk G | 4.72 | 1978 | Steiner Ranch Ph 1 Sec 9 | 155.32 | 2002 |
| Nations Rainbow Canyon | 0.54 | 1978 | River Ridge Amend Lots 2-4 | 0.90 | 2002 |
| Stone Subd Resub Lot 2 | 5.11 | 1978 | River Dance Ph 1 | 101.74 | 2002 |
| Majestic Hills Ranchettes | 83.16 | 1978 | Foley Subd | 7.34 | 2002 |
| Stone Subd | 1.67 | 1978 | Capital View Estates Resub Lot 16 | 4.29 | 2002 |
| Bruton Springs 1st Resub Lots 5, 6 | 1.29 | 1978 | Foothills of Barton Creek Am 36A Blk E | 5.04 | 2002 |
| La Tierra De Los Pedernales Sec 1 | 15.20 | 1979 | Medway Ranch Sec 1 | 36.25 | 2002 |
| La Tierra De Los Pedernales Sec 2 | 13.90 | 1979 | Nalle Woods | 0.01 | 2003 |
| Clover Hill | 111.95 | 1979 | Highland Creek Lakes Sec 1 Replat of Lots 54 and 53 Blk H | 0.38 | 2003 |
| Arroyo Doble Estates Sec 2A | 12.77 | 1979 | Broken Oar Ranch | 9.70 | 2003 |
| Shady Hollow Sec 2A Ph 1 | 33.57 | 1979 | Mountain Creek Lakes Sec 1 Rev Lots 38 & 39 Blk O | 0.67 | 2003 |
| Shady Hollow Sec 5 Ph 1 | 33.07 | 1979 | Twin Lake Hills Replat of Lots 1&2, Blk YY | 1.21 | 2003 |
| Shady Hollow Sec 5 Ph 2 | 27.89 | 1979 | Mountain Creek Lakes Sec1 Resub of Lots | 0.46 | 2003 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| | | | 5&6, Blk M | | |
| Hinton Estates | 2.46 | 1979 | Twin Lake Hills Rev Lots 3, 4, 5 & 6 Blk XX | 1.12 | 2003 |
| Spring Valley | 36.96 | 1979 | Cypress Ranch Commercial | 8.45 | 2003 |
| Larson Estates | 66.93 | 1979 | Tres Vistas | 38.02 | 2003 |
| Hal Haralson Subd | 15.00 | 1979 | Spanish Oaks Sec 5 | 5.06 | 2003 |
| Tanglewood West | 34.68 | 1979 | La Vista | 10.04 | 2003 |
| McKownville II | 85.21 | 1979 | Porter Subd No 2 | 20.75 | 2003 |
| Sunrise Country | 82.92 | 1979 | Amarra Drive (Wynton Place) | 5.49 | 2003 |
| Valley at Lost Creek Ph 3 plus common area | 2.98 | 1979 | Angelwylde Place | 4.64 | 2003 |
| Hills of Lost Creek Sec 9 | 11.89 | 1979 | J&S Subd Resub Lot 1 Blk B J Hoover Makin Addn | 2.46 | 2003 |
| Hills of Lost Creek Sec 7A | 19.54 | 1979 | High Road | 2.85 | 2003 |
| Valley at Lost Creek Ph 1 plus common area | 4.57 | 1979 | 6D Ranch | 613.32 | 2003 |
| Hills of Lost Creek Sec 2A | 0.57 | 1979 | Werkenthin Sec 5 Amend Lot 45 | 5.56 | 2003 |
| Best Part of Lost Creek | 0.85 | 1979 | Seven Oaks Sec 2 Ph 2 Amend Lots 15-17 | 6.47 | 2003 |
| Bull Mountain Ph 2 | 18.07 | 1979 | Seven Oaks Sec 2 Ph 2 Resub Lot 1 Blk A | 6.58 | 2003 |
| Robin Estates | 2.32 | 1979 | Westminster Glen Ph 3 Am Lots 47-50 | 10.89 | 2003 |
| Bee Cliffs | 2.08 | 1979 | River Place Sec 22 Am Lots 142-145 | 1.02 | 2003 |
| Bull Mountain Ph 1A | 2.16 | 1979 | Steiner Ranch Ph 1 Sec 6B | 80.89 | 2003 |
| Rob Roy Ph 2 | 349.79 | 1979 | Steiner Ranch Ph 1 Sec 10A | 780.62 | 2003 |
| Rob Roy | 204.60 | 1979 | Steiner Ranch Ph 1 Sec 6D | 56.73 | 2003 |
| Lillian & Richard Creasy Subd | 1.61 | 1979 | Steiner Ranch Ph 1 Sec 6C | 39.94 | 2003 |
| Capitol Ridge Addn | 17.21 | 1979 | Steiner Ranch Ph 1 Sec 6F | 77.22 | 2003 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Briarpatch | 16.07 | 1979 | Steiner Ranch Ph 1 Sec 6A Replat | 28.19 | 2003 |
| Richard J Kaiser Subd | 1.55 | 1979 | Steiner Ranch Parkside | 73.32 | 2003 |
| Westlake Crossroads | 18.86 | 1979 | Steiner Ranch Ph 1 Sec 10B | 85.39 | 2003 |
| Barton Valley Sec 2 | 5.53 | 1979 | Steiner Ranch Ph 1 Sec 6E | 72.06 | 2003 |
| Lost Valley Estates | 11.96 | 1979 | Overlook at Kollmeyer Springs Subd | 13.16 | 2003 |
| Mercado Heights | 3.16 | 1979 | Apache shores Sec 7 Am Lot 44-45 | 1.41 | 2003 |
| Bluff Springs Estates | 11.64 | 1979 | Apache Shores Sec 7 Am Lot 15-17 | 1.64 | 2003 |
| Valdez Acres | 1.02 | 1979 | Fox Creek Estates | 11.25 | 2003 |
| Johnie F Plumley Addn | 0.50 | 1979 | 11505 Texas 71 Ph 2 | 25.19 | 2003 |
| Barton Creek Square | 0.42 | 1979 | Barton Creek Sec H Ph 3 | 13.98 | 2003 |
| Barrow's Lakeside Addn | 4.73 | 1979 | Nalle Woods Subd | 45.85 | 2003 |
| Peter's & Joyce's Addn | 4.27 | 1979 | Cyrus Subd | 12.73 | 2004 |
| Southwest Territory Sec 2 | 3.19 | 1980 | Robichaux Addn | 2.04 | 2004 |
| Conroy Park No 1 | 13.77 | 1980 | Travis Oak Trails Am Lots 4 & 5 Blk B | 0.68 | 2004 |
| Shady Hollow Sec 3A Ph 3 | 19.69 | 1980 | Flint Rock Hill Resub Lot 2 | 2.62 | 2004 |
| Shady Hollow Sec 3A Ph 2 | 20.65 | 1980 | Lakehurst Rev Lt 15 & 16 Tr 6 | 0.42 | 2004 |
| Shady Hollow Sec 3A Ph 1 | 25.51 | 1980 | Travis Vista Business Park | 9.08 | 2004 |
| Shady Hollow Sec 2A Ph 2 | 64.46 | 1980 | Highland Creek Lakes Rev Lots 69, 70, 71 Blk H | 0.97 | 2004 |
| Chaparral Village Amended | 0.16 | 1980 | Sky Forest | 12.11 | 2004 |
| Granada Estates Sec 6 | 70.46 | 1980 | Round Mountain Amend Lot 21 & 22 | 1.49 | 2004 |
| Hills of Lost Creek Sec 5 | 28.22 | 1980 | Overlook at Flintrock Falls | 5.85 | 2004 |
| Bluffs of Lost Creek | 47.95 | 1980 | West Cypress Hills Ph 1 Sec 1 | 67.56 | 2004 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Lost Creek Sec 4 | 1.33 | 1980 | Spanish Oaks Sec 3 | 19.98 | 2004 |
| Emerald Bay | 4.72 | 1980 | Spanish Oaks Sec A | 27.81 | 2004 |
| Napier Addn | 1.75 | 1980 | Cypress Banks | 11.91 | 2004 |
| Lake Ridge Estates Sec 2C | 1.65 | 1980 | Exa Preslar Subd | 11.47 | 2004 |
| Penny L Baker Subd | 2.14 | 1980 | Barton Creek Sec N | 59.78 | 2004 |
| RLD Addn | 5.56 | 1980 | Alexan Mountain View | 29.83 | 2004 |
| Lakeside Terrace Lot 9-18 Lake Austin Village | 10.44 | 1980 | Old Bee Cave Subd | 37.05 | 2004 |
| Hardin Subd | 12.21 | 1980 | Collings Subd | 13.08 | 2004 |
| Malone Addn Sec 4 | 0.55 | 1980 | Barton Creek ABC West Ph 2 | 120.25 | 2004 |
| Francis Benoit Subd | 1.35 | 1980 | Wimberly Place | 8.09 | 2004 |
| Malone Addn Sec 5 | 0.50 | 1980 | Wimberly Place | 3.99 | 2004 |
| Velasquez Subd | 1.24 | 1980 | Davenport West Tr C3 Sec 2 Point at Rob Roy Am 6&7 | 6.55 | 2004 |
| Live Oak Community Cemetery | 7.24 | 1980 | Eanes Canyon Estates | 12.84 | 2004 |
| Chaparral Village | 3.98 | 1980 | Sterling Acres Amend Lots 10 & 11 | 2.00 | 2004 |
| Barton Creek Bluff Sec 1 | 9.88 | 1980 | River Place Sec 25 | 47.34 | 2004 |
| Walter Thomas Jones Subd | 2.66 | 1981 | Panther Hollow Creek Ph 1 | 20.49 | 2004 |
| Ashley Oaks | 74.26 | 1981 | Gomillion's Subd Resub Lot 1 & 2 | 4.33 | 2004 |
| Fox Run Ridge | 66.85 | 1981 | Schmidt Addn | 12.27 | 2004 |
| MCI West | 6.99 | 1981 | Steiner Ranch Ph 1 Sec 6G | 78.20 | 2004 |
| Crystal Creek | 17.79 | 1981 | Steiner Ranch Pardside Amend Lot 88 & 93 | 2.58 | 2004 |
| Barton Bend | 74.98 | 1981 | Spanish Oaks Ph 2B | 36.48 | 2004 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Barton Creek Highlands | 29.06 | 1981 | Tierra Del Caballo Sec 1 | 8.10 | 2004 |
| Lost Creek Sec 3A | 79.22 | 1981 | Kato's Place | 9.04 | 2004 |
| Estates Above Lost Creek | 318.37 | 1981 | Slaughter Creek Acres Replat Lot 6B Blk E | 2.50 | 2004 |
| West Rim | 81.12 | 1981 | Fitzhugh Ranch Sec 1 Am Lt 11, 12 Blk A & Lt 39 Blk A | 5.94 | 2004 |
| Bull Mountain Ph 4 Sec 1 | 37.59 | 1981 | Perkins Subd | 2.80 | 2004 |
| Woodlake Trails Amended | 14.66 | 1981 | Greenshores on Lake Austin Ph 1 | 0.73 | 2004 |
| Tumbleweed Trail Estates | 3.41 | 1981 | River Place at Panther Hollow Creek Ph 1 | 6.04 | 2004 |
| Long Canyon 1A | 127.97 | 1981 | Exa Preslar Subd | 2.01 | 2004 |
| Glenlake Ph 2 | 142.05 | 1981 | Greenshores on Lake Austin Ph 1 | 86.87 | 2004 |
| Barton Creek Bluffs Sec 5 | 48.41 | 1981 | Cypress Ranch Blvd Roadway Dedication | 5.69 | 2004 |
| Barton Creek Bluffs Sec 3 | 46.88 | 1981 | West Cypress Hills Ph 1 Sec 1 Replat Lots 7 Blk 1 | 0.52 | 2004 |
| Cedar Bluff Research Park Sec 1 | 110.06 | 1981 | Capitol View Estates Resub Lot 26 | 5.00 | 2005 |
| Willis Subd | 10.00 | 1981 | Vista Royale Ph 3 | 5.69 | 2005 |
| Manchaca Commercial Park | 12.92 | 1981 | Rland Subd. | 12.78 | 2005 |
| Wild Wood Hills II | 5.34 | 1981 | Vista Royale Ph 1 | 38.36 | 2005 |
| Texas Commerce Bancshares Subd | 5.55 | 1981 | 11505 Texas 71 Ph 1 Replat Lt 10 Blk D | 1.49 | 2005 |
| Bluebell Ridge | 87.25 | 1982 | Spanish Oaks Replat Lot 5 Blk A | 4.69 | 2005 |
| DC Estates | 13.13 | 1982 | Preserve at Barton Creek Amend Lots 5,6,7, Blk A | 3.84 | 2005 |
| Blue Hills Estates Sec 2 | 5.82 | 1982 | Lake Pointe Ph 5A Replat Lots 62, 63 Blk A & Lot 13 Blk N | 0.82 | 2005 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Oak Hill Park | 1.04 | 1982 | Bee Creek Vistas | 14.01 | 2005 |
| Glen-Ledge Park 1A | 11.08 | 1982 | Ranches at Hamilton Pool | 823.41 | 2005 |
| Glen-Ledge Park 2A | 11.69 | 1982 | Senna Hills Sec 7 | 28.64 | 2005 |
| McDonell Estates | 4.89 | 1982 | Turner Addn. | 2.65 | 2005 |
| George Bauer Subd | 2.02 | 1982 | Vista Verde | 7.25 | 2005 |
| Levbarg Estates | 9.99 | 1982 | Harbor Hill | 9.65 | 2005 |
| Barton Valley Sec 8 plus 1/2 vac street | 6.72 | 1982 | Travis Settlement Sec 1 Ph 1 Resub Lots 1-31 & 45-54 | 17.57 | 2005 |
| Barton Creek Highlands Sec 1A | 4.95 | 1982 | Rimrock Trail | 14.52 | 2005 |
| Lost Creek Sec 4A | 5.21 | 1982 | Barton Creek Sec G Ph 2 Amend Lots 2-3 Blk D | 1.10 | 2005 |
| Hills of Lost Creek Sec 4 Ph A | 36.86 | 1982 | Barton Creek Sec H Ph 2 | 70.41 | 2005 |
| Hills of Lost Creek Sec 4 Ph B | 30.90 | 1982 | Barton Creek Sec E Ph 2 | 27.84 | 2005 |
| Lost Creek Estates Ph 1B | 24.69 | 1982 | Summit at West Rim on Mount Larson Blk D Sec 1 Am 18-20 | 4.13 | 2005 |
| Bunny Run One | 1.88 | 1982 | Whitethorn Subd Amend Lots 5&6 | 4.37 | 2005 |
| Lost Canyon Ranch #2 | 6.81 | 1982 | Perro Cafe | 2.00 | 2005 |
| Tumbleweed Place | 3.00 | 1982 | Werkenthin Sec 6 Amend Lots 31-34 Blk D | 7.20 | 2005 |
| Leavitt Subd | 2.11 | 1982 | Austin Lake Hills Sec 1 Resub Lot 1 Blk 49 | 4.15 | 2005 |
| Robbin Road Addn | 0.99 | 1982 | River Place Sec 17 | 13.92 | 2005 |
| El Seems Estates | 1.98 | 1982 | Webb Addn | 2.95 | 2005 |
| Freund-Keeworth Subd | 2.03 | 1982 | Preserve at Lost Gold Cave Ph 2 | 12.17 | 2005 |
| Cielito De Catros Subd | 29.66 | 1982 | Preserve at Lost Gold Cave Ph 1 | 10.74 | 2005 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| John Gray Subd | 4.63 | 1982 | Rio Vista Parcel 3A | 18.54 | 2005 |
| Harold Hicks Subd | 7.99 | 1982 | Steiner Ranch Ph 1 Sec 7A | 130.45 | 2005 |
| Welch Addn | 1.07 | 1982 | Steiner Ranch Ph 1 Sec 7B | 85.51 | 2005 |
| Rob Roy Ph 3 | 37.79 | 1982 | Longhorn Village at Steiner Ranch | 55.18 | 2005 |
| Stagecoach Ranch Sec 5 | 48.09 | 1983 | Steiner Ranch Ph 1 Sec 10C | 48.16 | 2005 |
| Stagecoach Ranch Sec 1 | 23.88 | 1983 | Steiner Ranch Ph 1 Sec 8E | 7.14 | 2005 |
| Stagecoach Ranch Sec 3 | 148.06 | 1983 | River Dance Ph 2 | 147.49 | 2005 |
| Hammett's Crossing | 230.64 | 1983 | Apache Shores Sec 6 Am Lot 2-4 Blk U | 1.55 | 2005 |
| Coulver Estates | 156.91 | 1983 | Scanlon Addn | 1.06 | 2005 |
| Hawks Hill Subd | 5.76 | 1983 | Greenshores on Lake Austin Ph 2 | 1.00 | 2005 |
| Shady Hollow Sec 3B | 49.50 | 1983 | Greenshores on Lake Austin Ph 3 | 0.54 | 2005 |
| Hills of Lost Creek Sec 8 | 35.18 | 1983 | Greenshores on Lake Austin Ph 2 | 42.52 | 2005 |
| Crystal Mountain at Barton Creek Sec 1 | 88.97 | 1983 | Greenshores on Lake Austin Ph 3 | 31.17 | 2005 |
| Rob Roy on the Lake Sec 3 | 30.68 | 1983 | Senna Hills Sec 6 | 31.39 | 2006 |
| Rob Roy on the Lake Sec 1 | 224.13 | 1983 | Spanish Oaks Sec 5B | 4.41 | 2006 |
| Rob Roy on the Lake Sec 2 | 206.84 | 1983 | Crosswind Subd., Rev Lots 74 & 81 | 3.22 | 2006 |
| Lake Ridge Estates Sec 3A | 1.42 | 1983 | Spanish Oaks Sec 3B | 17.23 | 2006 |
| Rio Robles Sec 2 | 90.03 | 1983 | Belvedere Ph 1 | 140.49 | 2006 |
| Long Canyon Ph 1A Am Lot 9 & 10 | 3.34 | 1983 | Spanish Oaks Sec 7 | 60.32 | 2006 |
| Glenlake 3 PUD | 19.09 | 1983 | Pedernales Summit Parkway Road Dedication | 0.57 | 2006 |
| Rio Vista Ph 1 Sec 1 | 2.88 | 1983 | Vaught Ranch Sec 2 | 95.12 | 2006 |
| Malone Addn Sec 6 | 1.91 | 1983 | Sweetwater Sec 1 Blk B Lot 17 A | 12.21 | 2006 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Estates Above Lost Creek Sec 3 | 1.57 | 1983 | Sweetwater Sec 2 Pedernales Summit Parkway Ph a | 0.19 | 2006 |
| Travis Settlement Sec 2 | 132.82 | 1984 | River Dance Ph 3 | 65.86 | 2006 |
| Travis Settlement Sec 7 | 69.20 | 1984 | Cypress Creek Ranch | 1151.76 | 2006 |
| Ralph K. Williams | 7.84 | 1984 | Spanish Oaks Sec 3C | 8.69 | 2006 |
| Travis Settlement Sec 5 | 141.53 | 1984 | Lodge at Hammett's Crossing | 35.68 | 2006 |
| Travis Settlement Sec 3 | 141.72 | 1984 | Travis Settlement Ph 1 Sec 2 | 91.31 | 2006 |
| Travis Settlement Sec 1 | 102.17 | 1984 | Overlook on Bee Creek | 19.68 | 2006 |
| Travis Settlement Sec 4 | 120.26 | 1984 | Spanish Oaks Sec 8 | 53.57 | 2006 |
| Travis Settlement Sec 6 | 110.00 | 1984 | Ranches at Hamilton Pool, Rev Lots 8,9,14,15 Blk ! | 182.44 | 2006 |
| Turnersville Estates | 39.47 | 1984 | Amarra Drive Ph 1 | 34.67 | 2006 |
| Arroyo Doble Sec 2 | 30.10 | 1984 | Yachtman Resub Lot 5 Blk A Fleecie Purnell Estate | 31.90 | 2006 |
| Shady Hollow Sec 6 Ph A | 28.97 | 1984 | West Cypress Hills Ph 1 Sec 3A | 28.02 | 2006 |
| Shady Hollow Sec 4 | 33.30 | 1984 | West Cypress Hills Ph 1 Sec 2 | 29.42 | 2006 |
| Shady Hollow Sec 6 Ph B | 28.14 | 1984 | Noack Hill | 7.96 | 2006 |
| Shady Hollow Sec 6 Ph C | 36.60 | 1984 | Esquivel Subd | 7.20 | 2006 |
| Shady Hollow Sec 6 Ph D | 26.15 | 1984 | Draper Subd | 5.00 | 2006 |
| Arroyo Doble Sec 2C | 16.10 | 1984 | Pedernales Electric Coop Circle Dr Austin | 66.44 | 2006 |
| Granada Estates Sec 6 Amend Lots 38-39 Blk L | 1.13 | 1984 | Southwest Hills Sec 4 Am Lots 6-8 Blk B | 3.04 | 2006 |
| Kenny Addn | 3.49 | 1984 | Bee Cave West | 9.80 | 2006 |
| Watson-Fuller Oaks | 4.09 | 1984 | Rob Roy West Am Plat | 33.48 | 2006 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Ryswyk Estates | 40.45 | 1984 | Estates Above Lost Creek Amend Lots 43-45 Blk A | 8.73 | 2006 |
| Signal Hill Subd Ph 2 | 16.01 | 1984 | Senna Hills Sec 11 | 23.77 | 2006 |
| Summit Subd | 5.00 | 1984 | Bruton Springs Amend Lot 37, 15 Sterling Acres | 8.05 | 2006 |
| Critter Canyon | 35.53 | 1984 | Werkenthin East | 4.00 | 2006 |
| Rob Roy on the Creek Sec 1 | 41.21 | 1984 | Werkenthin Sec 5 Resub Lot 44 Blk D | 1.52 | 2006 |
| Rob Roy on the Creek Sec 5 | 88.48 | 1984 | Coldwater Sec 4 Ph B | 22.01 | 2006 |
| Rob Roy on the Creek Sec 6 | 157.32 | 1984 | Coldwater Sec 4 Ph A | 24.66 | 2006 |
| Hills of Lost Creek Sec 10 | 26.50 | 1984 | Westminster Glen Ph 1E Am Lot 88-89 A | 4.03 | 2006 |
| Barton Creek West Blk 4 | 183.58 | 1984 | Panther Hollow Creek Ph 2 | 20.46 | 2006 |
| Barton Creek West Blk 1 | 62.29 | 1984 | River Place Sec 26 Resub Lot 1 Blk B | 9.08 | 2006 |
| Barton Creek West Blk 5 | 115.15 | 1984 | River Place Sec 22 Am Lots 168 & 169 Blk A | 0.51 | 2006 |
| St. Michaels Academy | 49.98 | 1984 | River Dance Sec 5 | 66.19 | 2006 |
| Bluffs of Lost Creek Am Lot 57-58 | 0.89 | 1984 | River Dance Sec 4 | 35.50 | 2006 |
| Rob Roy on the Creek Sec 3 | 47.88 | 1984 | Apache Shores Sec 2 Am Lot 521, 522 | 0.57 | 2006 |
| Green Park Sec 3 | 38.01 | 1984 | FM 1626 Office Warehouse Subd | 13.20 | 2006 |
| Luth Subd | 5.48 | 1984 | Enclave at Alta Vista South | 100.64 | 2006 |
| West Rim Amend Lots 8-9 | 1.33 | 1984 | Estates of Rockcliff | 4.66 | 2006 |
| Rob Roy on the Creek Sec 2 Lot 104 Blk A | 12.55 | 1984 | Pecan Bottom on the Lake | 1.02 | 2006 |
| Davenport Ranch Ph 6 Sec 1 | 60.26 | 1984 | Belvedere Ph 2 | 93.03 | 2007 |
| Bee Creek Hills Addn | 41.60 | 1984 | Spanish Oaks Sec 9 | 93.09 | 2007 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Westlake Highlands Blk 1A Amend Lots 3-4 | 5.83 | 1984 | Silver Spur Ranchettes Sec 2 Resub Lot 5 | 36.79 | 2007 |
| Scott-Thomas Subd | 1.72 | 1984 | 11505 Texas 71 Amend Lots 6 & 7 Blk A | 0.88 | 2007 |
| Josephine Subd | 0.84 | 1984 | Lakehurst Rev Lots 50-52 & 49 & .3 ac. | 5.04 | 2007 |
| Lednicky Subd | 4.07 | 1984 | Spanish Oaks Golf Villas | 18.96 | 2007 |
| Westcliff Sec 1A | 59.06 | 1984 | Amarra Drive Ph 2 | 89.22 | 2007 |
| Long Canyon 2C | 8.45 | 1984 | Colonia Serendipity | 23.49 | 2007 |
| River Place Water Storage Site | 11.09 | 1984 | River Dance Sec 4 partial vacation & replat | 22.94 | 2007 |
| River Place Sec 1 | 43.73 | 1984 | CC Carlton Subd | 10.44 | 2007 |
| River Place Treatment Plant | 13.79 | 1984 | Edelmon Estates | 19.97 | 2007 |
| River Place Sec 3 | 17.72 | 1984 | Barton Creek Sec H Ph 4 | 103.69 | 2007 |
| Signal Hill Subd Ph 1 | 3.51 | 1984 | Senna Hills Sec 10 | 10.60 | 2007 |
| Watson Park IIIA | 8.37 | 1984 | Austin Lake Estates Sec 1 Amend Lots 3 & 4 Blk 15 | 0.69 | 2007 |
| Shady Hollow Estates Ph B | 38.84 | 1984 | Steiner Ranch Ph 1 Sec 10D | 35.30 | 2007 |
| Shady Hollow Estates Sec 3 | 10.08 | 1984 | River Dance Ph 6A | 84.96 | 2007 |
| Shady Hollow Estates Sec 1 | 163.88 | 1984 | River Dance Ph 6B | 21.80 | 2007 |
| Southland Oaks Sec 2 | 60.88 | 1984 | Palomba Addn No 2 Amend Replat Lots 2-7 | 8.12 | 2007 |
| Oak Run Estates | 134.36 | 1984 | Lynnbrook Condo Subd | 3.85 | 2007 |
| Rob Roy on the Creek Office Park | 5.22 | 1984 | Malone Addn Sec 1 Am Lot 7&8 Blk A | 1.86 | 2007 |
| Rob Roy on the Creek Office Park | 10.07 | 1984 | Malone Addn Sec 1 Am Lot 7&8 Blk A | 9.81 | 2007 |
| Saddletree Ranch Sec 3 | 215.19 | 1985 | Olympic Heights Outlot #2 | 0.90 | 2007 |
| West Cave Estates Sec 2 | 69.97 | 1985 | Belvedere 2A | 3.30 | 2007 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| West Cave Estates Sec 1 | 51.27 | 1985 | Steiner Ranch Ph 1 Sec 10D | 25.28 | 2007 |
| Woods of Bear Creek | 63.91 | 1985 | Steiner Ranch Ph 1 Sec 10D | 2.93 | 2007 |
| Jesse Castro No 2 | 9.70 | 1985 | Steiner Ranch Lake Club | 2.63 | 2008 |
| Hunters Ridge | 36.99 | 1985 | Senna Hills Sec 8 | 12.62 | 2008 |
| Arroyo Doble Sec 2B | 8.13 | 1985 | Travis Settlement Sec 4 Rev Lots 256 & 257 | 8.99 | 2008 |
| Fleeman Estates | 12.57 | 1985 | Hollow at Slaughter Creek Sec 1 | 29.55 | 2008 |
| Hill Country Ph 2A | 116.34 | 1985 | Woods of Greenshores Sec 1 | 59.78 | 2008 |
| Granada Oaks | 68.29 | 1985 | Moughanni Subd | 9.44 | 2008 |
| Centex-Larson Subd | 17.42 | 1985 | Belvedere Ph 3 | 37.85 | 2008 |
| Ledgeview Addn | 9.80 | 1985 | Villas on Blacksmith Cove | 13.06 | 2008 |
| Oak Run West | 116.44 | 1985 | Overlook at Pawnee Pass | 3.18 | 2008 |
| Maxson-Grant Subd | 10.04 | 1985 | Slaughter Creek Acres Resub Lot 1 Blk D | 5.05 | 2008 |
| Rob Roy on the Creek Sec 8 | 8.39 | 1985 | Miller Subd | 0.47 | 2008 |
| Barton Club Drive | 3.05 | 1985 | Belvedere Ph 4 | 52.51 | 2008 |
| Barton Creek West Blk 3 | 173.42 | 1985 | Palisades West Amended Plat of the Amended Plat | 22.35 | 2008 |
| Barton Creek West Blk 2 | 124.60 | 1985 | River Dance Ph 7A | 39.71 | 2008 |
| Barton Creek West Blk 1A | 7.42 | 1985 | Cherry Mountain Ph 2 Resub Lots 1-3, 9, 10 | 12.09 | 2008 |
| Estates of Barton Creek Sec 2A | 10.10 | 1985 | River Dance Ph 7B | 41.24 | 2008 |
| Estates Above Lost Creek Amend Lot 39 & 40 | 2.35 | 1985 | Vincent Subd | 4.51 | 2008 |
| Hills of Lost Creek Sec 2 Am Lot 12-13 | 0.78 | 1985 | Greenshores on Lake Austin Ph 2 Am Lots | 3.12 | 2008 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| | | | 32, 33, 34, 39 | | |
| Voelzel Acres | 2.35 | 1985 | Senna Hills Sec 9 | 11.92 | 2009 |
| Lakeplace Subd | 9.38 | 1985 | Hilltop Manor Rev Lot 1 Blk FFF & 19 RR Twin Lake Hills | 0.72 | 2009 |
| Tierra Madrones | 47.15 | 1985 | Amarra Drive Ph 3 | 233.43 | 2009 |
| BF&Q Subd | 2.21 | 1985 | RGK Commercial Unit A Lot 15 B Blk 2 | 2.12 | 2009 |
| Mount Larson South Ph 2A | 17.70 | 1985 | Bee Creek Hill Estates | 8.92 | 2009 |
| Little Bee Creek Estates | 3.19 | 1985 | Schuknecht Subd | 4.79 | 2009 |
| St Tropez PUD | 17.47 | 1985 | Grace Hill | 2.92 | 2009 |
| Rockcliff Estates PUD | 13.87 | 1985 | Lone Star Bank Subd | 9.70 | 2009 |
| Long Canyon 2B | 386.28 | 1985 | Sutter Hall Subd | 10.81 | 2009 |
| River Place Sec 9 | 65.95 | 1985 | River Terrace IV | 2.17 | 2009 |
| Westminster Glen Ph 1 | 107.59 | 1985 | Belvedere Ph 1 Rev Lots 38, 40 Blk D | 2.52 | 2009 |
| Hennig Heights I | 35.90 | 1985 | Belvedere 2A Rev. Lots 107, 108 & 109 Blk A | 8.46 | 2010 |
| Shady Hollow Estates Sec 2 Amended | 99.16 | 1985 | Montebella Subd | 41.82 | 2010 |
| Guajardo Subd | 12.41 | 1985 | Belvedere Ph 5 | 15.60 | 2010 |
| Malone Addn Sec 7 | 10.19 | 1985 | Tres Vistas Rev Lots 23 & 24 | 2.13 | 2010 |
| Highway 290 West Addn | 5.98 | 1985 | Noack Hill, Rev. Lot 3,4 Blk A | 2.13 | 2010 |
| Bee Creek Hills Addn Lot 1A | 1.96 | 1985 | Summit 56 | 0.36 | 2010 |
| Malone Addn Sec 7 | 4.58 | 1985 | Touba Estates | 15.98 | 2010 |
| David S. Minter Addn | 0.54 | 1985 | Crooked Cedar Ranch | 10.02 | 2010 |
| Malone Addn Sec 7 | 4.50 | 1985 | O&A Guerra Subd | 2.98 | 2010 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| The Preserve | 48.15 | 1985 | Sweetwater, Pedernales Summit Parkway Sec 1 | 7.29 | 2010 |
| River Place Sec 5 | 15.04 | 1985 | Angelwylde Sec 3 Resub Lot 9 | 40.35 | 2011 |
| Mason | 5.20 | 1986 | Rocky Creek Ranch Sec 1 Replat | 159.15 | 2011 |
| West Cave Estates Sec 4 | 282.64 | 1986 | Sola Vista Sec 1 | 1.02 | 2011 |
| Fitzhugh Ranch Sec 1 | 59.02 | 1986 | Ridgeview Ph 1 | 59.83 | 2011 |
| Texana Oaks | 24.87 | 1986 | Belvedere 2A Rev. Lots 31, 32 Blk D | 2.37 | 2011 |
| Southneast Park Addn | 4.96 | 1986 | NOAH ESTATES | 6.49 | 2011 |
| St. Alban's Addn | 14.74 | 1986 | Lake Pointe Ph 1B Rev Lots 6,7 Blk Q, Lot 7A Blk Q Ph 1E | 0.60 | 2011 |
| Enclave at Shady Hollow | 6.07 | 1986 | Travis County EMS #5 | 13.61 | 2011 |
| Appaloosa Run Sec 1A | 11.51 | 1986 | Travis Settlement Sec 6, Rev 368-370 pt Lots 367, 371 | 10.31 | 2011 |
| Overlook Estates Ph 1 | 80.13 | 1986 | West Cypress Hills Ph 1 Sec 4 Cypress Ranch Blvd | 2.94 | 2011 |
| Ramar Addn | 1.51 | 1986 | West Cypress Hills Ph 2 Sec 1 Cypress Ranch Blvd | 1.41 | 2011 |
| Lost Creek Sec 2 Am Lot 19-20 | 1.21 | 1986 | West Cypress Hills Ph 3 Sec 1 Cypress Ranch Blvd | 1.65 | 2011 |
| Whitehorn Subd | 10.70 | 1986 | Hazy Hills Office Park | 18.57 | 2011 |
| Toro Canyon | 9.99 | 1986 | West Cypress Hills Ph 1 Sec 4a | 31.32 | 2011 |
| Smith-Holley Addn | 2.78 | 1986 | Kellywood Estates Sec 2 Resub Lot 2 | 4.06 | 2011 |
| Bee Creek Hills Addn Lot 29A | 1.05 | 1986 | Steiner Ranch Ph 1 Sec 10D Resub 303- | 17.94 | 2011 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| | | | 315 Blk A & Lot 4 Blk F | | |
| McBrine Subd | 7.71 | 1986 | Caldwell-Abeyta | 7.76 | 2011 |
| Lake Shore Annex #2 | 2.99 | 1986 | Sweetwater Sec 1 Village G 1 | 20.98 | 2012 |
| Austin Lake Hills Sec 3 Amend Lots 13 & 14 | 0.88 | 1986 | Sweetwater Sec 1 Village G 2 | 19.25 | 2012 |
| Sunrise Terrace | 2.05 | 1986 | Ragan Subd | 9.08 | 2012 |
| Oak Shores on Lake Austin Sec 1 | 9.71 | 1986 | Reserve at Lynnbrook | 11.71 | 2012 |
| Oak Shores on Lake Austin Sec 3 | 8.77 | 1986 | West Cypress Hills Ph 1 Sec 4a Rev Lots 5,6,7,8,9 Blk C | 5.56 | 2012 |
| Long Canyon Ph 1A Am Lot 12 & 13 | 2.38 | 1986 | Bart Cr Sec H, am 54 B Ph 2 & Lt 12 Blk G Est Ab Lost Cr | 3.46 | 2012 |
| River Pointe Subd | 70.66 | 1986 | Overlook Estates Ph 2 | 40.94 | 2012 |
| Bokros Buffer Subd | 3.93 | 1986 | Rocky Creek Ranch Sec 2 | 66.45 | 2012 |
| Oak Shores on Lake Austin Sec 2 | 4.00 | 1986 | Spicehenge Subd. | 22.06 | 2012 |
| Lake Country Estates | 21.59 | 1986 | Amended Spanish Oaks Sec 3C Lot 35 | 0.79 | 2012 |
| Wild Basin Point | 12.25 | 1986 | Sweetwater Sec. 1 Village H | 14.33 | 2012 |
| Fairway Oaks Resub Lots 1-11 | 7.77 | 1986 | Sweetwater Sec 1 Village H2 | 3.97 | 2012 |
| Caudill Addn | 0.89 | 1986 | Sweetwater Sec 2 Vilage F-1 | 11.36 | 2012 |
| Hacienda Del Corazon | 24.88 | 1987 | Stoneridge Park | 4.49 | 2012 |
| Rob Roy Rim Condos | 41.35 | 1987 | Marbella Subd | 117.26 | 2012 |
| Crystal Creek Amend Lots 7, 9-11 | 8.26 | 1987 | Sweetwater Sec 1 Village A Replat | 9.64 | 2013 |
| Baldwin Subd | 5.99 | 1987 | Belvedere Ph 3 Rev Lots 83 & 84 | 2.03 | 2013 |
| Common Ford Commercial Park | 7.63 | 1987 | River Place Sec 9 Lot 1 Resub | 15.29 | 2013 |
| Eanes Ridge | 9.32 | 1987 | Sola Vista Sec 2 | 37.18 | 2013 |

## B-2: Past Subdivision Developments in Travis County

| Name | Acres | Year | Name | Acres | Year |
|---|---|---|---|---|---|
| Loma Graciosa Subd West Lake Green Am Lots 5 & 6 Lot 2 | 15.56 | 1987 | Belvedere Ph VI | 41.69 | 2013 |
| Flint Rock Hill Subd | 10.33 | 1987 | Spanish Oaks Sec 11 | 45.65 | 2013 |
| Geisler Addn | 6.13 | 1987 | West Cypress Hills Ph 2 Sec 2 | 6.94 | 2013 |
| Monte Verde Subd | 10.82 | 1987 | Montebella Sec 2 | 3.09 | 2013 |
| Fox Creek | 47.85 | 1987 | West Cypress Hills Ph 1 Sec 4a Rev Lot 4 Blk C | 0.20 | 2013 |
| Lake Shore Addn Resub Pt Lots 20, 21 | 0.73 | 1987 | Sola Vista Sec 3 | 35.79 | 2013 |
| Tierra De Las Brisas | 9.91 | 1988 | Vistancia Sec 2 | 22.87 | 2013 |
| Coldwater PUD Sec 2 | 77.18 | 1988 | Vistancia Sec 3 | 10.07 | 2013 |
| Circle Drive Subd | 2.93 | 1988 | Belvedere Ph VII A | 15.51 | 2013 |
| Lewis Mountain Ranch Ph 1 | 87.51 | 1988 | Sweetwater Ranch Sec 2 Village F2 | 10.51 | 2013 |
| Westlake Hills Presbyterian Church | 35.54 | 1988 | Bella Colinas Sec 1 | 32.33 | 2013 |
| Wild Basin Subd | 2.38 | 1988 | Agroland | 4.75 | 2014 |
| SUBTOTAL ACRES | 20,230 | | Preserve at Thomas Springs Road | 28.32 | 2014 |
| | | | SUBTOTAL ACRES | 20,298 | |
| | | | **TOTAL ACRES** | **40,528** | |

Source: Travis County Transportation and Natural Resources Department, 2014.

## Attachment B-3

## Emerging Projects – City of Austin

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| 1300 Dittmar | The 42-acre site will have 233 attached and detached homes that will be built over 12 years. |
| 1301 West 5th Street | The 1.64-acre site could have 230 multifamily apartments. |
| 1512 Forest Trail Apartments | This 0.79-acre site will have 19 two-br apartments in three buildings to replace the two existing houses. |
| 2300 Enfield Road | The 1-acre site will have 36 2-bedroom multifamily units. |
| 2712 & 2800 Del Curto Rezoning | The 2-acre site could have single family condominiums. |
| 300 Pressler | The 1.19-acre site will have 112 multifamily residential units. |
| 3100 Manchaca Road | The 3-acre site will have 49 multifamily units. |
| 315 Pressler | The 1-acre site will have 107 multifamily residential units. |
| 4411 Soco | If approved, the 2.9-acre site could have 300 multifamily residential units. |
| 5100 South Congress | The 18.2-acre site will have 352 multifamily apartments. |

*City of Austin Emerging Projects are depicted on **Figure 5** in **Attachment A** based on available City of Austin GIS data as of February 2017.

| | |
|---|---|
| 6500 Manchaca | The 6.349-acre site will have 134 residential townhouses, 9,000 sq.ft of specialty retail, 4,000 |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| | sq.ft of office space and 5,000 sq.ft of restaurant space in the form of 4 vertical mixed use buildings. |
| 6709 Circle S Road Rezoning | The 1.18-acre site will have 10,000 sq.ft of commercial retail space. |
| 6800 Manchaca Rd | The 4.6-acre site will have 46 multifamily residential units. |
| 7701 S Congress | The 5.38-acre site will have 81,600 sq.ft of industrial space. |
| 7720 & 7800 South 1st Street | The 1.6-acre site will have commercial uses. |
| 7804 Cooper Lane | If approved, the 1.38-acre site will have duplex residential units. |
| 7805 Cooper Lane | The 3.825-acre site will have 41 residential multifamily condominiums. |
| 8801 S Congress Ave Land Use | The 25.9-acre site will have a 130,000 sq.ft grocery store. |
| 9701 Westgate Blvd. (with/resub of SP-2015-0233C) | The 2.09-acre site will have 14 residential units in three buildings. |
| 9710 Shallowford | The 4.22-acre site will have warehouse space. |
| AAA Storage Bradshaw (with/resub of SP-2015-0333D) | The 14-acre site will have five self-storage buildings with 80,779 sq.ft of space. |
| Abel's Rib House | The 1.06-acre site will have around 22,800 sq.ft of office space, and 9,700 sq.ft of retail space. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| ACE Hardwood | The 4.33-acre site will have warehouses. |
| Addison Grove | The 26.43-acre site will have a 7,500 sq.ft building and will be developed as a wedding venue. |
| All Saints Presbyterian Church | The 6.7-acre site will have a 43,690 sq.ft religious assembly space. |
| Amarra | This project includes 132 single family homes on 365 acres. |
| Anonymous Brewery | The 5.61-acre site will have around 60,000 sq.ft of commercial space. |
| Arnold Oil | The 14.92-acre site will have 111,000 square feet of an industrial facility warehouse space along with attached office and retail space. |
| Aspen Heights | The 20.8-acre site will have 346 apartment units in six multifamily apartment buildings. |
| Austin ARC Women's Unit and Family Transitional Housing | The 15.08-acre site will see the addition of a Women's Adult Treatment Center and Family Transitional Housing. |
| Austin Onion Creek Fire & EMS Station | The 2.5-acre site will have a fire and EMS Station. |
| Austin Seventy-One | The 30.9 - acre lot will have 13 single family homes and 15.9 acres will be used for commercial uses. |
| Autumn Wood; Amended Plat | The 3.79-acre site will have 20 single family residential units. |
| Avana | This 1,020 acre upscale housing development will include nearly 800 homes, a 250-room resort hotel with 140 condominiums, 24 single family villas and an 18 hole golf course at build |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| | out, scheduled about ten years from now. |
| Avana Phase 2 | This 149.12-acre tract will have 229 single family residential units. |
| Aviara | The 39.5-acre site will have 216 single family condominiums. |
| Backyard | Redevelopment plans include six movie and television sound stages, three office buildings, a hotel with 150 rooms, a 6,000-capacity amphitheater, another 2,000-capacity amphitheater, restaurants, retail, parking garages, and a trail system. |
| Balfour Tract (6D Ranch) | A residential and retail development on 63 acres. |
| Barton Creek Office Park | This project will add 300,000 square feet of office space in two buildings on 13.6 acres. |
| Barton Creek Section N Multi-Family | The 27.4-acre site will have an apartment complex. |
| Bella Fortuna PP | The 158-acre site will have 450 single family residential units on 93.86 acres, an acre of commercial retail uses and 36 acres of open space. |
| Big 4 Auto Salvage | The 1.2-acre site will have a 15,035 sq.ft metal building for auto salvage. |
| Big Valley Subdivision | The 107 acres of farm land will have residential condominiums, multifamily residential units, office, retail, parkland, medical and hotel uses. |
| Blackstone Vineyard | This 209-acre site will have 153 residential units. |
| Bluebonnet Residence | The 0.7-acre site will have 14 detached residential units |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Bluebonnet Studios | The 0.6-acre site will have a 4-story apartment building with 120 studio apartments. |
| Bluff Springs RV Storage | The 5.54-acre site will have a storage facility for recreational vehicles. |
| BMW of Austin | The existing movie theater on the 14.6-acre site will be demolished to make way for a car dealership. |
| Boulevard City Homes | The 1.05-acre site will have 18 multifamily residential units. |
| Bowie High School Practice Fields | The 4-acre site will have two practice fields for Bowie High School. |
| Breakwater Subdivision | The 26.8-acre site will have 21 single family residential units on 24.68 acres. |
| Broadstone Scenic Brook | The 46.32-acre site will have retail on 6.5 acres and multifamily apartments on 39.7 acres. |
| Brodie 31 PUD | This 32-acre site will have 127,865 square feet of retail uses. |
| Buckingham Estates Condominiums | The 15.95-acre site will have residential condominiums. |
| Bungalows, The | The 1.5-acre site will have 14 residential units. |
| Calvert House | The 5.78-acre site will have a restaurant. |
| Carma - Pilot Knob | The 2,124 acre Pilot Knob project will be composed of five MUDs, and will include 5,660 single family units; 2,320 townhomes; 6,370 multifamily units; more than 3.8 million sq.ft of commercial space as well as a 40-bed hospital and an 850-room hotel. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Carpenter, The | The 1.38-site acre will have a hotel. |
| Cascades at Onion Creek, formerly Fox Hill Subdivision | The 215 acre site will include 467 single family residential units; 350 multi-family units; and 63 acres of open space. |
| Cebolla Creek | The 70.8-acre site will have 195 single family residential units. |
| Centex Produce | The 1.83-acre site will have a 13,000 sq.ft warehouse. |
| Chisolm Trail Single Family Condominiums | The 35-acre site will have around 246 detached single family condominium houses. |
| Circle "C" Ranch Office Complex | The 2.8-acre site will have 15,800 sq.ft of office space. |
| Circle C Apartments | The 12.26-acre site will have 240 multifamily residential units. |
| Circle C Child Development Center | The 6-acre site will have a 22,220 sq.ft daycare center. |
| Circle C Golf Estates Phase II | The 44.7-acre site will have 79 single family homes. |
| Circle C Ranch Tract 2B | The 12.3-acre site will have 14 single family homes. |
| Circle C Ranch Tract 8C | The 14.2-acre site will have eight single family residential units. |
| City of Austin - Austin Water Utility | Austin Water Utility is planning some construction at the existing facility. |
| Clawson Multi Family | The applicant is proposing development that consists of 40 units in 7 buildings with associated parking. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Clawson Townhomes | The 1.88-acre site will have 15 residential units. |
| Collings Guitars Phase II | Two additional buildings with 31,000 square feet of commercial space are proposed on this 13-acre site. |
| Comfort Suites Hotel South | The 1.6-acre site will have an eighty room hotel. |
| Cooper Lane Condominiums | The 9.68-acre site will have 65 detached residential condominiums. |
| Cottages of Lantana | The 8.8-acre site could have 41 single family condominiums. |
| Covered Bridge PUD | The 38-acre site will have 250 apartments; 8,000 sq.ft of retail; 8,000 sq.ft of restaurant space; 16,000 sq.ft of office space; an assisted living center with 150 beds and 2 single family residential units. |
| CR-163 Subdivision | The 60.6-acre site will have commercial uses. |
| Creeks Edge | The 56.8-acre site will have 30 single family residences on 42.45 acres and 12.61 acres of greenbelt area. |
| Cypress Creek at Ledge Stone | This site will have 234 single family homes and 244 multifamily apartments. The apartments will be rented to people who make less than 60% of MFI. |
| Dakota Springs (aka Marbridge Estates) | This 112.5 acre subdivision will have 301 single family homes, with 33.5 acres dedicated to open space. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Davis Lane Garden Homes | The 1.39-acre site will have 12 garden homes. |
| Decorum Stone (Withdraw/Resubmittal of SP-2015-0002C) | The site will have around 12,000 sq.ft of industrial space. |
| Dittmar Office Park | The 5.8-acre site will have around 74,000 sq.ft of medical office and office space. |
| Double Creek Residences | If approved, the 35-acre site could have 750 multifamily apartments, and over 250,000 sq.ft of commercial space. |
| Double Creek Village Blk B Resub of Lt 1, Blk B; Resubdivision of Lot 1C | The 14.34 acre lot will have multifamily apartments. |
| Double Creek Village; Resub Plat of Lot 1A of Resub of Lot 1 Block "B" | The 44.8-acre site will have multifamily apartments on 27.65 acres and retail on 17.22 acres. |
| Duke's Adventure Golf | The 1.3-acre site will have a mini golf course. |
| Edelmon Estates | The 7-acre site will have two single family homes. |
| Ellis Oaks | The 3.2-acre site could have single family residential units. |
| Encino Trace | A six story parking garage and 332,000 sq.ft. of office space in two buildings will be constructed on the 54-acre site. |
| Enclave at Oak Parke, The | The 12.8-acre site could have single family residential units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Escondera Section 4 | the 8.76 acre parcel will have 35 residential condominiums. |
| Estancia Hill Country | This 600-acre site will have 1,550 apartments; 750,000 sq.ft of industrial space; 905,000 sq.ft of office space; a 405,000 sq.ft shopping center; and 737 detached single family housing units. |
| Exposition Multifamily (former 3215 Residences) | The 1.72-acre site will have 25 multifamily residential units. |
| Fiesta Tortillas Expansion | About 18,000 square feet of manufacturing space will be added to the existing facility on this 2.95-acre site. |
| Foremost Zoning | If approved, the 14.6 -acre site could have 330 multifamily residential units. |
| Fossil Rim Road | The 3.75-acre site will have single family residential units. |
| Fox Hill Apartments | This 22-acre site will have 288 multifamily apartments. |
| Freedom Park | The 3.27-acre site will have an 19, 513 square feet office-warehouse development in two buildings. |
| Freeport Tech South | The 33.35-acre site will have industrial uses. |
| Fusion Flats | This 6.23-acre parcel will have 106 multifamily units and around 9,800 sq.ft of retail space. |
| Garcia's PP&M Subdivision | The 3-acre site will have commercial retail uses. |
| Garden Terrace Phase 3 | The 5.77-acre site could have multifamily residential units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Garrison Park Business Center | The 1.18-acre site will have 9,850 sq.ft of office space. |
| Golf Cove Rezoning A | If approved, the 1.66-acre site will have single family homes. |
| Goodnight Manchaca | The 2.82-acre site will have 31,500 sq.ft of commercial space. |
| Goodnight Ranch | The 703-acre site will have 1,192 single family units; 2,645 apartments; 696 townhomes, an elementary school for 800 students; a middle school for 1,100 students as well as a 1,260,000 sq.ft shopping center and a 15,000 sq.ft community center. |
| Great Commission Baptist Church | The one-acre site will have a church. |
| Greyrock Ridge Commons (formerly Wildflower Commons) | The 177 acre site will include 387 single family homes on 103 acres and 55 acres of open space. |
| Group 1 Automotive - Proposed Maxwell Ford Collision Center (W/R SP-2015-0058C) | The 3.06-acre site will have a 31,970 sq.ft collision center. |
| Grove, The | The 9.2-acre site could get 24 multifamily units in addition to the existing 184 multifamily units. |
| Hamilton I PP | The 443-acre site will have 225 residential lots on 325 acres. |
| Harlan Rezoning | This 0.396-acre site could have mixed use. |
| Harper Park | The 17-acre site could have 250 multifamily residential units. |
| Harper Park Hotel Tract | A 118-room hotel will be constructed at this 5.19 acre site. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Harris Ranch | The 102-acre site will have 350 single family residences, with 7.96 acres for retail. |
| Heritage Oaks | The 5.3-acre site will have 48 single family residential units. |
| Hetherly Tract | The 58-acre site could have 97 residential units. |
| Hills of Shady Hollow, The | The 77-acre site will have 208 single family residences, 35 acres of greenbelt and 5 acres of retail uses. |
| Hollow at Slaughter Creek, The | The 40-acre site will have 216 residential units. |
| Holt Cat Subdivision | The 15.6-acre site will have office uses. |
| It's About Thyme | The 43.9-acre site will have a garden center. |
| KB-Sheldon 230 (Smart Housing) | This 236-acre site will have 925 single family homes and 46.6 acres of open space/ |
| Keesee Tract | The 7.45-acre site will have 236 multifamily residential units. |
| La Mexicana Supermercado | The 4-acre site will have around 165,600 sq.ft of retail space. |
| La Vid Urban Homes | The 4.34-acre site will have 37 duplex condominium residential units. |
| LaCrosse at Circle C Residences | The 8.28-acre site will have 25 residential units. |
| LaMadrid Apartments and Townhomes | The 6-acre site will have 95 multifamily apartments. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Lamar Flats | The 2.62-acre site will have a vertical mixed use building with 308 residential units. |
| Landmark Conservancy | The 22-acre site will have 240 multi family units. |
| Lantana | This 16-acre site will have 73,107 sq.ft of medical office space. |
| Lantana Tract 28 | The 27-acre site will have eight apartment buildings with 300 residential units. |
| Lantana Tract 32 | The 46.7-acre site will have 428 multifamily residential units in 17 apartment buildings. |
| Lantana Tract 33 | The 27.56-acre site will have 370 multifamily apartment units. |
| Las Casa Verdes | This 2.19 acre project with 20 single family homes will meet the standards of the Austin Green Building Program. |
| Las Maderas Section 2 | The 5-acre site will have 28 residential units. |
| Laurelwood Commons | The 1-acre site will have a retail building. |
| Laurelwood Plaza | The 5-acre site will have 16,000 sq.ft of retail and office space. |
| Laurelwood Storage | The 4.64-acre site will have a 123,250 square feet storage facility. |
| Legends Way | This 108.25 acre subdivision will have 289 single family homes. |
| Lenox Industrial Park | This project will include multi-family and industrial uses. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Lenox Springs Phase 1 | The 19.5-acre site will have 200 multifamily residential units in 18 buildings. |
| Lightsey | The 4.7-acre tract will have 40 residential units. |
| Live Oak at Southpark Meadows | The 19-acre site will have 330 multifamily apartments. |
| Live Oak Trail | This 8.6 acre site will have 40,200 sq.ft in office condominiums space |
| LOCO-Motion Inflatable Play, LLC | The 1.2-acre site will have a 22,000 sq.ft children's indoor play area. |
| Lone Star Bank | The 9.6-acre site will have 20,932 sq.ft of bank, office and retail space. |
| Lost Creek | The 1.44-acre site could have 15 detached townhome units. |
| Malone Preliminary Plan | The 40.48-acre site will have 166 single family units on 20 acres, and 13 acres of greenbelt. |
| Manchaca Crossing Retail Center | The 1.49-acre site will have a 10,200 sq.ft retail use building. |
| Manchaca Industrial Center | The 1.25 site will have 13,510 sq.ft of office-warehouse space in two buildings. |
| Manchaca Road Business Park Phase B | The 3.96-acre site will have 48,900 square feet of warehouse and office space. |
| Marbella Section 3 | The 111.08-acre site will have 1,116 multifamily residential units. |
| Marbella Subdivision - Bluff Springs Estates | This 117 acre site will have 712 apartment units and 11,000 sq.ft of office space. |
| Marcy Hill | The 0.851-acre site will have four single family units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Mariposa Montessori School | The 7.28-acre site will have a 21,900 sq.ft private school. |
| Marx Property Fill and Drainage Improvements Plan | The 8-acre site will be a fill site. |
| Masonwood 71 & Terra Vista PP | The 147.6-acre site will have 294 residences. |
| Meadows at Double Creek | The 30.6 acre lot will include 126 single family residences as well as retail on 3.2 acres. |
| Meridian | 666 single family homes will be built on 194 acres of the 454-acre subdivision, 199 acres have been set aside for open space. |
| Meridian Village | The 15.82-acre site will have commercial retail uses. |
| Mockingbird Apartments | The 1.07-acre site will have 15 residential units. |
| Moontower Offsite parking | The 4-acre site will be used for off-site parking. |
| New Theatre @ Zach Scott | This 27.21-acre site will have a single-rake 418 seat theater. |
| North Bluff | If approved, the 1.233-acre site will have 16 single family residential units. |
| North Bluff 2 | The 4.21-acre site will have 52 single family homes. |
| North Bluff Apartments | The 6.4 acre site will have 118 condominiums. |
| Nutty Brown Business Park | The 7.8-acre site will have office and retail buildings. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Oak Hill Emergency Center | The almost 1-acre site will have an emergency center. |
| Oakhill Medical Center | The 4.49-acre site will have 12,800 sq.ft of medical office space. |
| Old Bee Cave Rd. Subdivision | If approved, the 10.16-acre site will have two single family residential units. |
| Old Bee Caves Office Building | The 8.8-acre site will have a 15,535 sq.ft office building. |
| Old Bee Caves Road Condos | The 20-acre site will have 76 duplex units and 15 single family residential units. |
| Oporta Zoning | If approved, this 0.86-acre site could have 12,000 sq.ft of retail space. |
| Overlook Estates | The 41-acre site will have 39 single family homes and a 6-acre greenbelt. |
| Overwatch Phase 2 | A 3-acre portion of the site will have a 43,200 sq.ft office building. |
| Parking Garage Addition for Judges Overlook | The 5-acre site will have a parking garage. |
| Parkside Community School | The 12.2-acre site will have a private elementary school. |
| Parkway Village | This 23 acre lot will have retail uses. |
| Pleasant Valley | The 3.63-acre site will have commercial uses. |
| Precision Sports Facility | The 4.44-acre site will have an indoor sports facility. |
| Preserve at Thomas Springs Road, The | This 38.465-acre site will have 32 single family residential units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Rancho Garza Preliminary Plan | The 34.7-acre site will have multifamily apartments, a hotel, office space, as well as retail space. |
| Ravenscroft Commercial | The 4-acre site will have 11,790 sq.ft medical office, a 4,000 sq.ft convenience retail, a 5,000 sq.ft restaurant, and 7,723 sq.ft of general retail. |
| Regency Park | The 2.9-acre site will have 96,500 sq.ft of office space. |
| Regents West Campus | The 18.27-acre site will have athletic fields and a sports building. |
| Remington Ranch | The 1.28-acre site will have an animal boarding facility. |
| Reserve at Lynnbrook | The 11.5 acre development will have 34 single family residential units. |
| Revised Springfield Sections 2,3,4,5,10&11 Preliminary Plan | The 20.15-acre site will have 504 multifamily residential units. |
| Ridgeview | The 93-acre site will include 197 single family homes and 36.6 acres of greenbelt/open space area. |
| Ring Tract | The 87-acre site will have 249 single family residential units on 38 acres, and 33.2 acres of open space. |
| River Ridge Estates Ph. 2 & 3 | The 43.72-acre site will have 178 single family homes. |
| Rob Roy | The 6.5-acre site will have two single family residential units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Rocky Creek Ranch MUD | The 468-acre planned residential community is expected to have 400 homes and 325 acres of open space. The project is being developed by Hillwood Development and Spanish Oaks. The development will take place over four phases. |
| Saint Elmo Public Market | The 9.45-acre site will have a hotel; 45,000 sq.ft of restaurant space; about 25,500 sq.ft of retail space, and 229,000 sq.ft of office space. |
| Salem Center | This 8.18-acre lot will have 42 single family homes. |
| Samdorosa Communities | The 1.7-acre site will have an office / apartment development. |
| Sames Red Barn Automotive | The 1.22-acre site will be developed for automotive sales. |
| Second Amended Plat of Lots 3-7, Blk. B, Commerce Center South Section Two | The 30-acre site will have commercial uses. |
| Seton Southwest Expansion | A 7,190 sq.ft expansion to the existing medical facilities will be built on the 58 acre parcel. |
| Seven Oaks Office Park | The 15-acre site will have office buildings. |
| Shady Hollow Gardens | This 35.5-acre multifamily subdivision will have 144 townhomes. |
| Skywest Ranch | The 98-acre site will have 79 single family residential units. |
| Slaughter 100 tract 14A | This 36 acre site will have office uses. |
| Slaughter Lane Retail Center W/R SP-2015- | The 2.62-acre site will have 22,185 sq.ft of retail and restaurant space. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| 0362C | |
| Smithfield Condominiums | The 8.8-acre site will have 97 multifamily triplex and fourplex units. |
| SOCO II Apartments | The 6.09-acre site will have 268 multifamily residential units. |
| Songhai at West Gate | If approved, the 5.15-acre site could have 146 multifamily units. |
| South Austin Beer Garden | The 1-acre site will have a beer garden. |
| South Austin Medical Center Medical Office Building | The 17.1-acre site will see the addition of a 59,466 sq.ft medical office building. |
| South Congress @ Little Texas Lane Commercial | If approved, the 2.11-acre site will have convinience storage. |
| South Congress Residences | If approved, the 2.81-acre site will have 253 multifamily residential units as well as almost 5,000 sq.ft of retail space. |
| South IH 35 Mixed-Use Apartment Community | If approved, the 9.43-acre site could have 380 multifamily apartments. |
| South Park Crossing Apartments | The 16.4-acre site will have 308 multifamily units. |
| South Six | If approved, the 6.5-acre site will have industrial development. |
| South Urban Lofts | The 2.69-acre lot will have four 6-story mixed use buildings with 149 residential units, 22, 692 sq.ft of retail use and two parking garages. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| SouthPark Industrial | The 26.6-acre site will have around 95,100 sq.ft of office space, and 255,100 sq.ft of warehouse space. |
| Southpark Meadows | This master planned retail-residential project by Endeavor Real Estate Group LLC is being built on 425 acres, and will include 1.6 million sq.ft of retail space, 650 multifamily units, 330 single family units, 110 townhomes, office and medical uses. |
| Southwest Parkway Office Building | The 8.6-acre site will have 8,340 sq.ft of office space. |
| Spanish Oaks Sec 7 PP | The 59-acre site will have 41 residential units. |
| Spanish Oaks Sec XI PP | The 51.7-acre site will have 29 residences. |
| Springfield 7, 8 & 9 | The 89 acre site will have 337 single family units and 20 acres of greenbelt/open space. |
| St. Andrew's School Miller Tract | The 93-acre site will have commercial uses. |
| St. Gabriel's Catholic School, Building B | The proposed building on the 31-acre site will add classroom space for the existing school. |
| Stablewood Drive | A city roadway has been proposed for this 2.35-acre site. |
| Starpark Village | The 8.12-acre site will have 184 multifamily apartments. All apartments will serve households at or below 60% Median Family Income. |
| Stassney Lane Townhomes | The 20-acre site will have 116 single family townhomes. |
| Stately Hill Condominiums | The 9.5-acre site will have 60 single family residential condominiums. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Still Waters | The 22.73-acre site will have 512 multifamily apartment units. |
| Stoneridge | The 2.53-acre site will have office buildings. |
| Sunfield | Scarborough Lane's 2,700 acre development will be a master planned community with a mix of single family, multifamily, commercial and light industrial. The site will have 5,311 single family homes and 1,660 multifamily homes on 1,087 acres. |
| Sunset Ridge | The 9.6-acre site will have 199,800 sq.ft. of office space. |
| Sunset Trail Residences | If approved, this 2.75-acre site could have 60 multifamily units. |
| Sweetwater Ranch | Around 1,800 homes will be built on the 1,400 acre site. The scenic ridges and canyons near the lake will be preserved as a greenbelt, according to Wheelock Street Capital LLC. |
| Tarlton 360 Townhomes | Plans for the 16-acre former movie theater site include a 75,819 sq.ft office building; a 8,300 sq.ft shopping center; a 3,500 sq.ft restaurant as well as 229 residential units. |
| Taylor Estates | The 23.7-acre site will have 77 single family homes. |
| Terrace Sec. 5 of Lots 1 & 2 Blk A, Terrace Sec.7 Lots 1 & 2 Blk B; Amended Plat | The 42-acre site could have commercial uses. |
| Texas Oaks Three Resubdivision of Lot 1 Blk A; Amended Pla | The 10-acre site will have commercial - retail uses. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Tipco Subdivision | The 85-acre site will have 24 single family residences. |
| Tranquilo Trail Park | The 0.45-acre site could be a park. |
| Transwestern Data Ranch | This 36-acre site within the Expo Business Center industrial area will have a 249, 518 sq.ft data center. |
| Travis County Emergency Services District #5 Subdivision | |
| Travis County MUD 4 South Wastewater Treatment Plant | A wastewater treatment plant will be built on this 34-acre site. |
| Travis County MUD No. 4 Barton Creek Section N Regional Stormwater Mgmt. Wet Pond | The 9.2-acre site will have a stormwater management facility. |
| Trinity Place Apartments | This 9.5-acre site within the Belterra master planned community will have 152 apartments , with 32-one bedroom apartments, 104-two bedroom apartments and 16-three bedroom apartments. |
| Valley View Condominiums | The 1.64-acre site will have 13 condominium units. |
| Value Place Hotel | The 1.8-acre site will have a 124-room hotel. |
| Vega Office | The 4.2-acre site could have a 34,000 sq.ft office building. |

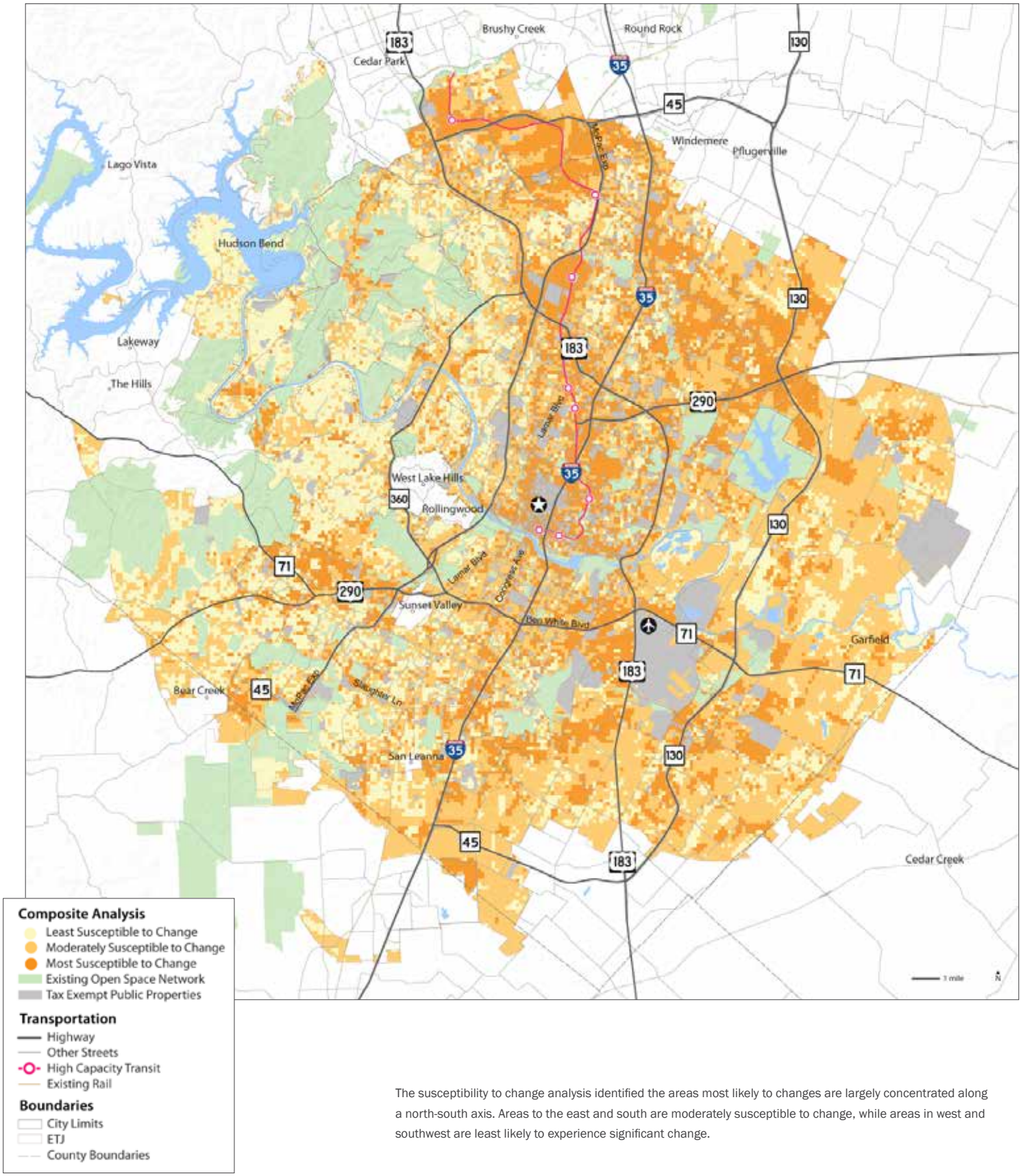
| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Venue at Slaughter | The 8.8-acre site will be developed into an event venue. |
| Village on Congress | This mixed use project will include 108 multifamily townhomes and 5,461 sq.ft of retail and restaurant space. |
| Villas at Vinson Oak | The 1.9-acre site will have 20 residential units. |
| Villas of Barton Ridge Estates Section II | The 39.93-acre site will have 39 single family residential units. |
| Vistas of Austin, The | The 158-acre site will have 669 single family homes |
| Vistas of Western Hills, The | The 1.91-acre site could have multifamily apartments. |
| Waterleaf Medical At Davis Lane-Autumn Leaves of Southwest Austin | The 5.8-acre site will have a 54-bed assisted living facility. |
| West 5th Street Self Storage | The 1-acre site will have 194,822 sq.ft of self storage space. |
| West Oak | The 6.73-acre site will have 38 single family condominiums. |
| Western Oaks Retail Center | An office building will be added on to the existing development on this 15.44-acre site. |
| Westgate and Davis Lane | The 6.11-acre site will have 34 residential condominiums. |
| Westgate Grove | This 9.39 acre development will have 61 single family detached condominium units. |
| Westgate Grove Phase II | The 6.72-acre site will have 88 multifamily units. |

| B-3: Emerging Projects as of February 2017- City of Austin* | |
|---|---|
| **Name** | **Description** |
| Westlake Residential | The almost 20-acre site will have multifamily residential units. |
| Westrock | The 5.43-acre site could have single family condominiums. |
| William Cannon Senior Housing | The 9.14-acre site will have 259 multifamily residential units. |
| Windrift Way Condominiums | This 4-acre lot will have 32 single family condominium. |
| Xbiotech Research Facilities | The 48 acre site of a bio-medical research and development project will consist of six buildings in a campus type setting. The first phase will consist of a 51,900 sq.ft office warehouse building. |
| Zachary Scott II (Smart Housing) | This 270 acre site will have 651 single family homes. |

Source: City of Austin Emerging Projects, 2017.

# Attachment C
# Transportation, Land Use, and Other Planning Maps from Various Jurisdictions

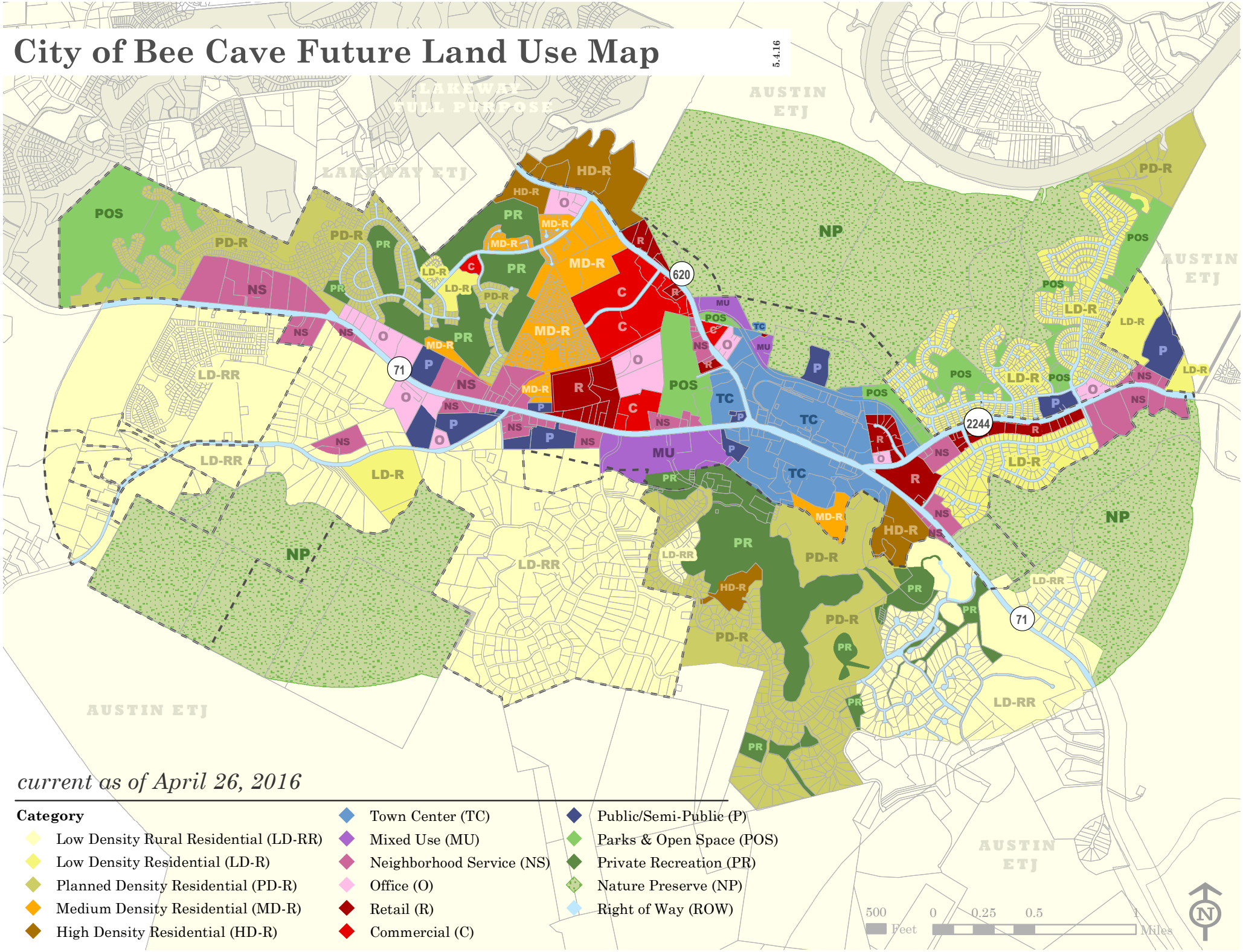
Figure 2.5 **Susceptibility to Change Analysis**




The susceptibility to change analysis identified the areas most likely to changes are largely concentrated along a north-south axis. Areas to the east and south are moderately susceptible to change, while areas in west and southwest are least likely to experience significant change.

# City of Bee Cave Future Land Use Map

5.4.16




*current as of April 26, 2016*

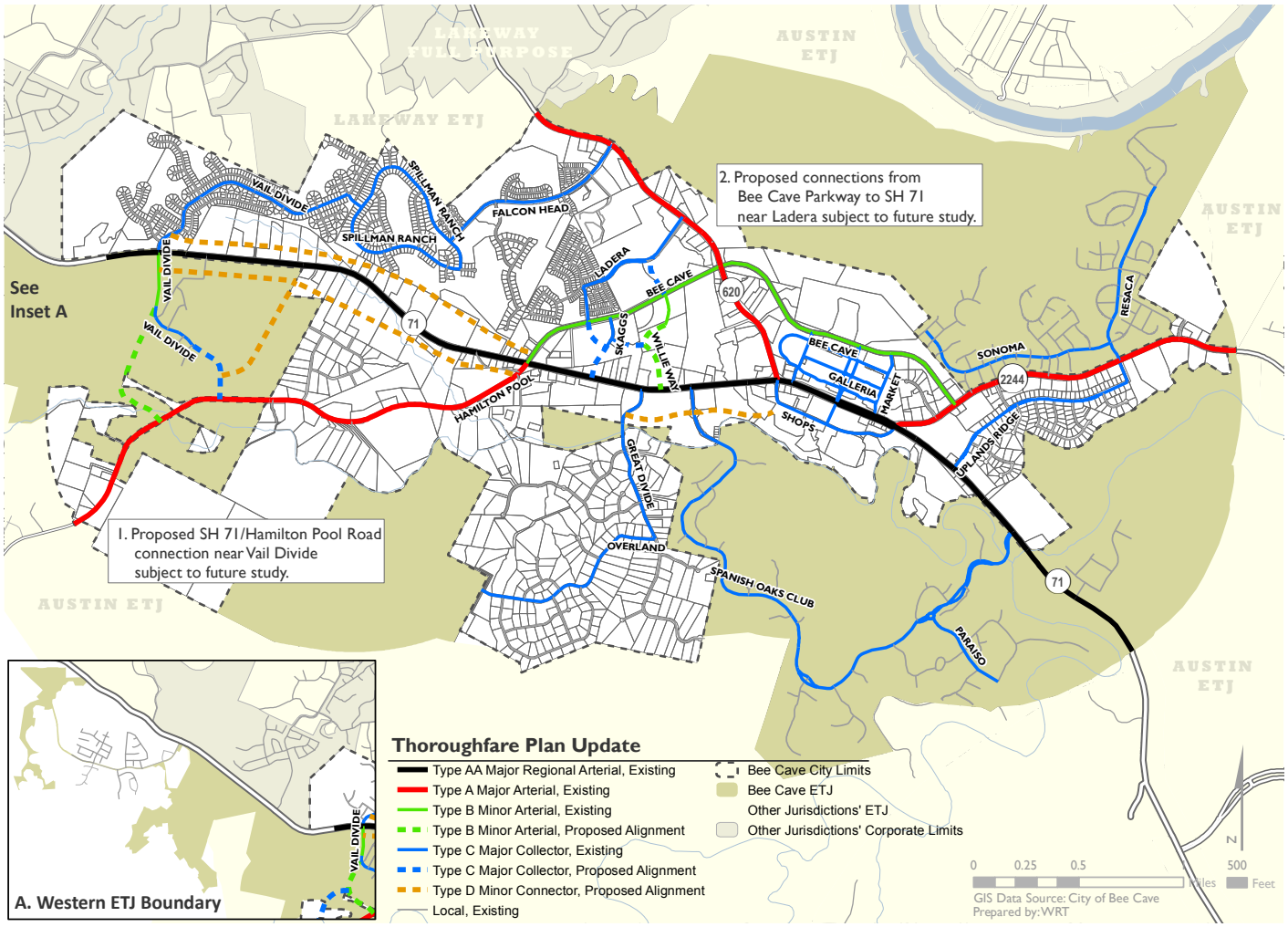
**Category**

- Low Density Rural Residential (LD-RR)
- Low Density Residential (LD-R)
- Planned Density Residential (PD-R)
- Medium Density Residential (MD-R)
- High Density Residential (HD-R)
- Town Center (TC)
- Mixed Use (MU)
- Neighborhood Service (NS)
- Office (O)
- Retail (R)
- Commercial (C)
- Public/Semi-Public (P)
- Parks & Open Space (POS)
- Private Recreation (PR)
- Nature Preserve (NP)
- Right of Way (ROW)

500 0 0.25 0.5 1
Feet Miles

N

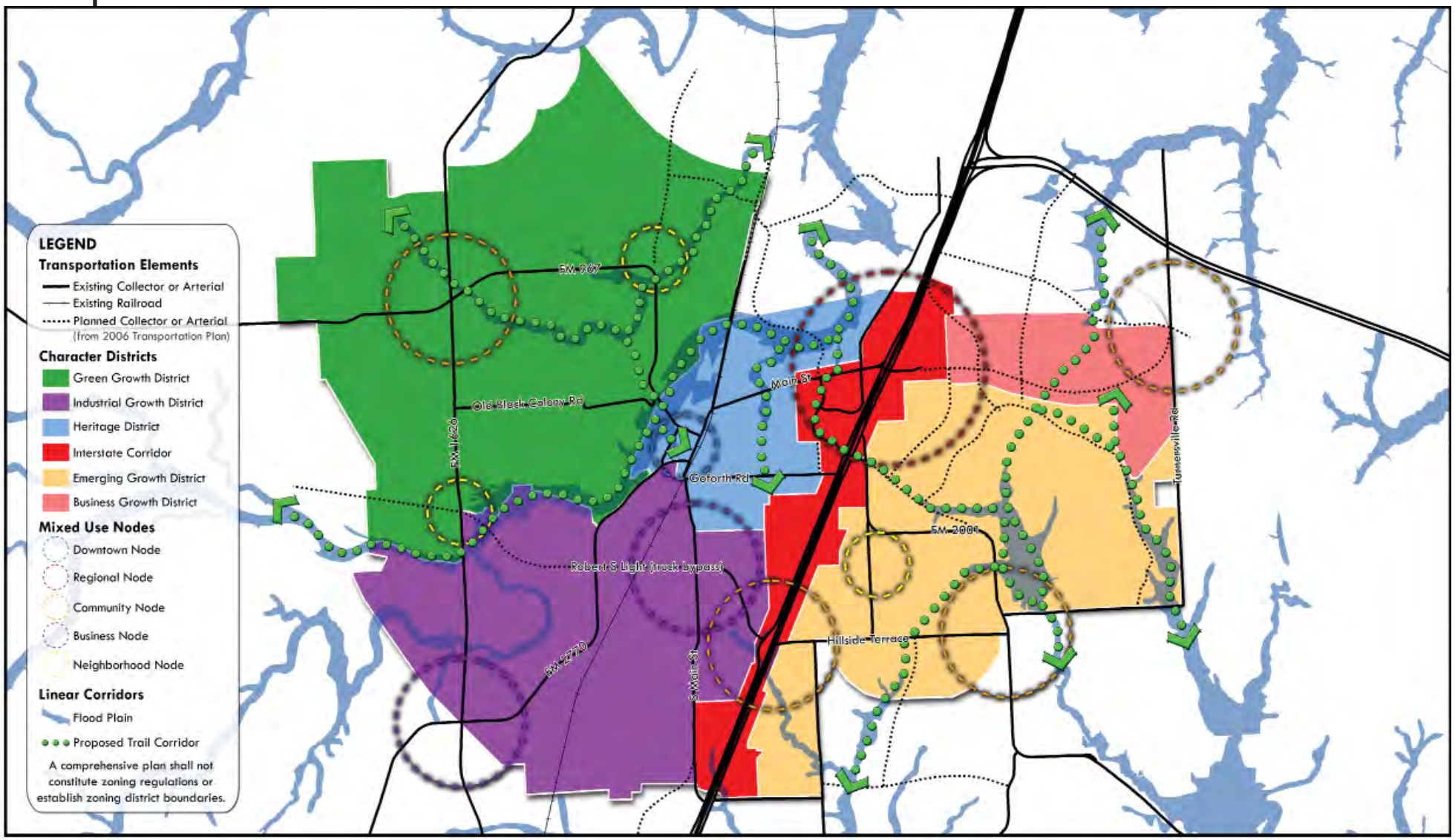
*Figure 3-2 Thoroughfare Plan*



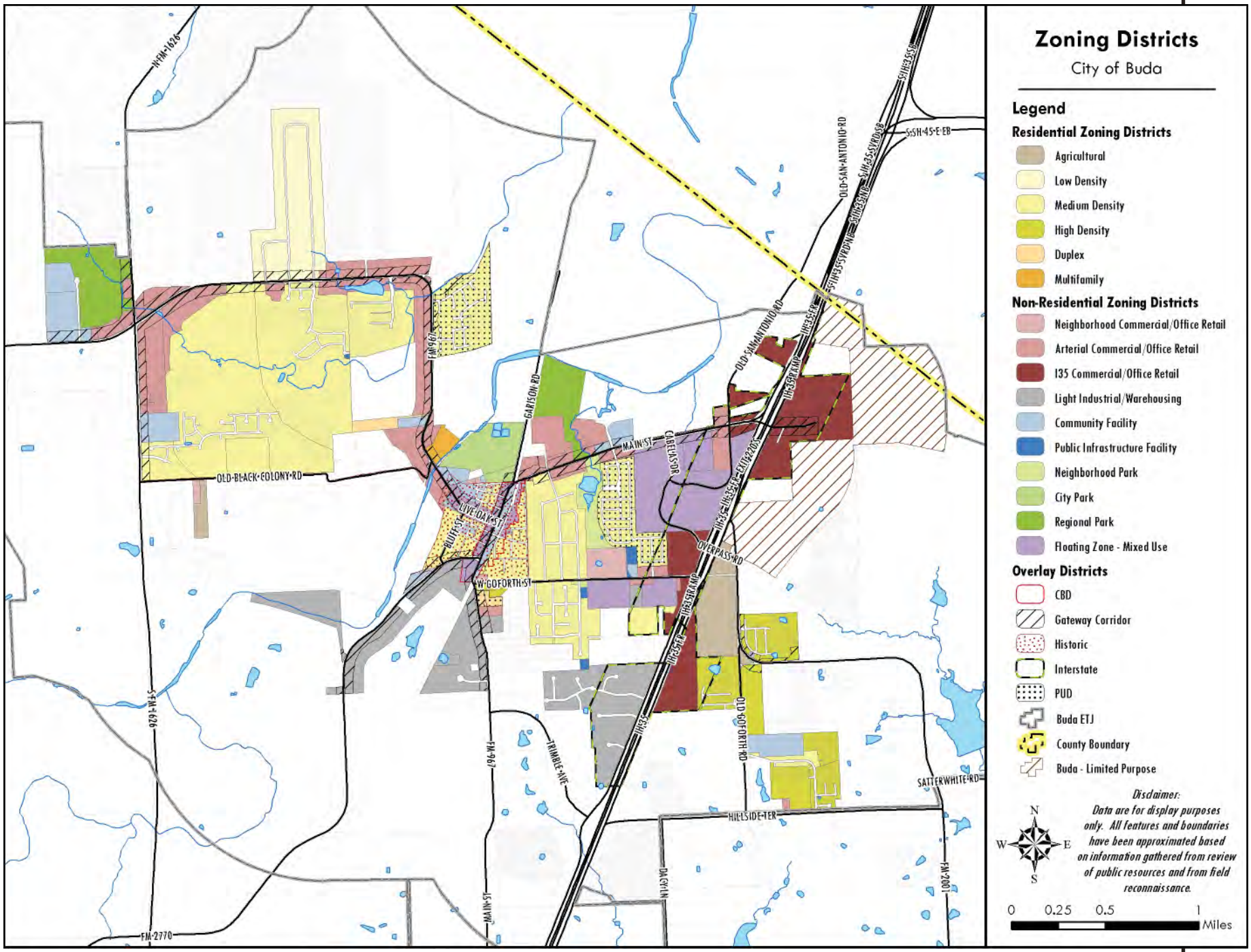

of-way or a public access easement, which provides connectivity between developments in order for short trips to bypass using the arterial and collector network. These connectors will provide Bee Cave residents, businesses, and visitors another option when making local trips, intentionally reducing the need to get on SH 71. Type D's are displayed on the Thoroughfare Plan Map to represent areas where additional connections are needed.

The implementation of Type D's will require focus at the time these properties are developed to determine the preferred alignment and facility type. This will include consideration of the following:

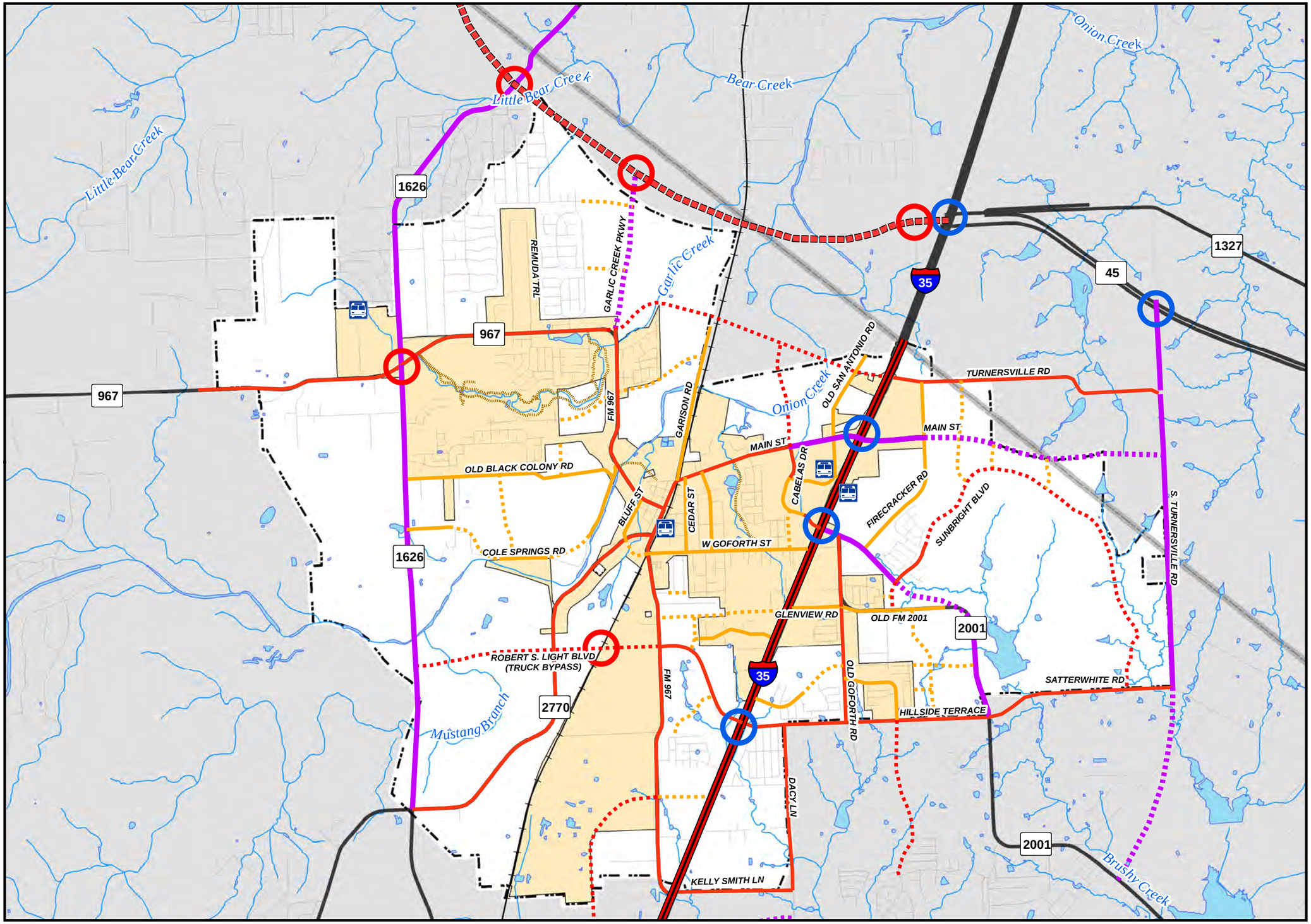
- Location of connections to collectors and arterials;
- Intersection design options;
- Flexibility relative to location of the alignment; and
- Whether the roadway is a public facility or an access easement.




# Buda Future Land Development Plan


Zoning Districts
City of Buda
Legend
Residential Zoning Districts
Agricultural
Low Density
Medium Density
High Density
Duplex
Multifamily
Non-Residential Zoning Districts
Neighborhood Commercial/Office Retail
Arterial Commercial/Office Retail
I35 Commercial/Office Retail
Light Industrial/Warehousing
Community Facility
Public Infrastructure Facility
Neighborhood Park
City Park
Regional Park
Floating Zone - Mixed Use
Overlay Districts
CBD
Gateway Corridor
Historic
Interstate
PUD
Buda ETJ
County Boundary
Buda - Limited Purpose
Disclaimer:
Data are for display purposes only. All features and boundaries have been approximated based on information gathered from review of public resources and from field reconnaissance.
N
W
E
S
0
0.25
0.5
1
Miles
N-FM-1626
FM-967
OLD-BLACK-COLONY-RD
GARRISON-RD
MAIN-ST
CABEZAS-DR
LIVE-OAK-ST
BLUFF-ST
W-GOFORTH-ST
OLD-SAN-ANTONIO-RD
IH-35-SVRD-NB
IH-35-SVRD-SB
S-SH-45-E-EB
IH-35-EXIT-220B
OVERPASS-RD
IH-35-RAMP
IH-35-NB
IH-35-SB
OLD-GOFORTH-RD
SATTERWHITE-RD
HILLSIDE-TER
TRIMBLE-AVE
DACHAN
FM-2001
S-FM-967
FM-2770

# EXHIBIT 3 - Transportation Master Plan




## Grade Separations

- Exist. Overpass
- New Overpass

## Roadway Network Classification

| | ROW* |
|---|---|
| New Highway | |
| Highway | |
| New Parkway | 120' |
| Parkway | 120' |
| New Arterial | (70'-110') |
| Arterial | (70'-110') |
| New Collector | (60'-90') |
| Collector | (60'-90') |

*ROW varies based on typical section. Please refer to the Major Roadway Planning Guide for ROW widths of individual segments.

- 8' Off-Street Trail*

On-street Pedestrian and Bicycle Facilites shown in Exhibits 2a & 2b.

- Potential Park and Ride

## Legend

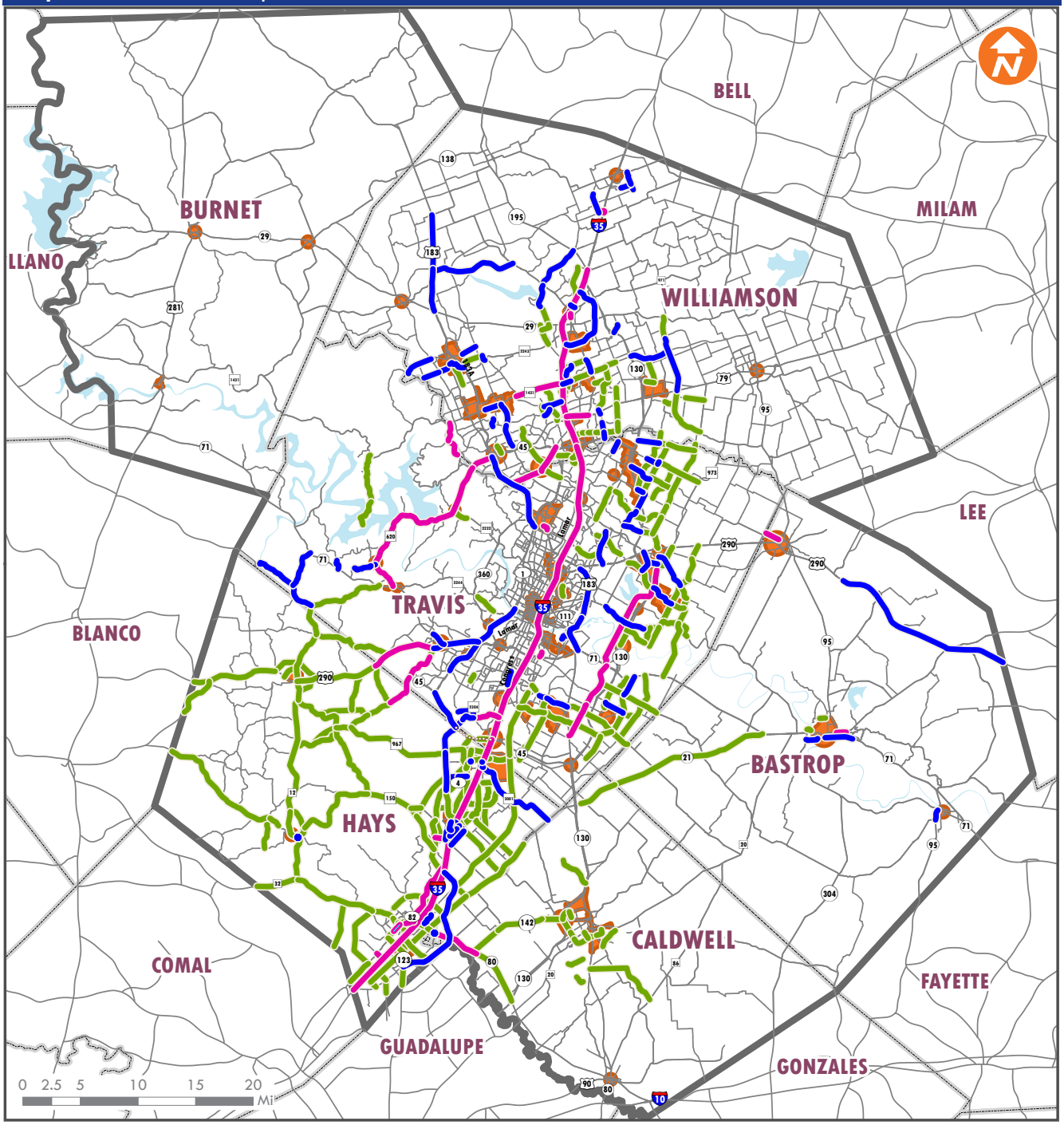
- Railroad
- River/Creek
- Lake/Pond/Reservoir
- County Boundary
- Buda City Limit
- Buda ETJ

N

CITY OF BUDA

Lockwood, Andrews & Newnam, Inc.
A LEO A DALY COMPANY

## **Map 14:** 2040 Road Projects with Centers




This map was developed by CAMPO for the purpose of aiding in regional transportation planning decisions and is not warranted for any other use. CAMPO makes no guarantee regarding its accuracy or completeness. If you would like to receive the GIS layers found on this map send your request to: campo@campotexas.org.
Data Source: CAMPO

Author: GSG
Document Path: H:\Maps\2040 Plan Maps\Revised Plan Maps\CAMPO 2040 Plan Road Projects with Centers.mxd

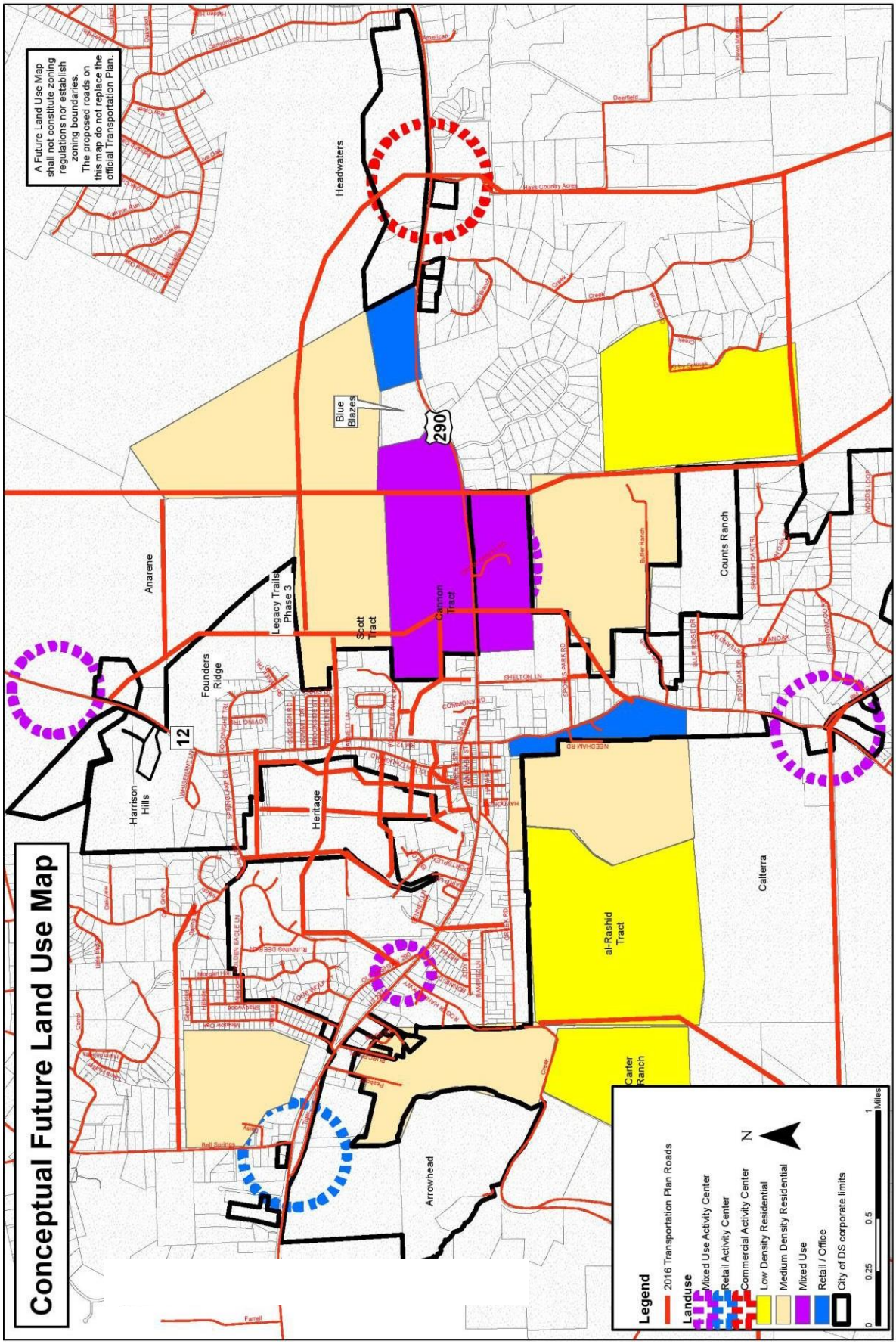



Figure 1: Conceptual Future Land Use Map

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

N
W E
S

**Active & Potential Development**

**City of DS corporate limits**

**Type_Annex**
- Full Purpose
- Limited Purpose

**Potential Subdivisions**

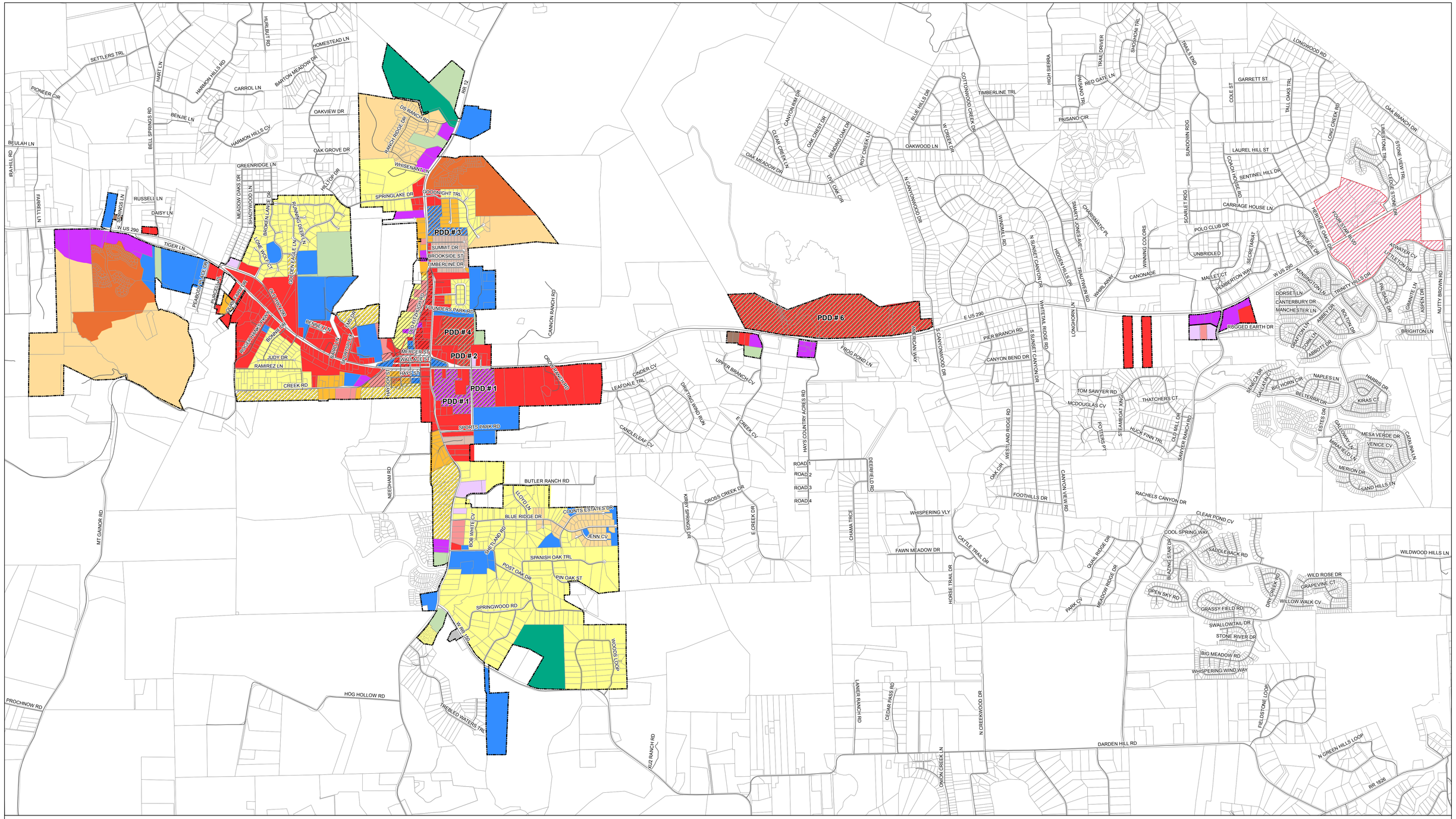
**Status**
- Approved - Concept Plan
- Approved - Development Agreement
- Approved - condo plat
- Future Potential
- Under Consideration - Development Agreement
- Under Consideration - Final Plat and Constr Plans
- Under Consideration - Revised Dev Agreement
- Under Construction - Homes
- Under Construction - Infrastructure

Bella Vista
Bonham Tract
Anarene
Anarene
Anarene
Anarene
Anarene
Needham tract
Scenic Greens
Harrison Hills
Founders Ridge
Merritt Hill Country Senior Apts
Legacy Trails, Phase 3
HC Carter 17 acres
Heritage tract (fka Baird)
Heritage tract (fka Davidson)
Scott tract
Twenty Six Doors
Arrowhead
Burrows
Meritage
Cannon tract
Blue Blazes
Headwaters @ Barton Creek
Saratoga Hills
Ledgestone
Ledgestone Senior Apts
Belterra Springs Apts
Belterra
al-Rashid tract (fka Slaughter tract)
Carter Ranch
Counts Ranch
Caliterra
Gardens of Howard Ranch
Howard Ranch
Garnett Ranch
Highpointe
Parten Tract
Reunion Ranch
Driftwood
Rim Rock
Rutherford Ranch

12
290
290
150
12
1826
967

0 0.5 1 2 3 4 5 Miles

| Name | Acres | Lots | Status |
|---|---|---|---|
| al-Rashid tract (fka Slaughter tract) | 454.64161221818 7 | TBD | Future Potential |
| Anarene | 224.96437791283 | Development Agreement (1600 homes) | Approved - Development Agreement |
| Anarene | 1279.15701020129 | Development Agreement | Approved - Development Agreement |
| Anarene | 136.75855420335 | Development Agreement | Approved - Development Agreement |
| Anarene | 34.088205413173 7 | Development Agreement | Approved - Development Agreement |
| Anarene | 17.641409762760 1 | Development Agreement | Approved - Development Agreement |
| Arrowhead | 363.93777587783 9 | 375 homes | Under Construction - Homes |
| Bella Vista | 155.69567771803 31 | 89 homes | Approved - Development Agreement |
| Belterra | 1536.52942677379 | 2000 permitted (500 left to build approx.) | Under Construction - Homes |
| Belterra Springs Apts | 9.5382968668036 1 | 150 units | Under Construction - Homes |
| Blue Blazes | 34.503327799558 7 | 30 homes - mixed use w / commercial | Approved - Development Agreement |
| Bonham Tract | 308.28451949667 5 | TBD | Future Potential |
| Burrow s | 15.845589264816 5 | 76 homes | Under Construction - Infrastructure |
| Caliterra | 563.38058860449 7 | 600 | Under Construction - Homes |
| Cannon tract | 296.25804650051 3 | TBD | Future Potential |
| Carter Ranch | 201.69541089994 6 | TBD | Future Potential |
| Counts Ranch | 152.20598461016 8 | 100 homes approx. | Under Construction - Homes |
| Driftw ood | 453.345767323862 | 150 homes | Under Construction - Infrastructure |
| Founders Ridge | 107.037580850213 | 204 | Under Construction - Infrastructure |
| Gardens of How ard Ranch | 8.5485146981593 1 | 35 | Approved - condo plat |
| Garnett Ranch | 150.70165862845 6 | 89 previously approved by preliminary plat | Future Potential |
| Harrison Hills | 156.79251879927 5 | 100 homes approximately | Under Construction - Homes |
| HC Carter 17 acres | 17.070792775987 6 | TBD | Future Potential |
| Headw aters @ Barton Creek | 1503.77826181254 | 1000 homes | Under Construction - Infrastructure |
| Heritage tract (fka Baird) | 83.429618566172 2 | In design (anticipated 600-800 homes) | Under Consideration - Development Agreement |
| Heritage tract (fka Davidson) | 102.437441215531 | In design | Under Consideration - Development Agreement |
| Highpointe | 740.15659889380 6 | 1029 (several phases already built) | Under Construction - Homes |
| How ard Ranch | 229.13631250596 8 | 150 | Under Construction - Homes |
| Ledgestone | 197.88143468441 6 | 242 | Under Construction - Homes |
| Ledgestone Senior Apts | 15.624499360190 1 | 160 units (Combination: Assisted / Independent) | Under Construction - Infrastructure |
| Legacy Trails, Phase 3 | 58.821380356568 6 | 54 homes | Under Construction - Infrastructure |
| Meritage | 28.048263170715 7 | PDD # 4 (130 homes) | Under Consideration - Final Plat and Constr Plans |
| Merritt Hill Country Senior Apts | 6.8391272790444 | In progress (80 apts) | Approved - Concept Plan |
| Needham tract | 107.478220741139 | TBD | Future Potential |
| Parten Tract | 508.63679804328 5 | 500+ homes | Under Consideration - Development Agreement |
| Reunion Ranch | 526.96479815694 2 | 524 homes | Under Construction - Homes |
| Rim Rock | 1229.353885581 99 | 675 | Under Construction - Homes |
| Rutherford Ranch | 858.75727192759 9 | 291 | Under Construction - Homes |
| Saratoga Hills | 347.97511572754 7 | 156 homes | Under Construction - Homes |
| Scenic Greens | 728.40385973928 1 | 918 per development agreement | Under Consideration - Revised Dev Agreement |
| Scott tract | 200.75554800651 6 | TBD | Future Potential |
| Tw enty Six Doors | 6.5745923477327 8 | 27 homes (13 duplexes, 1 SFR) | Approved - condo plat |




## Legend

- City Limits
- Limited Purpose
- Historic Overlay
- PDD Overlay
- AG
- PP
- SF-1
- SF-2
- SF-3
- SF-4
- SF-5
- MF
- MH
- O
- LR
- GR
- GUI
- CS
- LI
- Industrial

0 0.5 1 2 3 Miles

# City of Dripping Springs, Texas
# Official Zoning Map

**Map Updated January 2017**

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

N

W E

S

12

290

Bell Springs Road

Springlake Drive

Old 290

Roger Hanks Pkwy

Old Fitzhugh Road

Rob Shelton Blvd

290

Creek Road

Butler Ranch Rd

Blue Ridge Dr

Springwood Rd

150

12

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

**City of Dripping Springs**
**Official Transportation Map**
**Approved by City Council**
**March 4, 2014 (Resolution # 2014-14)**

- Existing Streets
- Corporate Limits
- Proposed Routes

# HAYS COUNTY TRANSPORTATION PLAN

## MAJOR THOROUGHFARE PLAN

*ADOPTED: JANUARY 22, 2013*
*AMENDED: MARCH 5, 2013*
*AMENDED: JUNE 25, 2013*
*AMENDED: APRIL 15, 2014*
*AMENDED: JULY 22, 2014*
*AMENDED: AUGUST 2, 2016*

## Legend

- Add Lanes
- Enhance to MAU 2
- New Facilities
- Interstate Highway 35

0 1 2 4 Miles

### Disclaimer

**The roads shown on this map represent general routes. Precise alignments will be established by the Hays County Engineer and the Development Services Department Director in accordance with the subdivision and development process.**

THIS MAP IS NOT OF SURVEY QUALITY.
NO GUARANTEE IS EXPRESSED
OR IMPLIED REGARDING ACCURACY
OR COMPLETENESS.

SOURCE: CAPCOG; HAYS COUNTY DEVELOPMENT SERVICES; PARSONS BRINKERHOFF

## The Districts of the Future Land Use Plan

Each district of the Future Land Use Plan was created to manifest land use in a consistent, yet unique manner, fostering a clearly recognizable sense of place. This sense of place in turn reinforces the meaning, and therefore community, established within the various areas of the City of Kyle.

The land use districts of the Future Land Use Plan are grouped into three general categories. These categories articulate the primary determinant of the nature of each district. This determinant guides and directs decisions made regarding form, function, boundaries, density, and acceptable uses within the given district. The districts of the Future Land Use Plan are categorized as:

- Landscapes preserve and promote environment
- Communities preserve and promote neighborhoods
- Nodes preserve and promote commercial development

## Future Land Use Plan Map Graphic

Figure 2 displays the 15 land use districts designed for Kyle, as well as the two corridor conditions. Each one of the Landscapes, Communities, and Nodes will be described in greater detail on the following pages. The Corridor Conditions are conceptually illustrated on the Land Use Plan graphic in Figure 2 as a series of hatched areas, marking land that directly interfaces with key roadways, including existing roadways and those identified by the Thoroughfare Plan element of this Comprehensive Plan document.

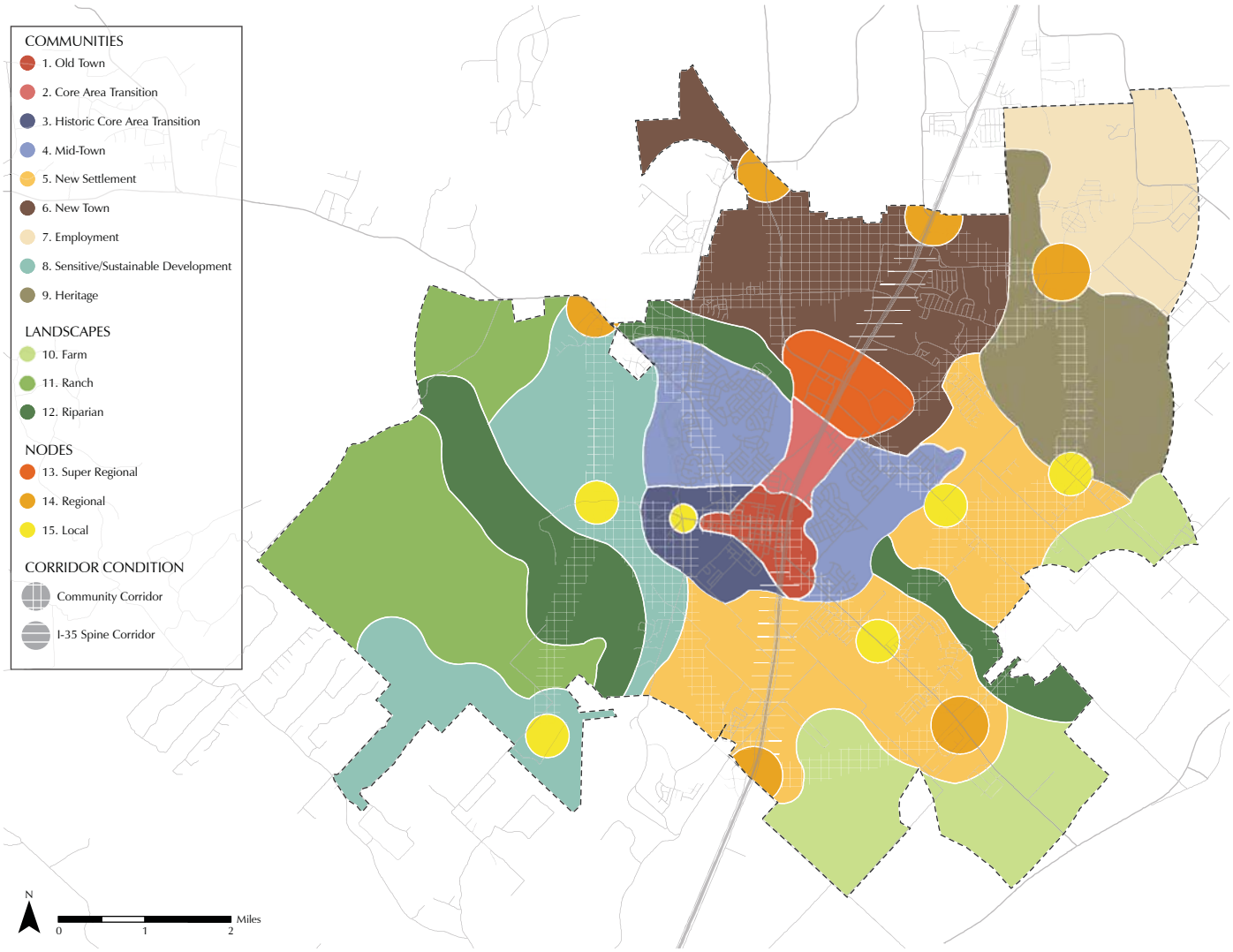



Figure 2: Kyle Future Land Use Plan.

## Zoning Categories

- R-1: Single Family
- R-1-1: Single Family Residential 1
- R-1-2: Single Family Residential 2
- R-1-A: Single Family Attached
- R-1-T: Residential Townhome
- R-2: Residential Two Family
- R-3-1: Multi-Family Residential 1
- R-3-2: Multi-Family Residential 2
- R-3-3: Apartments Residential 3
- M-2: Manufactured Home Subdivision
- M-3: Manufactured Home Park
- A: Agriculture
- PUD: Planned Unit Development
- CBD-1: Central Business District 1
- CBD-2: Central Business District 2
- R/S: Retail/Service
- CC: Community Commercial
- C-1: Commercial
- C-2: Commercial - General Business
- C/M: Construction/Manufacturing
- E: Entertainment
- HI: Heavy Industrial
- HS: Hospital Services
- T/U: Transportation/Utilities
- W: Warehouse

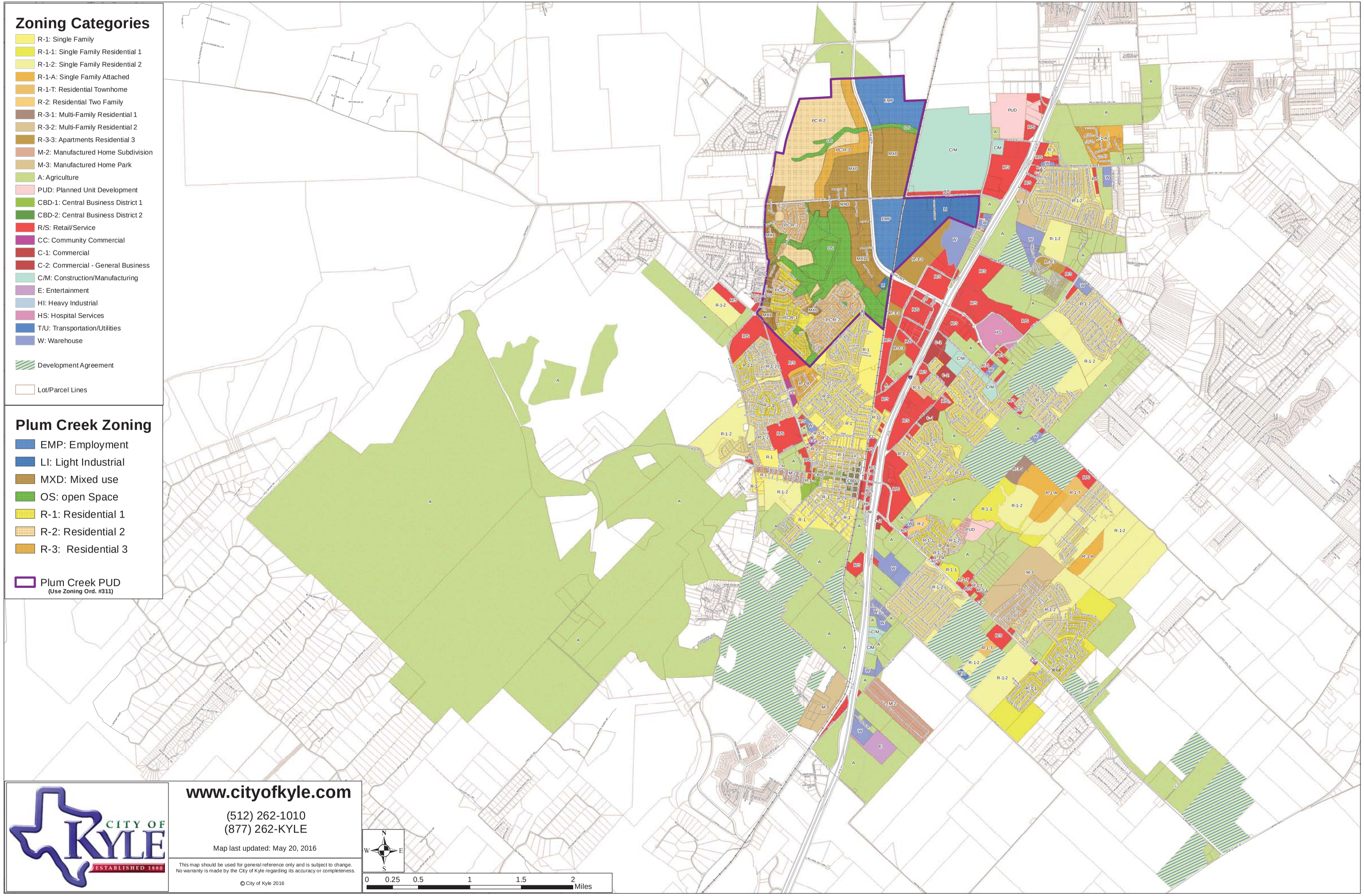
Development Agreement

Lot/Parcel Lines

## Plum Creek Zoning

- EMP: Employment
- LI: Light Industrial
- MXD: Mixed use
- OS: open Space
- R-1: Residential 1
- R-2: Residential 2
- R-3: Residential 3

Plum Creek PUD
(Use Zoning Ord. #311)




**www.cityofkyle.com**

(512) 262-1010
(877) 262-KYLE

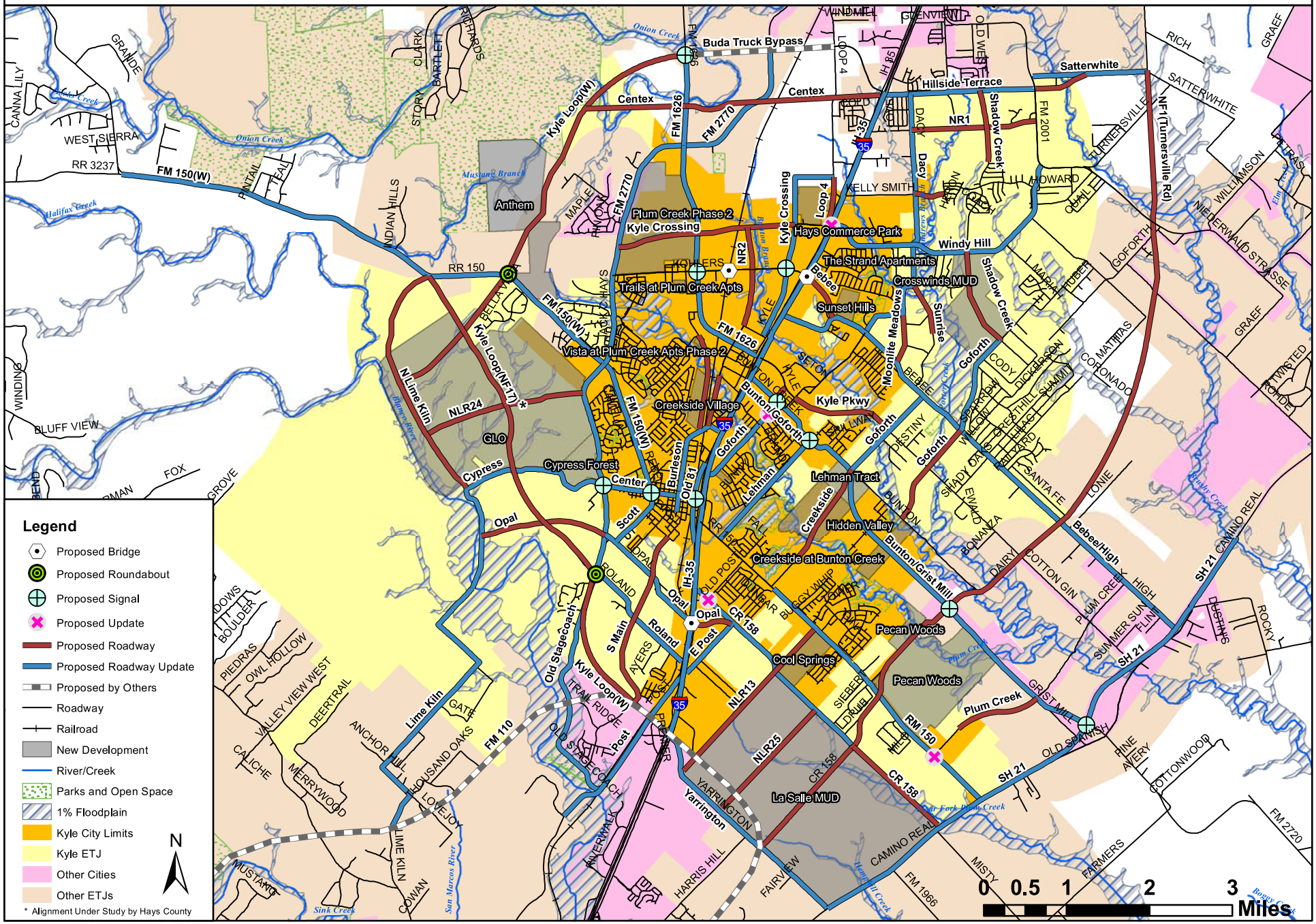
Map last updated: May 20, 2016

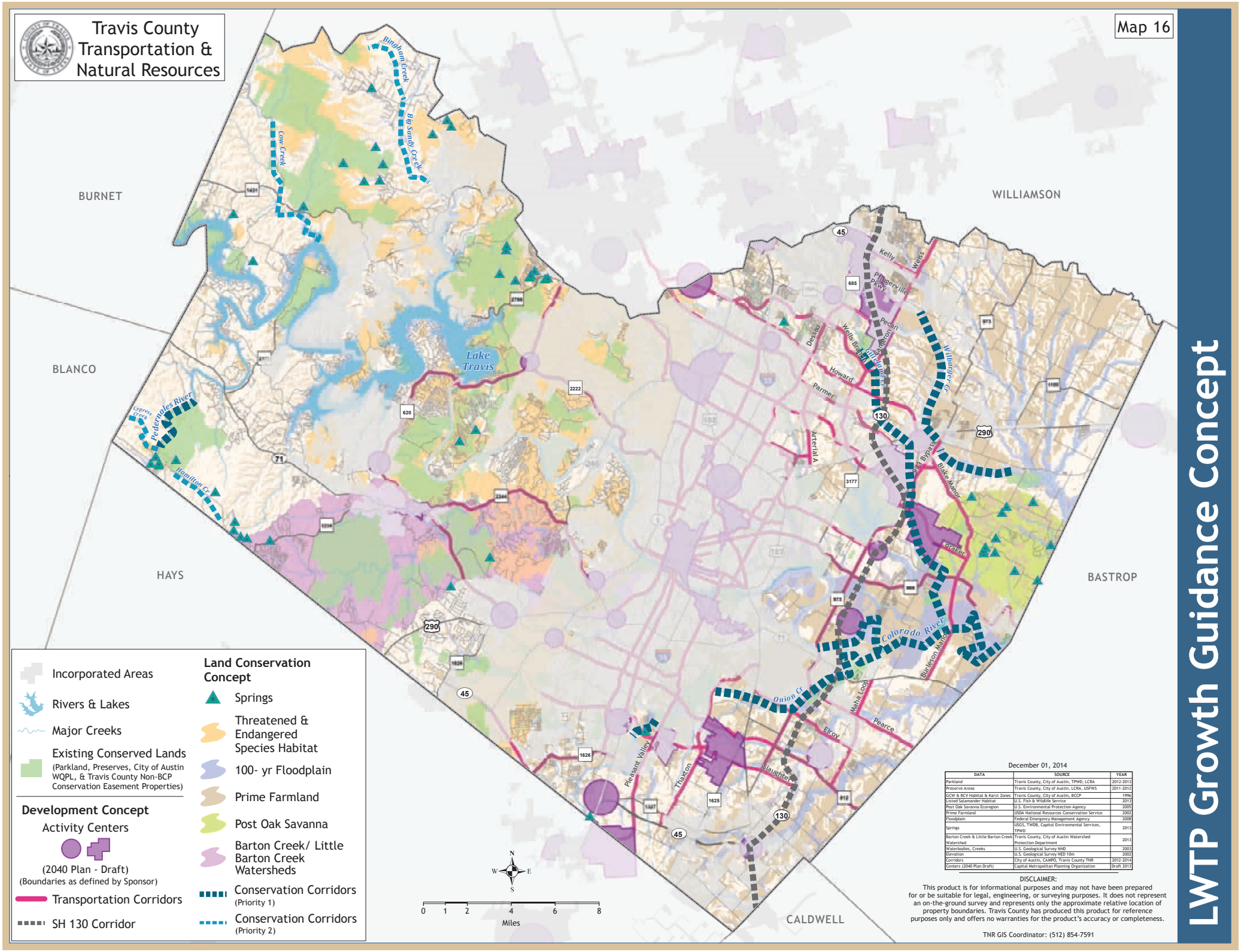


N W E S

0 0.25 0.5 1 1.5 2 Miles

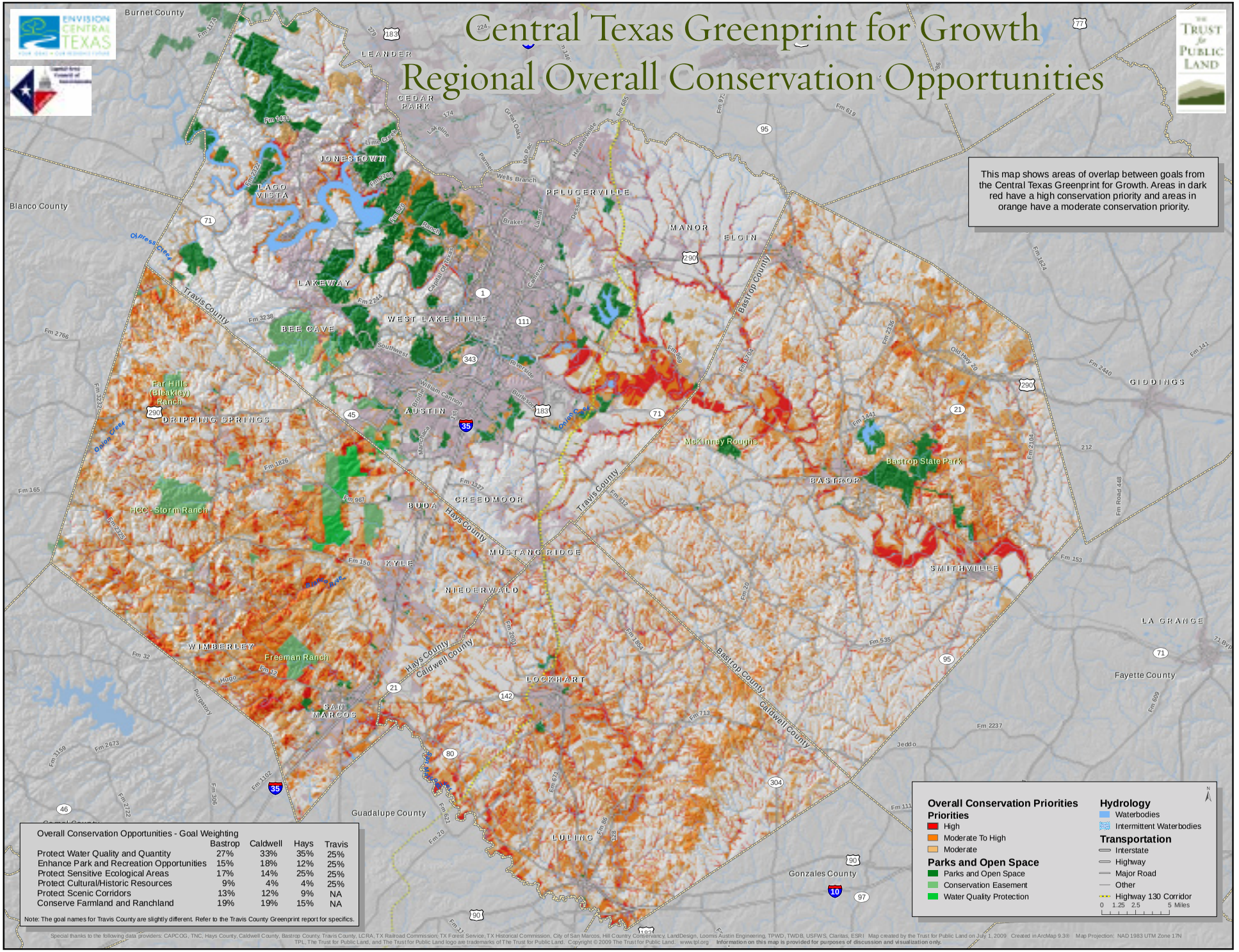
# Kyle Transportation Master Plan - 2045 Proposed Projects






| DATA | SOURCE | YEAR |
|---|---|---|
| Parkland | Travis County, City of Austin, TPWD, LCRA | 2012-2013 |
| Preserve Areas | Travis County, City of Austin, LCRA, USFWS | 2011-2012 |
| GCW & BCV Habitat & Karst Zones | Travis County, City of Austin, BCCP | 1996 |
| Listed Salamander Habitat | U.S. Fish & Wildlife Service | 2013 |
| Post Oak Savanna Ecoregion | U.S. Environmental Protection Agency | 2005 |
| Prime Farmland | USDA National Resources Conservation Service | 2002 |
| Floodplain | Federal Emergency Management Agency | 2008 |
| Springs | USGS, TWDB, Capitol Environmental Services, TPWD | 2013 |
| Barton Creek & Little Barton Creek Watershed | Travis County, City of Austin Watershed Protection Department | 2013 |
| Waterbodies, Creeks | U.S. Geological Survey NHD | 2003 |
| Elevation | U.S. Geological Survey NED 10m | 2002 |
| Corridors | City of Austin, CAMPO, Travis County TNR | 2012-2014 |
| Centers (2040 Plan Draft) | Capital Metropolitan Planning Organization | Draft 2013 |

# Central Texas Greenprint for Growth
# Regional Overall Conservation Opportunities




| Overall Conservation Opportunities - Goal Weighting | Bastrop | Caldwell | Hays | Travis |
|---|---|---|---|---|
| Protect Water Quality and Quantity | 27% | 33% | 35% | 25% |
| Enhance Park and Recreation Opportunities | 15% | 18% | 12% | 25% |
| Protect Sensitive Ecological Areas | 17% | 14% | 25% | 25% |
| Protect Cultural/Historic Resources | 9% | 4% | 4% | 25% |
| Protect Scenic Corridors | 13% | 12% | 9% | NA |
| Conserve Farmland and Ranchland | 19% | 19% | 15% | NA |

Note: The goal names for Travis County are slightly different. Refer to the Travis County Greenprint report for specifics.

Special thanks to the following data providers: CAPCOG, TNC, Hays County, Caldwell County, Bastrop County, Travis County, LCRA, TX Railroad Commission, TX Forest Service, TX Historical Commission, City of San Marcos, Hill Country Conservancy, LandDesign, Looms Austin Engineering, TPWD, TWDB, USFWS, Claritas, ESRI Map created by the Trust for Public Land on July 1, 2009 Created in ArcMap 9.3® Map Projection: NAD 1983 UTM Zone 17N

# Attachment D
# CAMPO 2040 Regional Tolling Analysis

# Regional Tolling Analysis
# for the
# Capital Area Metropolitan Planning Organization Region
# based on
# CAMPO's 2040 Regional Transportation Plan

**Prepared by:**


**Capital Area Metropolitan Planning Organization**

**June 2016**

## What is CAMPO?

The **Transportation Policy Board** is supported by policy development, technical advisory, and study committees, as well as a professional staff of 10.

CAMPO's offices are located in The City of Austin's One Texas Center Building at 505 Barton Springs Rd., Suite 700, Austin TX.

**Capital Area Metropolitan Planning Organization**
**P. O. Box 1088**
**Austin, Texas 78767-1088**
**(817) 640-3300**

The Capital Area Metropolitan Planning Organization (CAMPO) is the Metropolitan Planning Organization (MPO) for Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson Counties. MPOs are designated for areas having a population greater than 50,000 as identified by the U.S. Bureau of the Census. CAMPO was established in 1973 and is governed by the Transportation Policy Board (CAMPO Board), which comprises regional and local officials.

CAMPO approves the use of federal transportation funds within the region, and produces both the long-range Regional Transportation Plan (RTP) and the short-range Transportation Improvement Program (TIP). Project sponsors are responsible for design and implementation of projects.

CAMPO coordinates regional transportation planning with cities and counties; the Capital Metropolitan Transportation Authority (Capital Metro); the Capital Area Rural Transportation System (CARTS); the Central Texas Regional Mobility Authority (CTRMA); the Federal Highway Administration (FHWA); the Federal Transit Administration (FTA); the Texas Department of Transportation (TxDOT); and other transportation providers in the region.

This report was prepared in cooperation with the Texas Department of Transportation and the US Department of Transportation, Federal Highway Administration, and Federal Transit Administration.

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Commissioner Clara Beckett, Vice-Chair, Bastrop County
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***DISCLAIMER***

*The preparation of this report has been financed in part through grants from the Federal Highway Administration and Federal Transit Administration, US Department of Transportation, under the Metropolitan Planning Program [Section 104 (f) of Title 23, US Code]. The contents of this report do not necessarily reflect the official views or policy of the US Department of Transportation.*

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# 1.0 Introduction

The purpose of this document is to evaluate the effects of proposed expansion of the regional priced facility system in the CAMPO region based on the improvements included in *the CAMPO 2040 Regional Transportation Plan (RTP)*. The implementation of the regional priced facility system has the potential to affect land-use, air quality, and environmental justice (EJ) populations.

Potential effects from large, regional transportation projects are considered throughout the planning and development process from the long-range plan to construction. Assessing the impacts at the long-range, system-, and project-level planning provides a greater understanding of how a project may impact a community on a macro and micro level (see **Table 1**).

**Table 1 Levels of Analysis**

| Analysis | Metropolitan Transportation Plan (*CAMPO 2040 Regional Transportation Plan*) | Regional Tolled Facilities | National Environmental Policy Act (NEPA) |
|---|---|---|---|
| Scope | All projects proposed in CAMPO's 2040 Regional Transportation Plan on a regional level | All new tolled facilities proposed in CAMPO's 2040 Regional Transportation Plan on a regional level | Project/corridor specific analysis |
| Results | Impacts on regional mobility and accessibility of proposed projects | Regional impacts on communities with the addition of all tolled facilities | Localized impacts on a community due to the construction and operation of a project |

The following sections provide the context of the existing and planned transportation system, and assess the potential effects. The study area for this analysis is CAMPO's 6-county region which includes the counties of Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson.

# 2.0 Context of the Transportation System

This section discusses the process for developing the regional transportation system in the CAMPO area as a function of demographics, funding, and performance.

## 2.1 Regional Transportation Plan Development

The Capital Area Metropolitan Planning Organization (CAMPO) serves as the metropolitan planning organization (MPO) for transportation for the Central Texas Region, which include Metropolitan Austin. The Transportation Policy Board (TPB) is the policy body of the MPO and is comprised of elected officials and appointed staff representing the counties, municipalities, and transportation providers to include; the Capital Area Metropolitan Transit Authority (CMTA), and the Texas Department of Transportation (TxDOT). MPOs have the responsibility of developing and maintaining an RTP. The RTP is a federally mandated plan. CAMPO's RTP

must be updated every five years and has a 25-year planning horizon. It identifies transportation needs; guides federal, state, and local transportation expenditures; and is the basis for project specific studies. The RTP is developed in coordination with the public, local governments, transit authorities, TxDOT, CTRMA, Federal Highway Administration (FHWA), and Federal Transit Administration (FTA).

Federal transportation regulations require the RTP to be fiscally constrained; only projects that can be constructed under reasonable funding assumptions are contained in the multi-year plan. The CAMPO region is classified as a transportation management area (TMA) (population over 200,000) so the RTP must include a congestion management process (CMP) to address congestion.

The development of CAMPO's current 2040 Regional Transportation Plan was guided by the twelve goals listed in **Table 2**. The goals, adopted by the TPB as part of the RTP, represent CAMPO's regional commitment to a comprehensive, cooperative, and continuous transportation planning process for a balanced transportation system by recognizing the evolving transportation and air quality needs of the region. CAMPO's 2040 Regional Transportation Plan can be viewed at http://www.campotexas.org/plans-programs/campo-plan-2040.

**Table 1 CAMPO's 2040 RTP Planning Goals**

| Mobility | Quality of Life | System Sustainability | Implementation |
|---|---|---|---|
| Improve connectivity within and between the various transportation modes for goods and for people of all ages and abilities.<br><br>Improve the efficiency and performance of the transportation system.<br><br>Maintain and enhance mobility and access of goods and people within the region. | Ensure that the benefits and impacts of the transportation system are equitably distributed regardless of income, age, race, or ethnicity.<br><br>Maximize the economic competitiveness of the region.<br><br>Minimize negative impacts to environmental resources, reduce adverse noise impacts, and preserve neighborhood character.<br><br>Minimize air pollution and energy consumption related to the transportation system. | Ensure that the transportation system can be maintained and operated over time.<br><br>Increase the safety and security of the transportation system. | Maximize the affordability of the transportation system in both the near and long term.<br><br>Reduce project delays through the project development and delivery process and in the allocation of funds.<br><br>Support coordinated planning of land use and transportation, where applicable. |

Source: *CAMPO's 2040 Regional Transportation Plan*, May 2015

## CAMPO's 2040 Regional Transportation Plan - Regional Tolling Analysis

The *CAMPO 2040 Regional Transportation Plan* preferred scenario includes road and transit projects for which the region expects to receive funding between 2015 and 2040. The preferred scenario invests $4.85 billion in state and federal funds, including matching funds, to improve IH 35 and its supporting roads. CAMPO developed the preferred scenario based on data gathering and analysis, as well as on input from residents, local government agencies, regional partners and policy makers. The *2040 Plan* represents the region's shared goal of producing the most effective transportation system possible. Selection of road projects for state and federal funds followed an iterative process. First, the CAMPO Board selected IH 35 projects in Hays, Travis, and Williamson counties (at a cost of $4.25 billion). CAMPO then allocated the remaining $605 million of state and federal road funds based, in part, on a project's ability to relieve IH 35 traffic by improving other north-south routes and IH 35 connections, by improving safety or by relieving congestion on other roads. See the *CAMPO 2040 Regional Transportation Plan* for the complete list of road projects funded with state and federal dollars.

The preferred scenario includes projects from the following project lists:

- All Existing + Committed Projects;
- All Grouped Projects;
- All Rural Transit Projects; and,
- All 100 percent Locally Funded Projects.

Funding was not sufficient to include all the urban transit, regional, and sub-regional projects that jurisdictions submitted. The CAMPO Board approved a revised urban transit list, adjusted to meet fiscal constraints, for inclusion in the *2040 Plan*. The board also approved roads for state and federal funding. The *2040 Plan* shows the transportation supply the CAMPO region can expect to have by 2040. Managing the transportation system efficiently and reducing demand for the system are the remaining options for improved mobility.

**Table 3 CAMPO 2040 Plan Scenario Development**

| Project Lists | Description of Project Lists | Preferred Scenario |
|---|---|---|
| E+C (Existing + Committed) | Funding for projects expected to be built in the next five years has already been identified and it is very likely these projects will be built. | All E+C projects are included in the preferred scenario. |
| Grouped | Some types of projects do not need to be listed individually in the plan and these projects are funded from sources dedicated to these purposes. The different groupings are: safety, bridges, rehabilitation, and maintenance. | All Grouped projects are included in the preferred scenario. |
| Regional | These are road projects on limited-access highways (those without traffic signals) and | Selected Regional projects are included in the preferred |

| Project Lists | Description of Project Lists | Preferred Scenario |
|---|---|---|
| | other principal arterials. | scenario – see text for description. |
| Sub-Regional | These are road projects on other regionally significant roads. | Selected Sub-Regional projects are included in the preferred scenario – see text for description. |
| Urban Transit | These are transit projects eligible for federal urban transit funding. | Some Urban Transit projects were included in the preferred scenario |
| Rural Transit | These are transit projects eligible for federal rural transit funding. | All Rural Transit projects are included in the preferred scenario. |
| Locally Funded (100%) | These are projects that a sponsor plans on building solely with their local funds. | All 100 percent Locally Funded projects are included in the preferred scenario. |
| Illustrative | These are projects for which there is no funding and in some cases no sponsor. These projects have the potential to be amended into the fiscally constrained project list at a later date. | The Illustrative list is not included in the preferred scenario. Some Regional and Sub-Regional projects were moved to the Illustrative List after project selection for the preferred scenario. |

## 2.2 Population Forecast

The CAMPO region's population tripled between 1980 and 2010, growing from 585,000 residents in 1980 to 1,716,300 residents in 2010. All six counties experienced growth, with Travis and Williamson counties experiencing the largest increases in total population (see **Table 4** and **Figure 1**). Forecasts suggest the population will more than double by 2040. This growth reflects the region's reputation as a desirable place to live, and its history of fostering a robust economy. Rapid growth, and an unwillingness to expand the system during prolonged population growth, negatively affects the region's transportation system.

**Table 4 CAMPO 6 County Population Forecast**

| County | 2010 | 2020 | 2040 |
|---|---|---|---|
| **Bastrop** | **71,827** | **99,565** | **198,263** |
| **Burnet** | **41,680** | **52,058** | **72,618** |
| **Caldwell** | **34,644** | **46,110** | **74,582** |
| **Hays** | **149,950** | **250,630** | **621,291** |
| **Travis** | **1,001,490** | **1,250,211** | **1,709,791** |
| **Williamson** | **417,508** | **635,602** | **1,401,915** |
| **Total** | **1,717,099** | **2,334,176** | **4,078,460** |

**Sources:** **1. Texas State Data Center and Office of the State Demographer**
**2. US Census Bureau Population Projections**

## 2.3 Financial Forecast

Financial analysis is vital to plan development. Fiscal constraint is a federally required element of every long-range regional transportation plan. Plans may only include projects for which funding can reasonably be expected during the life of that plan. The financial analysis for the *CAMPO 2040 Plan* contains the most accurate and timely information available. It uses the TRENDS model, developed by the Texas A&M Transportation Institute (TTI), to determine estimated amounts of federal/state funding sources. All 25 Texas Metropolitan Planning Organizations (MPOs) are able to use this model. It allows each MPO the flexibility to analyze effects of future income scenarios. A subcommittee of the CAMPO Technical Advisory Committee used this model to produce the financial forecast for this plan. State and federal funding comes to CAMPO through TxDOT. Rule 16.53 of Title 43, Texas Administrative Code describes the state highway program's various funding categories. The TRENDS model provides analysis for four of those categories. CAMPO used TxDOT's 2014 Unified Transportation Plan for future funding estimates in the other categories.

In November 2014, Texas voters approved Proposition 1, an amendment to the Texas constitution that authorizes increased allocations for highway improvements. The amendment allows for the diversion of some general revenue from the economic stabilization fund (informally known as the Rainy Day Fund) into the state highway fund. The *2040 Plan's* budget includes estimates of the CAMPO region's share of those funds. Voters in several of CAMPO's member jurisdictions approved transportation funding bonds in 2014. Revenues that will become available because of those elections are included in the local funding portion of the *2040 Plan*. CAMPO used local entities' revenue estimates (when available) to develop local revenue projections. CAMPO estimated revenues for local entities when needed. According to these revenue estimates, available local resources appear sufficient to meet the requisite match for all anticipated federal funding sources requiring a local match. Projections from the TRENDS analysis and local revenue projections allow CAMPO to develop a financial forecast for regional transportation

funding through 2040. The estimated revenue from all sources to implement the plan is $35 billion.

### 2.4 2040 Plan Project Costs

Project sponsors usually provide project cost estimates. If sponsors did not submit costs, CAMPO calculated the costs for their road projects (except for limited-access highways) using a cost calculator developed by the City of Austin and Travis County. Staff assumed that costs were in 2015 dollars and estimated costs for the year of expenditure using a 4 percent annual rate of inflation. TxDOT and other member jurisdictions use the same rate (note that highways do not follow this process, as the sponsoring jurisdiction is required to provide all costs for highways). Estimated costs for the plan include: added capacity projects (all transportation modes); and, operations and maintenance. The forecast summary for the *2040 Plan* is in **Figure 2.**

### 2.5 Public Transportation

Public transportation includes all shared passenger services available to the public. It may be fixed-route via bus or train or demand response, which provides service via vans. Public transportation is funded through a variety of sources, including federal funds dedicated to urban and rural areas, and to types of riders, such as the elderly or people with disabilities. Additionally, state and local funds contribute to the public transportation system. In the CAMPO area, municipalities, counties, and portions of counties can dedicate a one-percent sales tax to Capital Metro for public transportation services. Public transportation is also funded by fares. Service providers charge fares based on the type of service provided. For example, express bus service, which tends to cover longer distances with fewer stops, typically has a higher fare than local bus service. Transit is largely funded by the local sales taxes that are collected within the given service area of the transit authority. **Table 5** provides a current funding sources summary for transit providers in the region and the cities within the service area. In addition to funding through a one cent dedicated sales tax.

**Table 5 Dedicated Transit Funding Sources**

| Agency | Type of Funding Source | Amount | Service Area Cities |
|---|---|---|---|
| Capital Metro | Sales tax | 1% | Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Volente, and portions of Travis County and Williamson County, including the Anderson Mill area. |

#### 2.5.1 Transit Providers in the Region

Public agencies, universities, and non-profit organizations provide public transportation service in the capital area.

##### 2.5.1.1 Urban Transit

The Capital Metropolitan Transportation Authority (Capital Metro) provides urban public

transportation services and complementary paratransit services within its service area. The Capital Metro service area comprises the following jurisdictions: Austin, Jonestown, Lago Vista, Leander, Manor, Point Venture, San Leanna, Volente, and portions of Travis and Williamson counties. These member jurisdictions voted to join Capital Metro, which operates the MetroBus, MetroExpress, MetroRapid, MetroRail, Night Owls, E-Bus, University of Texas Shuttles (for more information, see University Transit section), MetroAccess, MetroRideshare, and freight rail services. The City of Round Rock Demand Response Bus Service provides reservation-based services within the city limits and the extraterritorial jurisdiction of Round Rock.

#### 2.5.1.2 Rural Transit

The Capital Area Rural Transportation System (CARTS) provides fixed-route transit service to Bastrop and San Marcos on a contract basis. San Marcos Transit serves San Marcos and Martindale via twelve routes that operate from the central hub of San Marcos Station. CARTS also provides rural transit and paratransit services to rural areas within the CAMPO region. This rural/urban transit district operates the Interurban Coach, Country Bus, Metro Connector, Municipal Bus (Bastrop and San Marcos), Medical Transportation, and Commuter Route services. It provides additional connections to Blanco, Fayette, and Lee counties, as well as intercity services.

#### 2.5.1.3 University Transit

The University of Texas (UT) at Austin Shuttle System includes 10 routes providing circulator services around the central campus and express services to UT students, faculty, and staff from multiple locations in the city of Austin. The UT Shuttle system is jointly funded through a partnership between Capital Metro and the University of Texas. The Bobcat Shuttle System at Texas State University includes ten circulator routes from off-campus housing and remote parking locations in the City of San Marcos.

#### 2.5.1.4 Client-Based Transportation Providers

The region has 38 client-focused transportation providers. These organizations provide transportation services to various specific populations, such as clients of human service organizations, residents of particular communities, or specific demographic groups (such as the elderly or people with disabilities).

### 2.5.2 Other Modes Active Transportation: Bicycle and Pedestrian Network

Bicycling and walking are vital elements of a well-balanced transportation system. Non-motorized transportation modes can enrich the livability of a community, reduce congestion, improve mobility, improve physical health, and enhance the overall quality of life for residents.

Whether for an entire trip, or just a segment of it, "human-powered" modes are essential transportation, particularly for non-drivers. The 2009 National Household Travel Survey indicates nearly one in 20 households in the CAMPO region does not have a vehicle. The U.S. Census shows that the six-county CAMPO region had an increase of approximately 3,500 work trips by bicycle and 2,500 pedestrian work trips between 2000 and 2010. The active transportation system is made up of many elements provided by

a variety of sources. Local regulations may require developers to construct sidewalks. Bicycle infrastructure in the road right-of-way is provided by cities, counties, or the state. Off-road paths may be provided by cities, counties, or the state, and sometimes these paths are built by the developer of a large tract of land. In 2012, CAMPO staff inventoried bicycle and pedestrian transportation network facilities on the CAMPO modeled road network. This inventory, along with Census data and the American Community Survey, provides data regarding the CAMPO region's use of its bicycle and pedestrian infrastructure. The Central Texas Regional Mobility Authority is constructing bicycle- and pedestrian-friendly facilities as part of every project, whenever feasible. This includes the design and implementation of Shared Use Paths (SUP), sidewalks and cross-street connections.

## 3.0 Evaluating Alternative Future Scenarios

What will traffic conditions in 2040 be like? How can we best use our limited resources to improve conditions? These questions can be answered, to the extent possible, by comparing different "what if" scenarios. Scenario planning provides the opportunity to compare the outcomes and potential benefits of different investments in the future transportation system. CAMPO used its data-driven travel demand model to produce several potential scenarios for the CAMPO 2040 Regional Transportation Plan. We considered scenarios that included both road and public transportation projects, since some federal and state funds are allocated to specific transportation modes. CAMPO solicited projects from local governments and agencies (or "sponsors") to develop several scenarios for the future transportation system. Sponsors provided project information such as description, limits, cost, expected funding source, and estimated funding and opening date. Using this information, CAMPO staff and the CAMPO Technical Advisory Committee developed project lists for the scenarios. CAMPO assigned each project to at least one of the project lists.

### 3.1 Comparing Scenarios

CAMPO used the travel demand model to assess benchmark scenarios, alternative scenarios, and the preferred scenario. The alternative scenarios and the preferred scenario were compared to the benchmark scenarios to evaluate performance. There are two benchmark scenarios consisting of the existing transportation network plus committed projects (projects with committed funding that will be implemented by 2020). These benchmarks were run with either 2020 demographics (existing plus committed scenario) or 2040 demographics (no-build scenario). The benchmark scenarios indicate transportation system performance in 2020 and 2040 if no additional investment is made in the transportation system. CAMPO tested two alternative scenarios that were not fiscally constrained. The regional and sub-regional scenarios evaluate the effectiveness of different types of road and transit projects in addressing the region's overall mobility needs in 2040. Since these scenarios are not fiscally constrained, they are theoretical scenarios for evaluation purposes only. CAMPO included all of the submitted regional projects plus those transit projects that met the definition of regional projects, the committed projects, and 100 percent locally-funded projects in the regional scenario. All of the submitted sub-regional projects were included in the sub-regional scenario plus those transit projects that met the definition of sub-regional projects, the committed projects, and 100 percent

locally-funded projects. Sponsors submitted more sub-regional projects than regional projects. CAMPO ran both scenarios with 2040 demographics. Results indicate that both arterial street and highway improvements are needed, as well as regional and local transit service. Arterial street improvements may offer significant mobility improvement opportunities.

# 4.0 Transportation System Performance

Over the past 20 years, vehicle miles of travel (VMT) has continued to increase in the CAMPO region. Increased VMT is the result of several factors:

- Population and employment growth
- Increased automobile ownership
- Increased single-occupant vehicle travel
- Increased number and length of trips due to continued suburbanization

## 4.1 **Roads**

Roads are essential to the region's transportation system, providing for the movement of people and freight within and through the region. Different types of roads function differently. The primary function of highways and other limited access roads is mobility; these roads provide for the movement of people and freight for longer distances, while providing limited local access. The primary focus of arterials and other non-limited access roads is local accessibility. It is more difficult to move efficiently across the region on the non-limited access roads; it is more difficult to access local destinations on the limited access roads. An effective transportation system will have sufficient supply of all road types so that the system provides efficient mobility and accessibility. **Table 18** compares the 2010 road network to the proposed 2040 road network by road type, and details the daily vehicle miles traveled (VMT) for each road type.

## 4.2 **Forecasting Future Travel**

The existing transportation system described previously is used to assess current traffic congestion. CAMPO then forecasts future travel demand. Travel demand is the result of thousands of individual travelers making decisions on when, where, and how to travel every day. These decisions place varying levels of demand on the transportation system.

**Table 6** summarizes the roadway system performance for the existing 2010 system and proposed 2040 system. The numbers reflect a 57.9 percent increase in population and a 66.7 percent increase in employment. The projects listed in *CAMPO 2040 Regional Transportation Plan* result in a 55.0 percent increase in 2040 congestion levels when compared to 2010 levels.

**Figure 3** and **Figure 4** show congestion levels in 2010 and 2040 with *CAMPO 2040 Regional Transportation Plan* improvements.

**Table 6 Regional Performance Summary`**

| Performance Measure | 2010 | 2040 | 2040 FPNB |
|---|---|---|---|
| Population | 1,717,099 | 4,078,460 | 4,078,460 |
| Employment | 774,786 | 2,324,736 | 2,324,736 |
| Vehicle Miles of Travel per weekday | 44,224,994 | 98,298,080 | 97,888,087 |
| Daily Capacity (Miles) | 179,870,966 | 244,544,927 | 234,199,167 |
| Vehicle Hours Spent in Delay (Daily) | 146,339 | 1,095,135 | 1,254,744 |
| Percent Increase in Travel Time Due to Congestion | 16.90% | 55.90% | 63.90% |
| Annual Cost of Congestion (Millions) | $537.80 | $4,024.62 | $4,611.18 |

Source: *CAMPO 2040 Regional Transportation Plan, May 2015*

## 5.0 Planned Transportation Actions

The *CAMPO 2040 Regional Transportation Plan* is a blueprint for transportation improvements in the CAMPO region through 2040. **Figure 5** and **Figure 6** show the planned roadway (including tolled facilities) and passenger rail systems for the region in 2040. Priced facilities are defined as roadway facilities that charge a toll for some or all vehicles to use the facility, and include toll roads, and tolled managed lanes. **Table 7** shows a summary of the roadway and passenger rail system. Approximately 524 lane-miles of priced lanes would be added to the transportation system by 2040. In comparison, about 2,113 lane-miles of non-priced capacity would be added to the system with almost 10 percent of this new capacity being freeway mainlanes. The transit system (excluding bus service) would be expanded by almost 182 miles; a 286 percent increase.

**Table 7 CAMPO Roadway Facility Types**

| Roadway/Transit Facility Type | 2010 | 2040 | 2040 No Price Build | 2040 - 2010 Difference | 2040-2010 Percent Change | Percentage of Total Lane-Miles (2040) |
|---|---|---|---|---|---|---|
| Interstate | 514 | 534 | 534 | 20 | 4% | 4% |
| Freeways | 341 | 521 | 507 | 180 | 53% | 3% |
| Major Arterials | 4,558 | 6,450 | 6,464 | 1,892 | 42% | 43% |
| Minor Arterials | 3,846 | 3,599 | 3,599 | (247) | -6% | 24% |
| Collectors | 1,252 | 1,229 | 1,229 | (24) | -2% | 8% |
| Locals | 512 | 517 | 517 | 5 | 1% | 3% |
| Direct Connectors | 26 | 34 | 31 | 7 | 28% | 0% |
| Ramps | 116 | 128 | 128 | 12 | 10% | 1% |

| Roadway/Transit Facility Type | 2010 | 2040 | 2040 No Price Build | 2040 - 2010 Difference | 2040-2010 Percent Change | Percentage of Total Lane-Miles (2040) |
|---|---|---|---|---|---|---|
| Frontage Roads | 852 | 1,119 | 1,105 | 267 | 31% | 7% |
| **Total Non-Priced Lanes** | **12,016** | **14,129** | **14,113** | **2,113** | **18%** | **94%** |
| Toll Lanes | 346 | 596 | 576 | 250 | 72% | 4% |
| Toll Direct Connectors | 31 | 52 | 51 | 21 | 69% | 0% |
| Toll Ramps | 60 | 84 | 83 | 24 | 40% | 1% |
| Managed Lanes | - | 218 | 22 | 218 | 0% | 1% |
| Managed Lane Ramps | - | 11 | 2 | 11 | 0% | 0% |
| **Total Priced Lanes** | **436** | **961** | **734** | **524** | **120%** | **6%** |
| **Total All Lanes** | **12,452** | **15,090** | **14,847** | **2,637** | **21%** | **100%** |
| | | | | | | |
| Commuter Rail | 64 | 245 | 245 | 182 | 286% | 5.9% |
| PM 1 | - | - | - | - | 0% | 0.0% |
| PM 2 | - | - | - | - | 0% | 0.0% |
| Express Bus | 816 | 2,426 | 2,426 | 1,609 | 197% | 58.1% |
| Local Bus | 1,325 | 1,391 | 1,371 | 66 | 5% | 33.3% |
| UT Shuttle | 112 | 112 | 112 | - | 0% | 2.7% |
| **Transit Total** | **2,317** | 4,174 | **4,154** | **1,857** | **80%** | **100%** |

In a rapidly growing region that has limited resources available to improve the existing transportation system, planning efforts have shifted from expansion to maintaining and operationally enhancing the existing system. The total cost of implementing the transportation improvements in CAMPO 2040 Regional Transportation Plan is estimated at $35.1 million in year of expenditure (YOE) dollars. **Table 8** through **Table 13** show the costs by component and funding source included in the RTP.

**Table 8 CAMPO 2040 Regional Transportation Plan Cost Summary**

| Source | Amount |
|---|---|
| Local Funding | $11,770,000 |
| Federal / State | $8,663,000 |
| Local Transit Funding | $9,662,000 |
| Regional Funding | $5,010,000 |
| Total | **$35,105,000** |

**Table 9 FHWA / TxDOT / Proposition 1 Funding**

| FHWA/TxDOT/Proposition 1 | 2015-2024 | 2025-2030 | 2031-2040 | Total |
|---|---|---|---|---|
| Category 2-Metropolitan Area Corridor Projects | $325.40 | $83.50 | $275.70 | $684.60 |
| Category 7-Surface Transportation Program Metropolitan Mobility | $333.60 | $318.70 | $835.30 | $1,487.60 |
| Category 9 - Transportation Alternatives | $75.90 | $74.10 | $191.50 | $341.50 |
| Category 11 - District Discretionary | $42.30 | $40.10 | $105.20 | $187.60 |
| Other TxDOT Mobility Funding | $82.25 | - | - | $82.25 |
| TxDOT Preservation Funding | $678.13 | $420.28 | $700.46 | $1,798.87 |
| Proposition 1 | $1,000.00 | $600.00 | $1,000.00 | $2,600.00 |
| **Totals** | **$2,537.58** | **$1,536.68** | **$3,108.16** | **$7,182.42** |

**Table 10 Regional Funding Sources**

| Regional Funding Sources | 2015-2024 | 2025-2030 | 2031-2040 | Total |
|---|---|---|---|---|
| Central Texas Regional Mobility Authority | $1,631.15 | - | - | $1,631.15 |
| Lone Star Rail District | $1,467.06 | $636.63 | $1,061.06 | $3,164.75 |
| Regional Infrastructure Fund | $37.00 | $62.00 | $115.00 | $214.00 |
| **Totals** | **$3,135.21** | **$698.63** | **$1,176.06** | **$5,009.90** |

**Table 11 Federal Transit Funding**

| Federal Transit Funding | 2015-2024 | 2025-2030 | 2031-2040 | Total |
|---|---|---|---|---|
| Urban Transit (FTA 5307 & 5340) | $288.59 | $174.69 | $293.00 | $756.28 |
| Rural Transit (FTA 5311) | $41.69 | $34.40 | $87.70 | $163.79 |
| Elderly and Disabled Transit | $9.28 | $7.98 | $20.80 | $38.06 |
| Bus and Bus Facilities (FTA 5339) | $21.51 | $12.91 | $21.51 | $55.93 |
| New Starts (FTA 5309) | $389.25 | $27.18 | $49.89 | $466.32 |
| **Totals** | **$750.32** | **$257.16** | **$472.90** | **$1,480.38** |

**Table 12 Local Transit Funding**

| Local Transit Funding | 2015-2024 | 2025-2030 | 2031-2040 | Total |
|---|---|---|---|---|
| MTA Sales Tax | $2,339.14 | $1,985.63 | $4,005.62 | $8,330.39 |
| CMTA Fares and Other Income | $349.59 | $239.23 | $428.56 | $1,017.39 |
| CARTS Fares and Other Income | $104.55 | $75.00 | $135.00 | $314.55 |
| **Totals** | **$2,793.28** | **$2,299.86** | **$4,569.18** | **$9,662.33** |

**Table 13 Local Funding**

| Local Funding | 2015-2024 | 2025-2030 | 2031-2040 | Total |
|---|---|---|---|---|
| City of Austin | $905.00 | $726.00 | $1,210.00 | $2,841.00 |
| City of Round Rock | $164.00 | $98.40 | $164.00 | $426.40 |
| Bastrop County | $73.46 | $44.08 | $73.46 | $191.00 |
| Burnet County | $42.40 | $25.50 | $42.40 | $110.30 |
| Caldwell County | $61.30 | $50.10 | $89.10 | $200.50 |
| Hays County | $364.57 | $338.44 | $589.07 | $1,292.08 |
| Travis County | $589.14 | $442.26 | $963.09 | $1,994.49 |
| Williamson County | $1,050.00 | $650.00 | $1,050.00 | $2,750.00 |
| Other local funding | $787.60 | $453.94 | $722.79 | $1,964.33 |
| **Totals** | **$4,037.47** | **$2,828.71** | **$4,903.91** | **$11,770.09** |

Source: *CAMPO 2040 Regional Transportation Plan*, May 2015

## 5.1 Roadway System

For the roadway system, the 2010 transportation network for the CAMPO region (calculated in lane-miles) consists of 12,452 lane-miles of roadways with freeway and tollway lanes comprising 10.0 percent of the system (see **Table 7**). Of the total 2010 system, the freeway lanes account for 855 of the lane-miles (7.1 percent) and 346 of the lane-miles are tolled (approximately 2.8 percent). The anticipated 2040 transportation network for CAMPO would consist of approximately 15,090 lane-miles of roadways with freeway, tollway, and tolled managed lanes comprising 0.06 percent of the system. Of the total system in 2040, the freeway lanes account for 1,054 of the lane-miles (7.5 percent) and tolled facilities (toll roads, express, and tolled managed lanes) account for approximately 961 additional lane-miles or 6.4 percent (see **Figure 7**).

Priced facilities are divided into three categories in *CAMPO 2040 RTP*: tollways, express lanes, (see section 6.1 ) and tolled managed lanes. Traditional tollways, such as SH 130, operate on a fixed schedule and fixed rate toll rate. Any roadway user will pay a set fixed rate that does not change by time of day or occupancy. Tolled managed lanes, such as the MoPac Improvement Project, are separate lanes within a highway where the toll rate changes throughout the day based on congestion. **Table 14** details the comparison of the different tolled facilities that would be in use during the region to 2040.

**Table 14 Priced Facility Variations**

| Priced Facility Variation | Schedule | Price | Speed Targets | Examples |
|---|---|---|---|---|
| Tollway | Fixed | Fixed | None | US 183A, Loop 1, SH 130, SH 45 N, and SH 45 SE |
| Express | Dynamic | Fixed | | Future US 290 (Manor Expressway), SH 71 Express Project |
| Tolled Managed | Dynamic | Volume Based | None | MoPac Improvement Project |

**Table 15** and **Figure 5** and **Figure 7** show the major planned roadway projects included in the CAMPO 2040 Regional Transportation Plan. For tolled facilities, the type of tolling (fixed versus dynamic) is also noted.

**Table 15 Planned Projects on Major Roadways**

| # | Location | County | Limits | Type of Improvement | Type of Tolling |
|---|---|---|---|---|---|
| 1 | IH-35 - Hays County | Hays | SH 45 SE -Posey Rd | IH-35 Improvement Projects | None |
| 2 | IH-35 - Travis County | Travis | SH 45 N - SH 45 SE | IH-35 Improvement Projects | None |
| 3 | IH-35 - Williamson County | Williamson | SH 45 N - SH 195 N | IH-35 Improvement Projects | None |

| # | Location | County | Limits | Type of Improvement | Type of Tolling |
|---|---|---|---|---|---|
| 4 | US 183 N | Travis | Loop 1 N - RM 620 | 2 Express Lanes in each direction | None |
| 5 | US 183 S | Travis | Boggy Creek - SH 71 | Completion of environmental document, traffic and revenue studies, final engineering, ROW acquisition, utility relocation and construction for 6 tolled mainlanes and 4 to 6 continuous, non-tolled access road lanes and operational improvements on SH 71. | Fixed |
| 6 | US 183 S | Travis | US 290 - Boggy Creek | Completion of environmental document, traffic and revenue studies, final engineering, ROW acquisition, utility relocation and construction for 6 tolled mainlanes and 4 to 6 continuous, non-tolled access road lanes, project may be phased. | Fixed |
| 7 | US 290 E Hurricane Evacuation Route | Bastrop | 1 mile east of FM 696 - Lee County Line | Reconstruct existing 4-lane undivided rural principal arterial to a 4 lane divided rural principal arterial. | None |
| 8 | US 290 W | Travis | RM 1826 - Nutty Brown Rd | Widen to MAD-6 | None |
| 9 | US 290 W | Travis | West of RM 1826 - Loop 1 | Construct 6-lane tolled facility with frontage roads | Fixed |
| 10 | US 79 | Williamson | IH-35 - A. W. Grimes Boulevard | Reconstruct to a 6 lane divided roadway with sidewalks | None |
| 11 | SH 45 SW | Hays / Travis | Loop 1 S - FM 1626 | Construction of a 4-lane tolled freeway (Project may be phased; shared use path where feasible | Fixed |
| 12 | SH 71 | Bastrop | west of Colorado River - east of Loop 150 E | Construct 4-lane freeway with 3-lane frontage roads | None |

| # | Location | County | Limits | Type of Improvement | Type of Tolling |
|---|---|---|---|---|---|
| 13 | SH 71 W | Travis | Silvermine Dr. to US 290 | Construct tolled lanes and frontage road | Fixed |
| 14 | SH 80 | Caldwell | County Line Road - FM 1979 | Widen to 6 lanes with raised median | None |
| 15 | SH 80 at Old Bastrop Hwy (CR 266) | Hays | east of Old Bastrop Hwy (CR 266) - east of Old Bastrop Hwy (CR 266) | Construct center left-turn lanes | None |
| 16 | SH 95 | Bastrop | Loop 230 - Smithville High School | Add continuous turn lane and sidewalks (both sides) | None |
| 17 | SH 95 | Bastrop | Smithville High School - Loop 230 at Fawcett Street | Construct recommendations from the in-progress SH 95 study. Improvements could include sidewalks, shoulders, turn lanes and drainage improvements | None |
| 18 | FM 1100 | Bastrop | Travis County Line - SH 95 | Construct MAD-4 | None |
| 19 | FM 1626 | Hays | 0.2 miles south of Brodie Ln to FM 967 | Widen to 4-lane divided | None |
| 20 | FM 1626 | Hays | FM 967 - FM 2770 | MAD-4 | None |
| 21 | FM 1626 | Travis | IH-35 - Manchaca Road | Widen to MAD-4 | None |
| 22 | FM 1626 | Travis | Manchaca Rd - 0.2 miles south of Brodie Ln | Improve to MAD-4 | None |
| 23 | FM 1660 Realignment | Williamson | 800' south of CR 101 - US 79 | Construct new location 2-lane roadway | None |
| 24 | FM 2304 (Manchaca Rd) | Travis | FM 1626 - Ravenscroft Drive | Improve to MAD-4 | None |
| 25 | FM 969 | Travis | FM 3177 - Hunters Bend | Improve to MAD-4 | None |
| 26 | FM 973 | Travis | FM 812 - US 183 | Widen to MAD-4 | None |
| 27 | FM 973 | Travis | FM 973 Relocation - SH 71 E | Widen to MAD-4 | None |
| 28 | FM 973 | Travis | SH 71 E - FM 812 | Widen to MAD-4 | None |
| 29 | Loop 1 | Travis | Cesar Chavez - Slaughter | 2 Express Lanes in each direction - MoPac South | Dynamic |
| 30 | RM 12 and FM 3237 Intersection Improvement | Hays | RM 12 - north and south of FM 3237 - FM 3237 - east of RM 12 | Engineering, design and right-of-way purchase to add turn lanes and pedestrian crossings | None |
| 31 | RM 1431 | Williamson | Sam Bass - IH-35 | Reconstruct and widen to 6 lane divided | None |

| # | Location | County | Limits | Type of Improvement | Type of Tolling |
|---|---|---|---|---|---|
| 32 | RM 1431 / Whitestone Blvd Reconstruction and Widening | Williamson | Cottonwood Creek Trail - Market Street | Reconstruct and widen to a six lane arterial roadway with a raised center median, turn lanes, wide outer lanes and shared use path. The project will also reconstruct and elevate the Spanish Oak Creek bridge | None |
| 33 | RM 1826* | Hays | SH 45 SW - Nutty Brown Rd | Improve to MAD-4 | None |
| 34 | RM 1826* | Travis | Slaughter Lane - SH 45 SW | Improve to MAD-4 | None |
| 35 | RM 620 | Travis | Anderson Mill Rd. - SH 71 W | Widen to MAD-6 | None |
| 36 | RM 620 | Williamson | Pecan Park Blvd - Anderson Mill Road | Improve to MAD-6 | None |

Source: CAMPO 2040 Regional Transportation Plan May 2015

Tolled managed lanes are proposed as part of the expansion or rehabilitation of 36 existing non-priced roadway projects. Drivers will have the choice of paying a toll to use the tolled managed lanes or traveling on non-priced general purpose lanes or frontage roads. The tolls collected from the tolled managed lanes will help finance the expansion/rehabilitation and operation of existing roadways (including tolled facilities).

In addition to the major roadway improvements, *CAMPO 2040 Regional Transportation Plan* identifies smaller, regionally significant roadway that include major improvements (additions of lanes or new roadways) throughout the plan years. These improvements do not include any tolled facilities and do not include any type of tolling element. **Table 16** lists these improvements.

**Table 16 Planned Projects on Regional Arterials**

| # | Location | County | Limits | Type of Improvement |
|---|---|---|---|---|
| 1 | A.W. Grimes Blvd | Williamson | Westinghouse Road - University Boulevard | Reconstruct to a MAD-4 with sidewalks |
| 2 | Anderson Mill Rd | Travis / Williamson | RM 1431 - Lime Creek Rd | Improve roadway to MAD-4 |
| 3 | Anderson Mill Rd | Travis / Williamson | Zeppelin Drive - Cypress Creek Rd | Widen to MAD-4 |
| 4 | Arterial A | Travis | US 290 - Samsung Blvd | New MAD-4, new alignment |

| # | Location | County | Limits | Type of Improvement |
|---|---|---|---|---|
| 5 | Arterial A (Kenny Fort Blvd) | Williamson | Joe DiMaggio Blvd - 1000' S of US 79 | Widen from 2 lanes with median to 6 lanes with median |
| 6 | Center St | Hays | Old Stagecoach - FM 150 | Widen to 4 lanes |
| 7 | Congress Ave | Travis | North Bluff Dr - South Boggy Creek | Improve to MAD-4 |
| 8 | Frate Barker Rd | Travis | Brodie Ln - Manchaca Rd | Widen to MAD-4 |
| 9 | McCarty Ln / CR 233 | Hays | FM 2439/Hunter Rd - IH 35 | Improve to MAD-4 |
| 10 | McNeil Dr | Travis | US 183 - Howard Ln | Widen to 6 lanes |
| 11 | McNeil Rd | Travis | 700' north of SH 45 - McNeil Dr/Howard Ln | Improve to MAD-6 |
| 12 | Old FM 2001 | Hays | FM 2001 - Old Goforth Rd. | Reconstruct with TWLTL and sidewalks |
| 13 | Old Settlers Boulevard | Williamson | Sam Bass Road - Chisholm Trail Road | Widen to a MAD-4 with sidewalks |
| 14 | Pleasant Valley Rd | Travis | Existing Pleasant Valley Rd - SH 71 | New MAD-4 |
| 15 | Post Rd / CR 140 | Hays | IH-35 - Aquarena Springs Rd | Improve to MAU-4 |
| 16 | Robert Light Blvd | Hays | FM 1626 - FM 2770 | New 4-lane divided |
| 17 | Robert Light Blvd | Hays | FM 2770 - Main St/FM 967 | New 4-lane divided with railroad overpass |
| 18 | Ronald Reagan Blvd | Williamson | at IH-35 | Construct new 6-lane Overpass |
| 19 | Rundberg Ln | Travis | FM 1325 - Metric Blvd | New MAD-2 |
| 20 | Wild Horse Connector | Travis | FM 973 - Parmer LN | New MAD-4 |

Source: CAMPO 2040 Regional Transportation Plan, May 2015,

# 6.0 Dynamic Tolling

The Central Texas Regional Mobility Authority (CTRMA) is constructing the CAMPO region's first managed lanes that will use dynamic toll pricing as part of the MoPac North Improvement Project. Tolls will vary to ensure at least a free flow. Toll rates rise if the lane becomes overcrowded and drop when it is clear. Researchers at the University of Texas at Austin Center for Transportation Research (CTR) propose Credit-Based Congestion Pricing. Vehicles would have windshield stickers (TX Tags or a compatible device) loaded with a monthly travel allowance. Tolls would be variable, congestion-based, and deducted from the allowance amount. If a vehicle's travel along congested toll roads exceeds its allowance amount, the account receives a bill for the overage. Tolled managed lanes are separate lanes within a highway that charge a toll but the cost varies based on time-of-day, vehicle occupancy, or other operational strategies. This type of pricing is also called value, congestion, or dynamic pricing. This pricing strategy establishes higher rates during the peak periods and lower rates during off-peak travel times. Peak toll rates would be set to maintain a free flow of traffic, thus offering motorists a reliable and congestion-free trip in exchange for the higher peak toll. This can encourage the use of toll facilities more during off-peak periods. These effects are anticipated to help manage congestion and improve regional air quality. Transit vehicles and certain other exempt vehicles (e.g., emergency response vehicles) would not be charged a toll, which would allow riders and users to take advantage of the reliability and predictability of tolled managed lanes. This can be an incentive to facilitate increased transit usage. Commuters who travel on the tolled managed lanes will be able to benefit from faster and more reliable travel times through the use of value pricing.

## 6.1 What Are Express Lanes?

Express Lanes are special lanes that will be separated from the three existing non-tolled lanes by special striping and white plastic sticks. Express Lanes provide public transit buses, registered van pools, and emergency vehicles with a reliable, uncongested, non-stop, toll free route to their destination. Because public transit buses, registered vanpools and emergency vehicles will not use up all of the space in the Express Lanes, individual drivers will be permitted to use the lane if they choose to. To keep the Express Lanes from becoming congested, individual drivers are charged a dynamic toll that increases when traffic is heavy and goes down when traffic is light. The primary goal is not to generate revenue, but to keep the Express Lane free flowing as much as possible. The MoPac Express Lanes will encourage people to carpool because they have the option to split the cost of the trip among each occupant in the vehicle. The Express Lanes are not intended for everyday use. There will not be enough capacity to accommodate everyone who might want to use them. Individual drivers will have to decide whether any particular trip is worth the toll being charged at the time they wish to use the Express Lanes. Please see the Access Points page found on the MoPac Improvement Project website (*http://www.mopacexpress.com/express-lanes/access-points.php*) to see how and where you can access the Express Lanes after they are constructed.

### 6.1.1 Focus on Public Transit

Right now, Express Buses and vanpools sit in traffic with all other vehicles on MoPac, but with the construction of the Express Lanes, these transit vehicles will be able to bypass congestion and get to their destination reliably on time.

### 6.1.2 Moving More People, Not Just Vehicles

- Opportunity for expanded Capital Metro Premium Express Bus service
- Incentive for greater participation in Capital Metro's Ride Share vanpool program

- See more at: *http://www.mopacexpress.com/express-lanes/index.php*

## 7.0 Public Transportation

Public transportation, and especially high-capacity public transportation, can move more people in a traffic-lane sized area than can individual cars. High-capacity transit is designed to move more people than a typical bus. This is generally accomplished by fewer stops, higher speeds, and more frequent service. Capital Metro and the City of Austin are exploring options for high-capacity transit in the capital area.

### 7.1 Expanded Transit Service

*Service Plan 2020* is a comprehensive analysis of the entire Capital Metro bus system and provides a roadmap for growth between 2010 and 2020. *Service Plan 2020* guides the agency's actions to meet the current and projected transit needs through new and revised local bus routes, new MetroExpress bus routes and park-and-ride facilities, and a new frequent route network including MetroRapid. *Service Plan 2020* recommendations also seek to improve the transit system in the following ways: design bus services to better meet the needs of the region; increase transit ridership to mitigate traffic congestion and improve air quality; and increase cost effectiveness of bus operations. Capital Metro has a policy to update its Service Plan every five years to respond to growth, changing demographics, and transit market demands. A new Service Plan will be developed in 2015 to address these changes, including the recent additions of MetroRail and MetroRapid. The new Service Plan will also incorporate elements of the P*roject Connect Long Range Transit Plan* that fall within the agency's designated service area.

Capital Metro is working to extend transit services to cities in the capital area that do not dedicate sales tax money to support the system. Through their Service Expansion Policy, adopted in 2014, Capital Metro defines five approaches for service to jurisdictions within the Austin urbanized area that are not currently members of Capital Metro. These options are:

1. Join Capital Metro: A municipality, county, or portion of a county may hold a vote to join Capital Metro and support it with a 1 percent sales tax;
2. Contract for Service: A jurisdiction may enter into a contract with Capital Metro to receive transit services;
3. Form a Local Government Corporation (LGC): A jurisdiction or group of jurisdictions, and Capital Metro may form an LGC for the purpose of overseeing transit initiatives;
4. Become an FTA Sub-Recipient: A jurisdiction can contract directly with a service provider and funnel Federal Transit Administration (FTA) funding reimbursement requests through

Capital Metro; or,

5. Become a Direct Recipient: A qualifying jurisdiction may receive federal funds directly.

Transit improvements included in this plan, such as the implementation of express bus service to Jarrell, Liberty Hill, and Wimberley, will provide new public transportation connections to Centers throughout the CAMPO area. Upgrades to existing service in the densest part of the area will increase capacity for travel via public transportation. Planned Bus Rapid Transit (BRT) projects will improve reliability and travel time for patrons. A complete list of planned projects can be found in Chapter Five.

### 7.1.1 Project Connect

Project Connect is the proposed high-capacity transit system plan for central areas of the CAMPO region. The Transit Working Group, a committee of the CAMPO Transportation Policy Board, worked with regional partners both inside and beyond the Capital Metro service area to develop a long-range vision for Regional Rail, Commuter Rail, Urban Rail, Bus Rapid Transit, and Bus on Express Lanes. It will take a variety of jurisdictions and service providers to implement Project Connect. Several projects developed through Project Connect are included in the *2040 Plan* and outlined in Chapter Five. Additional information can be found online at *ProjectConnect.com*.

## 8.0 Management and Operations

CAMPO's prioritization process looks at improving operations and removing trips from the system without significant capital investment. The regional CMP incorporates several strategies to help address congestion:

1. **Active Transportation** – Also known as bicycle and pedestrian, these modes offer additional transportation options to improve our existing transportation system efficiency and cost effectiveness through a variety of systematic enhancements, while providing benefits to all road and transit users. *CAMPO 2040 Regional Transportation Plan* has identified approximately $1.5 billion of potential funding for bicycle and pedestrian improvements. Some examples of this are, the regional veloweb system would be expanded from the existing 237 miles to 1,728 miles by 2040. Also the Central Texas Regional Mobility Authority is constructing bicycle- and pedestrian-friendly facilities as part of every project, whenever feasible. This includes the design and implementation of Shared Use Paths (SUP), sidewalks and cross-street connections. To date, on projects currently open to traffic (183A and US 290 - Manor Expressway), the Mobility Authority investment in bicycle and pedestrian accommodations totals $11 million. $31 million more is invested in projects under construction (MoPac and 183S). Additional investments are planned for projects currently under environmental study (MoPac South, Oak Hill Parkway, and 183 North).
2. **Travel Demand Management (TDM)** – TDM promotes strategies that reduce the demand for drive-alone travel on roadways thus allowing traffic to move more efficiently. Examples of strategies include rail and bus transit, ridesharing options like carpools and vanpools, and bicycling, which reduce the demand on the roadway capacity. *CAMPO 2040 Regional Transportation Plan* includes $507 million for TDM strategies.

3. **Transportation System Management (TSM)** – Some examples of system management and operation improvements include traffic signal enhancements, removal of freeway and arterial bottlenecks, and ITS deployment. *CAMPO 2040 Regional Transportation Plan* includes $1.7 billion for non-ITS TSM strategies.
4. **ITS** – ITS, a subset of TSM, integrates advanced communications technologies into transportation infrastructure and in vehicles to improve travel conditions on the transportation system. *CAMPO 2040 Regional Transportation Plan* estimates the capital costs for regional ITS implementation at $383 million with an annual operating cost of $39 million at full system implementation.
5. **Transportation safety and security** – *CAMPO 2040 Regional Transportation Plan* includes various regional safety programs to help improve reliability, efficiency, and maintenance of the transportation system. *CAMPO 2040 Regional Transportation Plan* includes $405.7 million for safety and security strategies.

## 8.1 Regional toll system effects

The implementation of the regional toll system has the potential to affect land-use, air quality, and EJ populations. These topics are discussed in the following sections.

## 8.2 Land-use

Where people live and need to go influences travel patterns and traffic congestion. Altering land use can affect travel demand and the need for improvements to different elements of the transportation system. For example, when different uses are closer together, people are more likely to walk or bicycle, thereby increasing demand for sidewalks, safe street crossings, and shade.

## 8.3 Centers definition

CAMPO first used the concept of Centers as a transportation strategy in the 2035 Plan, building on the outcome of the Envision Central Texas process. Centers are now a central theme in the comprehensive plans of many jurisdictions in the CAMPO area. In the 2035 Plan, Centers were identified conceptually with a dot on a map and categorized as small, medium, and large. During development of the 2040 Plan, CAMPO worked with jurisdictional partners to define boundaries for Centers consistent with local plans. Centers, designated by the Transportation Policy Board, are locally-approved planning districts, either nodal- or linear-based, supported by their jurisdictions and other implementing agencies that are:

- A framework for regional multi-modal transportation corridor and network planning;
- Built and planned mixed-use environments that possess the density, diversity, and design attributes that produce lower vehicle-miles traveled and support transit, bicycling, and walking; and
- Incorporating, at the discretion of the local government, the following CAMPO Centers Guidelines and Notes:

- Activity Density – Total population and employment per acre based upon the maximum development potential of selected areas in approved local land use or development plans that meet the recommended target ratio of jobs to population.
- Transit – 'High Capacity Transit' modes include existing or planned Regional Rail, Commuter Rail, Urban Rail, Bus-Rapid Transit, or Managed Lanes. 'Local' transit is existing or planned local bus service provided by Capital Metro, CARTS, or another provider.
- Village Centers – Incorporated cities outside of the 2010 Austin and San Marcos Census Urbanized Areas that would otherwise not have a Community or other Center may designate a single Center that meets this Activity Density threshold.
- Centers Clusters – Multiple Centers that are adjacent or connected along a major transportation corridor can be designated as a Centers Cluster.

Each Center will develop based upon the existing built environment and locally approved plans. In this way each Center will ultimately develop in a way that is tailored to the desires and characteristics of the local community, and many of the Centers shown on the map will evolve differently over time. There are expected to be some common features among Centers, once they reach maturity. They would be:

- More intensely developed than the surrounding areas;
- Pedestrian-oriented (many destinations within walking distance, safe and convenient pedestrian facilities);
- A mix of employment, housing, and retail; and,
- Connected to surrounding neighborhoods and the region by a range of transportation options, including public transportation, highways, arterials, and bicycle and pedestrian connections (the mix of modes would be deter-mined by the overall context of the location).

### 8.3.1 **Centers benefits**

Strategic planning of major transportation investments. Defining areas of focused growth supports the identification of priority transportation corridors, and helps in planning major additions to the regional network including highway improvements, rail, and fixed guideway public transit.

#### 8.3.1.1 **Demand management**

Encouraging a mixed-use, higher-density land use pattern supports the ability of residents to live, work, and play in the same area and can reduce demand on the regional roadway network by allowing more trips to be made via alternatives to single occupant vehicles, and encouraging trips that don't use the transportation network.

#### 8.3.1.2 System efficiency

Encouraging higher density development in specific locations can allow the region to better meet future needs within available transportation resources, by developing a transportation system that costs less per capita.

#### 8.3.1.3 Improved accessibility and equity

Encouraging a land use pattern that can be adequately served by alternatives to the private automobile including transit, biking, and walking improves the accessibility and equity of the transportation system by providing everyone with the ability to access the region's opportunities.

#### 8.3.1.4 Improved connectivity and transportation choice

Encouraging development to cluster in activity centers can increase the overall connectivity of the transportation system, particularly within Centers, and can increase choices among transportation modes and routes.

#### 8.3.1.5 Improved Safety

Encouraging a mixed use, higher density land use pattern can improve the overall safety of the system by improving the safety of pedestrian and bicycle facilities and by helping to reduce the amount of time that individuals spend in private vehicles, reducing their exposure to vehicle crashes.

#### 8.3.1.6 Economic Benefits

Supporting local and regional economic vitality and competitiveness strengthens fiscally sustainable communities.

#### 8.3.1.7 Supporting Local Plans

Providing a regional plan that encompasses and integrates local visions for future land use helps local jurisdictions.

In 2009 CAMPO commissioned a study by researchers at the University of Texas at Austin to quantify the potential changes to travel in the CAMPO region (then five counties) in mixed use areas. The researchers worked with local planners to identify mixed use areas throughout the five county region. They then used data from the 2005 Austin Activity Travel Survey to calculate the influence of mixed-use areas on travel. They found that mixed-use areas reduce demand on the transportation system because:

There is a 40 percent higher internal capture rate in mixed use areas (a trip begins and ends in the same traffic analysis zone);

- There are more zero or one-car households in mixed-use areas;
- Households in mixed-use areas travel on average a shorter distance per day; and,
- Network connectivity and the presence of sidewalks also influence mode choice in mixed-use areas.

While we cannot quantify the changes that may happen, this study indicates that in the CAMPO region, mixed-use areas are already producing the desired benefits of shorter trips and more trips by non-automobile modes.

### 8.4 Centers implementation

CAMPO will develop a formal designation process for Centers and include them in our annual Growth Monitoring Report to track changes in those areas. Also, examples of Centers implementation can be found in local plans. The Travis County Commissioners Court approved its Land Water and Transportation Plan (LWTP) in December 2014. The LWTP, which was completed by the County's Transportation and Natural Resources Department, provides a framework for protecting land and water resources, building a comprehensive transportation system and efficiently delivering related services to the unincorporated area of Travis County. The plan looks to balance development with conservation while expanding options people have when choosing where to live, work, and play and how they travel. Part of those options include encouraging growth that follows CAMPO's Centers supported by transportation corridor development that accommodates multiple modes. The plan and more information on the LWTP can be found at https://www.traviscountytx.gov/tnr/lwtp.

## 9.0 Environmental Justice and Title VI

*The CAMPO 2040 Regional Transportation Plan* supports a transportation system that meets the needs of all users. Through its EJ analysis CAMPO works to ensure that traditionally under-represented groups such as racial and ethnic minorities and low-income residents are involved in decision-making about the future development of the transportation system and that negative impacts of transportation projects do not disproportionately affect these residents.
The 1994 Presidential Executive Order 12898 directed every federal agency to "make achieving EJ part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." As a recipient of federal funds, CAMPO is required to comply with this mandate and with Title VI of the Civil Rights Act of 1964. Title VI prohibits discrimination on the basis of race, color, or national origin by requiring that no person in the U.S. shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

### 9.1 Environmental Justice Areas

CAMPO uses demographic data compiled by traffic analysis zones (TAZs) to identify EJ areas. EJ TAZs must meet one or more of the following thresholds:

- "Low-income" TAZs
    - Have at least 50 percent of the population earning less than 80 percent of the county median family income and/or,

  - Have at least 25 percent of the population earning an income below the national poverty thresholds for a family of three ($17,373 in 2010, U.S. Census Bureau).

- "Minority" TAZs
  - Have less than 50 percent of the population identifying themselves as "White, non-Hispanic".

CAMPO used the following data from the U.S. Census Bureau to identify EJ TAZs:

- 2010 median family income levels;
- 2010 poverty data; and,
- 2010 ethnicity data.

## 9.2 CAMPO 2040 Plan Environmental Justice Analysis

CAMPO analyzed the 2040 transportation system to determine whether the system as envisioned would cause disproportionate negative impacts for the EJ population. Some of the road improvements include a tolling component, which may disproportionately burden low-income individuals. The plan also includes several Centers in EJ areas, focusing growth and economic opportunity. **Figure 8** shows the EJ areas and the planned 2040 transportation system.

## 9.3 Travel Time Analysis

Travel time is one measure of equity in transportation. The distance traveled in a specified amount of time should be roughly the same whether the trip originated in an EJ area or not. If EJ areas have a significant time or distance disadvantage compared to non-EJ areas, then there are likely transportation system inequities.

CAMPO analyzed travel times using output from the travel demand model. CAMPO selected representative sample EJ and non-EJ zone pairs in Bastrop, Burnet, Caldwell, Hays, Travis, and Williamson counties. CAMPO selected EJ zones with high populations and non-EJ zones based on comparable distance from major roads and similar population as the EJ zones. CAMPO calculated five-minute travel time intervals from five to 30 minutes for both the EJ and non-EJ zones for each zone pair, resulting in the area (in square miles) covered for each five-minute travel interval. CAMPO compared the area covered by each of the time intervals for each zone pair to determine whether there were any significant differences between the two. Since most people tend to think of their trips in five minute intervals, the area covered by a five-minute interval for the EJ zone of the zone pair is used to determine significant differences. If the area covered by an EJ zone five-minute interval is one half or less of the area covered by a non-EJ zone five-minute interval, then the EJ zone is initially determined to have a significant travel time disadvantage.

Results of the travel time analysis for 2010, 2040, and 2040 Priced Facility No Build (all recommended transportation (roadway and transit) facilities in *CAMPO 2040 Transportation Plan* except proposed roadway facilities with any priced elements (built after 2010) with year 2040 demographics),

did not identify any significant differences in travel times between EJ and non-EJ zones. This finding indicates that implementation of the 2040 transportation system would not cause the EJ population any disproportionate negative impacts in terms of travel time.

## 9.4 Mobility and Accessibility

Mobility is the potential for movement or the ability to travel from one place to another. Accessibility measures how well the transportation system provides access to locations and opportunities. Factors that impact accessibility include the cost in both time and dollars and the number of choices available to reach a location. Accessibility has a direct impact on quality of life. For this reason the performance characteristics focus on measuring accessibility versus mobility. As part of the regional commitment to providing a transportation system that is equally accessible and beneficial to all populations of the region, CAMPO performed a system-level analysis during the development of *CAMPO 2040 Regional Transportation Plan* on the proposed transportation improvements included in the:

- 2040 network (all *CAMPO 2040 Regional Transportation Plan* recommended roadway and transit facilities with year 2040 demographics from the *2040 Demographic Forecast*)
- 2040 no build network (2010 roadway and transit facilities with year 2040 demographics from the *2040 Demographic Forecast*)

Please see Chapter 4 of *CAMPO 2040 Regional Transportation Plan* for more discussion of the methodology and results for the EJ analysis.

**Table 17** shows the results of the analysis included in *CAMPO 2040 Regional Transportation Plan*. This analysis shows the 2040 network would provide protected populations access to 200 percent more jobs accessible within 30 minutes by car and 187 percent more jobs accessible within 30 minutes by transit in the future when compared to the 2010 network. Non-EJ populations would also experience a 200 percent increase in the number of jobs accessible within 30 minutes by auto and a 191 percent increase in the number of jobs within 30 minutes by transit compared to the 2010 network. In comparison to non-EJ populations, these results show a less than one percent decrease in access to jobs for protected classes by vehicles. For jobs accessible by transit, non-protected classes show an increase of less than one percent than EJ classes.

**Table 17 CAMPO 2040 RTP Accessibility and Mobility Performance Measures**

| Measure | Protected | | | Non-Protected | | |
|---|---|---|---|---|---|---|
| | 2010 Network | 2040 Network | 2040 Priced Facility No Build | 2010 Network | 2040 Network | 2040 Priced Facility No Build |
| Number of jobs accessible within 20 minutes by automobile* | 759,084 | 2,289,521 | 2,284,916 | 774,786 | 2,324,736 | 2,324,736 |
| Percent change from 2010 network | | 202% | 201% | | 200% | 200% |
| Number of jobs accessible within 30 minutes by automobile* | 773,860 | 2,319,728 | 2,319,342 | 774,786 | 2,324,736 | 2,324,736 |
| Percent change from 2010 network | | 200% | 200% | | 200% | 200% |
| Number of jobs accessible within 20 minutes by transit* | 539,887 | 1,551,010 | 1,551,010 | 534,436 | 1,553,189 | 1,553,189 |
| Percent change from 2010 network | | 187% | 187% | | 191% | 191% |
| Number of jobs accessible within 30 minutes by transit* | 539,887 | 1,551,010 | 1,551,010 | 534,436 | 1,553,189 | 1,553,189 |
| Percent change from 2010 network | | 187% | 187% | | 191% | 191% |
| Percent of lane-miles congested | 6.8% | 27.1% | 25.9% | 7.1% | 37.3% | 36.3% |
| Percent change from 2010 network | | 298% | 280% | | 423% | 409% |

## 9.5 Congestion Characteristics

Road congestion results when supply is not sufficient to meet travel demand. Congestion typically occurs on weekdays during the morning and evening peak periods when most people are going to work and returning home. CAMPO monitors congestion during the morning and evening peak periods through the congestion management process (CMP). In 2012, CAMPO collected and analyzed cell-phone and global positioning system (GPS) data on 2,400 centerline miles of roads in the region to evaluate the region's peak-period congestion levels.

The CMP data showed that, region-wide, 21 percent of the roads monitored are moderately to severely congested in the morning peak and 26 percent of the roads monitored are moderately to severely congested in the evening peak. Roads in the more urbanized counties are more congested; in Hays, Travis and Williamson counties combined, 26 percent of the roads monitored are moderately to severely congested in the morning peak and 33 percent are moderately to severely congested in the evening peak. In Travis County, 37 percent of the roads monitored are congested in the morning peak and 44 percent are moderately to severely congested in the evening peak. An analysis of Travis County freeways indicates that 44 percent of the freeways monitored are moderately to severely congested in the morning peak and 61 percent are

moderately to severely congested in the evening peak. More information on the CAMPO CMP and data analysis is found in CAMPO's *2012 Roadway Congestion Analysis: Performance Report and Information System.*

## 9.6 Interstate Highway 35—One of the Most Congested Roads in Texas

Interstate Highway (IH) 35 bisects the CAMPO region, passing through Williamson, Travis, and Hays counties and connecting several municipalities. More than 200,000 vehicles travel on segments of IH 35 in Travis County every day. IH 35 in Travis County consistently ranks near the top of the Texas Department of Transportation's (TxDOT) list of the 100 most congested road segments in the state. Segments of IH 35 in Williamson County also rank in the top 100 most congested segments. In 2013, IH 35 from US 183 to SH 71/US 290W was the most congested road segment in Texas. In 2014, the same segment was the second most congested road segment overall and the most congested road segment for freight. Congestion is not the only concern; the accident rate on IH 35 in the CAMPO region is higher than the state average. State and local officials, the business community, and the general public all identify IH 35 as the region's biggest transportation problem and agree that it must be improved now. Other highly congested roads in the capital area include US 183, MoPac (Loop 1), US 290E, and Loop 360.

## 9.7 Performance Measures

CAMPO evaluates potential future transportation scenarios by measuring how they "perform" against current conditions and a no-build or "do nothing" scenario. Twenty-two performance measures assess how well a modeled network meets *CAMPO 2040 Plan* goals. Appendix G contains a matrix of performance measures and results for the 2010 baseline, no-build, and preferred scenarios.

## 9.8 Modeling Results

The results of all the modeling runs, or forecasts, indicate that traffic congestion will become an increasingly challenging issue by 2040 due to rapid population growth and a reasonable assumption of limited funding for transportation improvements. The model is only capable of assessing the impact of projects that alter the capacity of the system. It cannot predict behavioral changes to travel patterns. Regional mobility will be improved both by building or improving our transportation infrastructure and by reducing demand on the transportation system. To specifically analyze the transportation effects of the tolled facilities on EJ populations, regional traffic was modeled under the three transportation network conditions:

- 2010 network (2010 roadway and transit facilities with 2010 demographics)
- 2040 network (all *CAMPO 2040 Transportation Plan* recommended roadway and transit facilities with year 2040 demographics)
- 2040 Priced Facility No Build network - *PFNB* [all recommended transportation - roadway and transit - facilities in *CAMPO 2040 Transportation Plan* except proposed roadway facilities with any priced elements (built after 2010) with year 2040 demographics)]

The daily VMT on each roadway classification under the three conditions is shown in **Table 18**. In the 2010 network there are approximately 5.1 million trips per day on the roadway system. Freeway facilities, (**Table 7**), which comprise 2.8 percent of the total roadway lane-miles, carry 11.4 percent of the daily VMT. Priced (toll road) facilities carry 3.3 percent of all VMT.

**Table 18 Daily Vehicle Miles Traveled**

| Facility Type | 2010 Network | | 2040 Network | | 2040 Priced Facility No Build Network | |
|---|---|---|---|---|---|---|
| | Daily VMT | Percent | Daily VMT | Percent | Daily VMT | Percent |
| Interstate | 9,365,825 | 21.2% | 13,337,360 | 13.5% | 13,514,770 | 13.8% |
| Freeways | 5,021,372 | 11.4% | 8,991,952 | 9.1% | 8,975,888 | 9.2% |
| Major Arterials | 18,093,458 | 40.9% | 40,286,224 | 40.7% | 41,315,675 | 42.2% |
| Minor Arterials | 4,791,788 | 10.8% | 10,855,656 | 11.0% | 11,041,700 | 11.3% |
| Collectors | 873,262 | 2.0% | 2,689,996 | 2.7% | 2,761,214 | 2.8% |
| Locals | 530,366 | 1.2% | 1,019,283 | 1.0% | 1,046,034 | 1.1% |
| Direct Connectors | 260,019 | 0.6% | 494,833 | 0.5% | 463,599 | 0.5% |
| Ramps | 708,750 | 1.6% | 1,169,664 | 1.2% | 1,118,362 | 1.1% |
| Frontage Roads | 3,142,328 | 7.1% | 7,156,301 | 7.2% | 7,317,974 | 7.5% |
| Toll Lanes | 1,215,286 | 2.7% | 8,632,398 | 8.7% | 8,785,543 | 9.0% |
| Toll Direct Connectors | 118,373 | 0.3% | 531,721 | 0.5% | 539,598 | 0.6% |
| Toll Ramps | 104,167 | 0.2% | 498,470 | 0.5% | 500,764 | 0.5% |
| Managed Lanes | - | 0.0% | 3,228,730 | 3.3% | 494,987 | 0.5% |
| Managed Lane Ramps | - | 0.0% | 109,878 | 0.1% | 11,981 | 0.0% |
| **Daily VMT - Total** | **44,224,994** | **100.0%** | **99,002,466** | **100.0%** | **97,888,087** | **100.0%** |
| Daily Vehicle Trips - Total | **5,114,757** | | **11,667,739** | | **11,660,964** | |

Source: CDM Smith

Under the 2040 PFNB network, the total number of daily trips increases to approximately 11.7 million because of projected population increases. Capacity constraints increased the proportion of VMT on tolled facilities slightly (both toll roads, express, and tolled managed lanes) by 7.3 percent and decreased on freeways by 9.6 percent in comparison to the existing 2010 network. All roadway classifications have a higher VMT under this condition than under the 2010 network.

The 2040 network has over 11.6 million trips per day, only 6,775 more than under the 2040 PFNB network. The combined proportion of VMT on freeways and tolled facilities is 75.3 percent compared to 45.9 percent under the 2040 PFNB network. The greater VMT on freeways and tolled facilities under the 2040 network would reduce the amount of VMT on major arterials, frontage roads, and collectors compared to the 2040 PFNB network.

A comparison of the average loaded speed per roadway classification is shown in **Table 19**. The average loaded speed is the average speed a vehicle travels (including congestion delays) along a specific roadway classification and is calculated by dividing the total VMT by the total vehicle hours traveled. The results show that the 2040 network would result in a slight increase in daily roadway speed for most roadway classifications compared to the 2040 PFNB network. The average loaded speeds for the 2040 network would be lower than the 2010 network because of the expected population increase of over 42 percent (see **Table 6**).

**Table 19 Average Loaded Speed (mph)**

| Roadway Classification | 2010 Network | | | 2040 Network | | | 2040 Priced Facility Network | | |
|---|---|---|---|---|---|---|---|---|---|
| | AM | PM | Daily | AM | PM | Daily | AM | PM | Daily |
| Interstate | 51.8 | 46.6 | 53.6 | 35.7 | 31.0 | 40.3 | 32.1 | 26.8 | 36.5 |
| Freeways | 45.5 | 39.2 | 47.6 | 35.9 | 30.0 | 39.5 | 31.8 | 26.7 | 36.1 |
| Major Arterials | 39.5 | 36.9 | 40.8 | 22.7 | 21.5 | 27.7 | 22.1 | 19.5 | 26.6 |
| Minor Arterials | 39.1 | 36.5 | 38.7 | 23.3 | 22.3 | 27.2 | 22.8 | 21.5 | 26.7 |
| Collectors | 38.5 | 37.6 | 38.7 | 28.2 | 26.1 | 30.2 | 27.2 | 24.8 | 29.5 |
| Locals | 29.9 | 27.5 | 28.8 | 21.8 | 17.9 | 21.7 | 21.4 | 17.6 | 21.3 |
| Direct Connectors | 47.5 | 43.8 | 47.5 | 43.8 | 42.5 | 44.9 | 42.4 | 41.3 | 44.0 |
| Ramps | 34.7 | 33.6 | 34.4 | 30.9 | 28.5 | 30.5 | 30.7 | 28.8 | 30.6 |
| Frontage Roads | 41.4 | 37.8 | 41.4 | 30.0 | 25.2 | 31.2 | 27.9 | 23.5 | 29.9 |
| Toll Lanes | 76.9 | 76.1 | 76.9 | 52.7 | 44.5 | 57.3 | 49.4 | 41.0 | 54.6 |
| Toll Direct Connectors | 53.6 | 52.0 | 53.4 | 45.4 | 45.0 | 47.3 | 47.3 | 45.3 | 48.2 |
| Toll Ramps | 38.4 | 38.4 | 38.4 | 32.7 | 31.6 | 32.7 | 32.7 | 31.6 | 32.7 |
| Managed Lanes | 0.0 | 0.0 | 0.0 | 46.5 | 40.0 | 48.7 | 53.8 | 50.6 | 55.7 |
| Managed Lane Ramps | 0.0 | 0.0 | 0.0 | 57.2 | 56.6 | 57.8 | 62.6 | 62.8 | 63.5 |

Source: CDM Smith

**Table 20** shows a comparison of the congestion levels during the morning peak period for the three analysis conditions. The morning peak period was used because it best represents travel to work; the evening peak period includes more discretionary travel. When comparing the 2040 and the 2040 PFNB network to the 2010 network there is an overall average increase in congested lane miles of 9.2% and 10.8% respectively and an overall average increase in severe congested lane miles of 4.0% and 4.6% respectively. Non-Congested lane miles show an overall average increase of 1.1% for 2040 network and decrease by the same percentage for the 2040 PFNB network. Implementing all of the transportation system improvements in the *CAMPO 2040 Regional Transportation Plan*, including the additional tolled facilities, is not expected to accommodate the increased travel demand created by an increasing regional population without increasing congestion throughout the roadway network compared to the 2010 network.

**Table 20 Morning Peak Period Congestion Levels**

| Roadway Classification | Congestion Level | 2010 Network | | 2040 Network | | 2040 PFNB Network | |
|---|---|---|---|---|---|---|---|
| | | Lane-Miles | % by Class | Lane-Miles | % by Class | Lane-Miles | % by Class |
| Interstate | Non-Congested | 514 | 86.1% | 534 | 56.7% | 534 | 51.7% |
| | Congested | | 13.9% | | 35.0% | | 39.3% |
| | Severe Congestion | | 0.0% | | 8.3% | | 9.0% |
| Freeways | Non-Congested | 341 | 77.6% | 521 | 64.7% | 507 | 62.6% |
| | Congested | | 22.0% | | 30.8% | | 30.8% |
| | Severe Congestion | | 0.4% | | 4.5% | | 6.6% |
| Major Arterials | Non-Congested | 4,558 | 96.8% | 6,450 | 83.5% | 6,464 | 81.7% |
| | Congested | | 2.8% | | 10.9% | | 12.2% |
| | Severe Congestion | | 0.4% | | 5.5% | | 6.2% |
| Minor Arterials | Non-Congested | 3,846 | 99.5% | 3,599 | 91.7% | 3,599 | 91.0% |
| | Congested | | 0.5% | | 5.5% | | 6.0% |
| | Severe Congestion | | 0.1% | | 2.8% | | 3.0% |
| Collectors | Non-Congested | 1,252 | 99.4% | 1,229 | 90.5% | 1,229 | 89.6% |
| | Congested | | 0.6% | | 5.4% | | 5.8% |
| | Severe Congestion | | 0.0% | | 4.1% | | 4.6% |
| Locals | Non-Congested | 512 | 97.8% | 517 | 87.2% | 517 | 86.1% |
| | Congested | | 2.1% | | 8.8% | | 9.3% |
| | Severe Congestion | | 0.1% | | 3.9% | | 4.6% |
| Direct Connectors | Non-Congested | 26 | 95.2% | 34 | 86.9% | 31 | 77.6% |
| | Congested | | 2.3% | | 3.8% | | 9.9% |
| | Severe Congestion | | 2.5% | | 9.4% | | 12.4% |
| Ramps | Non-Congested | 116 | 97.6% | 1,28 | 91.3% | 128 | 91.5% |
| | Congested | | 2.0% | | 6.0% | | 6.4% |
| | Severe Congestion | | 0.4% | | 2.6% | | 2.1% |

| Roadway Classification | Congestion Level | 2010 Network | | 2040 Network | | 2040 PFNB Network | |
|---|---|---|---|---|---|---|---|
| | | Lane-Miles | % by Class | Lane-Miles | % by Class | Lane-Miles | % by Class |
| Frontage Roads | Non-Congested | 852 | 94.3% | 1,119 | 78.6% | 1,105 | 74.9% |
| | Congested | | 4.7% | | 13.9% | | 15.1% |
| | Severe Congestion | | 1.0% | | 7.5% | | 10.0% |
| Toll Lanes | Non-Congested | 346 | 100.0% | 596 | 83.1% | 576 | 80.5% |
| | Congested | | 0.0% | | 15.1% | | 15.6% |
| | Severe Congestion | | 0.0% | | 1.8% | | 3.9% |
| Toll Direct Connectors | Non-Congested | 31 | 94.6% | 52 | 91.9% | 51 | 91.8% |
| | Congested | | 5.4% | | 1.4% | | 1.4% |
| | Severe Congestion | | 0.0% | | 6.7% | | 6.8% |
| Toll Ramps | Non-Congested | 60 | 100.0% | 84 | 94.8% | 83 | 94.6% |
| | Congested | | 0.0% | | 4.3% | | 4.9% |
| | Severe Congestion | | 0.0% | | 0.9% | | 0.5% |
| Managed Lanes | Non-Congested | - | 0.0% | 218 | 75.8% | 22 | 55.8% |
| | Congested | | 0.0% | | 24.0% | | 44.2% |
| | Severe Congestion | | 0.0% | | 0.2% | | 0.0% |
| Managed Lane Ramps | Non-Congested | - | 0.0% | 11 | 77.9% | 2 | 93.8% |
| | Congested | | 0.0% | | 19.3% | | 6.2% |
| | Severe Congestion | | 0.0% | | 2.9% | | 0.0% |

Source: CDM Smith

### 9.8.1 Travel Time

A travel time comparison for EJ and Non-EJ traffic analysis zones (TAZ) was performed based on the 2010, 2040, and 2040 PFNB networks previously described. The average 2040 network trip times for Non-EJ and EJ TAZs was 30.22 and 18.58 minutes respectively and the 2040 PFNB network was 32.28 and 19.42 percent, respectively). The reduced congestion and improved travel efficiency under the 2040 network allows longer average trip lengths for residents of all TAZs when compared to the 2040 PFNB network. Based on the increase in trip times in both 2040 networks, the average speed during the morning peak period is projected to decrease. The increase in average travel speed for trips from all TAZs was between 4.1 and 4.4percent greater in the 2040 network than in the 2040 PFNB network. The results indicate that trips from both EJ and Non-EJ TAZs receive travel benefits under the 2040 network. **Table 21** shows the changes in average travel time, trip length, and trip speed between morning peak period trips under the 2040 PFNB and 2040 networks as compared to 2010 network.

**Table 21 Morning Peak Period Trip Characteristics (Roadway Users)**

| Roadway Trip Characteristics | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income and Minority |
| **Average Vehicle Trip Time (Minutes)** | | | | | | |
| 2010 Network | 14.06 | 18.11 | 14.17 | 13.61 | 0.00 | 14.35 |
| 2040 PFNB Network | 19.26 | 32.28 | 19.42 | 25.71 | 0.00 | 17.60 |
| Percent Change from 2010 | 37.0% | 78.3% | 37.0% | 88.9% | 0.0% | 22.7% |
| 2040 Network | 18.44 | 30.22 | 18.58 | 24.57 | 0.00 | 16.86 |
| Percent Change from 2010 | 31.2% | 66.9% | 0.31 | 80.5% | 0.0% | 0.17 |
| **Average Vehicle Trip Length (Miles)** | | | | | | |
| 2010 Network | 9.90 | 12.52 | 9.98 | 9.76 | 0.00 | 10.07 |
| 2040 PFNB Network | 10.57 | 14.02 | 10.64 | 11.97 | 0.00 | 10.29 |
| Percent Change from 2010 | 6.7% | 12.0% | 6.6% | 22.6% | 0.0% | 2.1% |
| 2040 Network | 10.56 | 13.67 | 10.64 | 11.97 | 0.00 | 10.28 |
| Percent Change from 2010 | 0.07 | 9.2% | 0.07 | 22.7% | 0.0% | 0.02 |
| **Average Vehicle Trip Speed (mph)** | | | | | | |
| 2010 Network | 42.25 | 41.48 | 42.25 | 43.05 | 0.00 | 42.11 |
| 2040 Network | 34.37 | 27.14 | 34.34 | 29.25 | 0.00 | 36.58 |
| Percent Change from 2010 | -0.19 | -34.6% | -0.19 | -32.1% | 0.0% | -0.13 |
| 2040 PFNB Network | 32.92 | 26.06 | 32.89 | 27.93 | 0.00 | 35.06 |
| Percent Change from 2010 | -22.1% | -37.2% | -22.2% | -35.1% | 0.0% | -16.7% |

Transit users from both EJ and Non-EJ TAZs receive travel benefits from transit improvements included in *CAMPO 2040 Regional Transportation Plan*. **Table 22** shows the total trips, average travel time, trip length, and travel speed for morning peak period transit trips under the 2010 network, 2040 PFNB network, and 2040 network. In all three conditions, trips from EJ TAZs are a majority of transit trips. The 2040 network shows an average transit trip length of 4.5 miles and an average speed of 13.18 mph for all TAZs, so the number of jobs accessible by transit would probably be under this condition. The shorter trip distances and lower speeds for transit trips from EJ TAZs may reflect greater access to and use of transit bus service. Transit users from Non-EJ TAZs may be more likely to use park and ride facilities or rail transit, resulting in longer (in both time and distance) transit trips at higher speeds.

**Table 22 Morning Peak Period Transit Trip Characteristics**

| Transit Trip Characteristics | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income and Minority |
| **Total Transit Trips** | | | | | | |
| 2010 Network | 85,839 | 27,019 | 58,820 | 19,298 | 0.00 | 39,522 |
| 2040 Network | 155,366 | 54,668 | 100,697 | 32,161 | 0.00 | 68,536 |
| Percent Change from 2010 | 81.0% | 102.3% | 71.2% | 66.7% | 0.0% | 73.4% |
| 2040 PFNB | 155,848 | 54,733 | 101,114 | 32,328 | 0.00 | 68,786 |
| Percent Change from 2010 | 81.6% | 102.6% | 71.9% | 67.5% | 0.0% | 74.0% |
| **Average Trip Time (Minutes)(in vehicle travel time)** | | | | | | |
| 2010 Network | 19.31 | 21.12 | 18.53 | 15.19 | 0.00 | 20.18 |
| 2040 Network | 20.64 | 22.73 | 19.58 | 16.18 | 0.00 | 21.21 |
| Percent Change from 2010 | 6.9% | 7.6% | 5.7% | 6.5% | 0.0% | 5.1% |
| 2040 PFNB | 20.81 | 22.97 | 19.72 | 16.18 | 0.00 | 21.42 |
| Percent Change from 2010 | 7.8% | 8.7% | 6.4% | 6.5% | 0.0% | 6.1% |
| **Average Trip Length (miles)(in vehicle travel time)** | | | | | | |
| 2010 Network | 4.60 | 5.04 | 4.41 | 3.61 | 0.00 | 4.81 |
| 2040 Network | 4.53 | 5.13 | 4.23 | 3.46 | 0.00 | 4.60 |
| Percent Change from 2010 | -1.4% | 1.8% | -4.1% | -4.2% | 0.0% | -4.4% |
| 2040 PFNB | 4.44 | 5.01 | 4.15 | 3.37 | 0.00 | 4.53 |
| Percent Change from 2010 | -3.5% | -0.5% | -6.0% | -6.5% | 0.0% | -6.0% |
| **Average Travel Speed (mph)** | | | | | | |
| 2010 Network | 14.30 | 14.31 | 14.29 | 14.24 | 0.00 | 14.31 |
| 2040 Network | 13.18 | 13.54 | 12.97 | 12.82 | 0.00 | 13.02 |
| Percent Change from 2010 | -7.8% | -5.4% | -9.3% | -10.0% | 0.0% | -9.0% |
| 2040 PFNB | 12.80 | 13.09 | 12.63 | 12.50 | 0.00 | 12.68 |
| Percent Change from 2010 | -10.4% | -8.5% | -11.6% | -12.2% | 0.0% | -11.4% |

The number of transit trips from low-income TAZs may under-represent the actual usage by low-income populations. On-board surveys conducted by Capital Metro in 2010 showed that 67 percent of transit users had an annual household income below $30,000 and 50 percent of transit users have no car.

Three counties (Caldwell, Hays, and Travis) have a higher proportion of EJ to Non-EJ TAZs. The CAMPO region as a whole has a slightly higher number of Non-EJ zones compared to EJ zones, (1151 to 951 respectively). Examining the counties individually shows the percentage of Non-EJ zones ranging from 96 percent in Burnet to 37 percent in Caldwell. At the regional level the ratio of Non-EJ to EJ zones is 55% to 45% respectively. The majority of the EJ TAZ's

consist of both low-income and minority populations while no EJ zones contain minority only populations.

**Table 23 EJ Status by TAZ by Area Type**

| County | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income and Minority |
| Bastrop | 139 | 84 | 55 | 12 | 0 | 43 |
| | 6.6% | 7.3% | 5.8% | 5.0% | 0.0% | 6.0% |
| Burnet | 102 | 98 | 4 | 4 | 0 | 0 |
| | 4.9% | 8.5% | 0.4% | 1.7% | 0.0% | 0.0% |
| Caldwell | 101 | 37 | 64 | 0 | 0 | 64 |
| | 4.8% | 3.2% | 6.7% | 0.0% | 0.0% | 9.0% |
| Hays | 296 | 131 | 165 | 50 | 0 | 115 |
| | 14.1% | 11.4% | 17.4% | 21.0% | 0.0% | 16.1% |
| Travis | 998 | 469 | 529 | 93 | 0 | 436 |
| | 47.5% | 40.7% | 55.6% | 39.1% | 0.0% | 61.2% |
| Williamson | 466 | 332 | 134 | 79 | 0 | 55 |
| | 22.2% | 28.8% | 14.1% | 33.2% | 0.0% | 7.7% |
| **Total** | **2102** | **1151** | **951** | **238** | **0** | **713** |

Source: CDM Smith

**Table 24** shows how travel performance improvements for roadway users under the 2040 network vary based on the land area type. The travel characteristics in suburban areas, where trip lengths and times start at a higher baseline, change by larger absolute and relative amounts than in the urban residential areas. Because the EJ TAZs are predominantly in urban residential areas, the change in average trip times and lengths are smaller than for Non-EJ TAZs in both the 2040 network and the 2040 PFNB network. Persons traveling to/from suburban and rural areas would see a larger relative degradation of service compared to the 2010 network in both the 2040 network and 2040 PFNB network.

**Table 24 Average Morning Peak Trip Characteristics by Area Type**

| | Bastrop | Burnet | Caldwell | Hays | Travis | Williamson |
|---|---|---|---|---|---|---|
| **Average Vehicle Trip Time (Minutes)** | | | | | | |
| 2010 Network | 24.75 | 19.77 | 21.15 | 19.11 | 14.64 | 17.32 |
| 2040 Network | 30.23 | 35.89 | 22.92 | 38.41 | 17.36 | 28.68 |
| Percent Change from 2010 | 0.22 | 0.82 | 0.08 | 1.01 | 0.19 | 0.66 |
| 2040 Priced Facilities No Build Network | 30.71 | 38.08 | 23.58 | 41.52 | 18.57 | 30.15 |
| Percent Change from 2010 | 0.24 | 0.93 | 0.11 | 1.17 | 0.27 | 0.74 |

| | Bastrop | Burnet | Caldwell | Hays | Travis | Williamson |
|---|---|---|---|---|---|---|
| **Average Vehicle Trip Length (Miles)** | | | | | | |
| 2010 Network | 18.68 | 15.01 | 16.68 | 14.02 | 9.41 | 13.21 |
| 2040 Network | 18.45 | 18.66 | 17.64 | 15.89 | 9.52 | 13.09 |
| Percent Change from 2010 | -1.2% | 24.3% | 5.8% | 13.4% | 1.2% | -0.9% |
| 2040 Priced Facilities No Build Network | 18.62 | 19.24 | 17.71 | 16.93 | 9.41 | 13.34 |
| Percent Change from 2010 | -0.3% | 28.2% | 6.2% | 20.8% | 0.1% | 1.0% |
| **Average Vehicle Trip Speed (mph)** | | | | | | |
| 2010 Network | 45.29 | 45.55 | 47.31 | 44.00 | 38.57 | 45.74 |
| 2040 Network | 36.63 | 31.20 | 46.17 | 24.83 | 32.92 | 27.39 |
| Percent Change from 2010 | -19.1% | -31.5% | -2.4% | -43.6% | -14.6% | -40.1% |
| 2040 Priced Facilities No Build Network | 36.38 | 30.32 | 45.07 | 24.47 | 30.42 | 26.56 |
| Percent Change from 2010 | -19.7% | -33.4% | -4.7% | -44.4% | -21.1% | -41.9% |

Source: CDM Smith

### 9.8.2 Congestion Levels

The daily congestion levels within the CAMPO region under the 2010, 2040 PFNB, and 2040 networks are shown in **Table 25**. This analysis shows the percentage of TAZs with no, light, moderate, and severe congestion based on EJ status. Both the 2040 network and 2040 PFNB network show much higher congestion levels than the 2010 network. In general, the total percentage of TAZs with no or light congestion and the total percentage of TAZs with moderate to severe congestion is expected to be approximately the same for EJ and Non-EJ TAZs. In all three network conditions EJ TAZs are projected to have fewer no congestion and severe congestion TAZs, but more light to moderate congestion TAZs than the Non-EJ areas. The large differential between EJ and Non-EJ TAZs that have no congestion is expected because most of the No Congestion TAZs are in rural areas where EJ communities are less common. **Figure 3 and Figure 4** show the congestion levels under the 2040 network and 2040 PFNB network, respectively.

**Table 25 Environmental Justice TAZ Congestion Levels**

| | | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| **Congestion Level** | **All MPO TAZs** | **Non-EJ TAZs** | **EJ TAZs** | **Low-Income** | **Minority** | **Low-Income and Minority** |
| Total Number of TAZs | 2,102 | 1151 | 951 | 238 | 0 | 713 |
| Percentage of TAZs in the EJ category (within the same column) | | | | | | |
| **2010 Network** | | | | | | |
| No Congestion | 43.1% | 48.0% | 37.3% | 43.3% | 0.0% | 35.3% |
| Light Congestion | 27.6% | 23.6% | 32.4% | 23.9% | 0.0% | 35.2% |
| Moderate Congestion | 22.5% | 22.0% | 23.1% | 20.6% | 0.0% | 24.0% |

| Congestion Level | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income and Minority |
| Severe Congestion | 6.8% | 7.1% | 6.3% | 8.8% | 0.0% | 5.5% |
| **2040 PFNB Network** | | | | | | |
| No Congestion | 13.6% | 17.6% | 8.6% | 13.9% | 0.0% | 6.9% |
| Light Congestion | 16.8% | 15.2% | 18.8% | 13.4% | 0.0% | 20.6% |
| Moderate Congestion | 27.6% | 23.8% | 32.3% | 32.4% | 0.0% | 32.3% |
| Severe Congestion | 42.0% | 44.0% | 39.4% | 37.0% | 0.0% | 40.3% |
| **2040 Network** | | | | | | |
| No Congestion | 14.6% | 18.4% | 9.9% | 14.3% | 0.0% | 8.4% |
| Light Congestion | 18.6% | 16.0% | 21.7% | 15.5% | 0.0% | 23.7% |
| Moderate Congestion | 29.2% | 27.5% | 31.2% | 30.3% | 0.0% | 31.6% |
| Severe Congestion | 37.7% | 38.8% | 36.4% | 36.6% | 0.0% | 36.3% |
| **Difference (2040 Network minus 2040 PFNB Network)** | | | | | | |
| No Congestion | 1.0% | 0.8% | 1.3% | 0.4% | 0.0% | 1.5% |
| Light Congestion | 1.7% | 0.8% | 2.8% | 2.1% | 0.0% | 3.1% |
| Moderate Congestion | 1.5% | 3.6% | -1.1% | -2.1% | 0.0% | -0.7% |
| Severe Congestion | -4.2% | -5.2% | -3.0% | -0.4% | 0.0% | -3.9% |

Between the 2040 network and the 2010 network, the percentage of TAZs with light to moderate congestion is overall slightly higher at 1.7 percent and 1.5 percent, respectively. While severe congestion decreases by a much larger margin of 4.2 percent. For both EJ and Non-EJ zones light to moderate congestion will increase while severe congestion is projected to decrease. The construction of additional facilities in the build network is projected to reduce the percentage of Non-EJ and EJ TAZs with severe congestion by 5.2 and 3.0 percent respectively.

### 9.8.3 Regional Origin-Destination Analysis

To further analyze the effects of the expansion of the priced facility network in the CAMPO region, a regional origin-destination analysis of the morning peak period (6:30 am to 9:00 am) was performed to show how trips in the three networks are distributed based on the EJ status of TAZs. **Figure 9** through **Figure 11** show the number of daily trips using tolled facilities from EJs TAZs.

The origin-destination results for the 2010 network are shown in **Table 26** and **Figure 9.** Ninety-seven point eight percent (930 of 951), EJ TAZs in the 2010 network generate at least one trip that utilizes a priced facility. The EJ TAZs generate a smaller portion of priced facility trips (24.3 percent) than would be expected based only on their share of the regional population (46.2 percent) or total vehicle trips (42.8 percent). A contributing factor to this difference is the average trip length and, as noted in **Table 21**, trips from EJ TAZs average 9.8 miles while trips

from Non-EJ TAZs average 12.5 miles in the 2010 network. For EJ TAZs, approximately 2.9 percent of trips would utilize tolled facilities in the 2010 network compared to 6.8 percent for Non-EJ TAZs. This lower percentage of usage is likely a factor of the geographic location of existing toll roads relative to low-income and minority populations.

**Table 26 Morning Peak Period Origin-Destination Results**

| Data of Interest | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income / Minority |
| 2010 Population | 1,717,099 | 924,249 | 792,850 | 136,262 | 0 | 656,588 |
| | | 53.8% | 46.2% | 7.9% | 0.0% | 38.2% |
| 2040 Population | 4,078,460 | 2,356,717 | 1,721,743 | 401,467 | 0 | 1,320,276 |
| | | 57.8% | 42.2% | 9.8% | 0.0% | 32.4% |
| **TAZs Utilizing Priced Facilities (at least once per day)** | | | | | | |
| TAZs in the MPO | 2,102 | 1151 | 951 | 238 | 0 | 713 |
| | | 55.1% | 44.9% | 10.9% | 0.0% | 33.9% |
| 2010 Network | 2,057 | 1,139 | 930 | 229 | 0 | 701 |
| | 97.9% | 99.0% | 97.8% | 96.2% | 0.0% | 98.3% |
| 2040 PFNB Network | 2,092 | 1,155 | 937 | 229 | 0 | 708 |
| | 99.5% | 100.3% | 98.5% | 96.2% | 0.0% | 99.3% |
| 2040 Network | 2,093 | 1,155 | 938 | 230 | - | 708 |
| | 99.6% | 100.3% | 98.6% | 96.6% | 0.0% | 99.3% |
| **Vehicle Trips Utilizing Priced Facilities from TAZs with any Priced Facility Trips** | | | | | | |
| 2010 Network | 36,670 | 27,766 | 8,904 | 1,163 | 0 | 7,741 |
| | | 75.7% | 24.3% | 3.2% | 0.0% | 21.1% |
| 2040 PFNB Network | 175,839 | 112,458 | 63,382 | 11,182 | - | 52,200 |
| | | 64.0% | 36.0% | 6.4% | 0.0% | 29.7% |
| 2040 Network | 225,234 | 152,126 | 73,109 | 11,307 | - | 61,801 |
| | | 67.5% | 32.5% | 5.0% | 0.0% | 27.4% |
| **Vehicle Trips on Entire Transportation Network from TAZs with any Priced Facility Trips** | | | | | | |
| 2010 Network | 717,354 | 410,487 | 306,867 | 62,881 | 0 | 243,986 |
| | | 57.2% | 42.8% | 8.8% | 0.0% | 34.0% |
| 2040 PFNB Network | 1,625,463 | 1,001,745 | 623,718 | 123,585 | 0.00 | 500,133 |
| | | 61.6% | 38.4% | 7.6% | 0.0% | 30.8% |
| 2040 Network | 1,626,897 | 1,002,698 | 624,199 | 123,715 | - | 500,484 |
| | | 61.6% | 38.4% | 7.6% | 0.0% | 30.8% |
| **Percent of Vehicle Trips (from TAZs with Priced Facility Trips) Utilizing Priced Facilities** | | | | | | |
| 2010 Network | 5.1% | 6.8% | 2.9% | 1.8% | 0.0% | 3.2% |

| Data of Interest | All MPO TAZs | EJ Status | | EJ TAZ Type | | |
|---|---|---|---|---|---|---|
| | | Non-EJ TAZs | EJ TAZs | Low-Income | Minority | Low-Income / Minority |
| 2040 PFNB Network | 10.8% | 11.2% | 10.2% | 9.0% | 0.0% | 10.4% |
| 2040 Network | 13.8% | 15.2% | 11.7% | 9.1% | 0.0% | 12.3% |

In the 2040 PFNB network, 98.5 percent EJ TAZs (937 of 951) generate at least one trip that utilizes a priced facility (see **Table 26** and **Figure 10**). The proportion of the regional population within EJ TAZs is 46.2 percent in 2010 and projected to be 42.2 percent in 2040. The EJ TAZ share of priced facility trips and total trips goes up between 2010 and 2040, and the percentage of priced facility trips increases by a greater amount (36.0 percent minus 24.3 percent equals 11.8 percent) than the proportion of the total population living in EJ TAZs (46.2 percent minus 42.2 percent equals 2.6 percent). A contributing factor to why 42.2 percent of the EJ population only contributes 36.0 percent of the trips is because of the average trip length. As noted in **Table 21**, trips from EJ TAZs average 10.64 miles while Non-EJ TAZs average 14.02 miles in the 2040 PFNB network. Shorter trip lengths (as identified for EJ populations) are less likely to use tolled facilities. For EJ TAZs, approximately 10.2 percent of trips would utilize tolled facilities in the 2040 PFNB network compared to 11.2 percent for Non-EJ TAZs.

In the 2040 network, 98.6 percent EJ TAZs (938 of 951) generate at least one trip that utilizes a priced facility (see **Figure 11**). The EJ TAZ share of priced facility trips and total trips goes up between 2010 and 2040, and the percentage of priced facility trips increases by a greater amount (32.5 percent minus 24.3 percent equals 8.2 percent) than the proportion of the total population living in EJ TAZs (46.2 percent minus 42.2 percent equals 2.6 percent). These percentages are very similar to those on the 2040 PFNB network. A contributing factor to why 42.2 percent of the population (EJ population) only contributes 32.5 percent of the trips is because of the average trip length. As noted in **Table 21**, trips from EJ TAZs average 10.64 miles while Non-EJ TAZs average 14.02 miles in the 2040 network. Shorter trip lengths (as identified for EJ populations) are less likely to use tolled facilities. For EJ TAZs, approximately 10.2 percent of trips would utilize tolled facilities in the 2040 network compared to 11.2 percent for Non-EJ TAZs.

Under the 2040 network fewer TAZs (32.5 percent) would send trips to tolled facilities than under the 2040 PFNB network (36.0 percent). As shown in **Figure 7**, existing toll roads are not adjacent to the majority of EJ TAZs, but proposed tolled facilities would be built closer to EJ populations. This would increase accessibility to these roadway facilities as shown by the lower proportion of trips from EJ TAZs on tolled facilities in the 2040 network (32.5 percent) than in the 2040 PFNB network (36.0 percent).

The total number of trips on tolled facilities in the 2040 network is 225,324 during the morning peak period. This is 22 percent more than in the 2040 PFNB network and a 58 percent increase

over the 2010 network. Similarly, the total trips on tolled facilities from EJ TAZs in the 2040 network is projected to be 73,109 during the morning peak period, an increase over the 2010 network and 2040 PFNB network of 58 percent and 13 percent, respectively. The 225,234 vehicle trips represents less than 14 percent of vehicle trips in the morning peak period; therefore, the majority of travel (over 86 percent) is occurring on non-tolled facilities.

The potential impacts to low-income populations were evaluated because low-income populations would use a greater proportion of their income for transportation expenses. As shown in **Table 26**, of the 951 environmental justice TAZs, TAZs (238 low-income alone plus 713 both low-income and minority TAZs) or 45 percent (951of 2,102 total TAZs) are low-income. In the 2010 network, approximately 2.9 percent [from **Table 26** (1,163 plus 7,741 divided by 62,881 plus 243,986)] of trips from these TAZs use tolled facilities. In the 2040 PFNB network, approximately 10.2 percent [from **Table 26** (11,182 plus 52,200 divided by 123,585 plus 500,133)] of trips from these TAZs use tolled facilities. Projections from the 2040 network indicate that approximately 11.7 percent [also from **Table 26** (11,307 plus 61,801divided by 123,715 plus 500,484)] of trips from low-income TAZs would use tolled facilities.

### 9.8.4 Toll Rates

Tolls are based on how far you drive and what kind of vehicle you're driving. Drivers pay a toll each time they pass through a toll plaza. Depending on where they get on or get off the road, drivers also pay a toll on certain entrance and exit ramps (see **Table 27**). Drivers without a TxTag pay 33 percent more on Loop 1, SH 45 N, SH 130, and SH 45 SE.

**Table 27 Toll Rates by Location**

| Facility | 2-axle vehicles | | 3-axle vehicles | | 4-axle vehicles | | 5-axle vehicles | | 6-axle vehicles | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Tag | Pay By Mail | Tag | Pay By Mail | Tag | Pay By Mail | Tag | Pay By Mail | Tag | Pay By Mail |
| **Loop 1** | | | | | | | | | | |
| Plazas | 1.06 | 1.41 | 2.12 | 2.82 | 3.18 | 4.23 | 4.24 | 5.64 | 5.3 | 7.05 |
| Ramps | 0.7 | 0.93 | 1.4 | 1.86 | 2.1 | 2.79 | 2.8 | 3.72 | 3.5 | 4.66 |
| **SH 45 North** | | | | | | | | | | |
| Plazas | 1.06 | 1.41 | 2.12 | 2.82 | 3.18 | 4.23 | 4.24 | 5.64 | 5.3 | 7.05 |
| Parmer Ln & RM 620 Ramps | 0.91 | 1.21 | 1.82 | 2.42 | 2.73 | 3.63 | 3.64 | 4.84 | 4.55 | 6.05 |
| O'Connor Dr and Ramps to Loop 1 Direct Connectors | 0.93 | 1.24 | 1.86 | 2.47 | 2.79 | 3.71 | 3.72 | 4.95 | 4.65 | 6.18 |
| Greenlawn & AW Grimes Ramps | 0.7 | 0.93 | 1.4 | 1.86 | 2.1 | 2.79 | 2.8 | 3.72 | 3.5 | 4.66 |
| Shultz Ln & Wilke Ln Ramps | 1.06 | 1.41 | 2.12 | 2.82 | 3.18 | 4.23 | 4.24 | 5.64 | 5.3 | 7.05 |
| **SH 45 Southeast** | | | | | | | | | | |
| Plaza | 1.04 | 1.38 | 2.08 | 2.77 | 3.12 | 4.15 | 3.12 | 4.15 | 3.12 | 4.15 |
| Ramps | 0.68 | 0.9 | 1.36 | 1.81 | 2.04 | 2.71 | 2.04 | 2.71 | 2.04 | 2.71 |
| **SH 130 Segments 1-4** | | | | | | | | | | |
| Plazas | 1.75 | 2.33 | 3.5 | 4.66 | 5.25 | 6.98 | 5.25 | 6.98 | 5.25 | 6.98 |
| SH 29, Blue Bluff, Harold Green & Moore Rd Ramps | 0.47 | 0.63 | 0.94 | 1.25 | 1.41 | 1.88 | 1.41 | 1.88 | 1.41 | 1.88 |
| FM 104, Pecan St, Gregg Manor, FM 973, FM 969, Pearce Ln & FM 812 Ramps | 0.58 | 0.77 | 1.16 | 1.54 | 1.74 | 2.31 | 1.74 | 2.31 | 1.74 | 2.31 |
| US 79, CR 138, Chandler Rd & Elroy Rd Ramps | 0.75 | 1 | 1.5 | 2 | 2.25 | 2.99 | 2.25 | 2.99 | 2.25 | 2.99 |
| Cameron Rd Ramps | 1.75 | 2.33 | 3.5 | 4.66 | 5.25 | 6.98 | 5.25 | 6.98 | 5.25 | 6.98 |

### 9.8.5 Transportation Benefits

While the previous sections focused on potential impacts from tolled facilities within the regional transportation system, these facilities are also expected to provide benefits to system users. Benefits from the transportation system can be categorized into two forms: quality of life and economic. Quality of life benefits include the social benefits to persons within the CAMPO region. Economic benefits would be realized by many users of the regional transportation system (including private individuals, area businesses, and freight transporters) with the implementation of the planned improvements in the CAMPO 2040 Regional Transportation Plan.

Quality of life is enhanced through various benefits within the proposed transportation network from the CAMPO 2040 Regional Transportation Plan. The transportation system, including tolled facilities, increases the number of travel options available to transportation system users. These facilities may serve as bus transit corridors, improving the performance of the on-road transit system. The planned priced facility projects help to manage congestion, improve air quality (and therefore public health), improve travel time reliability, and improve safety compared to the no build and priced facility no build alternatives. By helping to reduce overall congestion levels, improvements to the overall transportation system, including tolled facilities, also contributes to the economic vitality of the region.

The tolled lane system proposed in the Central Texas region also provides a method for a reliable vehicle trip through variable-rate tolling using a fixed pricing schedule. Managed tolled lanes take this step further by dynamically adjusting the toll cost to maintain free-flowing traffic throughout the managed toll lanes. Although a toll is required for vehicle use, both buses and emergency service vehicles will be allowed to use these facilities without a toll payment. This free usage allows better and more reliable service from the bus transit system and emergency vehicles attempting to respond to calls. An increase in service for both bus and emergency vehicles improves the quality of life for those choosing to use or in need of those services, respectively.

In addition to benefiting cars, trucks, and buses, the Central Texas Regional Mobility Authority is constructing bicycle- and pedestrian-friendly facilities as part of every project, whenever feasible. This includes the design and implementation of Shared Use Paths (SUP), sidewalks and cross-street connections. To date, on projects currently open to traffic (183A and US 290 - Manor Expressway), the Mobility Authority investment in bicycle and pedestrian accommodations totals $11 million. $31 million more is invested in projects under construction (MoPac and 183S). Additional investments are planned for projects currently under environmental study (MoPac South, Oak Hill Parkway, and 183 North).

The revenue from tolled facilities will also help finance improvements/rehabilitation of both tolled (dynamic and fixed rate) and non-tolled facilities. This financing is also accelerating the funding for construction as compared to traditional tax-supported highway finance, thereby

minimizing capital costs and making new transportation capacity (via transit, roadway, or other modes) available to the traveling public sooner.

## 10.0 Limitations of the Data and Model

The traffic analysis performance report, travel time comparison, and origin-destination studies were completed using the CAMPO 2040 Plan Travel Demand Model (TDM). This application is developed and maintained by CAMPO staff and consists of a collection of software components implemented on the TransCAD® 6.0 platform. The CAMPO TDM is a four-step trip-based travel demand model for the 6-County Central Texas region. The four steps of the modeling process are: trip generation, trip distribution, mode choice, and traffic assignment. The model was validated for the year 2010 using a variety of user surveys and traffic counts to ensure that roadway traffic volume, transit usage, peak/off-peak period conditions, and roadway speeds are accurately reproduced by the model.

The CAMPO TDM application was implemented to forecast travel demand within the CAMPO region. It is not a social or economic prediction model, but it does incorporate some income data in the trip generation, mode choice, and transit trip assignment steps for home based work trips. Within each TAZ the total population, number of households, and number of jobs in several employment categories vary depending on the selected year of analysis and/or demographic scenario. The forecasted demographic datasets used in this analysis are derived from the CAMPO 2040 Demographic Forecast. Median income levels for each TAZ are included as primary demographic inputs, but they are held largely static (except for inflation adjustments) for all modeled years and scenarios because no reliable forecasts of changes in the geographic distribution of income levels are available. At no point in the modeling process is the race or ethnicity of transportation system users considered or documented.

The household income model calculates the percentage of households in each household income category based on a distribution curve. The input zonal median income is divided by the regional median income to get a ratio by zone. This ratio is identified in a household income distribution curve to determine the distribution of households for the five income categories corresponding to the ratio. The regional average household income is defined through a generation parameters input file by year. The output from this model is an array of the median income distribution as well as the percentage of households within five income categories populated in the TAZ file. The median income distribution curve was updated based on ACS and Census data. Each block group of the CAMPO six-county region was compared to the regional average. The block group data for the household income was taken from the ACS 5-year 2007-2011 estimates. The number used in these curves represents household incomes and is given in 2010 inflation adjusted dollars. To calculate the median household income of the region, the average median household income of the six counties was averaged, which was calculated as $53,470.

In the trip generation step of the travel model forecasting process, the socio-economic characteristics of each TAZ are used to determine the number of trips that will be generated by

and attracted to each TAZ. Trip production rates are based on the American Community Survey (ACS) 5-year 2007-2011 and 2010 U.S. Census were used at the block group level in the CAMPO six-county study area. Trip production rates are applied using cross-classification of household data due to the robustness of disaggregated household data in estimating travel characteristics. Home based work production rates are cross-classified by household size, income, and workers. All other production rates are cross-classified by household size and income. The external trip purposes do not use cross-classification of production rates but are direct inputs based on observed data.

The CAMPO mode choice model structure is a nested multinomial logit model. The models were estimated as multinomial logit models and a nesting structure was developed for model application. Such model recognizes the potential for something other than equal competition among modes. This structure assumes that modes, sub-modes, and access modes are distinctly different types of alternatives that present distinct choices to travelers. Each mode within a nest competes with each other. This is a fairly complex nesting structure with three 'levels 'of nests. The first, or highest level, splits the choice to auto, transit, and non-motorized modes of transport, indicating that this decision is foremost in choice of mode. The next level splits drive-alone from shared-ride trips in the auto nest, by access type (walk, PNR, and KNR) in the transit nest, and also non-motorized into walk and bike. The third and final nest splits share-ride modes by share 2 and 3+ person and access type by modes of transit. The transit nesting structure is organized with access type at the top of the nesting structure, and modes of transit below each access type.

Each vehicle trip is classified by the purpose of the trip. Each vehicle trip of a given type is treated equally by the model, so the socio-economic factors that contributed to the creation of any given vehicle trip do not factor into the trip assignment step of the modeling process. Vehicle trips are assigned to the roadway network based on minimizing generalized travel costs (including per-mile travel costs, value of time, and tolls where applicable) for each trip. As currently implemented, the modeling process requires all vehicle trips to operate under the same value of time assumptions. No data to reliably estimate variations in the value of time based on socio-economic status is readily available. At the step in the modeling process where socio-economic variations in the value of time would need to be applied, some of the relevant socio-economic information is no longer tracked by the CAMPO TDM application.

Based on these characteristics of the modeling process, the EJ analysis performed using the CAMPO TDM should be understood to have the following limitations:

- Race and ethnicity are based on 2010 census data. Income is based on data provided by the Texas Workforce Commission (TWC). Therefore, the data used does not reflect any changes to these factors.
- Model-derived projections of socio-economic characteristics of vehicle trips have not been validated using any control data and should not be assumed to be accurate.

- Demographic projections to 2040 assume the same distribution of income, race, and ethnicity and does not account for any potential shifts in population types across the region.
- There is no available data about the race, ethnicity, and economic status of the users of tolled facilities within the CAMPO region.
- Model inputs do not include race or ethnicity; therefore, the model cannot identify trips based on the race or ethnicity of an individual user.
- For the purposes of trip distribution, mode choice, and traffic assignment, all vehicle trips of the same type are treated identically. CAMPO TDM, as implemented, is not capable of generating results that produce outputs that differentiate vehicle trips based on the economic characteristics of transportation system users.
- The vehicle trip assignment process does not consider relative income differences or the differences in relative cost to potential users in the population when assigning vehicle trips.
- CAMPO TDM was not designed to model the socio-economic characteristics of each vehicle trip. Model-derived reproductions of socio-economic characteristics of vehicle trips have not been validated using any control data and should not be assumed to be accurate.
- The CAMPO TDM cannot replicate dynamic pricing.

## 11.0 Summary of Assessment and Discussion of Mitigation

Based on the EJ analysis conducted it was determined that the recommended transportation projects included in *CAMPO 2040 Regional Transportation Plan* do not have a highly adverse or disproportionate impact on EJ populations. The *CAMPO 2040 Regional Transportation Plan* states the transportation recommendations included in the plan meet federal nondiscrimination and EJ requirements and have no disproportionate impacts on protected populations.

In addition, results from the performance reports prepared for the CAMPO region showed a marginal increase in roadway speed and an improvement in congestion for the majority of the roadway classifications in the 2040 network compared to the 2040 PFNB network. Even under the 2040 network for the CAMPO region the roadway performance conditions for freeways and toll roads throughout the CAMPO region would be degraded compared to the 2010 network due to the travel demand created by an increase of 42 percent in the regional population.

Although EJ populations would see an increase in out of pocket cost for priced facility usage under the 2040 scenario, the growth in usage by EJ populations is proportional to the increased usage by the entire CAMPO region population as the priced system expands. Almost all EJ TAZs were identified by the CAMPO TDM to potentially be sending trips along tolled facilities in the 2010 network and 2040 network. As shown in **Table 7**, over 93 percent (1,4129 lane miles) of new roadway capacity would not be tolled. For populations (including EJ populations) who would choose to use non-tolled facilities, the 2040 network would provide a non-priced

roadway network that would operate at better traffic conditions (slightly higher speeds and improved congestion) on all roadways and an increased benefit over the 2040 PFNB network.

The planned transit system is the same for both the 2040 network and 2040 PFNB network. Current statutory requirements built into most transportation improvement funding mechanisms prohibit or limit the transfer of funds between modes, so eliminating tolled facilities would not necessarily increase opportunities to invest in other types of improvements. As shown in **Table 22**, in the 2010 network 68.5 percent of transit users come from EJ TAZs. The total number of transit trips from EJ TAZs is expected to decrease to 64.8 in both the 2040 PFNB and 2040 network. This compares to the 49.2 percent increases in vehicle trips between the 2010 network and the 2040 PFNB and 2040 networks, respectively, shown in **Table 21**. Improved roadway performance would lead to slightly longer distance and higher speed transit trips in the 2040 network compared to the 2040 PFNB network.

Impacts to EJ populations were one of the several issues included and considered during the RTP planning process. All corridor planning and development activities are consistent with the RTP recommendations for congestion management and multimodal opportunities which benefit all segments of the population. The region will continue its efforts to work with all communities in the planning process to identify transportation challenges and explore and develop the appropriate strategies to respond to the issues. Specific strategies and projects would be developed through discussions with local governments and community representatives, as needed. Example strategies could include regional or targeted local programs and projects to:

- Improve availability and accessibility to alternate transportation options such as transit, biking and walking.
- Provide discounted transit fares and tolls
- Provide better accessibility to regional transportation systems
- Enhance community-level congestion management
- Promote sustainable development to help minimize VMT

Regardless of strategies that may be implemented, each transportation entity would require efforts to minimize impacts to EJ populations at the specific project level. TxDOT builds, maintains, and operates the majority of the major roadway system in the CAMPO Region, the CTRMA and TxDOT oversee construction and implementation of the toll roads throughout CAMPO, while the transit agencies focus on the passenger rail and bus systems, and CAMPO directs its resources on future transportation system planning.

TxDOT follows numerous guidelines and regulations to assess potential impacts to EJ populations for specific projects. These guidance documents, such as FHWA Order 6640.23, discuss potential mitigation for EJ populations when impacts are determined. Both FHWA and TxDOT have procedures in place to ensure compliance with state and federal laws and regulations regarding project-specific impacts to EJ populations. Each roadway project that receives state and/or federal money is evaluated under NEPA or similar Texas requirements

which include analysis for EJ populations and potential mitigation if an unfair distribution of benefits and/or a disproportionate high and adverse impact is identified. A summary of this RTA is included as part of project-specific analysis.

Similarly, the CTRMA follows TxDOT and FHWA guidelines for its Title VI and EJ procedures. The CTRMA policy in their environmental manual references the current TxDOT and FHWA policies for addressing potential impacts to EJ populations. This consistency extends to the inclusion of an EJ analysis in environmental documents as well as addressing any potential impacts and mitigation. Any mitigation would be addressed on a per project basis.

Transit agencies follow FTA guidelines for Title VI and EJ. The analysis that is included in FTA documents is similar to those that are required by FHWA for roadway analysis. Because transit systems have a greater propensity for utilization by EJ and Title VI populations, the analysis required by FTA is more robust. Similar to roadway projects, each independent transit project is assessed for EJ impacts and mitigation would be proposed if adverse and disproportionate impacts are identified. Mitigation would be tailored specifically to each project.

Additionally, CAMPO is required to complete an entire Title VI analysis for each version of the Regional Transportation Plan. During the Title VI analysis, CAMPO assesses regional parameters on the entire future transportation system, created with inputs from the local transportation partners, on Title VI populations. Through the analysis, it is determined if the future transportation system would impact Title VI populations. If adverse and disproportionate impacts are identified, CAMPO would implement procedures to mitigate for the impacts or change the future roadway network to prevent the impacts from occurring.

## 12.0 Conclusion

Based on these analyses, the CAMPO 2040 Regional Transportation Plan build network for the CAMPO region, including future tolled facilities, would not cause disproportionately high and adverse impacts on any minority or low-income populations as per Executive Order 12898 regarding EJ. Therefore, no regional mitigation measures are proposed at this time. This regional analysis is based on the most recent policies, programs, and projects included in *CAMPO 2040 Regional Transportation Plan*. Changes in tolling/managed lane policies could necessitate this regional tolling analysis be revised if, after a thorough review, the changes are of sufficient magnitude. These elements are subject to change in future long range plans. During the development of future long range plans, new analyses of the effects of pricing to EJ and protected classes would be conducted.

*CAMPO 2040 Regional Transportation Plan* and the regional transportation planning process provide ways to avoid and minimize potential impacts that could occur due to transportation projects. CAMPO has performed an EJ and Title VI analysis, using the same demographic data that was used in the development of *CAMPO 2040 Regional Transportation Plan*, to ensure that no person is excluded from participation in, denied benefits of, or discriminated against in planning efforts, including the development of the long range plans. This assures the long range

plans are consistent with Title VI of the Civil Rights Act of 1964 and Executive Order 12898 on environmental justice, as well as the Civil Rights Restoration Act of 1987.

# Appendix A

**Figure 1 Population Growth**

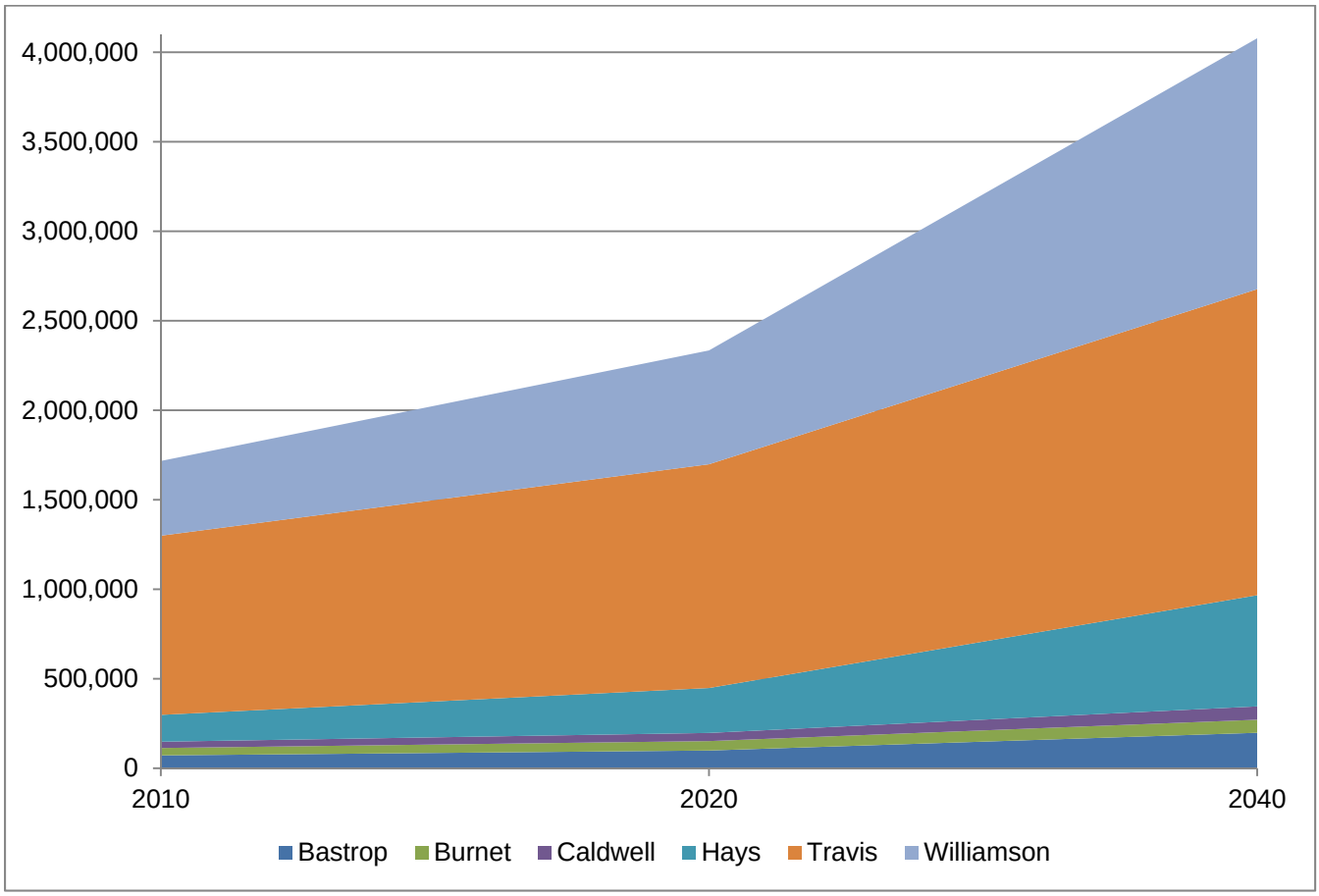

**Figure 2 CAMPO 2040 RTP Funding Summary**

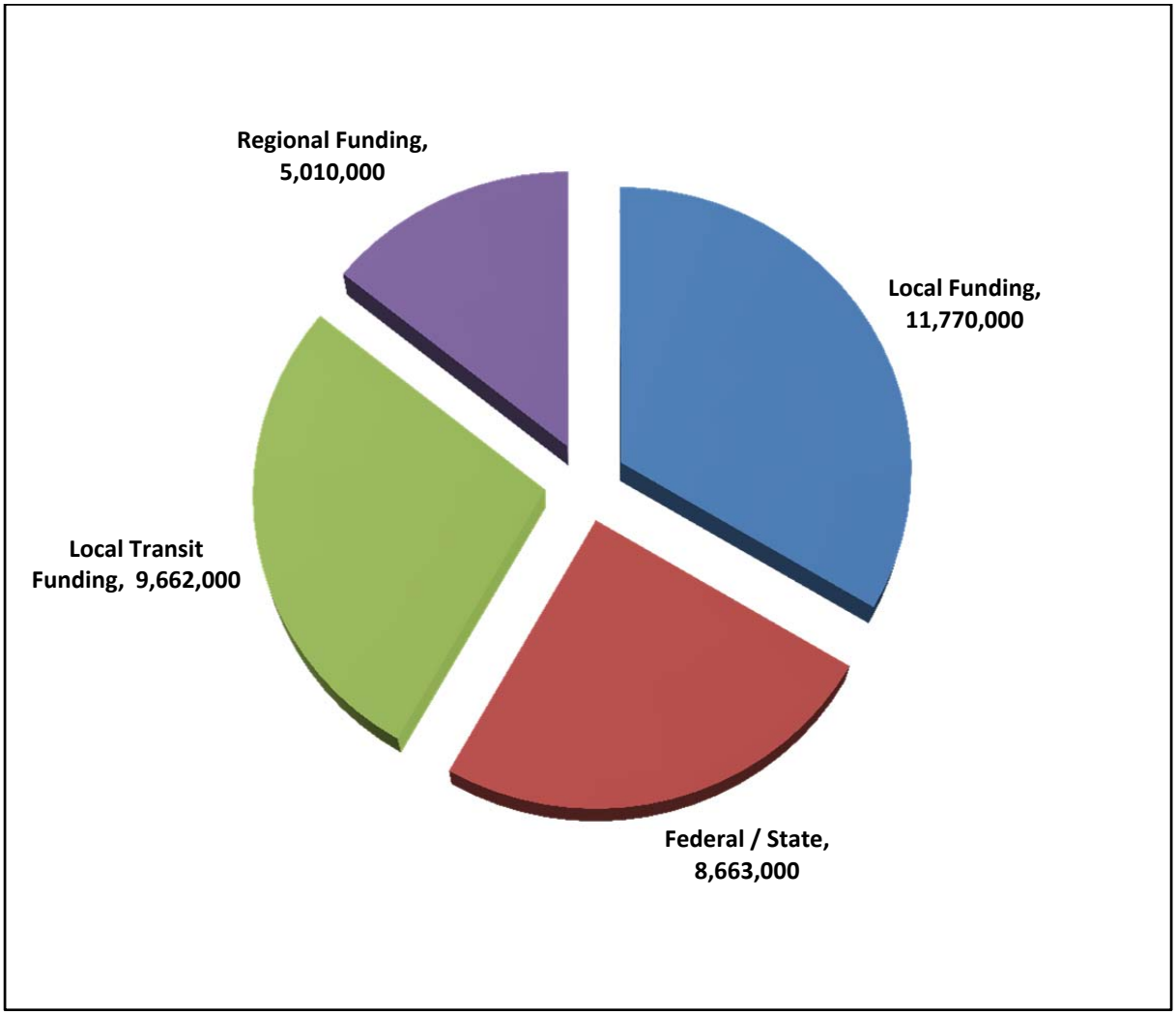

**Figure 3 2010 Modeled Network Congestion**

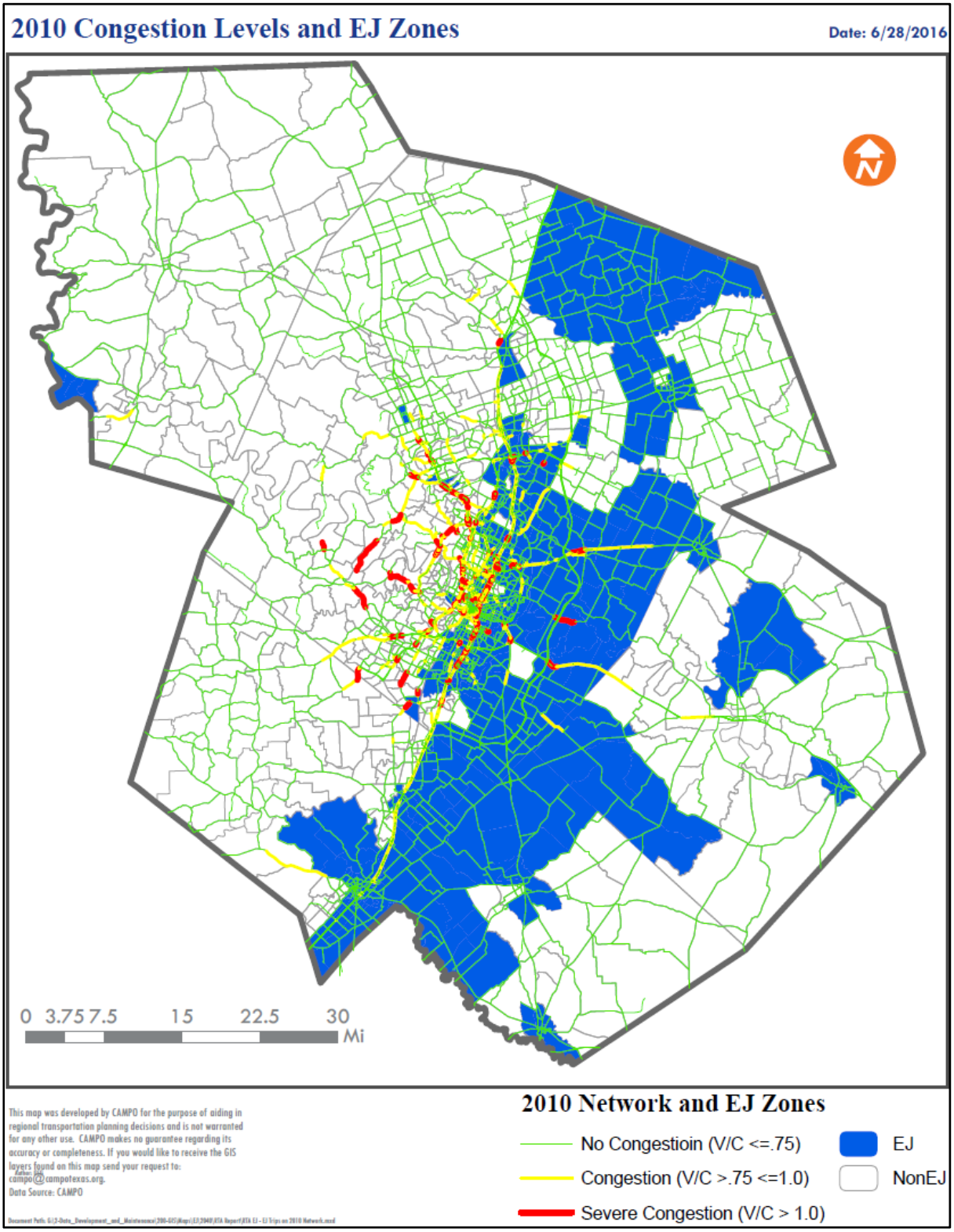

**Figure 4 2040 Modeled Network Congestion**

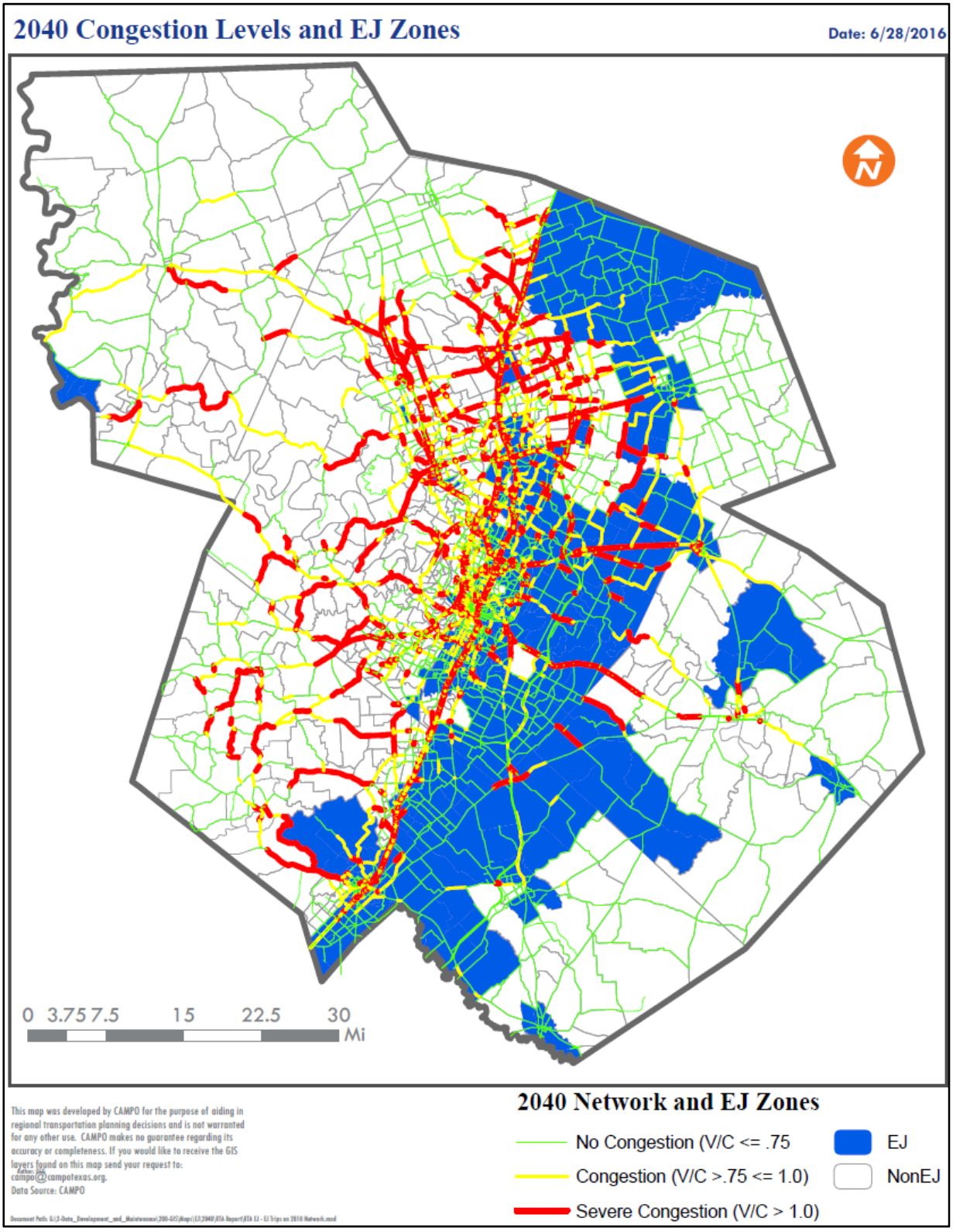

**Figure 5 Planned 2040 Transit System**

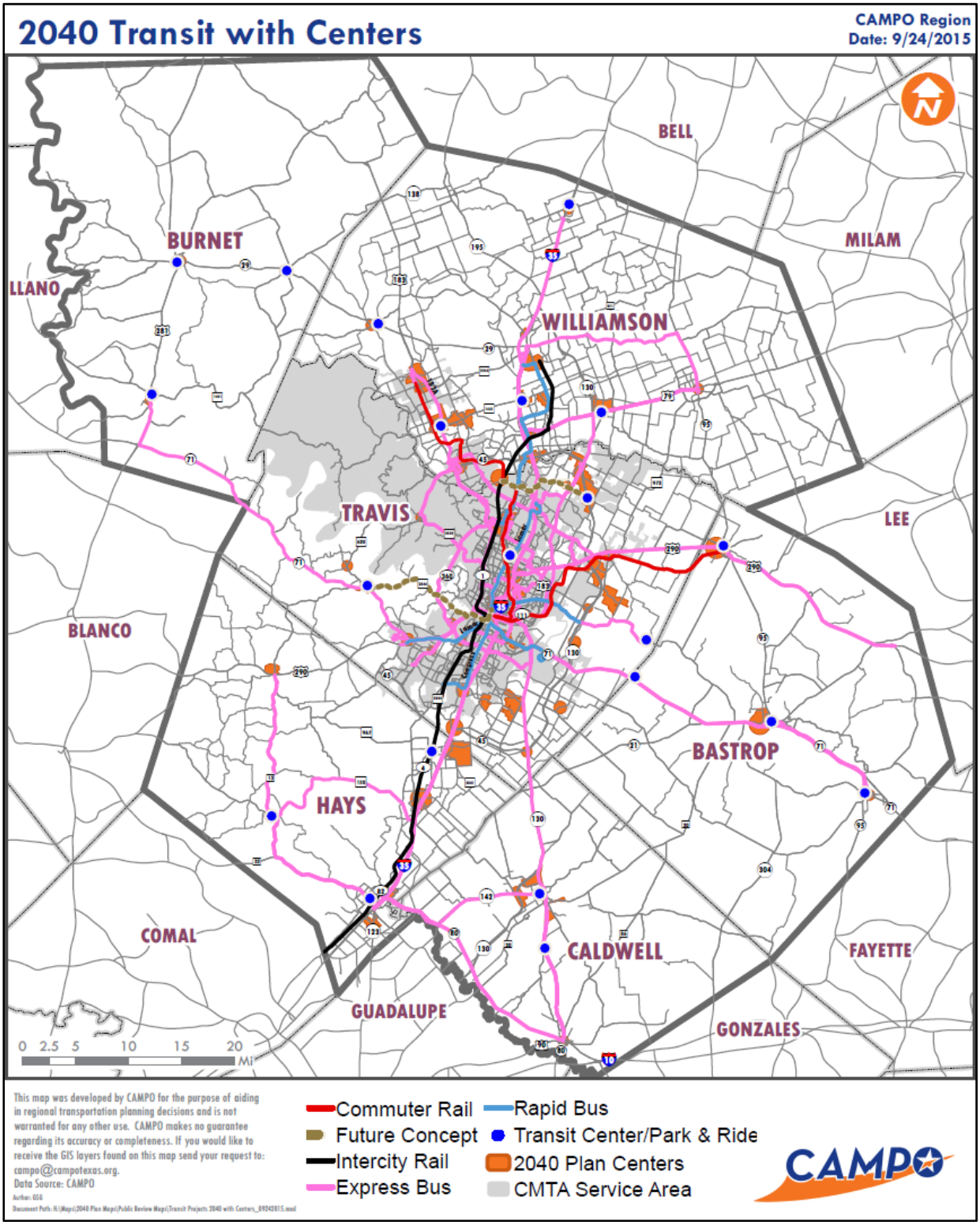

**Figure 6 2040 Planned Roadway System**

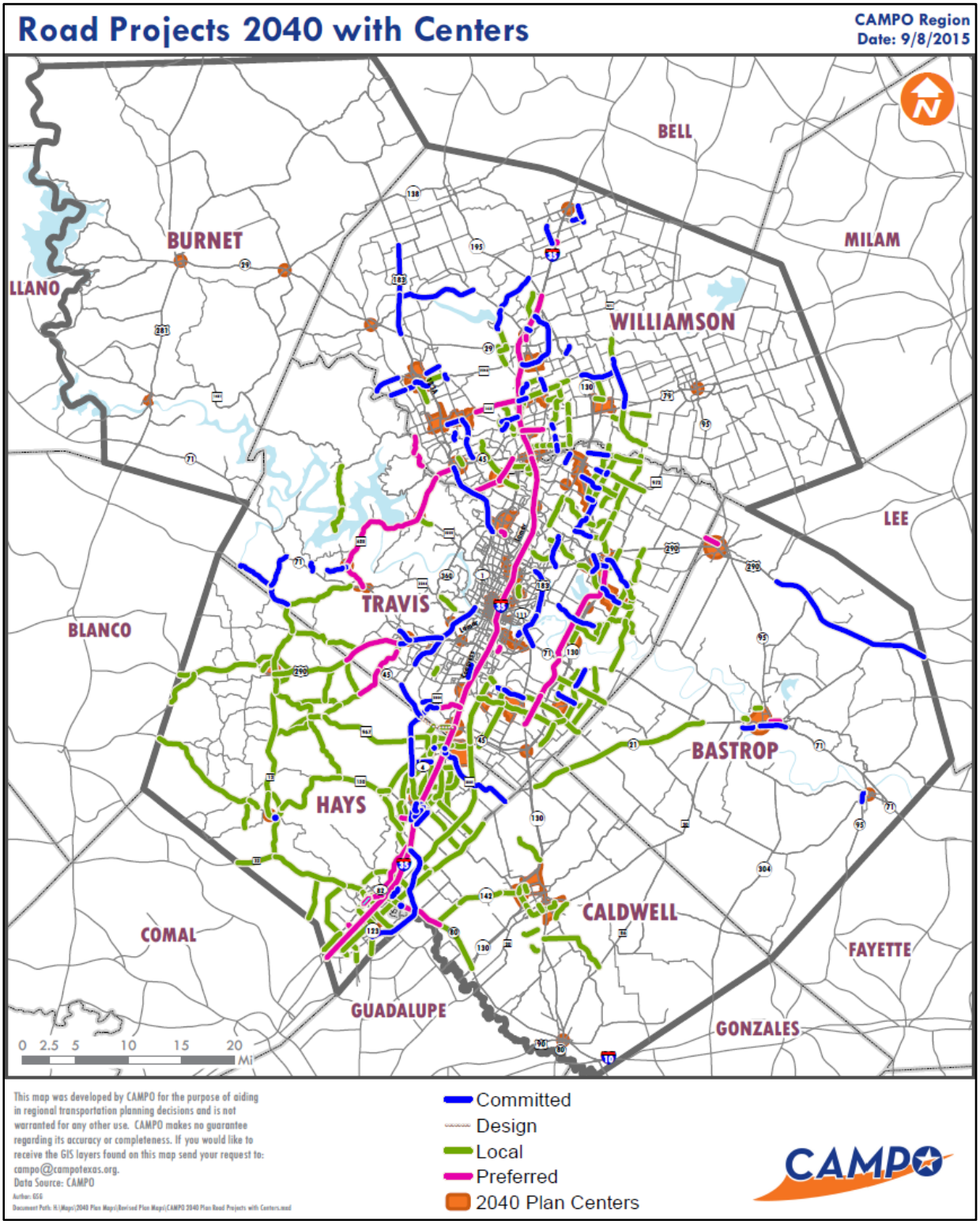

**Figure 7 2040 Planned Priced Facilities**

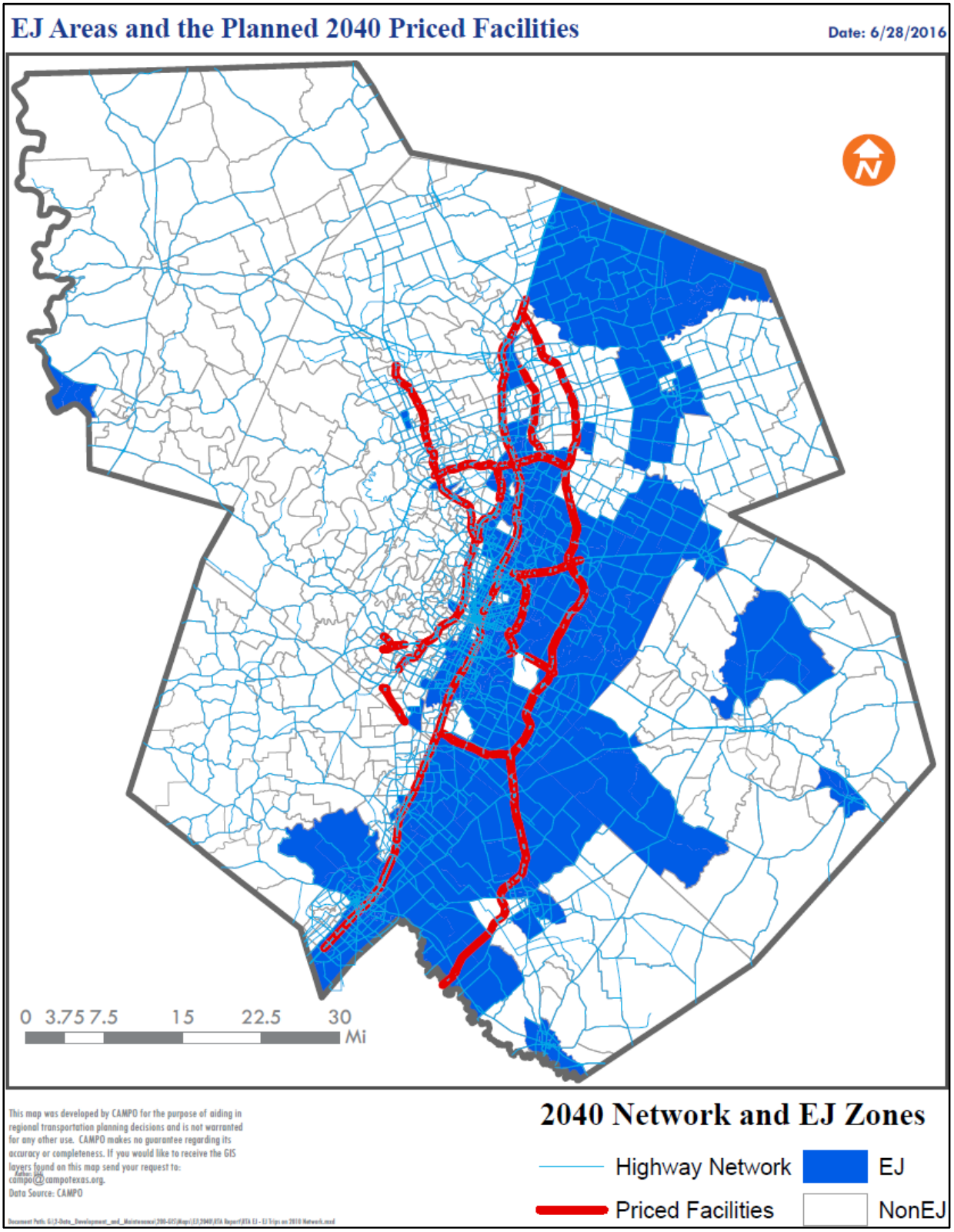

**Figure 8 EJ Zones with Planned 2040 Roadway Network**

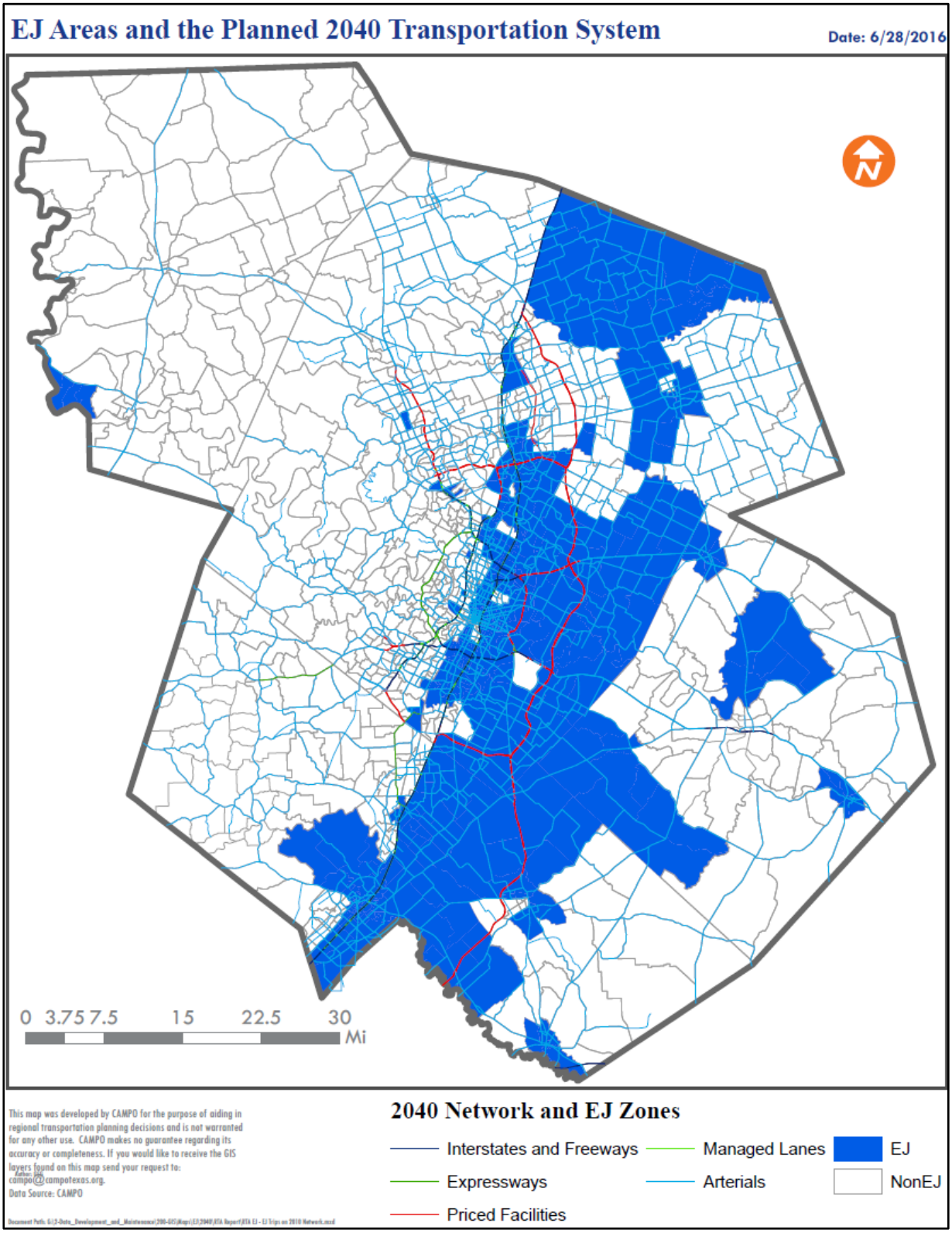

**Figure 9 Daily EJ Trips on 2010 Priced Facilities**

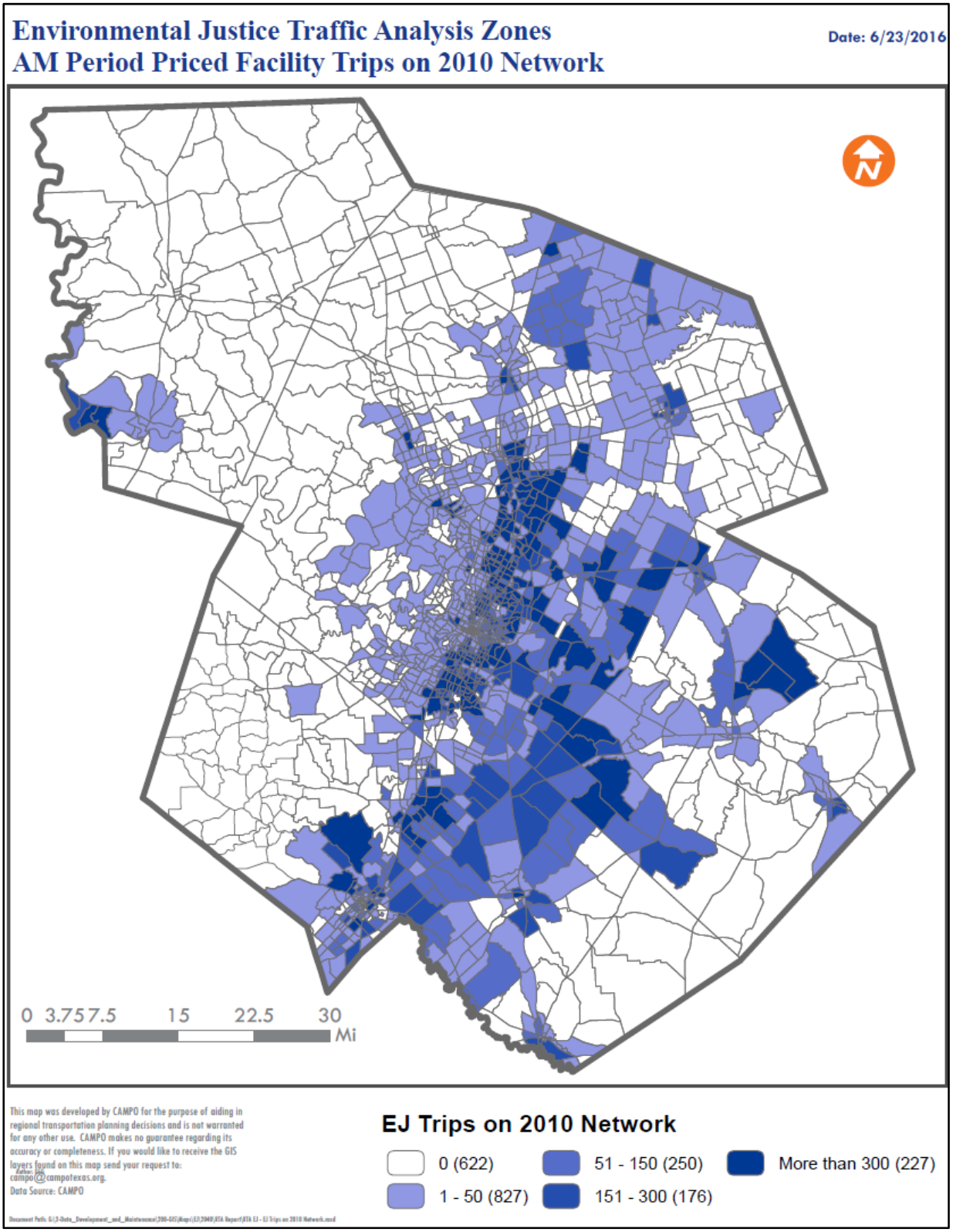

**Figure 10 Daily EJ Trips on 2040 Priced Facilities No Build Network**

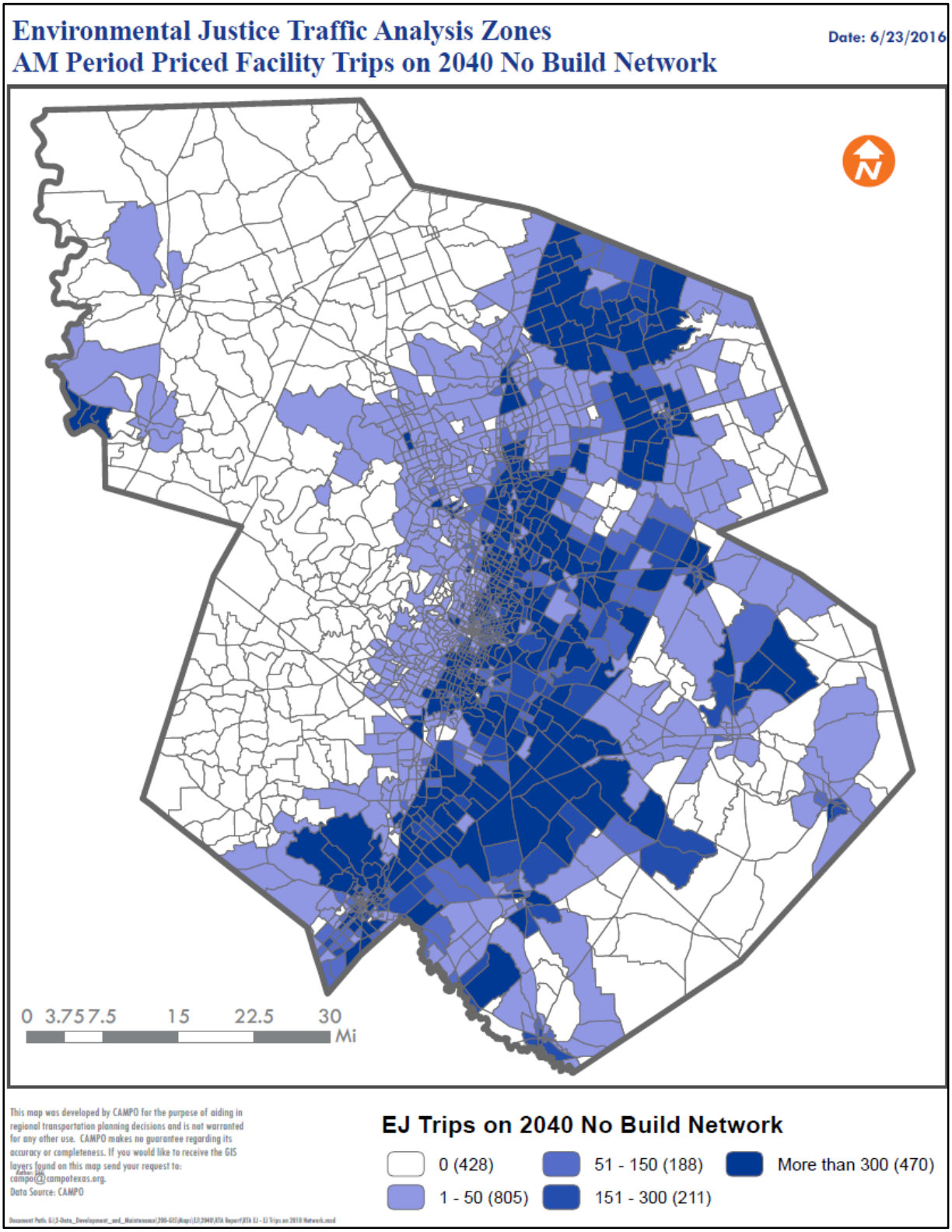

**Figure 11 Daily EJ Trips on 2040 Network**