Draft
Environmental Assessment

FM 2001 Improvement Project, Austin District
From I-35 to SH 21
CSJ: 1776-02-018
Hays and Caldwell Counties, Texas
January 2017

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

This Environmental Assessment (EA) evaluates the social, economic, and environmental impacts resulting from proposed improvements to Farm-to-Market Road (FM) 2001 in Hays and Caldwell Counties. The proposed FM 2001 Improvement Project is being developed by the Texas Department of Transportation (TxDOT) and Hays County. The limits of the proposed project extend from Interstate Highway 35 (I-35) to State Highway (SH) 21 (Camino Real) – a distance of approximately 8.5 miles. The proposed letting date is August 2017, with the design year slated for 2034. This EA has been developed in accordance with the National Environmental Policy Act (NEPA) of 1969, FHWA regulations (23 Code of Federal Regulations [CFR] – Part 771) and the TxDOT environmental and public involvement rules (43 Texas Administrative Code [TAC] – Part 1, Chapter 2).

1.1 Project Background

The project is identified in the Capital Area Metropolitan Planning Organization (CAMPO) *2040 Regional Transportation Plan* (RTP) and the CAMPO fiscal year 2015–2018 Transportation Improvement Program (TIP) as a priority project. As of September 2016, the estimated total cost of the proposed FM 2001 project is $35.5 million in year of expenditure dollars. The project would be financed with a combination of federal, state, and local funding. **Appendix A** contains the TIP and RTP pages.

In 2010, Texas Engineering Solutions (TES) conducted a preliminary alignment study for FM 2001 between I-35 and SH 21 on behalf of Walton Development and Management, Inc. The study found that, in light of the current and proposed development along the roadway, the current FM 2001 facility is a rural roadway "not designed, constructed, or maintained in a manner that promotes the safe conveyance of the volume of traffic" it is likely to serve in the near future. The study evaluated four alignments, recommending two similar alignments for Hays County staff review. The study also recommended the realignment of two curves.

The proposed project is listed in the 2013 *Hays County Transportation Plan* (HCTP) in three separate sections: the first section from I-35 to Old Goforth Road as an upgrade from a major, undivided two-lane roadway to a major, divided four-lane roadway; the second section from Old Goforth Road to Goforth Road as an upgrade from a major, undivided two-lane roadway to a major, divided four-lane roadway; and the third section from Goforth Road to SH 21 as an upgrade from a major, undivided two-lane roadway to a major, divided four-lane roadway and new alignment. The project is proposed to be constructed in two phases. Phase 1 would consist of the construction of two lanes for the length of the entire alignment (all three sections listed on the

HCTP) on one side. Phase 2 would follow and would consist of construction of the remaining two lanes on the opposite side for the length of the project (all three sections listed on the HCTP).

1.2 Proposed Project Limits

The proposed FM 2001 Improvement Project would have logical termini at I-35 and SH 21. The I-35/FM 2001 intersection is a logical northern terminus for the proposed improvements as I-35 is a major traffic generator. The section of FM 2001 within the proposed project includes numerous 90-degree turns and narrow shoulders. Further, FM 2001 is not on a continuous alignment through its intersection with SH 21; rather, FM 2001 traffic between Buda and Lockhart must stop, turn onto SH 21, and travel on SH 21 for 1.4 miles between Niederwald and Rohde Road before turning back onto FM 2001. SH 21 is a logical southern terminus that would allow for the straightening of the 90-degree turns and the construction of a continuous connection of FM 2001 north and south of SH 21.

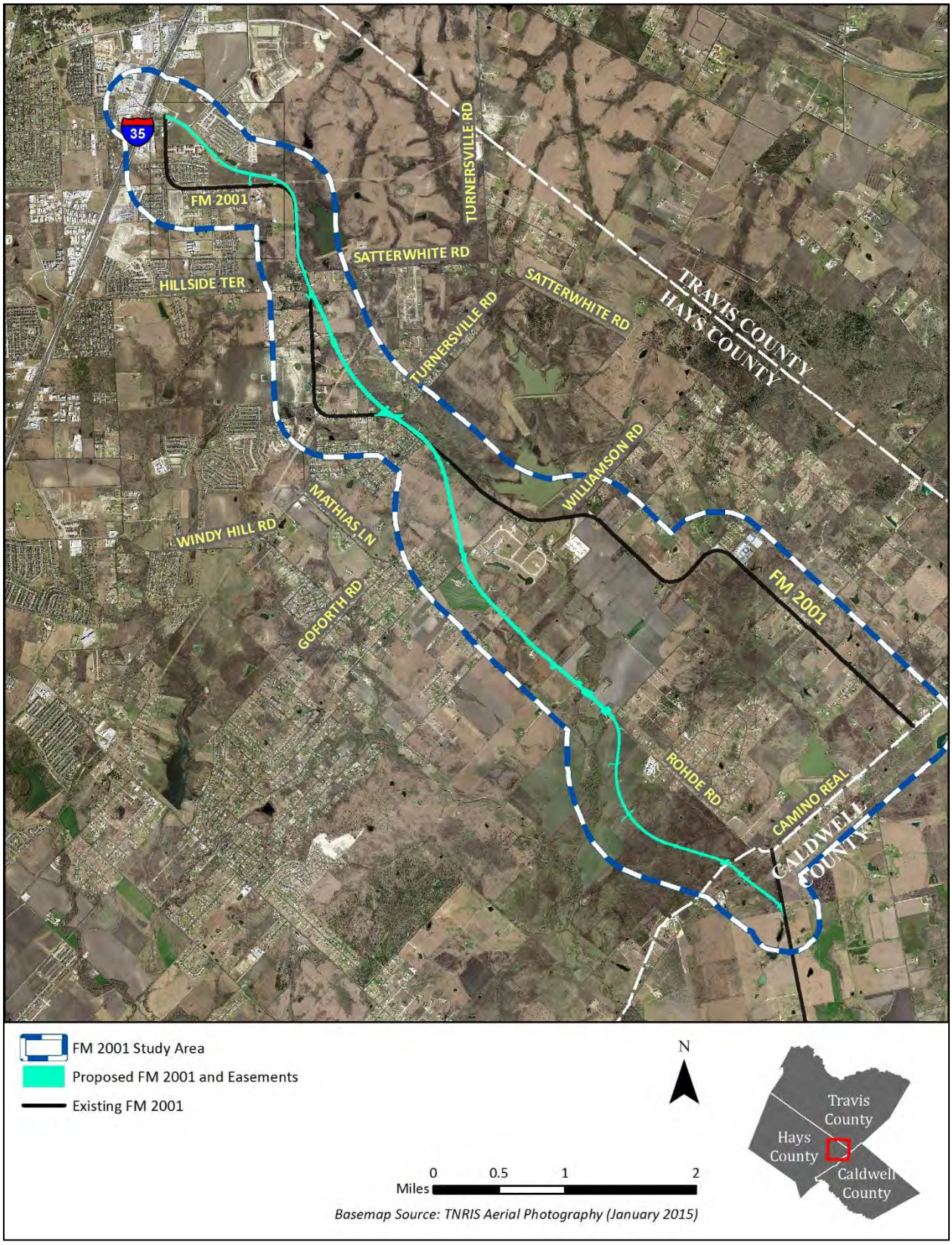
The proposed improvements would have independent utility — the project improvements would function as a usable roadway, would not require implementation of any other projects to operate, and would not restrict consideration of alternatives for other foreseeable transportation improvements. **Figure 1.3-1** shows the general project location.

1.3 Description of Existing Facility

The current FM 2001 facility is a rural two-lane highway, consisting of one 11-foot-wide travel lane in each direction, typically with four-foot-wide outside shoulders. Existing right-of-way (ROW) varies, with a minimum ROW width of 70 feet. Overpass Road, which connects existing FM 2001 to I-35, consists of two 12-foot-wide travel lanes in each direction within a 120-foot ROW. The overall corridor provides access to the cities of Buda and Niederwald, as well as numerous residential subdivisions adjacent to the proposed project. Several minor roadways intersect with FM 2001 along the project limits; each of these intersections occurs at grade. Only one intersection – of FM 2001 and I-35 – is signalized. No sidewalks exist along FM 2001 in the project limits. The speed limit on the existing FM 2001 facility is 50 miles per hour (mph) and 60 mph on SH 21. Existing drainage is conveyed through open ditches.

Photographs of the project area are shown in **Appendix B**. A typical section of the existing facility is shown in **Appendix C**.

Figure 1.3-1: Project Study Area



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2 PURPOSE AND NEED

2.1 Introduction

Environmental documents prepared under NEPA begin with a discussion of the "purpose and need" of a proposed action, which explains why the proposed action (project) is being considered. The solutions (alternatives) proposed will be evaluated on their ability to address the challenges discussed below. In addition, the consequences of not addressing the problem (i.e., not building the project or not taking any action to address the challenges) will also be evaluated. The purpose and need is essentially the foundation of the NEPA decision-making process.

The purpose and need section presents a statement explaining why the proposed action is being considered and what factors have influenced the decision-making process during the project's development phase. This process provides the basis for identifying and developing the range of alternatives that will be analyzed in the alternatives section of the EA, ultimately leading to the selection of a Recommended Alternative. The purpose and need provides important screening criteria for determining whether alternatives are reasonable and feasible. Reasonable alternatives must meet the defined project purpose and need. **Table 2.1-1** provides a summary of the purpose and need for the proposed FM 2001 project.

Table 2.1-1: FM 2001 Summary of Purpose and Need

Desired Outcome (Purpose)	Condition to be Addressed (Need)
• Improve safety • Provide system linkage between FM 2001 north and south of SH 21 to improve travel times for commuters and emergency vehicles • Improve mobility	• Increasing congestion and the discontinuous roadway causes unreliable operations • Geometric deficiencies due to substandard horizontal alignment and lack of shoulders

2.2 Purpose of the Proposed Action

The purpose of the proposed project is to:

- Improve safety
- Provide system linkage between FM 2001 north and south of SH 21 to improve travel times for commuters and emergency vehicles; and
- Improve mobility.

2.2.1 Improve Safety

Existing FM 2001 within the project limits includes numerous 90- degree turns, which do not meet design criteria for rural farm-to-market roads. Additionally, the existing facility contains narrow shoulders and does not meet the design criteria needed for the volume of traffic projected in the near future (TES, 2010).

2.2.2 System Linkage

Currently, FM 2001 is aligned for approximately 1.4 miles along a portion of SH 21 between Rohde Road and Niederwald. This is not ideal as it forces traffic to merge with SH 21 traffic for a short time and then get back onto FM 2001 (TES, 2010). Additionally, the numerous 90-degree turns on existing FM 2001, often at intersections with other roadways, can cause driver confusion.

2.2.3 Improve Mobility

The existing two-lane facility, with its narrow shoulders, numerous 90-degree turns, and lack of connectivity, hampers mobility along this section of FM 2001. There is a need to provide an improved facility that accommodates the projected traffic demand in this rapidly growing area in Hays County.

2.2.4 Conclusion

Due to increasing traffic congestion in the corridor and geometric deficiencies (such as several 90-degree turns, narrow shoulders, and a discontinuous roadway at SH 21), improvements to the existing FM 2001 roadway facility are needed. The FM 2001 Improvement Project seeks to address these issues by identifying an alternative that improves safety and mobility in the corridor and provides system linkage and improved travel times between FM 2001 north and south of SH 21.

2.3 Need for the Proposed Action

Transportation improvements are needed in the project area because the existing roadway geometry and alignment, coupled with increasing congestion due to population and economic growth in Hays County, has caused safety and mobility concerns. These conditions, which are

projected to worsen in response to continued population and economic growth, indicate a need for transportation improvements.

2.3.1 Increasing Congestion and Discontinuous Roadway Cause Unreliable Operations

2.3.1.1 Population and Economic Growth

Hays County has seen rapid population growth in the last several decades, growing from a population of 65,614 in 1990 to 168,990 in 2012, an increase of 158 percent (US Census, 2013). Caldwell County has also seen a significant increase in population, growing from a population of 26,392 in 1990 to 38,066 in 2010, an increase of 44 percent (US Census, 2013). As shown in **Table 2.3-1**, this trend is projected to continue for both counties, with the projected 2040 population expected to more than triple for Hays County and more than double for Caldwell County (TXSDC, 2015). Employment in Hays County is also anticipated to almost triple from 48,000 in 2010 to over 137,000 by 2035 (Hays County, 2013). Employment in Caldwell County is anticipated to grow at a similar rate from 7,224 in 2010 to 21,034 by 2040 (CAMPO, 2015).

Table 2.3-1: Population Growth by County

County	Year	Population	% Change
Hays	1990	65,614	N/A
	2012	168,990	+ 158%
	2040	556,982 (projected)	+ 230%
Caldwell	1990	26,392	N/A
	2010	38,066	+ 44%
	2040	77,373 (projected)	+ 103%

Source: US Census, 2013; TXSDC, 2015

2.3.1.2 Congestion

In 2014, traffic on FM 2001 east of I-35 was approximately 8,770 vehicles per day (vpd) and traffic along the roadway south of County Road (CR) 133 (Hillside Terrace) was approximately 11,700 vpd. Traffic on the roadway is projected to increase over the next twenty years, with volumes east of I-35 increasing by 178 percent (to 24,400 vpd) and volumes south of Hillside Terrace increasing by 85 percent (to 21,600 vpd) (Kimley-Horn, 2014).

With the current roadway facility, these projected traffic volumes would result in low levels of service along the roadway. Level of service (LOS) is a measure of traffic flow and congestion that is generally related to factors such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. LOS is classified A through F, with A being the least congested and F being the most congested. **Table 2.3-2** describes the LOS descriptions as presented in the *Highway Capacity Manual*.

Table 2.3-2: Level of Service Characteristics

Level of Service	Description
A	Free flow with low volumes and high speeds
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions
C	Stable flow zone, but most drivers are restricted in the freedom to select their own speeds
D	Approaching unstable flow; drivers have little freedom to select their own speeds
E	Unstable flow; may be short stoppages
F	Unacceptable congestion; stop and go; force flow

Adapted from Transportation Research Board, 2000

Based on the traffic projections discussed above, by 2034 FM 2001 would experience a LOS D east of I-35 and south of Hillside Terrace as traffic volumes exceed lane capacity by as much as 208 percent (**Table 2.3-3**).

Table 2.3-3: LOS Analysis for FM 2001 in 2034

Road Section	2014 ADT	2034 ADT	Capacity (vehicles/lane)	LOS
FM 2001 (east of I-35)	8,770	24,400	9,000	D
FM 2001 (south of Hillside Terrace)	11,700	21,600	7,000	D

Source: Kimley-Horn, 2014

2.3.1.3 Roadway Geometry

Existing FM 2001 consists of numerous substandard curves and a discontinuous roadway north and south of SH 21. This configuration results in reduced mobility and travel times, a situation that would continue to decline as population increases in the area, as indicated by the projected 2034 LOS D (**Table 2.3-3**).

2.3.2 Geometric Deficiencies Cause Safety Concerns

Existing FM 2001 does not meet current design criteria for rural farm-to-market roads due to the numerous 90-degree turns and narrow shoulders. The existing configuration is considered substandard and results in safety issues along the roadway. The 90-degree turns reduce the line of sight and driver expectancy. The narrow shoulders, or lack thereof, creates safety concerns for vehicles that have become disabled along the roadway. Both of these situations would be further compounded as traffic in the area increases. Therefore, there is a need to correct these deficiencies along FM 2001.

As **Table 2.3-4** shows, reported vehicle crash data from 2012–2015 shows a consistently high rate of collisions within this section of FM 2001 when compared to the statewide average for a rural, two-lane, two-way road.

Table 2.3-4: Vehicle Crash Data for FM 2001 from 2012–2015

Crash Year	Fatal Crashes	Total Crashes	Existing FM 2001 Crash Rate	Statewide Average Crash Rate
2012	2	40	205.54	93.34
2013	0	42	192.01	103.21
2014	0	38	167.15	105.15
2015*	1	46	N/A	N/A

**Crash data was not available for 2015 at the time the data was analyzed*

3 ALTERNATIVES ANALYSIS

As part of the planning process, and in accordance with the Council on Environmental Quality (CEQ) regulations implementing NEPA, as well as FHWA and TxDOT guidelines, preliminary alternatives to the proposed action were developed and evaluated. The preliminary alternatives were then narrowed to reasonable alternatives; and from the reasonable alternatives, a recommended alternative has been proposed. This section explains the alternatives analysis process leading to the identification of the Recommended Alternative.

3.1 Background

The proposed project, listed in the CAMPO *2040 RTP*, would consist of widening the existing two-lane undivided roadway to a four-lane divided roadway and realigning portions of the roadway from I-35 to SH 21. The project is included in the HCTP, and the Hays County Commissioners Court adopted a resolution in support of rerouting FM 2001 between SH 21 and I-35 (Hays County, 2013). The preliminary alternatives considered in this evaluation were developed during a previous study of the FM 2001 corridor by TES in a report titled *FM 2001 Preliminary Alignment Study Hays County, Texas* (TES, 2010).

This evaluation builds upon the previous work conducted for the FM 2001 corridor. The previously developed preliminary alternatives were reevaluated in relation to the Purpose and Need Statement developed for the current FM 2001 Improvement Project. The preliminary alternatives that met the current purpose and need were carried forward as reasonable alternatives, and an additional reasonable alternative was developed based on public input.

3.2 Existing Facility

The FM 2001 corridor between I-35 and SH 21 is located within Hays and Caldwell Counties. The current facility is a rural two-lane undivided highway, consisting of one 11-foot-wide travel lane in each direction, typically with four-foot-wide outside shoulders. Overpass Road, which connects

existing FM 2001 to I-35, consists of two 12-foot-wide travel lanes in each direction. Currently, FM 2001 is aligned for approximately 1.4 miles along a portion of SH 21 between Rohde Road and the city of Niederwald. The corridor provides access to the cities of Buda and Niederwald within the study area, as well as numerous residential subdivisions adjacent to the proposed project.

3.3 Preliminary Alternatives

Four build alternatives were developed within the FM 2001 study area based on the earlier corridor study by TES. These alternatives, which are shown on **Figure 3.3-1**, were then evaluated based on their ability to meet the proposed project's purpose and need, as described in **Section 2**. A No-Build Alternative was also included as a preliminary alternative and evaluated as a baseline for comparison of the build alternatives. The preliminary alternatives and the project purpose and need were presented during an Open House in January 2014.

The proposed FM 2001 facility that was presented at the January 2014 Open House consisted of two typical sections – urban and suburban. The urban section consisted of one 12-foot wide inside lane and one 14-foot wide outside lane in each direction within a 120-foot ROW. This section of roadway would be curb-and-gutter and would include a 15-foot wide raised median. The urban section would be located from the northern extent of construction (Overpass Road) to Hillside Terrace and from approximately Graef Road to the southern project terminus. The design speed of urban sections of the proposed roadway would be 45 mph.

The suburban section consisted of two 12-foot wide lanes, a four-foot wide inside shoulder, and a 10-foot wide outside shoulder in each direction within a 160-foot ROW. This section of roadway would have a 16-foot wide vegetated median and drainage would be conveyed through open ditches. The suburban section would be located from Hillside Terrace to approximately Graef Road. The design speed of suburban sections of the proposed roadway would be 55 mph.

3.3.1 Alternative A

Alternative A would include the extension of the recently constructed four-lane FM 2001 spur east of I-35 to connect with the existing FM 2001 alignment at a point approximately 5,000 feet east of Old Goforth Road. The existing FM 2001 would then be expanded from two to four lanes until a point approximately 400 feet north of the intersection of FM 2001 and Hillside Terrace. Alternative A would then deviate from the current FM 2001 alignment using a gradual horizontal curve to create a more direct connection with the current facility at the intersection with South Turnersville Road, thereby eliminating the 90-degree turn currently present at Windy Hill Road. The existing facility would be expanded to a four-lane roadway between South Turnersville Road and CR 121, at which point Alternative A would deviate again from the existing FM 2001

alignment and make a gradual turn south and then east to avoid the Elm Creek Ranch and Circle N Ranch neighborhoods. Alternative A would then cross SH 21 and provide a direct connection to the current FM 2001 facility at a point approximately 2,800 feet south of the current intersection with SH 21.

Alternative A would eliminate all of the 90-degree turns present in the current FM 2001 alignment and provide a direct link between FM 2001 north and south of SH 21. Therefore, Alternative A meets the purpose and need of the proposed project and was carried forward as a reasonable alternative for further study.

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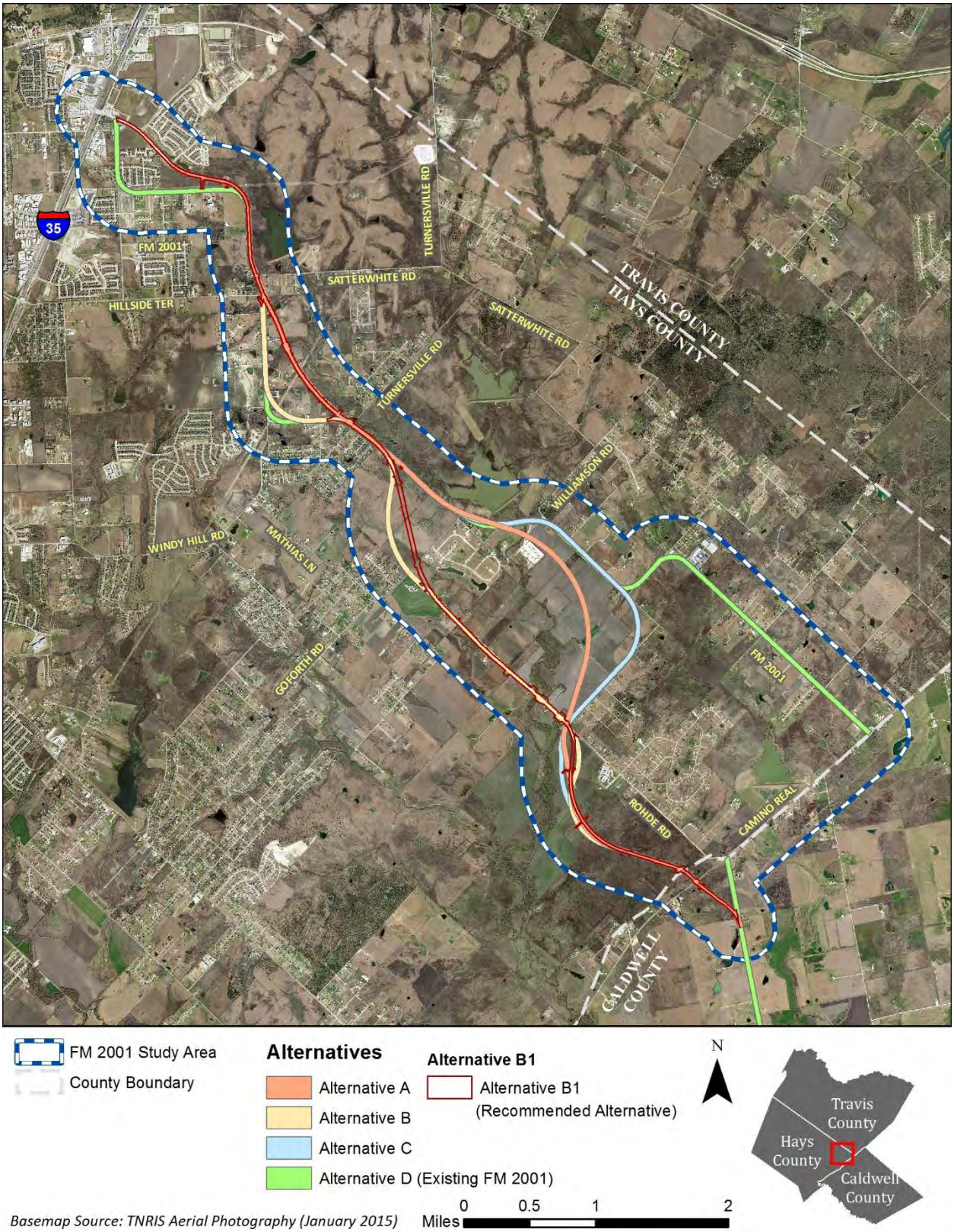
Figure 3.3-1: Project Alternatives



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3.3.2 Alternative B

Alternative B would follow the same alignment as Alternative A until the intersection with Hillside Terrace, at which point Alternative B would continue with an expansion of the existing roadway to a four-lane facility. Alternative B would improve the geometry of the horizontal curve at Windy Hill Road and continue to utilize the existing alignment until a point approximately 300 feet east of Quail Run. The alignment would then make a gradual curve south and then east in order to connect with the existing Rohde Road facility at its intersection with Goforth Road. Rohde Road would be expanded from a two-lane to a four-lane facility from Goforth Road to Graef Road, at which point the roadway would make a gradual turn to the south and generally follow the alignment of Alternative A until the connection with the current FM 2001 facility.

Alternative B would eliminate six 90-degree turns and improve the geometry of a seventh, while providing a direct link between FM 2001 north and south of SH 21. Additionally, Alternative B would maximize the use of the current facilities on FM 2001 and Rohde Road. Therefore, Alternative B meets the purpose and need of the proposed project and was carried forward as a reasonable alternative for further study.

3.3.3 Alternative C

Alternative C would follow the alignment of Alternative B until the intersection with Quail Run, at which point it would continue following the current FM 2001 alignment with an expansion of the roadway from a two-lane to a four-lane facility. The Alternative C alignment would make a gradual 90-degree turn to the south at Graef Road and follow the current Graef Road alignment to its intersection with Rohde Road, at which point it would make a gradual turn to the south and east before terminating in an alignment identical to the two previous alternatives.

Alternative C would provide a direct link between FM 2001 north and south of SH 21. Additionally, Alternative C would eliminate six 90-degree turns and improve the geometry of a seventh. Therefore, Alternative C meets the purpose and need of the proposed project and was carried forward as a reasonable alternative for further study.

3.3.4 Alternative D

Alternative D would consist of an upgrade to the existing FM 2001 alignment. Although the existing narrow shoulders would be improved to current TxDOT design standards as part of Alternative D, none of the 90-degree turns would be eliminated. Additionally, this alternative would not provide a direct link between FM 2001 north and south of SH 21. Therefore, Alternative D does not meet the project purpose and need and was not carried forward for further study.

3.3.5 No-Build Alternative

The No-Build Alternative would leave FM 2001 in its current condition, and no funds or energy would be expended for planning or construction. The No-Build Alternative would not improve local mobility or enhance safety within the project area. As traffic volumes continue to increase, mobility and safety along FM 2001 would continue to deteriorate. The No-Build Alternative does not satisfy the purpose and need for the proposed improvements, and is not consistent with the CAMPO *2040 RTP*; however, consistent with NEPA, the No-Build Alternative is considered a reasonable alternative and will be carried forward for further evaluation.

3.4 Public Response to Preliminary Alternatives

An open house was held on January 16, 2014 to obtain feedback from the public on the proposed project's purpose and need, as well as the preliminary alternatives. The preliminary alternatives, typical sections, and information on the environmental process were displayed for the 48 citizens in attendance. A total of 26 comments were received during the official public comment period, with common themes including safety, impacts to property, construction impacts on traffic, and addressing congestion at the intersection of I-35 and FM 2001. Alternative A received the most support, followed by Alternatives B and C. For more information on the open houses, please refer to **Section 5** of this EA or the Open House Summary Report, which is available at the Austin District of TxDOT.

Following the open house, project staff evaluated the preliminary alternatives based on public input, environmental impacts, engineering considerations and each alternative's ability to meet the proposed project's purpose and need, as discussed in **Section 2**.

3.5 Reasonable Alternatives

Based on the analysis of preliminary alternatives, it was determined that Alternatives A, B, and C met the purpose and need for the proposed FM 2001 project and were therefore carried forward for further evaluation as reasonable alternatives. Another alternative, herein referred to as Alternative B1, was developed as a result of public comments received after the open house.

Alternative B1 would be a blend of Alternative A north of South Turnersville Road and Alternative B south of South Turnersville Road. Alternative B1 would create a more gradual curve than Alternative B between FM 2001 and Rohde Road, and would have a slightly modified curve from that of Alternative B at the intersection with Graef Road. The terminus of Alternative B1 would be identical to that of the previous alternatives. Alternative B1 meets the purpose and need of the proposed project and was therefore carried forward as another reasonable alternative for further study.

The reasonable alternatives were screened against a secondary set of criteria in order to select the Recommended Alternative. The additional screening criteria are:

- ROW impacts and displacements
    - Total ROW
    - Residential displacements
    - Parcels requiring ROW acquisition
    - Large tracts of land split by ROW
- Environmental impacts
    - National Wetlands Inventory (NWI) wetlands
    - Creek crossings
    - Floodplains
    - Prime and unique farmlands
- Utility impacts

Results of the secondary screening are presented below and in **Table 3.6-1**.

Alternative A would result in one residential displacement, require approximately 120 acres of ROW from 37 parcels, and split 16 large tracts of land. Alternative A would also impact one water tank, one natural gas facility, 1.24 acres of potential wetlands, nine creek crossings, 5.79 acres of floodplain, and 76 acres of prime farmland soils.

Alternative B would result in seven residential displacements, require approximately 106 acres of ROW acquisition from 65 parcels, and split 10 large tracts of land. Alternative B would also impact one water tank, one natural gas facility, 1.17 acres of potential wetlands, 10 creek crossings, 6.17 acres of floodplain, and 73 acres of prime farmland soils.

Alternative B1 would result in one residential displacement, require approximately 114 acres of ROW from 42 parcels, and split nine large tracts of land. Alternative B1 would also impact 2.24 acres of potential wetlands, eleven creek crossings, 6.48 acres of floodplain, and 46 acres of prime farmland soils.

Alternative C would result in seven residential displacements, require approximately 116 acres of ROW acquisition from 65 parcels, and split nine large tracts of land. Alternative C would also impact one natural gas facility, 0.66 acre of potential wetlands, six creek crossings, 4.15 acres of floodplain, and 69 acres of prime farmland soils.

Figures 3.5-1 through **3.5-3** show environmental constraints associated with each of the Build Alternatives.

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Figure 3.5-1: Build Alternative Environmental Constraints (Map 1 of 3)

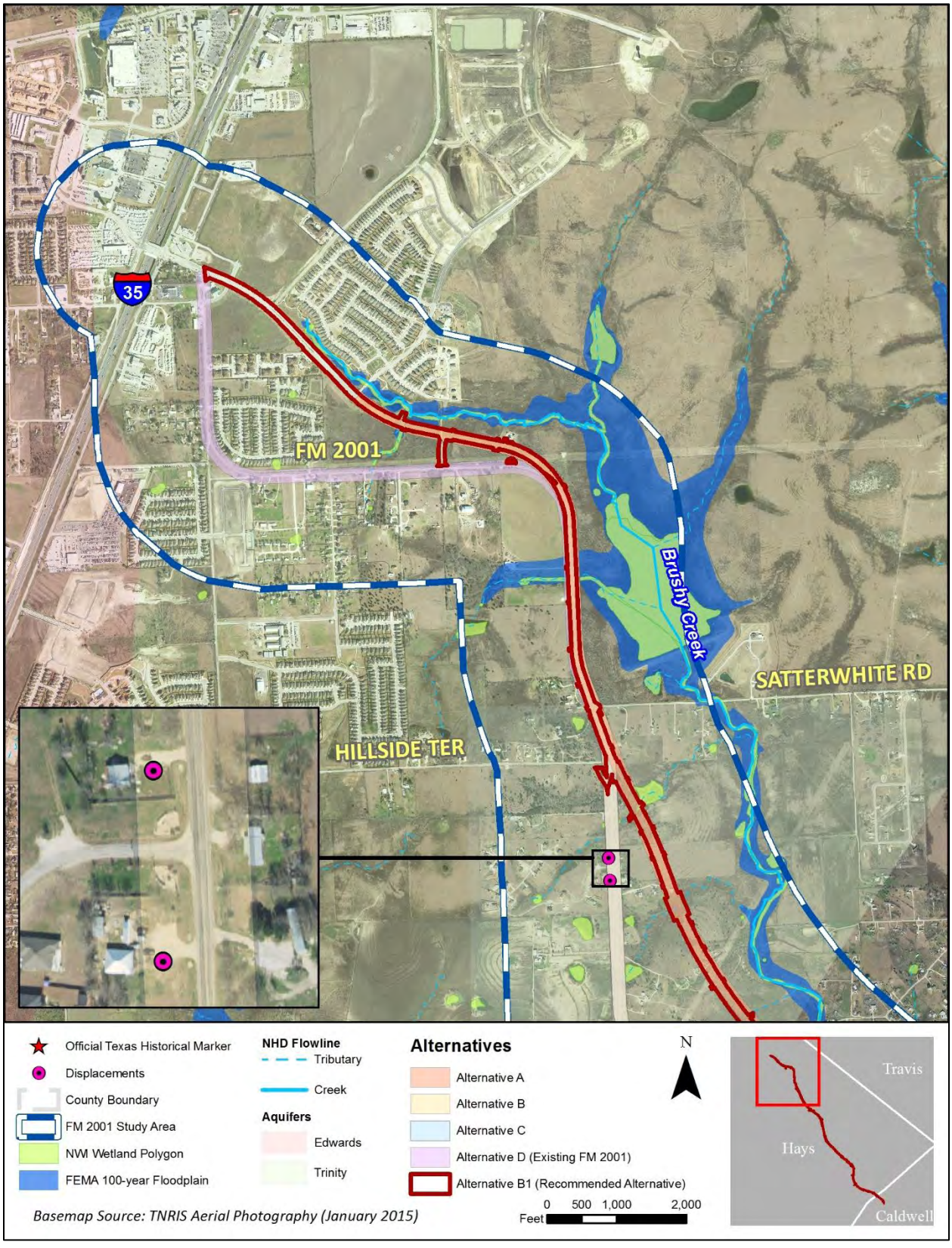

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Figure 3.5-2: Build Alternative Environmental Constraints (Map 2 of 3)

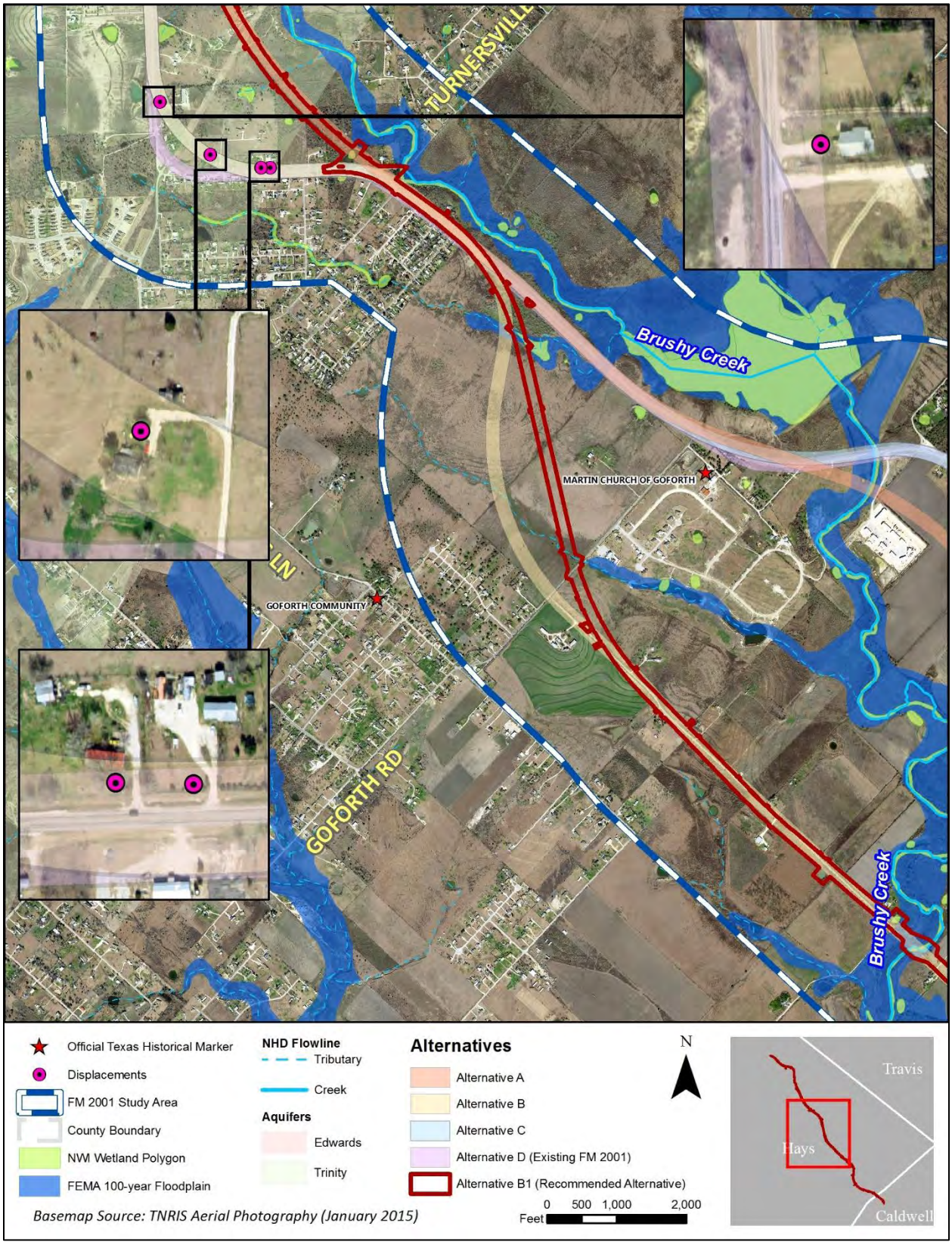

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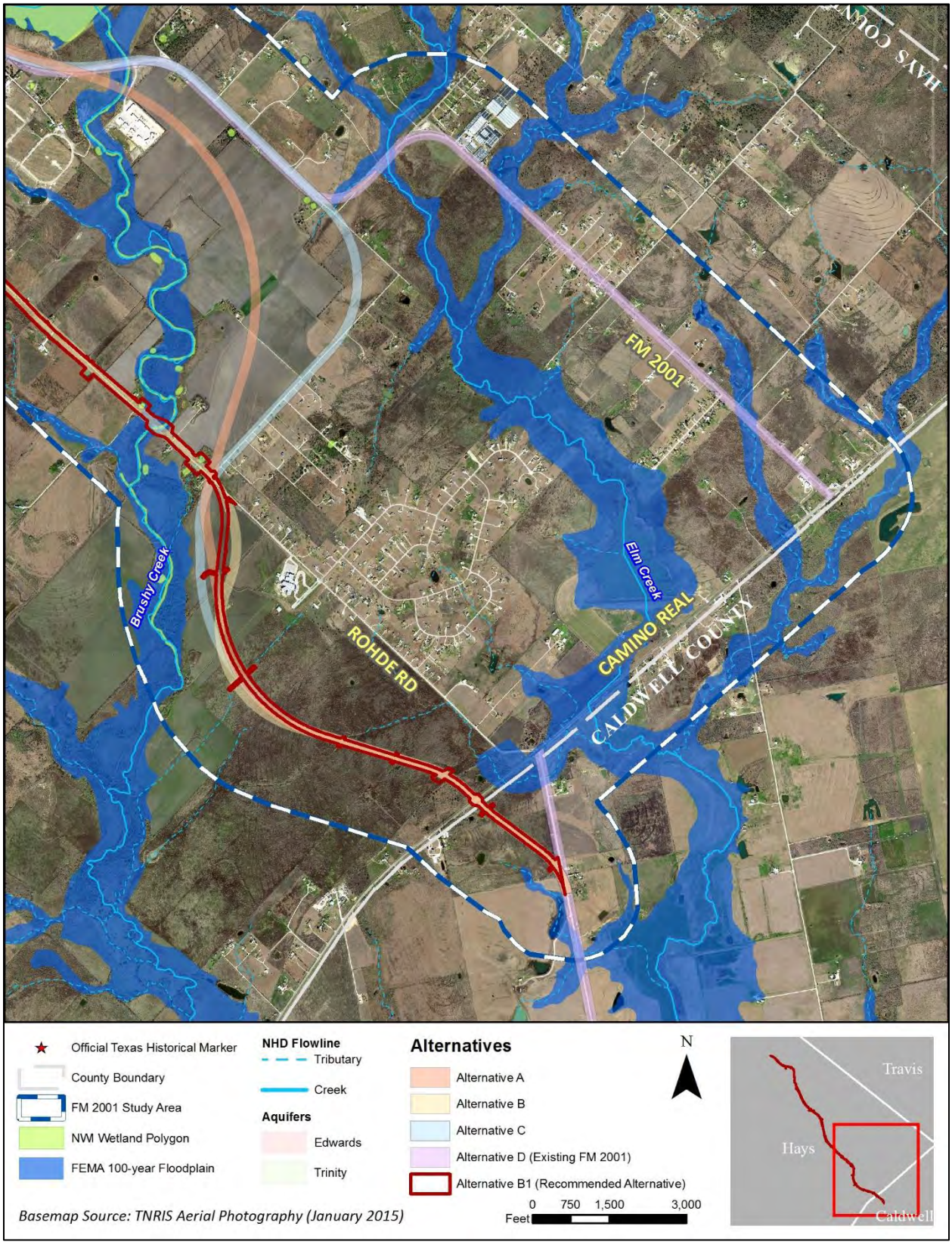
Figure 3.5-3: Build Alternative Environmental Constraints (Map 3 of 3)



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3.6 Recommended Alternative

3.6.1 Selection of the Recommended Alternative

As shown in **Table 3.6-1**, the proposed ROW of all reasonable alternatives would result in displacements and bisected properties. However, when compared to the other build alternatives, Alternative B1 would result in a substantial reduction in the number of residential displacements, new ROW required, parcels requiring ROW acquisition and bisected large tracts of land. Additionally, Alternative B1 would impact fewer acres of prime farmland soils and would require no utility adjustments. Alternative B1 would impact more waters of the U.S. and floodplains than the other build alternatives; however, those impacts would be reduced to the maximum extent practicable through design features and other avoidance/minimization measures. Unavoidable, permanent impacts would be mitigated for, as necessary. A public meeting was held on January 16, 2014 to solicit comments about the proposed alternatives. Of those that commented, everyone supported the realignment of the existing FM 2001 roadway; Alternative A received the most support, followed by Alternative B. As a result of public comments received at the open house, the Recommended Alternative (Alternative B1), was developed (see **Section 3.5**).

Based on the evaluation of the reasonable alternatives, Alternative B1 was identified as the Recommended Alternative and will be further evaluated. In accordance with NEPA requirements, the No-Build Alternative will also be carried forward for further evaluation.

Alternative B1 meets the project's purpose and need: it would improve safety by eliminating all 90-degree turns and providing wider shoulders. The realignment and widening of the roadway and the construction of a continuous intersection at SH 21 would also improve mobility and provide system linkage north and south of SH 21, thereby improving travel times.

Table 3.6-1: Evaluation of Reasonable Alternatives

Alternative	ROW Acquisition (acres)	Residential Displacements	Parcels Requiring ROW Acquisition	Large Tracts of Land Split by Project	NWI Wetlands (acres)	Creek Crossings	Floodplains (acres)	Prime and Unique Farmland (acres)	Utilities Impacted
A	120.4	1	37	16	1.24	9	5.79	76	2
B	105.8	7	65	10	1.17	10	6.17	73	2
B1	113.9	1	42	9	2.24	11	6.48	46	0
C	116.4	7	65	9	0.66	6	4.15	69	1
No-Build	0	0	0	0	0	0	0	0	0

3.6.2 Proposed Facility

Following the identification of the Recommended Alternative, the typical section of the proposed FM 2001 facility was modified from what was shown at the January 2014 Open House. The following describes the modified urban and suburban typical sections that were evaluated for the Recommended Alternative. The urban section would consist of two 12-foot wide lanes in each direction and a 16-foot wide raised median within a 120-foot ROW. The urban section would be located from the northern extent of construction (Overpass Road) to Station 120+76.31 and from Station 330+09.00 to the southern project terminus. The design speed of urban sections of the proposed roadway would be 45 mph.

The suburban section would consist of two 12-foot wide lanes and a 10-foot wide outside shoulder in each direction within a 160-foot ROW. This section of roadway would have a 16-foot wide center two-way left turn lane and drainage would be conveyed through open ditches. The suburban section would be located from Station 120+76.31 to Station 330+09.00. The design speed of suburban sections of the proposed roadway would be 55 mph.

In order to facilitate access to the proposed facility from adjacent developments, connecting roadways from the proposed FM 2001 to the existing FM 2001 would be constructed at several locations, as well as at Rohde Road. Additionally, SH 21 would be improved within existing ROW to provide a left-turn lane to the proposed FM 2001. Approximately 5.02 acre of temporary easements and 4.68 acres of permanent easements would be required for the proposed project. Existing portions of FM 2001 that remain away from ultimate alignments would be removed from the state system and be maintained by the County. Where the proposed alignment diverges from existing alignment, the existing FM 2001 would connect/terminate at the proposed alignment.

In accordance with TxDOT's memorandum titled *Guidelines Emphasizing Bicycle and Pedestrian Accommodations*, dated March 23, 2011, bicycle and pedestrian facilities would be provided. Along the urban sections, 5-foot wide bike lanes would be provided adjacent to the outer lanes (below curb) and 6-foot wide sidewalks would be constructed along both sides of the road (above curb). Along the suburban sections, although sidewalks would not be constructed as part of this project, an allowance would be made along both ROW lines for future 5-foot wide sidewalks. The 10-foot wide outside shoulders that would be built along the suburban sections as part of the proposed project would accommodate bicyclist/pedestrian movements throughout these areas.

Typical sections of the proposed facility are shown in **Appendix C**. The proposed project schematic is shown in **Appendix D**.

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 Resources Eliminated from Further Study

The following issues were evaluated and found not to have any bearing on the findings of this EA or on the decision resulting from this assessment:

- Section 4(f)/6(f) and Chapter 26 Properties
- Airway-highway clearance,
- U.S. Coast Guard permits,
- Coastal coordination,
- Essential fish habitat, and
- Wild and scenic rivers.

A discussion of each issue eliminated from further study is provided below.

4.1.1 Section 4(f)/6(f) and Chapter 26 Properties

There are no publicly-owned parks, recreation areas, scientific areas, or wildlife refuges within or adjacent to the project area. Additionally, a TxDOT historian determined on December 5, 2014 that no resources in the Area of Potential Effects are eligible for inclusion in the NRHP (see **Appendix G**). Therefore, there would be no impacts to properties protected under Section 4(f) of the Department of Transportation Act (49 USC 303) or Chapter 26 of the Parks and Wildlife Code. Additionally, there are no recreational facilities or sites within or adjacent to the project area that have received Land and Water Conservation Act (LWCA) or Texas Recreation and Parks Account funding. Therefore, there would be no impacts to properties protected under Section 6(f) of the LWCA.

4.1.2 Airway-Highway Clearance

There are no airports or heliports open to the public or operated by an armed force of the United States identified in the vicinity of the project. Therefore, airway-highway clearance need not be obtained.

4.1.3 U.S. Coast Guard Permits

No U.S. Coast Guard permits are considered necessary for this proposed project because no "navigable waters" as defined by the General Bridge Act of 1946 would be crossed.

4.1.4 Coastal Coordination

The proposed project is located in Hays and Caldwell Counties, neither of which is a coastal county. The proposed project is not under the jurisdiction of the Texas Coastal Management Program (TCMP); therefore, it would not require coordination under the TCMP rules.

4.1.5 Essential Fish Habitat

No tidally influenced water bodies exist within the proposed project area; therefore, no essential fish habitat would be impacted by the proposed project.

4.1.6 Wild and Scenic Rivers

Wild and Scenic Rivers are managed by an interagency council consisting of the National Park Service, U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service, and Bureau of Land Management. According to the National Park Service, the only Wild and Scenic River in Texas is the Rio Grande at Big Bend National Park. As there are no Wild and Scenic Rivers in the vicinity of the project area, the Wild and Scenic Rivers Act does not apply to the proposed project. Additionally, there are no river segments in the project area on the Nationwide Rivers Inventory, which is maintained by the National Park Service.

4.2 Land Use

Section 4.2 discusses community facilities and current and proposed land uses and developments within the land use study area. The land use study area encompasses those areas that would be most affected (i.e. due to displacements, noise and visual impacts) by the conversion of land to transportation use, and includes the project area and first row of parcels adjacent to the project area, as shown in **Figure 4.2-1**. Local government plans and policies that may affect the land use study area are also described. Impacts to land use and community facilities associated with both the Build and No-Build Alternatives are also discussed.

4.2.1 Existing Conditions

4.2.1.1 Existing Land Use

Existing land uses in the study area were identified through aerial photograph interpretation, geospatial data, and field verification. Developed land within the study area is characterized by low density, single family residential development and agricultural or range land. Most of the land within the study area (51 percent) is identified as vacant (including undeveloped land in the 100-year floodplain). Approximately 41 percent of the land within the study area is used for agricultural purposes, much of which is designated as agricultural or range land in the county tax rolls (CAPCOG, 2010). Approximately 6 percent is residential – comprised mostly of large lot single

family development. General land use types in the study area are listed in **Table 4.2-1** and are shown on **Figure 4.2-1**.

Table 4.2-1: General Land Use within the Study Area

Land Use Type	Acreage	Percent of Study Area	Notes
Vacant	2,708.4	51.28%	Includes vacant parcels in residential subdivisions as well as undeveloped lands. Also includes undeveloped land in the 100-year floodplain.
Agricultural	2,181.5	41.30%	Includes land identified as ranch land, range land, timberland, and agricultural land. Agricultural land uses are found throughout the corridor, often near residential subdivisions.
Residential	318.9	6.04%	Residential uses are comprised mostly of single family residences, many on large lots. Less than five percent of residential land is comprised of mobile homes or multifamily units
Open Space	18.0	0.34%	Consists of land in subdivisions that is not designated for building, such as communal open spaces or stormwater retention areas. Does not include parks or recreational areas.
Commercial	51.3	0.97%	Commercial development along the proposed roadway includes the proposed Shops at Sunfield (located at the corner of Overpass Road and Firecracker Drive), the Sunfield Pavilion/Activity Center, and the Studio Estates subdivision office near Goforth Road.
Utilities	1.9	0.04%	Includes wireless communications tower and water tower.
Civic	1.4	0.03%	Comprised of Buda Fire Station No. 2 at FM 2001 and Overpass Road.
TOTAL	**5,281.4**	**100.00%**	The total acreage listed here does not include roadways

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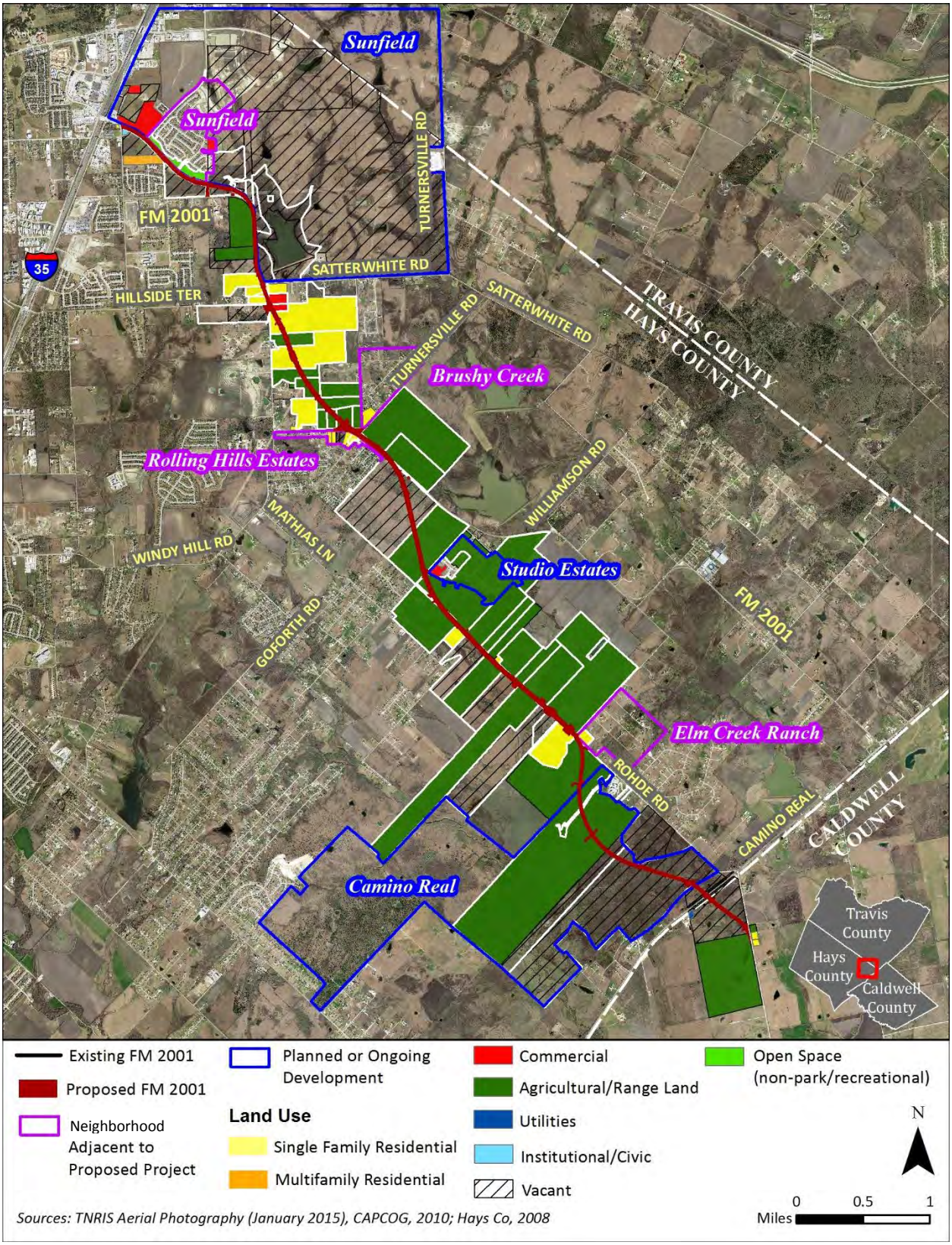
Figure 4.2-1: Land Use along the Proposed Alignment



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4.2.1.2 Proposed Land Uses

Approximately 1.6 miles of the proposed roadway are located within the city of Niederwald, which comprises approximately 923 acres of the land use study area. Roughly 3.2 miles of the proposed roadway fall within Niederwald's extraterritorial jurisdiction (ETJ), which comprises approximately 2,195 acres of the land use study area. Roughly 1.9 miles of the proposed roadway fall within Buda's ETJ, which comprises approximately 1,774 acres of the study area. Although land within a city's ETJ is not subject to zoning requirements, development within these areas is subject to the city's subdivision and water/wastewater regulations. Further, land within a city's ETJ may be annexed into the city's full purpose jurisdiction in the future, bringing it under all city ordinances and regulations. The remaining 1.8 miles of the proposed roadway are located in unincorporated Hays County, where zoning regulations do not apply. The northern terminus of the project, near I-35, abuts the Buda city limits.

Three residential subdivisions are planned for areas adjacent to the proposed roadway (**Table 4.2-2**).

Table 4.2-2: Planned Developments in the Land Use Study Area

Development Name	Location	Description
Sunfield	Overpass Rd, near I-35 and FM 2001	Mixed use development of over 2,700 acres that would have approximately 5,000 residential units and over 700 acres of commercial development at build out. Currently, 433 single family and approximately 300 multifamily units have been developed. In addition, 163 acres have been dedicated to the Shops at Sunfield commercial development (of that, 28 acres at the corner of Overpass Road and Fire Cracker Drive recently received final plat approval)
Studio Estates	South of Goforth Rd, between Rohde Rd and FM 2001	Residential subdivision with 218 single family lots, still undergoing development
Camino Real	South of Rohde Rd off SH 21	1,460-acre residential subdivision proposed

Source: Hays County Development Services Dept., August 2014; Sunfield MUD No. 4, August 2014; City of Buda City Council Meeting Minutes (January 27, 2015; February 3, 2015; September 8, 2015; and October 13, 2015)

4.2.1.3 Local Plans and Policies

Local plans and policies that may affect land use within the land use study area include the *HCTP*, the Buda *2030 Comprehensive Plan*, and the CAMPO *2040 RTP*. The city of Niederwald does not have a long range comprehensive plan.

The *HCTP* (2013) includes the following enhancements to FM 2001:

- Improve the existing roadway from a two-lane undivided major arterial to a four-lane, divided major arterial from I-35 to Old Goforth Road;
- Improve the existing roadway from a two-lane, undivided major arterial to a four-lane, divided major arterial from Old Goforth Road to Goforth Road;
- New alignment for the existing roadway from Goforth Road to SH 21, improving the roadway from a two-lane, undivided minor arterial to a four-lane, divided minor arterial.

Improvements to other local roadways connecting to FM 2001 that are described in the *HCTP* are shown in **Table 4.2-3**.

Table 4.2-3: Proposed Improvements to Hays County Roadways in Transportation Plan

Roadway	Boundaries	Description
SH 21	Caldwell County line to SH 80	Upgrade from two-lane, undivided major arterial to six-lane, divided major arterial
Goforth Road	FM 2001 to Hillside Terrace	Upgrade from two-lane, undivided minor roadway to two-lane, undivided major arterial
Hillside Terrace	From I-35 to FM 2001	Upgrade from two-lane, undivided minor roadway to two-lane, undivided major arterial
Dacy Lane/Goforth Road	Hillside Terrace to I-35	Upgrade from two-lane, undivided minor roadway to four-lane, undivided major arterial
Satterwhite Road	FM 2001 to Turnersville Road extension	Upgrade from two-lane, undivided minor roadway to two-lane, undivided major arterial
Williamson Road	FM 2001 to Travis County line	Upgrade from two-lane, undivided minor roadway to two-lane, undivided major arterial
Windy Hill Road	I-35 to Turnersville Road extension	Upgrade from two-lane, undivided minor roadway to two-lane, divided major arterial

Source: Hays County Transportation Plan, 2013

Other land use plans that may affect the area surrounding the proposed project include Buda's *2030 Comprehensive Plan* and the CAMPO *2040 RTP*. A CAMPO-designated center is located at the northern end of FM 2001, near I-35, generally within Buda's ETJ. According to general land development policies found in Buda's *2030 Comprehensive Plan*, the community will seek to direct development to land within the existing city limits and to growth areas identified in the plan. One of these new growth areas is located at FM 2001 and Hillside Terrace. Designated as a "community center," this area would provide a diverse mix of land uses in a dense development pattern. Types of development selected for this node include retail (including large anchor or grocery stores), multifamily housing (built above retail uses), and larger restaurants. Businesses in this node would draw clientele from across the city. Walkability would be emphasized in this area as well.

A larger "regional center" would be located at I-35 between Main Street and FM 2001. This node is the largest and most intense mixed-use node considered appropriate for the Buda area and would be a regional employment center and commercial destination. This node would also incorporate housing built above retail stores.

Finally, a "neighborhood center" would be located along Old Goforth Road, just south of FM 2001. This node is the smallest mixed-use node included in the plan and is intended to be located near residential areas to provide residents with quick access to every-day goods and services, including dry cleaners, banks, pharmacies, and cafes. These nodes would include housing above retail spaces as much as possible and would be highly walkable. **Figure 4.2-2** shows these nodes and the CAMPO Centers in relation to existing and proposed FM 2001.

CAMPO's *2040 RTP* includes improvements to the transportation network within the vicinity of the proposed project, as shown in **Table 4.2-4**:

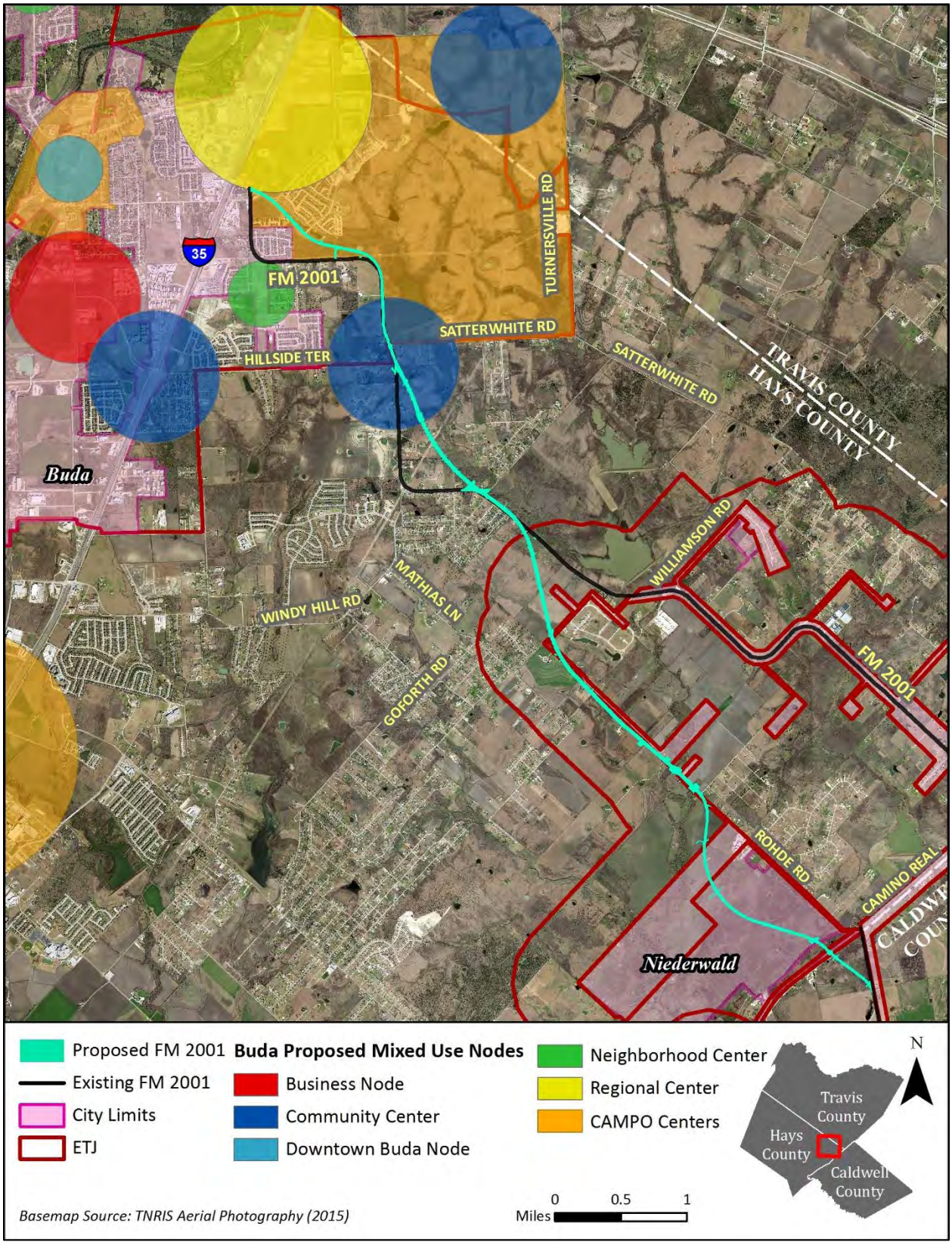
Table 4.2-4: Proposed Roadway Improvements in CAMPO's *2040 RTP*

Roadway	Boundaries	Description
SH 21	Caldwell County line to SH 80	Upgrade from two-lane, undivided major arterial to six-lane, divided major arterial
Goforth Road	FM 2001 to Hillside Terrace	Upgrade from two-lane, undivided minor roadway to two-lane, undivided major arterial
Hillside Terrace	IH 35 to Old Goforth Road / Old Goforth Road to FM 2001	Widen to four-lane divided roadway and add sidewalks
Turnersville Road	FM 2001 to FM 110	Construct new six-lane major divided roadway
New FM 2001	Sunbright Blvd	Traffic signal warranted and potential signage
Main Street East	IH 35 to Turnersville Road	Construct new four-lane divided roadway
Main Street East	IH 35 to Firecracker Drive	Widen to a six-lane divided roadway
Main Street West	Cabela's Drive to IH 35	Widen to a six-lane divided roadway
Cabela's Drive	Main Street to Manchaca Springs Road	New two-lane undivided roadway

Source: CAMPO, 2015

I-35 is also designated as an expanded highway throughout the five-county CAMPO planning area. The plan also designates FM 2001 from Goforth Road to I-35 as a medium-priority bicycle corridor and a medium-priority (suburban and urban) pedestrian district.

Figure 4.2-2: Future Buda Mixed Use Nodes near the Proposed Project



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4.2.2 Environmental Consequences

4.2.2.1 Build Alternative

Under the Build Alternative, approximately 32.6 acres of the proposed roadway would be located on existing transportation ROW. Therefore, for this portion of the roadway, no direct impacts to land use would occur. Approximately 113.9 acres of the proposed roadway would be on new ROW and would require the conversion of land to transportation use. Of these 113.9 acres, approximately 7 percent is residential, approximately 51 percent is agricultural/range land, and approximately 40 percent is vacant. The remaining two percent is comprised of open space (non-park/recreational) and commercial uses.

Approximately 4.7 acres would be utilized for permanent easements associated with the Build Alternative. Of these 4.7 acres, approximately 16 percent is currently used for residential purposes, approximately 18 percent is vacant, and approximately 61 percent is used for agriculture/rangeland. The remaining three percent is comprised of open space (non-park/recreational) and commercial uses.

The Build Alternative would result in the displacement of one residence and zero businesses. Displacements were determined from aerial photography with the proposed alignment overlaid, followed by field verification.

TxDOT would provide relocation advisory assistance to any person, business, or nonprofit organization displaced as a result of the acquisition of real property for public use. Any acquisition of property would be carried out in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. Consistent with the U.S. Department of Transportation (USDOT) policy, as mandated by the Uniform Act, TxDOT would provide relocation resources (including any applicable special provisions or programs) to all displaced persons without discrimination. The available structures would also be open to persons regardless of race, color, religion, or nationality, and be within the financial means of those affected individuals. All property owners from whom property is needed would be entitled to receive just compensation for their land and property. Just compensation is based on the fair market value of the property.

Approximately 11 percent of the housing stock within the two census tracts adjacent to the project in Hays County is vacant (according to 2010–2014 American Community Survey [ACS] estimates). As of January 2016, approximately 62 homes were listed for sale near the project area (from the Hays-Travis County line to High Road, bounded by I-35 on the west and SH 21 on the east) (Zillow.com). The prices of the newly listed homes range from $48,000 to $1,200,000 (Zillow.com). The residential structure that would be displaced by the proposed roadway is built

on piers and could potentially be relocated to another location on the remaining 68 acres of the parcel.

The Build Alternative would not negatively impact access to the Studio Estates community center or the fire station at FM 2001 and Overpass Road. Additionally, measures would be taken to ensure that access to the fire station would remain open during construction. Both the existing FM 2001 alignment and Overpass Road/new FM 2001 would remain open following construction. The existing portions of FM 2001 that remain away from the ultimate new alignment would be removed from the state system and be maintained by the County. Where the proposed alignment diverges from existing alignment, the existing FM 2001 would connect/terminate at the proposed alignment.

4.2.2.2 No-Build Alternative

Under the No-Build Alternative, the existing FM 2001 would remain in its current location and would not be widened or realigned, thus no land adjacent to the project area would be converted to transportation use. Additionally, no displacements of residences or businesses would occur under the No-Build Alternative.

4.3 Geology, Soils, and Farmlands

4.3.1 Existing Conditions

4.3.1.1 Physiographic Conditions

The project area is situated within the Texas Blackland Prairies ecoregion, which is to the east of the Edwards Plateau. The topography ranges from gently rolling hills to level land. Elevations in the project area range from approximately 523 feet above mean sea level (amsl) in the southeast to approximately 760 feet amsl in the northwest. Total topographic relief is approximately 237 feet and most slopes are in the two percent to five percent range (USGS, 1994).

4.3.1.2 Geology

The project area is underlain by two geologic formations of the late Cretaceous period: the Pecan Gap Chalk and the Navarro and Marlbrook Marl. The Pecan Gap Chalk is a slightly bituminous chalk that is, in part, argillaceous and sandy. The primary rock type of the Pecan Gap Chalk is limestones, which can be used as a building material or aggregate for the base of roads. The areas underlain by claystones, the major rock type of Navarro and Marlbrook Marl, however, may face problems with ground stability (USGS, 2014).

4.3.1.3 Soils

Soils mapped within the project area are dominated by the Heiden-Houston Black association. The Heiden-Houston Black association is composed of deep, calcareous, clayed soils overlying clays/marl. In Hays County, Heiden soils make up about 42 percent of the associations and

Houston Black soils about 38 percent, with the remaining 20 percent of soil associations consisting of Altoga, Branyon, Ferris, and Tinn soils. In Caldwell County, associations are composed of approximately 44 percent Heiden soils and 31 percent Houston Black soils with the remaining 25 percent composed of less extensive areas of Burleson, Crockett, Trinity and Wilson soils. The soils in the Heiden-Houston Black association are "moderately well suited" to "well suited" for row crops and use as pasture. There are limitations for urban uses in areas with these soils. These limitations include the high shrink-swell potential, corrosivity to uncoated steel, clayey texture, very slow permeability, and low strength, which can affect roads and streets (USDA, 1978, 1984).

According to the USDA Natural Resources Conservation Service (NRCS, 2014), "hydric soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils are commonly associated with wetlands; however, not all hydric soils are wetlands." The presence of hydric soils is one of three criteria used by the U.S. Army Corp of Engineers (USACE) in the determination of wetlands. The Soils Maps (**Figure 4.3-1 – Figure 4.3-4**) indicate that only 5.7 percent (8.9 acres) of the project area is composed of hydric soil — Tinn clay (Tn), 0–1% slopes, frequently flooded (USDA, 1978, 1984). However, soil survey information is not site-specific and does not preclude the need for on-site investigation (USACE, 2010).

4.3.1.4 Farmlands

Congress enacted the Farmland Protection Policy Act (FPPA) as a subtitle of the 1981 Farm Bill with the purpose of minimizing the extent to which federal programs contribute to the unnecessary conversion of farmlands to non-agricultural uses. The FPPA applies to federal programs, including construction projects such as highways, sponsored or financed in whole or part by the federal government. The NRCS of the USDA administers the FPPA.

The FPPA recognizes the following areas as not subject to the Act:

- Land that is already in or committed to urban development or water storage, including land with a density of 30 structures per acre;
- Land with a tint overprint on USGS topographic maps;
- Land identified as an urbanized area on US Census Bureau maps; and
- Land that receives a combined score of 160 points or less on form AD-1006 (or NRCS-CPA-106) for corridor-type projects.

The project area contains approximately 46 acres of prime farmland soils. A Farmland Conversion Impact Rating Form (Form AD-1006) was completed for this project for the land that would be converted to transportation use. Since the resulting score (35 points) is less than the 60 points required for coordination, the proposed project would not be subject to the FPPA and no coordination with the NRCS is required. The completed AD-1006 can be found in **Appendix E**.

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Figure 4.3-1: Soils Underlying the Project Area (Map 1 of 4)

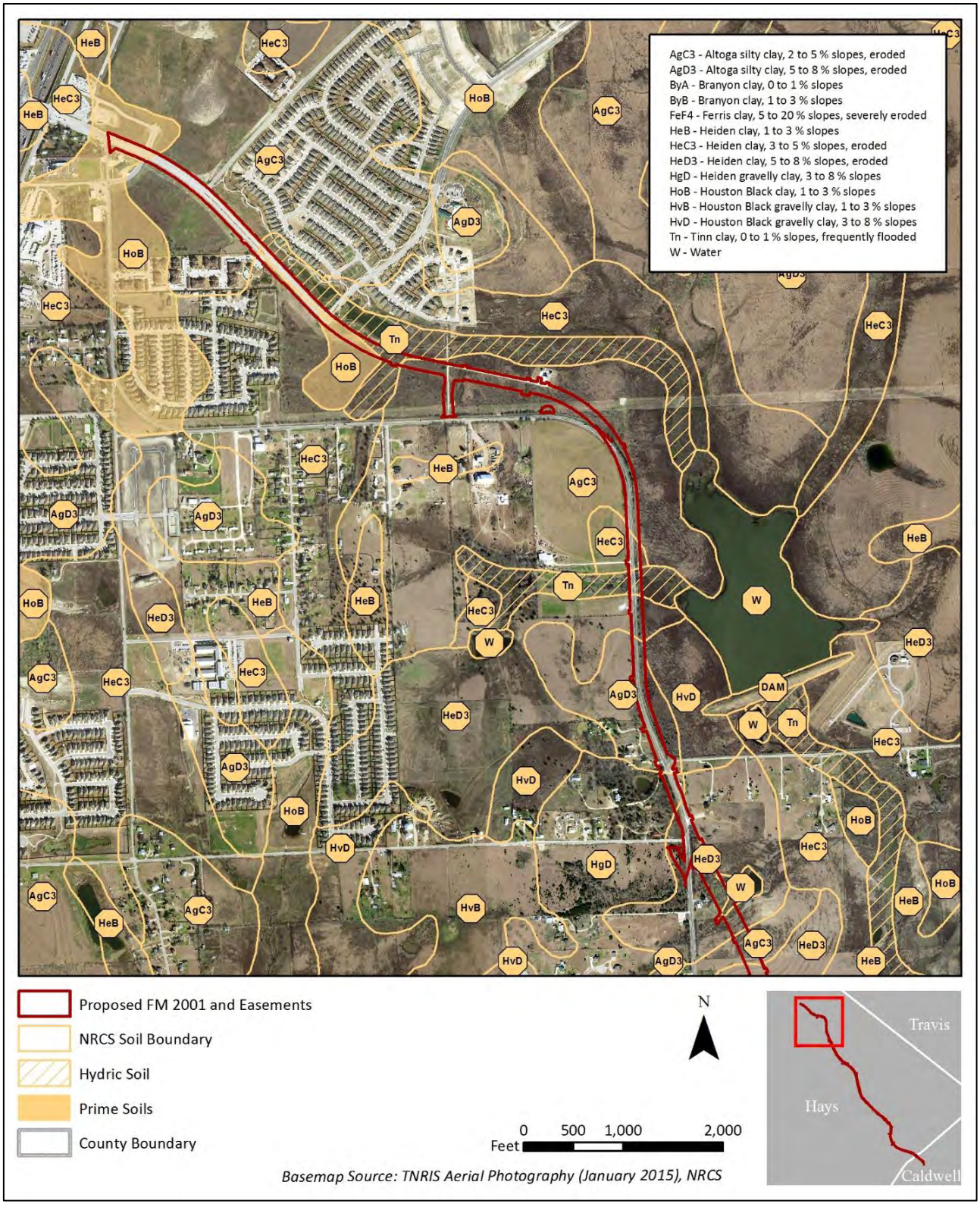

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Figure 4.3-2: Soils Underlying the Project Area (Map 2 of 4)

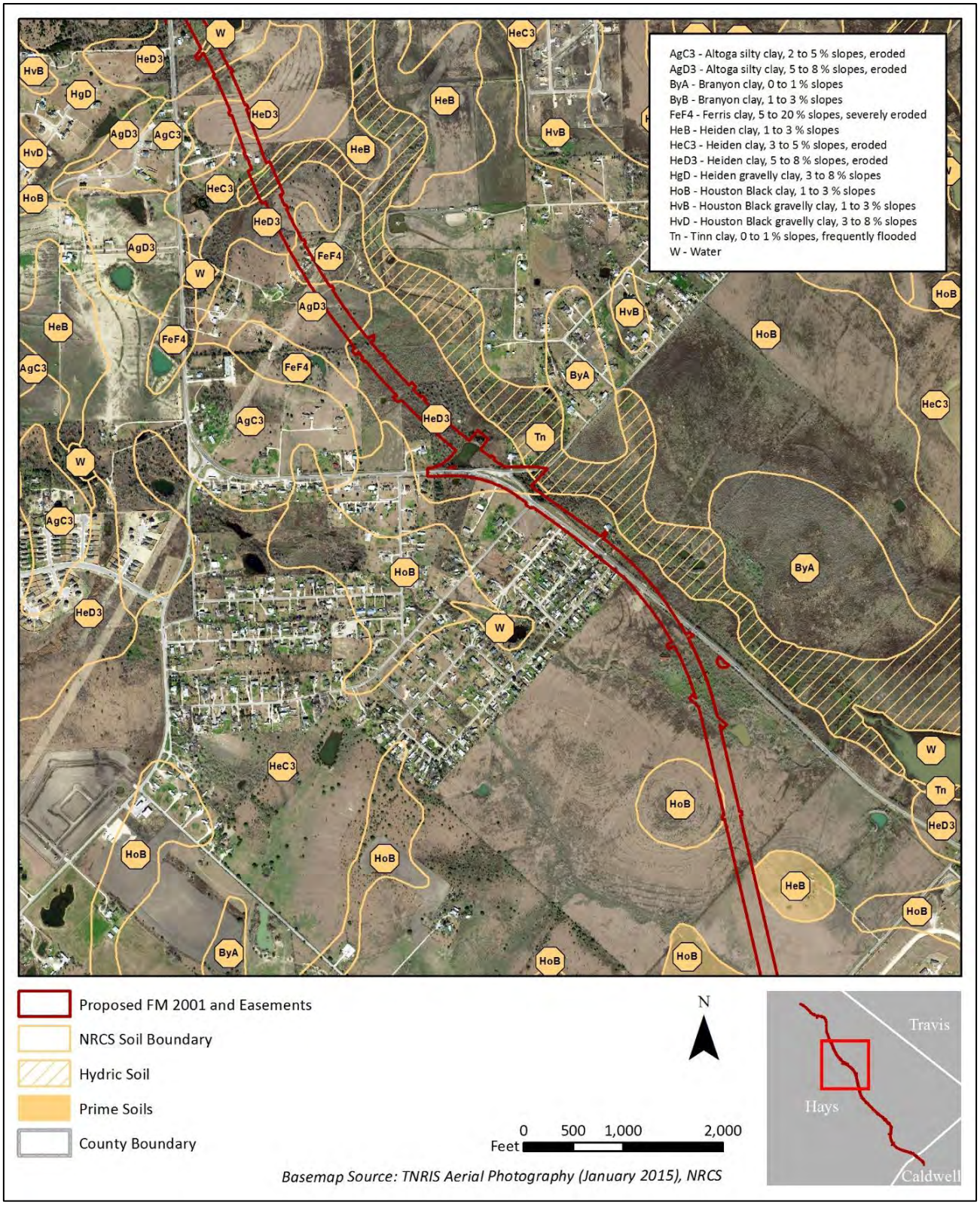

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Figure 4.3-3: Soils Underlying the Project Area (Map 3 of 4)

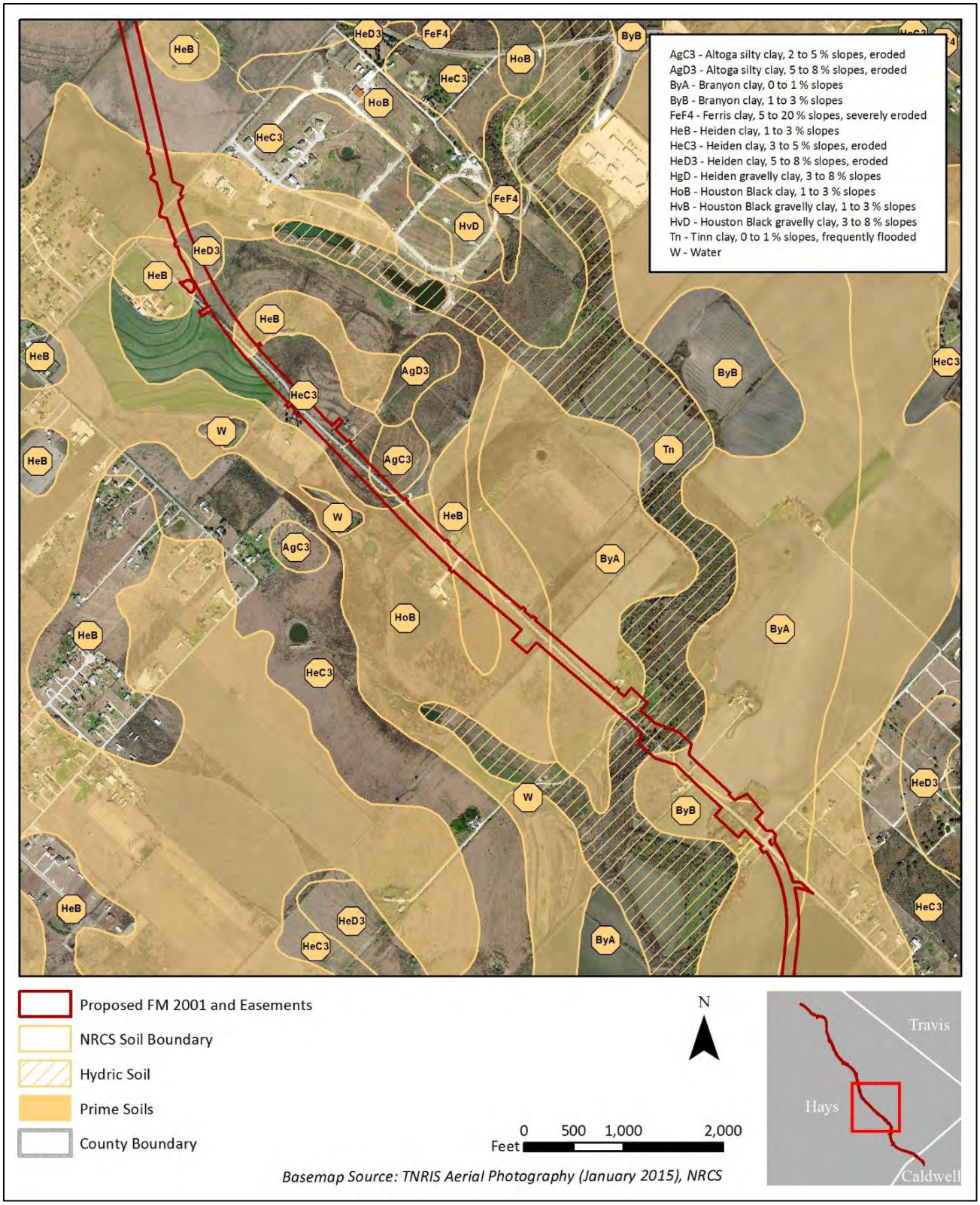

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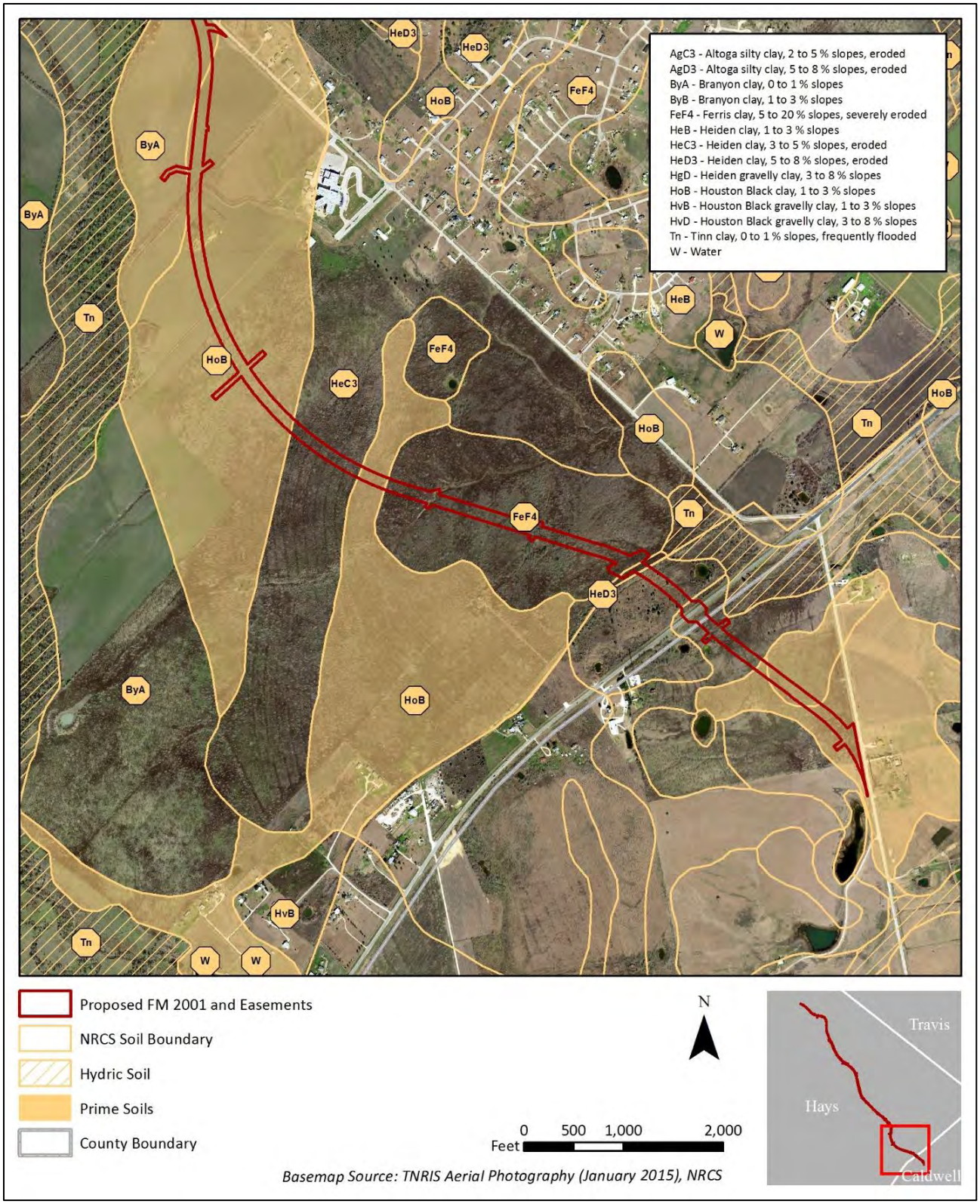
Figure 4.3-4: Soils Underlying the Project Area (Map 4 of 4)



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4.3.2 Environmental Consequences

4.3.2.1 Build Alternative

Under the Build Alternative, the effects of construction on soils would vary, depending on the type of construction activity underway. Construction activities associated with the proposed project would temporarily increase the potential for soil erosion. These short-term erosion problems would be minimized by implementing an interim site drainage plan and proper erosion protection techniques during construction. Permanent storm water erosion control measures would be incorporated into the design at the earliest practical time. Impacts of the Build Alternative on geologic resources are anticipated to be minor. Construction activities may expose certain geologic units to erosion, but erosion would be minimized by incorporating proper protection techniques during construction.

The Build Alternative would impact approximately 46 acres of prime farmland soils; however, because the resulting score on the Farmland Conversion Impact Rating Form (Form AD-1006) was less than 60 points, coordination with the NRCS would not be required.

4.3.2.2 No-Build Alternative

The No-Build Alternative would not require soil-disturbing construction activities and therefore, would not increase erosion or adversely impact soils (including hydric and prime/unique farmland soils) or geologic resources.

4.4 Utilities/Emergency Services

4.4.1 Existing Conditions

The project area has existing utilities, including overhead electric and underground fiber optic, gas, and water. The project area is served by the City of Buda's Fire Station #2, located at 151 FM 2001, and the Buda Police Department, located at 100 Houston Street, both located in Buda, Texas 78610. Seton Medical Center, located at 6001 Kyle Parkway, Kyle, Texas 78640, provides emergency medical services in the project area.

4.4.2 Environmental Consequences

4.4.2.1 Build Alternative

The proposed project would require the adjustment or relocation of underground and/or overhead utilities. At the current phase of project development, the locations of utilities potentially requiring adjustment or relocation have not yet been identified. Impacted utilities would be identified during the final design phase. At that time, coordination with utility owners and service providers would

occur and relocation/adjustment plans would be developed. Utility relocations and adjustments would be accomplished with the minimal practical disruption in service to utility customers.

Although project-related delays would be anticipated during construction, every reasonable effort would be made to minimize delays to these emergency services. Once construction is complete, emergency response times are expected to be lower than current response times because emergency vehicles would be able to access the corridor unhampered by the congestion that occurs along the existing FM 2001. The proposed project would facilitate more reliable and safer emergency response.

4.4.2.2 No-Build Alternative

Under the No Build Alternative there would be no project-related impacts to utilities. Emergency response would continue to be hindered by safety concerns and unreliable travel times associated with congestion. Response times would grow even longer in the future as congestion in the corridor worsens.

4.5 Socioeconomic Resources

Section 4.4 describes the demographic and economic characteristics of the population within and immediately adjacent to the project area (socioeconomic study area) and direct effects that may occur as a result of the proposed project. The area of socioeconomic analysis encompasses those areas containing the communities and populations that would be most affected (e.g., displacements, access modifications) by the proposed roadway improvements, and is comprised of three census tracts – two in Hays County and one in Caldwell County. Within these census tracts, there are five block groups and 31 census blocks that lie within the socioeconomic study area. Of these 31 blocks, 24 have resident populations.

4.5.1 Existing Conditions

4.5.1.1 Population Trends

Hays County has seen substantial growth in the past three decades, with its population increasing 287 percent between 1980 and 2010 to 157,107 people (**Table 4.5-1**). Hays County's rate of growth over the period 1980 to 2010 is substantially higher than the state of Texas'; the state experienced a population increase of 77 percent over the past three decades. Caldwell County has also grown consistently since 1980, with its population increasing 61 percent over the same period.

Table 4.5-1: Historic Population of Hays and Caldwell Counties and Texas

Year	Hays County	Caldwell County	Texas
1980	40,594	23,637	14,229,191
Percent Change 1980-1990	62%	12%	19%
1990	65,614	26,392	16,986,510
Percent Change 1990-2000	49%	22%	23%
2000	97,589	32,194	20,851,820
Percent Change 2000-2010	61%	18%	21%
2010	157,107	38,066	25,145,561

Source: U.S. Census, Census of Population and Housing, 1980, 1990, 2000, 2010

This trend of sustained growth is expected to continue, with the population of Hays County projected to more than double over the next two decades, reaching 325,744 by 2035. In Caldwell County, the population is expected to grow to 55,572 (TXSDC, 2012).

While the majority of Hays County's population resides along the I-35 corridor (Hays County, 2013) in the cities of Buda, Kyle, and San Marcos, the census tracts in the socioeconomic study area have also experienced significant population growth, adding between 30 and 110 percent more residents between 2000 and 2010 (U.S. Census, 2000, 2010).

4.5.1.2 Race/Ethnicity

Table 4.5-2 shows the racial and ethnic composition of the block groups and census tracts within the socioeconomic study area, as well as within the city of Buda and within Hays County. **Figure 4.5-1** shows percentage of minority residents by block within the blocks adjacent to the proposed project. Minority populations include all those racial and ethnic groups except White, Non-Hispanic.

The overall percentage of minority residents in the census blocks adjacent to the proposed project is 77 percent, much higher than minority populations in the city of Buda or Hays County (both approximately 41 percent). 15 of the 24 census blocks adjacent to the proposed project area contain over 50 percent minority residents (**Table 4.5-2**). Hispanic or Latino residents comprise the largest minority group in the census blocks adjacent to the proposed project, accounting for 72 percent of the total population.

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Figure 4.5-1: Census Geographies Adjacent to Proposed Project

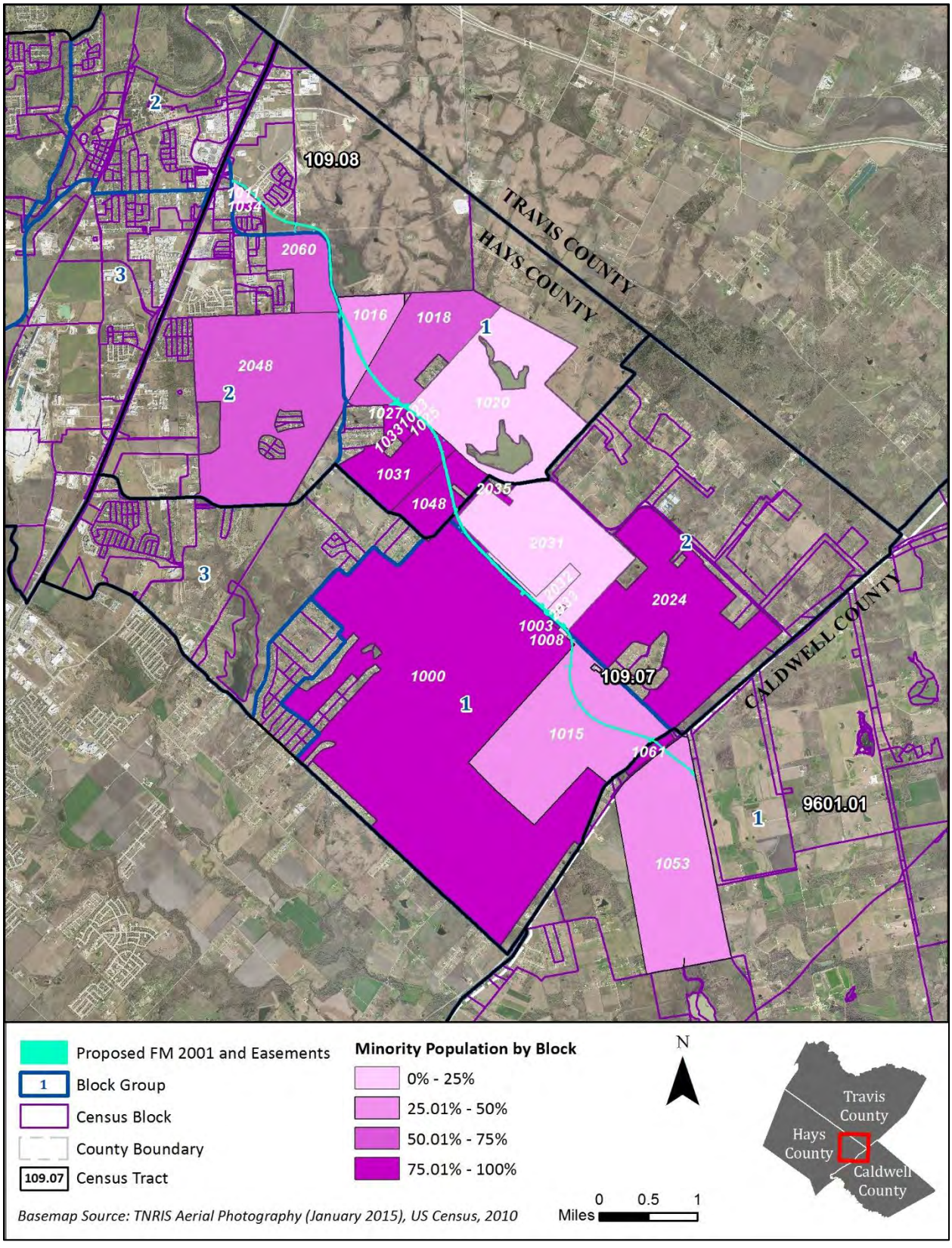

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Table 4.5-2: Race and Ethnicity in Socioeconomic Study Area

Census Tract	Block Group	Census Block	Total Population	Not Hispanic or Latino							Not Hispanic or Latino	Hispanic or Latino	Total Minority
				White	Black or African American	American Indian or Alaskan Native	Asian	Native Hawaiian or Pacific Islander	Other Race	Two or More Races			
109.07	--	--	10,854	26.37%	2.64%	0.26%	0.52%	0.01%	0.09%	0.71%	30.60%	69.40%	73.63%
	1	--	2,644	14.18%	2.42%	0.23%	0.19%	0.00%	0.15%	0.38%	17.55%	82.45%	85.82%
		1000	1,937	12.85%	2.12%	0.31%	0.26%	0.00%	0.15%	0.46%	16.16%	83.84%	87.15%
		1003	1	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
		1008	2	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
		1015	9	55.56%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	55.56%	44.44%	44.44%
	2	--	1,742	35.53%	2.01%	0.23%	0.17%	0.00%	0.06%	0.17%	38.17%	61.83%	64.47%
		2024	313	22.68%	0.32%	0.00%	0.00%	0.00%	0.00%	0.64%	23.64%	76.36%	77.32%
		2031	9	88.89%	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	11.11%
		2032	9	88.89%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	88.89%	11.11%	11.11%
		2033	2	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
		2035	4	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
109.08	--	--	7,256	28.85%	3.56%	0.22%	1.12%	0.12%	0.19%	1.21%	35.27%	64.73%	71.15%
	1	--	2,327	23.03%	1.76%	0.26%	0.60%	0.00%	0.04%	1.16%	26.86%	73.14%	76.97%
		1011	3	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
		1016	71	54.93%	0.00%	0.00%	0.00%	0.00%	1.41%	0.00%	56.34%	43.66%	45.07%
		1018	136	38.24%	0.00%	0.00%	0.00%	0.00%	0.00%	1.47%	39.71%	60.29%	61.76%
		1020	1	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
		1023	56	8.93%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.93%	91.07%	91.07%
		1025	49	14.29%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.29%	85.71%	85.71%
		1027	50	10.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.00%	90.00%	90.00%
		1031	189	14.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	14.81%	85.19%	85.19%
		1033	139	7.91%	2.16%	2.88%	0.00%	0.00%	0.00%	2.88%	15.83%	84.17%	92.09%
		1034	350	21.14%	2.86%	0.29%	0.29%	0.00%	0.00%	1.71%	26.29%	73.71%	78.86%
		1048	173	21.39%	1.73%	0.58%	0.00%	0.00%	0.00%	0.00%	23.70%	76.30%	78.61%
	2	--	4,929	31.59%	4.40%	0.20%	1.36%	0.18%	0.26%	1.24%	39.24%	60.76%	68.41%
		2048	1,441	33.45%	6.45%	0.42%	1.73%	0.14%	0.07%	1.67%	43.93%	56.07%	66.55%
		2060	159	32.70%	0.63%	0.00%	3.77%	0.00%	0.00%	0.63%	37.74%	62.26%	67.30%
9601.01	--	--	5,626	40.69%	4.05%	0.30%	0.59%	0.04%	0.12%	1.08%	46.87%	53.13%	59.31%
	1	--	1,739	45.19%	3.33%	0.46%	1.04%	0.12%	0.35%	1.21%	51.70%	48.30%	54.81%
		1053	30	73.33%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	73.33%	26.67%	26.67%
		1061	5	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%
Total Socioeconomic Study Area*			5,138	22.64%	2.98%	0.45%	0.72%	0.04%	0.10%	0.93%	27.75%	72.25%	77.36%
Buda			7,295	59.20%	2.60%	0.10%	1.00%	0.00%	10.0%	1.60%	64.60%	35.40%	40.80%
Hays County			157,107	58.60%	3.20%	0.30%	1.10%	0.10%	0.10%	1.40%	64.70%	35.30%	41.40%

**Socioeconomic Study Area totals based on census blocks. Source: US Census, 2010. SF 1, "Race, Combinations of Two Races, and Not Hispanic or Latino" (QT-P4).*

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4.5.1.3 Median Household Income and Poverty

Median household income information was collected at the block group level from the ACS 2010–2014 five-year estimates. It should be noted that the ACS is a survey disseminated to a representative sample of the U.S. population, thus this information represents estimates, not actual counts.

Median household incomes in block groups adjacent to the proposed project are lower than in the city of Buda or Hays County but similar to Caldwell County (**Table 4.5-3**), with the median household incomes for these block groups ranging from $32,303 to $69,685.

Table 4.5-3: Median Household Income (2014 $)

Geography	Median Household Income
Tract 109.07 BG 1	$47.852
Tract 109.07 BG 2	$65,625
Tract 109.08 BG 1	$32,303
Tract 109.08 BG 2	$56,875
Tract 9601.01 BG 1	$44,375
City of Buda	$69,685
Hays County	$58,878
Caldwell County	$47,435

Source: ACS, 2010-2014, Median Household Income

The 2010–2014 ACS also documents the percentage of the population below the Census-calculated poverty level, which is updated on an annual basis and differs by household size and age of householder. The average percentage of the population below poverty for the three census tracts adjacent to the socioeconomic study area is 18 percent, higher than the percentage of the population below poverty in Hays County (17 percent) and in the city of Buda (6 percent).

When calculating whether a census tract or block group contains a low income population, FHWA uses the U.S. Department of Health and Human Services' (DHHS) poverty guidelines. In 2016, the DHHS poverty guideline for a family of four is $24,300. A four-person family earning less than this amount is considered to be low income. Comparing this poverty guideline to the median household incomes of the block groups adjacent to the project area from 2010–2014 (the most recent period that income data is available), no block group or census tract exhibited a median household income below the FHWA-defined poverty level.

4.5.1.4 Environmental Justice

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." In a memorandum concerning EO 12898, the President stated that federal agencies should collect and analyze information concerning a project's effects on minorities or low-income groups when required by NEPA and if such investigations find that minority or low-income groups experience disproportionate adverse effects, then additional measures are to be taken. Disproportionately high and adverse human health or environmental effects are defined by FHWA as adverse effects that:

> (1) are predominantly borne by a minority population and/or a low-income population; or
>
> (2) will be suffered by the minority population and/or low-income population and are appreciably more severe or greater in magnitude than the adverse effects that will be suffered by the non-minority population and/or non-low-income population (FHWA, 1998).

For this project, Environmental Justice (EJ) populations are delineated based on their minority status; as discussed in **Section 4.5.1.2**, no low-income populations as defined by FHWA are located within the socioeconomic study area. Therefore, only the minority populations mapped on **Figure 4.5-1** are considered EJ populations for purposes of this analysis.

4.5.1.5 Limited English Proficiency

EO 13166, "Improving Access to Services for Persons with Limited English Proficiency," requires federal agencies to examine the services they provide, identify any need for services to those with Limited English Proficiency (LEP), and develop and implement a system to provide those services so that LEP persons can have meaningful access to them. In compliance with this EO, this project was assessed to determine if an LEP population is located within the block groups adjacent to the proposed project. Individuals who do not speak English as their primary language and who have a limited ability to read, write, or understand English are considered to have LEP.

As shown in **Table 4.5-4**, all of the socioeconomic study area block groups contain LEP residents. Of those residents who speak a language other than English, approximately 99 percent are Spanish speakers.

Table 4.5-4: LEP Population within Socioeconomic Study Area

Tract	Block Group	Population 5 and older	Speaks English Less Than Very Well	
			Number	Percentage
109.07	1	2,545	1,037	41%
	2	1,650	232	14%
109.08	1	2,718	996	37%
	2	6,259	598	10%
9601.01	1	1,468	130	9%
Total Block Groups		14,640	2,993	20%
Buda		8,499	267	3%
Hays County		159,526	11,376	7%
Caldwell County		36,445	3,507	10%

Source: U.S. Census, 2010-2014 ACS, "Age by Language Spoken at Home by Ability to Speak English," (Table B16004).

Some Spanish language signage was observed in the socioeconomic study area, although signage was predominantly displayed in English. Given that nearly all LEP residents who speak a language other than English are Spanish speakers, every effort has been and will continue to be made to provide project and meeting materials and information to the public in both English and Spanish.

4.5.1.6 Economic Characteristics

According to 2011 estimates, there are 17 jobs in the parcels adjacent to the proposed roadway. The construction sector supplies most of the jobs within the socioeconomic study area (88.2 percent or 15 jobs) (U.S. Census, 2011).

Approximately 430 workers live within the parcels adjacent to the proposed project; however, none of these residents also work within these parcels. Instead, workers who live in the parcels adjacent to the proposed project commute elsewhere for work, most to jobs in the Austin-Round Rock-San Marcos metropolitan statistical area (MSA) (25.6 percent). Of the 17 workers who work within the socioeconomic study area, but live elsewhere, most (14 workers or 82.4 percent) commute in from somewhere in the Austin-Round Rock-San Marcos MSA; approximately 47 percent of these outside workers come from the cities of Austin, Buda, and San Marcos.

Due to the small number of jobs within the parcels that comprise the socioeconomic study area, it is clear that workers who live in these parcels must use the area transportation network to travel to their jobs. Mobility and the existing transportation network are discussed in **Section 4.5.1.8**.

4.5.1.7 Parks, Community Facilities, and Places of Worship

There are no parks, churches, cemeteries, schools, or day cares located in the land use study area. There is one fire station adjacent to the roadway: Buda Fire Department Station 2 at 151 FM 2001. The Studio Estates community center, a privately owned subdivision community center, is located on Goforth Road adjacent to the proposed ROW.

4.5.1.8 Neighborhoods

Many of the parcels adjacent to the proposed roadway are comprised of vacant, agricultural, or range land. However, several residential subdivisions containing single family homes are located adjacent to the proposed project, including:

- Brushy Creek (49 lots)
- Elm Creek Ranch (19 lots)
- Rolling Hills Estates (65 lots)
- Sunfield (350 lots)

These neighborhoods (shown on **Figure 4.2-1**) are characterized by a low density pattern of development that is heavily reliant on automobile transportation. While a few commercial businesses exist along the proposed roadway, these neighborhoods currently consist only of residential uses. At build out, Sunfield, a master planned community, would contain not only single family homes, but retail, multifamily, and mixed-use developments as well. Currently, the neighborhood consists of approximately 380 homes and a community park area.

4.5.1.9 Mobility and Access

FM 2001 is a farm-to-market road on the state system. The portion of FM 2001 within the project limits links another state road, SH 21, to I-35, a federal highway and major transportation and trade corridor connecting Texas to Minnesota. Destinations reachable via FM 2001 include downtown Buda and retail along I-35 (including Cabela's, Walmart, and HEB Grocery Store). FM 2001 also provides access via I-35 to downtown Austin, Kyle, and San Marcos.

Austin's transit authority, the Capital Metropolitan Transportation Authority, does not extend bus service to FM 2001. The only transit available along this roadway is provided by the Capital Area Rural Transportation System (CARTS). The CARTS-operated Country Bus route provides service to residents along FM 2001. Riders can schedule to be picked up at their homes and be transported to destinations within Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Lee, Travis, and Williamson Counties. Service to San Antonio is also possible.

According to the *HCTP* (2013), most of the pedestrian system is provided by locally developed sidewalks along arterials. Bicycle access is primarily provided by interconnected, low-volume

streets, and shoulders or bicycle lanes on higher volume streets. Due to the rural nature of most parts of Hays County, most roads are shared roadways for bicyclists and pedestrians.

The existing typical section for FM 2001 includes outside shoulders that are typically two feet wide. The American Association of State Highway and Transportation Officials (AASHTO) recommends a minimum paved shoulder width of five feet to accommodate bicyclists (2010). No sidewalks are present along FM 2001 within the project limits.

4.5.2 Environmental Consequences

4.5.2.1 Build Alternative

Community Cohesion

The impact of a roadway on community cohesion may be defined as any effect that could sever or alter social interaction among groups or individual members of a community. The division or displacement of functioning neighborhoods and the creation of barriers limiting the ability of groups to join and interact are examples of negative impacts.

Under the Build Alternative, construction of the roadway would require approximately113.9 acres of additional ROW, resulting in one residential displacement. Displacements are discussed in **Section 4.2.2.1**. Adequate replacement housing is available within the census tracts adjacent to the project as of July 2014 (**Section 4.2.2.1**). The Build Alternative would also bisect nine large tracts of land. Agricultural activities (row crops, livestock) were observed at the time of the site visit within these tracts. Agricultural operations in these areas would be impacted by the proposed roadway; however, due to the availability of remaining land available for agriculture on these properties, it is not anticipated that significant economic or employment impacts would occur. The remaining portions of these agricultural fields not impacted by the project ROW would still have driveway access to proposed FM 2001, existing FM 2001, or Rohde Road; therefore, agricultural operators would still be able to safely move farm equipment and livestock around their parcels. Any property damages or uneconomic remainders would be addressed during ROW negotiations.

By shifting FM 2001 from its current alignment in three places (from Royston Road to 1580 FM 2001; from Hillside Terrace to Rolling Hills Drive; and from south of Quail Run to 9190 FM 2001), the Build Alternative would shift some through traffic from the existing roadway. Removing through traffic from the existing roadway in these sections would benefit residents along the road by decreasing traffic and its associated noise. However, the addition of through traffic along the portion of the proposed roadway utilizing existing Rohde Road would increase traffic and its associated noise.

The Build Alternative would not bisect any neighborhoods or substantially alter community cohesion. Of the proposed 8.5-mile alignment, approximately 40 percent (3.4 miles) would be located along existing roadways (White Wing Trail, existing FM 2001, and Rohde Road). Additionally, all cross streets along these sections would be maintained across the proposed FM 2001 facility in the same location. Therefore, the proposed FM 2001 roadway in these areas would not create a new barrier that would further limit the ability of the community to interact with one another. There are three developments (two residences and a business) along existing FM 2001 and Rohde Road within the proposed urban sections that would be impacted by the proposed raised median. Instead of being able to directly access the proposed FM 2001 (northbound or southbound), these individuals would be required to drive in the opposite direction (maximum distance 700 feet) to the nearest median break. Although access for these individuals would be altered, it is not anticipated that the modifications would substantially impact the ability of these individuals from interacting with the remainder of the community.

The remaining 60 percent (5.1 miles) of the proposed FM 2001 alignment would be located on new location. The only cross roads along the proposed new location sections are CR 118, Goforth Road, SH 21. These road crossings would be maintained under the proposed plan, allowing residents in the area to safely and efficiently cross and access the proposed FM 2001. Although an additional barrier (proposed FM 2001) is being added in these areas, the ability of communities on both sides to join and interact would not be substantially impacted. The remainder of the new location sections utilize large tracts of undeveloped land with no cross streets, such that the proposed roadway would not be a barrier to community interaction.

Mobility and Access

Under the Build Alternative, the realignment and widening of FM 2001 would improve mobility along the roadway by removing several 90-degree turns and by providing a continuous connection across SH 21. Mobility for bicyclists would also improve. Along the urban sections, 5-foot wide bike lanes would be provided adjacent to the outer lanes and 6-foot wide sidewalks would be constructed along both sides of the road. Along the suburban sections, a 10-foot wide outside shoulder would be built to accommodate bicyclist/pedestrian movements throughout these areas. Additionally, within the suburban section an allowance would be made along both ROW lines for future 5-foot wide sidewalks.

The Build Alternative would alter access to parcels along the proposed alignment. In several places, the roadway would provide access to portions of parcels where none previously existed: between Hillside Terrace and Turnersville Road, between Quail Run and Goforth Road, and south of Rohde Road from Graef Road to SH 21 (see **Appendix D**). The provision of additional access could make these parcels more attractive for development. Potential induced development effects are discussed in **Section 4.14.1.5**. Access to parcels along existing FM 2001 would not change;

this roadway would be transferred to the county roadway network with the construction of the proposed project. Mobility and access would be modified for these individuals as they would no longer be able to directly access FM 2001; however, access to proposed FM 2001 would still be maintained via other connections. The addition of raised medians in the urban sections would negatively impact access at three developments (two residences and one business). As previously stated, these individuals would be required to alter their travel patterns, as would emergency responders who need to access those properties. While these modifications may increase travel times and reduce mobility, the overall travel time to community destinations, I-35, and SH 21 may, in fact, decrease relative to the existing condition due to the other proposed improvements.

Environmental Justice Populations

No low-income populations as defined by FHWA exist within the socioeconomic study area. However, all adjacent block groups do contain greater than 50 percent minority populations. Out of the 23 populated census blocks adjacent to the proposed project, 15 contain minority populations greater than 50 percent (**Section 4.5.1.2**). These minority residents are overwhelmingly Hispanic or Latino, and many may also be classified as LEP (**Section 4.5.1.5**).

Four of eleven impacted noise receivers (R16, R19, R21, and R22) are located in blocks containing over 50 percent minority residents. However, in accordance with TxDOT's noise guidelines, no abatement is proposed in these locations. Noise impacts are discussed in **Section 4.7**.

ROW would be acquired from blocks containing greater than 50 percent minority populations, including from two of the nine large tracts that would be bisected. However, no disproportionate impacts to these populations would occur as all of the reasonable project alternatives would have resulted in ROW acquisition from blocks containing EJ populations. One residential displacement and zero commercial displacements would occur as a result of the Build Alternative. The residential displacement would occur in census block 1016 of tract 109.08 – a census block that does not contain over 50 percent minority residents. Comparable replacement dwellings are available in the area as of July 2014 (**Section 4.2.2.1**). Under the Uniform Act (49 CFR 24), the project sponsor may need to provide payments in excess of the standard payment limits in the event that inadequate comparable replacement dwellings in the area exist. Because no commercial displacements would occur, no employment effects would be anticipated under the Build Alternative.

The Build Alternative would result in benefits to the community by providing a safer, more direct route between I-35 and SH 21; these benefits would accrue to EJ and non-EJ populations alike. The Build Alternative would not remove existing access to residences or businesses adjacent to the existing FM 2001 corridor. The three developments (two residences and a business) that would have increased travel times due to the proposed raised median are located in census units (block

2060 in tract 109.08 and block 1000 in tract 109.07) that contain greater than 50 percent minority residents. However, it is not anticipated that the access/mobility impacts to these residents due to the raised median would be substantial as the overall travel time for these individuals to community destinations may, in fact, decrease relative to the existing condition due to the other proposed improvements. Additionally, it is not anticipated that these individuals, or any other EJ populations, would experience substantial community cohesion impacts because the proposed roadway is not bisecting a neighborhood or creating additional barriers to community interaction.

4.5.2.2 No-Build Alternative

Under the No-Build Alternative, FM 2001 would not be widened or realigned. No community benefits (i.e., increased safety and mobility) would be realized as the FM 2001 roadway would still be discontinuous with sharp curves. Additionally, bicycle and pedestrian mobility and accessibility would not be improved under this alternative. No project-related displacements or impacts to community cohesion or EJ populations would occur under the No-Build Alternative.

4.6 Air Quality

4.6.1 Project Conformity

The proposed project is located in Hays and Caldwell Counties, which is in an area in attainment or unclassifiable for all national ambient air quality standards (NAAQS); therefore, the transportation conformity rules do not apply.

4.6.2 Carbon Monoxide Traffic Air Quality Analysis

Traffic data for the design year of 2034 and pavement design year of 2044 are shown in **Table 4.6-1**.

Table 4.6-1: Design and Pavement Design Year ADT

Road Section	Average Daily Traffic (vpd)	
	2034 (Design Year)	2044 (Pavement Design Year)
FM 2001 (E of I-35)	24,400	32,200
FM 2001 (S of Hillside Terrace)	21,600	26,500
Future FM 2001 (N of CR 302)	14,700	21,500
Future FM 2001 (N of SH 21)	12,220	18,000

Source: TxDOT, 2014

A prior TxDOT modeling study and previous analyses of similar projects demonstrated that it is unlikely that a carbon monoxide standard would ever be exceeded as a result of any project with an annual average daily traffic (AADT) below 140,000 vpd. The AADT projections for the

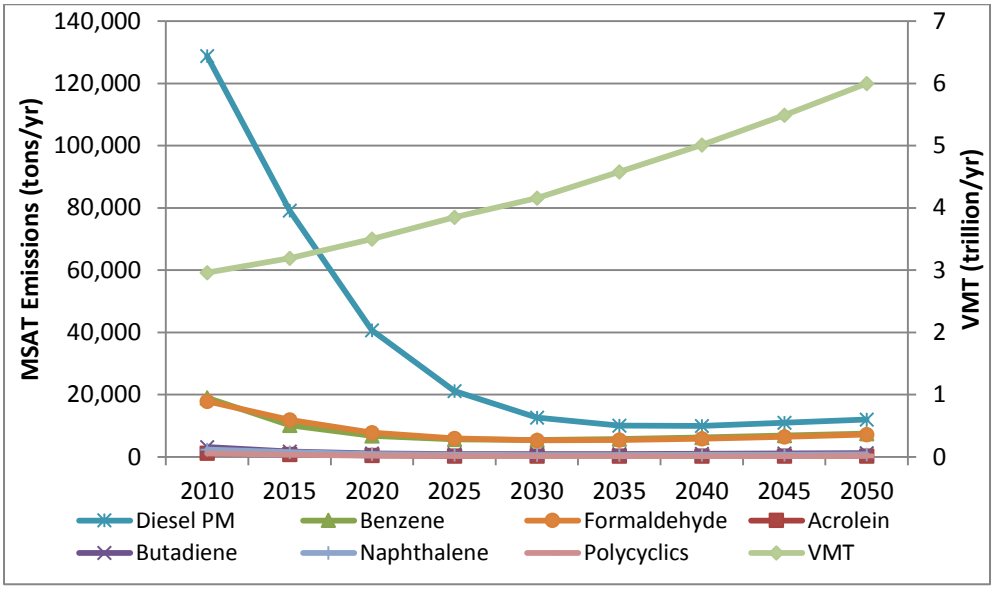
proposed project do not exceed 140,000 vpd; therefore a Traffic Air Quality Analysis was not required.

4.6.3 Mobile Source Air Toxics

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

The 2007 EPA MSAT rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. Based on an FHWA analysis using EPA's Motor Vehicle Emission Simulator (MOVES) 2010b model, as shown in **Figure 4.6–1** and **Table 4.6-2**, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

Figure 4.6-1: Projected National MSAT Emission Trends 2010–2050 for Vehicles Operating on Roadways using EPA's MOVES2010b Model



Source: Table 4.5-2 below.
Note: Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

Table 4.6-2: Projected National MSAT Emission Trends 2010-2050 for Vehicles Operating on Roadways using EPA's MOVES 2010b Model

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

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

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

4.6.3.1 Project-Specific MSAT Information

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

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

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

The additional travel lanes contemplated as part of the project alternatives would have the effect of moving some traffic closer to nearby homes, schools, and businesses; therefore, under each alternative there may be localized areas where ambient concentrations of MSAT could be higher

under certain Build Alternatives than the No-Build Alternative. The localized increases in MSAT concentrations would likely be most pronounced along the expanded roadway sections that would be built between Sunbright Boulevard and existing FM 2001, Satterwhite Road and South Turnersville Road, Quail Run South and Rohde Road, and Graef Road and existing FM 2001 south of SH 21. However, the magnitude and the duration of these potential increases compared to the No-Build Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT would be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause region-wide MSAT levels to be significantly lower than today

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

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

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

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the HEI. Among the adverse health effects linked to MSAT compounds at high exposures are: cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious are the adverse human health effects of MSAT compounds at current environmental concentrations (HEI,

http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

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

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

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

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

the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework.

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

4.6.3.3 Conclusion

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

4.6.4 Congestion Management Process

Because this project is located in an attainment area for all NAAQS, a congestion management process (CMP) analysis is not required.

4.6.5 Construction Emissions

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel particulate matter from diesel powered construction equipment and vehicles. The potential impacts of particulate matter emissions will be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/.

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project will have any significant impact on air quality in the area.

4.7 Traffic Noise Analysis

A traffic noise analysis was prepared for the proposed project to document existing and future predicted noise levels from vehicular traffic at select receivers along the project corridor. This analysis was accomplished in accordance with FHWA Regulation 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," and TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011).

4.7.1 Background Information

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

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

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

The traffic noise analysis process includes the following elements:

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

The FHWA has established the following Noise Abatement Criteria (NAC), shown in **Table 4.7-1** for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

Table 4.7-1: FHWA Noise Abatement Criteria (NAC)

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

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

Absolute criterion: The predicted noise level at the receiver approaches, equals, or exceeds the NAC. "Approach" is defined as one (1) dBA below the NAC (TxDOT, 2011). For example, a noise impact would occur at an exterior activity area of a Category B residence if the noise level is predicted to be 66 dBA or above.

Relative criterion: The predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA (TxDOT, 2011). For example: a noise impact would occur at an exterior activity area of a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11 dBA increase).

4.7.2 Existing Conditions

Land use activity categories located within the FM 2001 corridor include: residential (Category B); schools (Category C); and agricultural (Category F).

Current noise sources include traffic on FM 2001, White Wing Trail, Rohde Road, and SH 21. Existing traffic noise levels were measured at receiver locations (**Figures 4.7-1** and **4.7-2**) that represent the land use activity areas adjacent to the proposed project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. Additionally,

five existing ambient noise readings were collected within the project area. The five ambient noise readings were chosen to represent the existing noise levels on undeveloped parcels along the proposed facility. These ambient noise levels and corresponding receptors are shown in **Table 4.7-2** below and on **Figures 4.7-1** and **4.7-2**. The existing ambient readings range from 36.3 dBA at the south end of the project area (measurement location 5) to 46.9 dBA near the north end of the project (measurement location 1).

Table 4.7-2: Ambient Noise Readings

Ambient Measurement Location	Measured dBA (Leq)
1	46.9
2	38.8
3	39.7
4	36.3
5	41.3

4.7.3 Environmental Consequences

4.7.3.1 Build Alternative

The FHWA Traffic Noise Model (TNM) version 2.5 was used to calculate the predicted traffic noise levels. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills, and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Predicted traffic noise levels were modeled at receiver locations that represent the land use activity areas adjacent to the Build Alternative that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement. This data is presented in **Table 4.7-3**.

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Figure 4.7-1: Traffic Noise Receivers (Map 1 of 2)

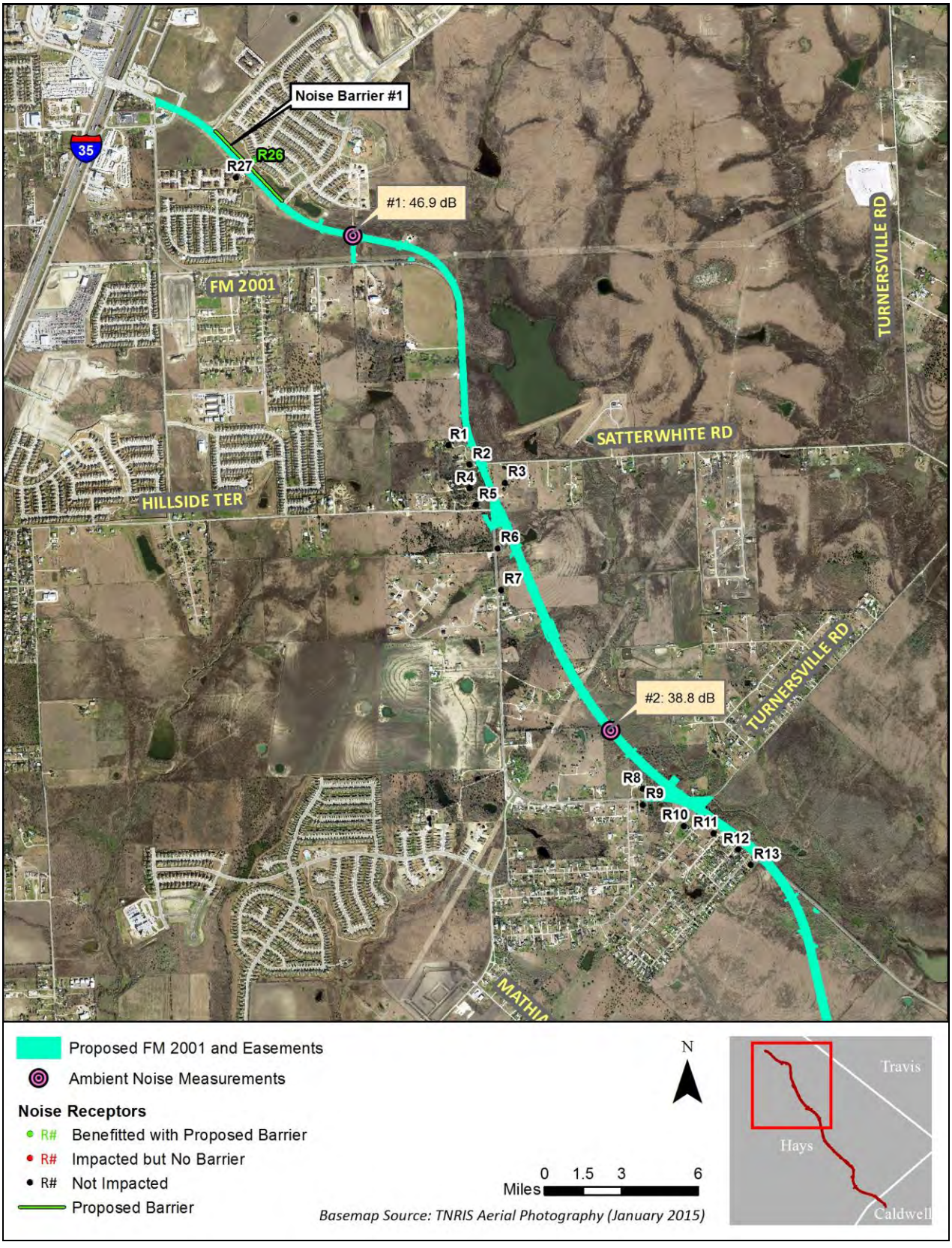

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Figure 4.7-2: Traffic Noise Receivers (Map 2 of 2)

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Table 4.7-3: Traffic Noise Levels dB(A) Leq

Receiver	NAC Category	NAC Level	Existing (2014)	Predicted (2034)	Change (+/-)	Noise Impact
R1 (Residence)	B	67	47	54	+7	No
R2 (Residence)	B	67	55	61	+6	No
R3 (Residence)	B	67	49	55	+6	No
R4 (Residence)	B	67	49	56	+7	No
R5 (Residence)	B	67	50	57	+7	No
R6 (Residence)	B	67	67	58	-9	No
R7 (Residence)	B	67	65	53	-12	No
R8 (Residence)	B	67	58	57	-1	No
R9 (Residence)	B	67	63	52	-11	No
R10 (Residence)	B	67	52	55	+3	No
R11 (Residence)	B	67	60	61	+1	No
R12 (Residence)	B	67	61	64	+3	No
R13 (Residence)	B	67	58	60	+2	No
R14 (Community Center)	C	67	44	53	+9	No
R15 (Residence)	B	67	44	53	+9	No
R16 (Residence)	B	67	49	64	+15	Yes
R17 (Residence)	B	67	45	62	+17	Yes
R18 (Residence)	B	67	51	62	+11	Yes
R19 (Residence)	B	67	38	58	+20	Yes
R20 (Residence)	B	67	45	62	+17	Yes
R21 (Residence)	B	67	50	63	+13	Yes
R22 (Residence)	B	67	44	57	+13	Yes
R23 (Residence)	B	67	39	54	+15	Yes
R24 (Residence)	B	67	44	55	+11	Yes
R25 (Residence)	B	67	41	58	+17	Yes
R26 (Residence)	B	67	50	61	+11	Yes
R27 (Apartment Pool)	B	67	47	56	+9	No

As indicated in **Table 4.7-3**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise walls.

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

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

Alteration of horizontal and/or vertical alignments: the majority of the impacted receivers are located on either side of Rohde Road (four houses on the north side and four on the south side; R16-R23) near the southeastern end of the project area. Horizontal alteration of the alignment would result in the taking of additional property from property owners, and potentially the residences themselves.

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

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

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

Receivers R16–R23: these receivers are separate, individual residences. Noise walls that would achieve the minimum feasible reduction of five dB(A) while achieving a seven dB(A) noise reduction design goal at each of these receivers would exceed the reasonable, cost-effectiveness criterion of $25,000.

Receivers R24 and R25: these receivers represent a total of 2 residences with driveways facing the roadway. A continuous noise barrier would restrict access to these residences. Gaps in a noise barrier would satisfy access requirements, but the resulting non-continuous barrier segments would not be sufficient to achieve the minimum, feasible reduction of five dB(A) or the noise reduction design goal of 7 dB(A).

The following is a description of the barrier that was determined to be feasible and reasonable for one of the impacted receivers:

Receiver R26: This receiver represents an exterior activity area of a residence at the Sunfield Subdivision. Based on preliminary calculations, a noise barrier 1,666 feet in length and 15 feet in height would reduce noise levels by at least five dB(A) for 19 benefited receivers and reduce the noise level at one or more receivers by at least 7 dB(A) at a total cost of $449,820 or $23,675 for each benefited receiver.

Table 4.7-4: Noise Barrier Proposal (preliminary)

Barrier	Representative Receivers	Total # Benefited	Length (feet)	Height (feet)	Total Cost	$/Benefited Receiver
1	R26	19	1,666	15	$449,820	$23,675

Any subsequent project design changes may require a reevaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barrier will not be made until completion of the project design, utility evaluation and polling of adjacent property owners. **Figure 4.7-1** depicts the representative noise receiver, as well as the proposed noise barrier that would benefit the impacted receiver.

To avoid noise impacts that may result from future development of properties adjacent to the project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the predicted 2034 noise impact contours shown in **Table 4.7-5.**

Table 4.7-5: Noise Contour Impact Zones

Location	Distance from the ROW of Southeast Bound FM 2001 Roadway	
	66 dB(A)	71 dB(A)
Northwestern Extent of the Proposed Alignment Northwest of CR 107	67 ft.	13 ft.
Southwest of CR 120 and North of Goforth Road	82 ft.	34 ft.
Southwest of Rolling Hills Drive and North of CR 302	80 ft.	17 ft.
Southwest of CR 302 and Northwest of SH 21	33 ft.	ROW

Noise associated with the construction of the project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. No extended disruption of normal activities is expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to

minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

A copy of this traffic noise analysis will be available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the project.

4.7.3.2 No-Build Alternative

The No-Build Alternative represents the existing FM 2001 facility plus any regional traffic growth. Traffic volumes are expected to increase between now and 2034. As a result, future traffic noise levels under the No-Build Alternative are expected to increase from the existing noise levels at all representative receiver locations. While future No-Build noise levels may exceed the NAC, they are not impacts because no project occurs in either case. Noise abatement would be considered only under the Build Alternative.

4.8 Water Resources

4.8.1 Existing Conditions

The project area is located within the San Marcos drainage of the Guadalupe River Basin. The Guadalupe Basin is the fourth largest river basin whose watershed area falls entirely within Texas. Other major waterways within the basin other than the Guadalupe River include the Blanco, Comal, and San Marcos Rivers and Sandies and Coleto Creeks (TWDB, 2013).

4.8.1.1 Floodplains

EO 11988, "Floodplain Management," requires that federal agencies avoid activities that directly or indirectly result in the development of floodplain areas. Floodplains are those areas subject to inundation by the one percent annual chance (or 100-year) flood events. Data from the Digital Flood Insurance Rate Maps (DFIRM) were used to identify the 100-year floodplain boundaries within the project area, as shown in **Figures 3.5-1** and **3.5-2**.

Approximately 6.48 acres of the 100-year floodplain occur within the project area and are associated with Brushy Creek and one of its unnamed tributaries. No regulatory floodways (i.e., floodplain areas reserved by federal, state, or local requirements) exist within the project area.

4.8.1.2 Waters of the U.S.

Waters of the U.S. are defined by Title 33 of the CFR Section 328.3; they include rivers and streams that support or influence interstate commerce, tributaries of those rivers and streams, and adjacent wetlands. Waters of the U.S. are regulated by the USACE under Section 404 of the Clean Water Act (CWA). Under Section 404 of the CWA, a permit is required from the USACE for any

activity involving the discharge of dredged or fill material into waters of the U.S., including wetlands.

According to the USGS topographic map and National Hydrography Dataset (NHD) data, the project area crosses Brushy Creek (two crossings) and nine unnamed, first-order tributaries to Brushy Creek (**Figures 4.8-1** and **4.8-2**). According to the USGS, these creeks are intermittent.

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Figure 4.8-1: USGS Topographic Map (Map 1 of 2)

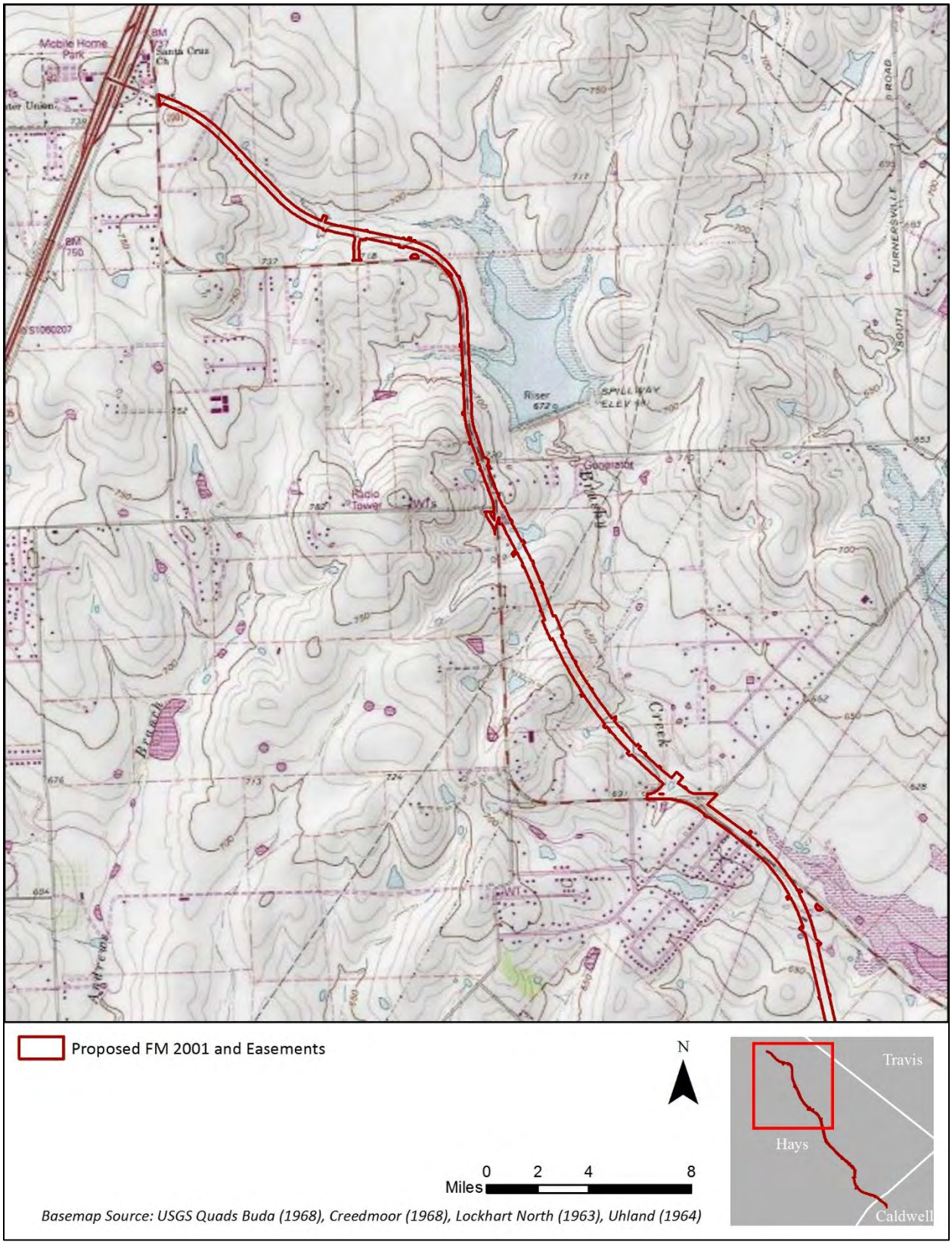

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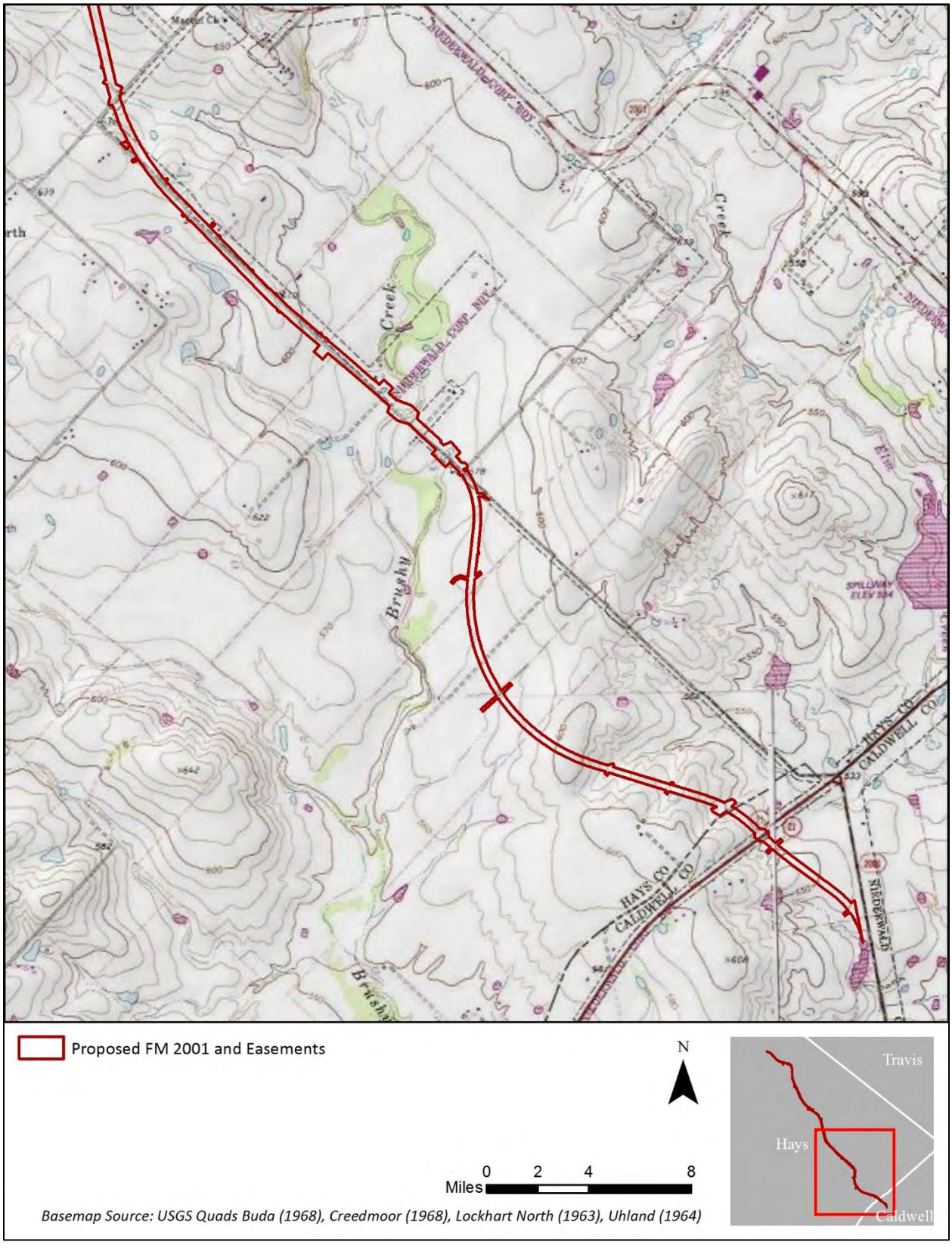
Figure 4.8-2: USGS Topographic Map (Map 2 of 2)



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Brushy Creek appears as a named stream on the USGS topographic map and in NHD data, meaning that it and its tributaries would likely be considered jurisdictional waters. Linear surface water features identified within the project area based on these desktop resources are included in **Table 4.8-1**.

Table 4.8-1: Linear Surface Water Features Within the Project Area

Water Feature Name	Length Within Project Area in Linear Feet
Brushy Creek	521
Unnamed Tributaries of Brushy Creek	2,331
Total	**2,852**

Based on the USACE definition, wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (USACE, 1987). A wetland is considered jurisdictional when it has a hydrologic connection via either a channel or floodplain to a water of the U.S.

According to the NWI maps, ten potential wetlands totaling approximately 2.24 acres are located within the project area (see **Figures 3.5-1 – 3.5-3** and **Table 4.8-2**).

Table 4.8-2: NWI Wetlands Identified within Project Area

Wetland Type	Potentially Jurisdictional Wetlands or Other Waters	Number Within Project Area	Acreage Within Project Area
Palustrine	Palustrine, emergent, persistent, seasonally flooded (PEM1C)	3	0.92
	Palustrine, open water/unknown bottom, permanently flooded, diked/impounded (POWHh/PUBHh)	7	1.32
Total		**10**	**2.24**

A survey for waters of the U.S., including wetlands, was conducted in June 2014 and September 2016 within the proposed project area. Wetlands were delineated in accordance with the 1987 Corps of Engineers Wetland Delineation Manual and 2010 Regional Supplement for the Great Plains Region. Wetland data forms can be found in **Appendix F**.

Results of the survey indicate that the two Brushy Creek crossings and three of the nine unnamed tributaries to Brushy Creek that were identified by the USGS exhibited an ordinary high water

mark (OHWM) in the project area. The OHWM of an additional tributary to Brushy Creek not identified by the USGS was also surveyed during the field investigations. Five of the nine tributaries identified by the USGS did not exhibit an OHWM. Brushy Creek flows west to east under the existing FM 2001 through culverts. The other tributaries that cross existing roadways within the project area also pass through culverts. In addition to Brushy Creek and its tributaries, there are three wetlands and seven (agricultural) ponds of varying sizes throughout the project area.

Right-of-entry (ROE) was not obtained within the entire project area. Areas where ROE had not been granted could not be surveyed at the time of the investigation and are therefore not included in the analysis below. These areas included one of the unnamed tributaries to Brushy Creek identified by the USGS, as well as a portion of one of the Brushy Creek crossings. All areas of potential waters of the U.S. were not visible from the public ROW adjacent to these properties. There are approximately 386 linear feet of potential waters of the U.S. in these areas, according to NHD data. Acreage from these potential waters cannot be estimated at this time as field work would be required to confirm widths of OHWMs, if present. Additionally, the possibility exists that surface waters that are not portrayed in NHD or NWI data may exist in these areas.

4.8.1.3 Water Quality

TCEQ is responsible for monitoring, assessing, and regulating surface water quality. The results of the assessment are published periodically in the Texas Water Quality Inventory and 303(d) List, as required by Sections 305(b) and 303(d) of the CWA. The Texas Water Quality Inventory and 303(d) List contains an overview of the status of the surface waters of the state, including concerns for public health, fitness for use by aquatic species and other wildlife, and specific pollutants and their possible sources.

Storm water runoff from the proposed construction would flow into Brushy Creek and Elm Creek, which both flow into Plum Creek (TCEQ Segment 1810) within the Guadalupe River Basin. Plum Creek is designated as impaired (elevated bacteria concentrations for contact recreation uses) in the 2014 CWA Section 303(d) list.

4.8.1.4 Groundwater

According to the TWDB, no portion of the project area is over the Edwards Aquifer. The project area is underlain entirely by the Trinity Aquifer, which extends from the Red River to the eastern edge of Bandera and Medina Counties. It consists of sandstone, sand, silt, clay, conglomerate, shale, limestone, dolomite, and marl of the Trinity Stage and the Coahuilan Series. This aquifer is underlain and confined by low-permeability rocks that range in age from Precambrian to Jurassic (Eckhardt, 2014). The Trinity Aquifer is not considered to be a sole source aquifer by the EPA

(EPA, 2014). Recharge to the aquifer occurs very slowly with only 4-5% of water that falls as rain over the Trinity Aquifer contributing to recharge (Eckhardt, 2014).

The TWDB groundwater database was searched to determine whether any water wells located in or near the project area might be affected. Based on the TWDB Groundwater database, there are no water wells located within or adjacent to the project area.

4.8.2 Environmental Consequences

4.8.2.1 Floodplains

Build Alternative

The Build Alternative would include construction within approximately 6.48 acres of floodplains along Brushy Creek and one of its unnamed tributaries. However, the Build Alternative would not take away flood pool storage volume from floodplains associated with the NRCS dams. The hydraulic design practices for the construction of the Build Alternative would be in accordance with current TxDOT and FHWA design policies and standards. Construction within the floodplains would not increase the base-flood elevation to a level that would violate applicable floodplain regulations. The proposed facility would permit the conveyance of the 100-year flood of the roadway without causing substantial damage to the roadway, stream, or property.

23 CFR 650.113 requires that encroachments on floodplains be the only practicable alternative which shall be supported by the following information: 1) The reasons why the proposed action must be located in the floodplain, 2) The alternatives considered and why they were not practicable, and 3) A statement indicating whether the action conforms to applicable state or local floodplain protection standards. Since the proposed project crosses floodplains, the following support information is provided: 1) Avoiding and minimizing floodplain crossings were considered during design of the Build Alternative. The proposed project must be located in floodplains because in order to avoid floodplains, a significant realignment of FM 2001 would be required, resulting in much higher ROW and project costs, as well as potentially more displacements. Additionally, no longitudinal encroachments on the floodplain would occur; 2) The only alternative considered during the course of project development that would avoid encroachments on floodplains was the No-Build Alternative, which does not satisfy the purpose and need for the proposed project; and 3) The proposed project would conform to state and local floodplain protection standards.

No-Build Alternative

The No-Build Alternative would not result in any impacts to floodplains, including those floodplains associated with NRCS dams.

4.8.2.2 Waters of the U.S.

Build Alternative

Figures 4.8-3 – 4.8-7 shows the project area wetlands, as well as the OHWM of Brushy Creek (two crossings), the four unnamed tributaries to Brushy Creek, and the seven project area ponds that were delineated within the project area. **Figures 4.8-4** and **4.8-6** shows the areas where ROE was not obtained that the USGS mapped a water crossing. Impacts to surveyed waters of the U.S. as a result of the Build Alternative are summarized in **Table 4.8-3**.

Table 4.8-3: Build Alternative Water Impacts

Waterbody	Water of the U.S.?	Linear Feet within ROW	Area within ROW (ac)	Area within Permanent Easements (ac)	Total Area in Project Area (ac)	USACE Permit
Unnamed Tributary of Brushy Creek 1	Yes	232	0.01	0.01	0.02	NWP 14
Unnamed Tributary of Brushy Creek 2	Yes	121	0.02	0.0	0.02	NWP 14
Brushy Creek (Crossing 1)	Yes	52	0.01	0.0	0.01	NWP 14
Brushy Creek (Crossing 2)*	Yes	280	0.03	0.02	0.05	NWP 14
Unnamed Tributary of Brushy Creek 3	Yes	21	<0.01	0.0	<0.01	NWP 14
Unnamed Tributary of Brushy Creek 4	Yes	16	<0.01	0.0	<0.01	NWP 14
Pond 1	To Be Determined	N/A	0.16	0.0	0.16	To Be Determined
Pond 2	Yes	N/A	0.01	0.03	0.04	NWP 14
Pond 3	To Be Determined	N/A	0.72	0.04	0.76	To Be Determined
Pond 4	To Be Determined	N/A	0.0	0.20	0.20	To Be Determined
Pond 5	Yes	N/A	0.05	0.0	0.05	NWP 14
Pond 6	Yes	N/A	0.11	0.04	0.15	NWP 14 with PCN
Pond 7	Yes	N/A	<0.01	0.15	0.15	NWP 14 with PCN
Wetland 1	Yes	N/A	0.01	0.06	0.07	NWP 14 with PCN
Wetland 2	Yes	N/A	0.11	0.06	0.17	NWP 14 with PCN
Wetland 3	To Be Determined	N/A	0.09	0.0	0.09	To Be Determined
TOTAL		**722**	**1.33**	**0.61**	**1.94**	

*ROE was not obtained for the parcel encompassing the remainder of this Brushy Creek crossing (south side of the proposed ROW); therefore, impact acreages and associated permit requirements presented in this table for this crossing would need to be updated following receipt of ROE.

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Figure 4.8-3: Waters of the U.S. and Wetlands within the Project Area (Map 1 of 5)

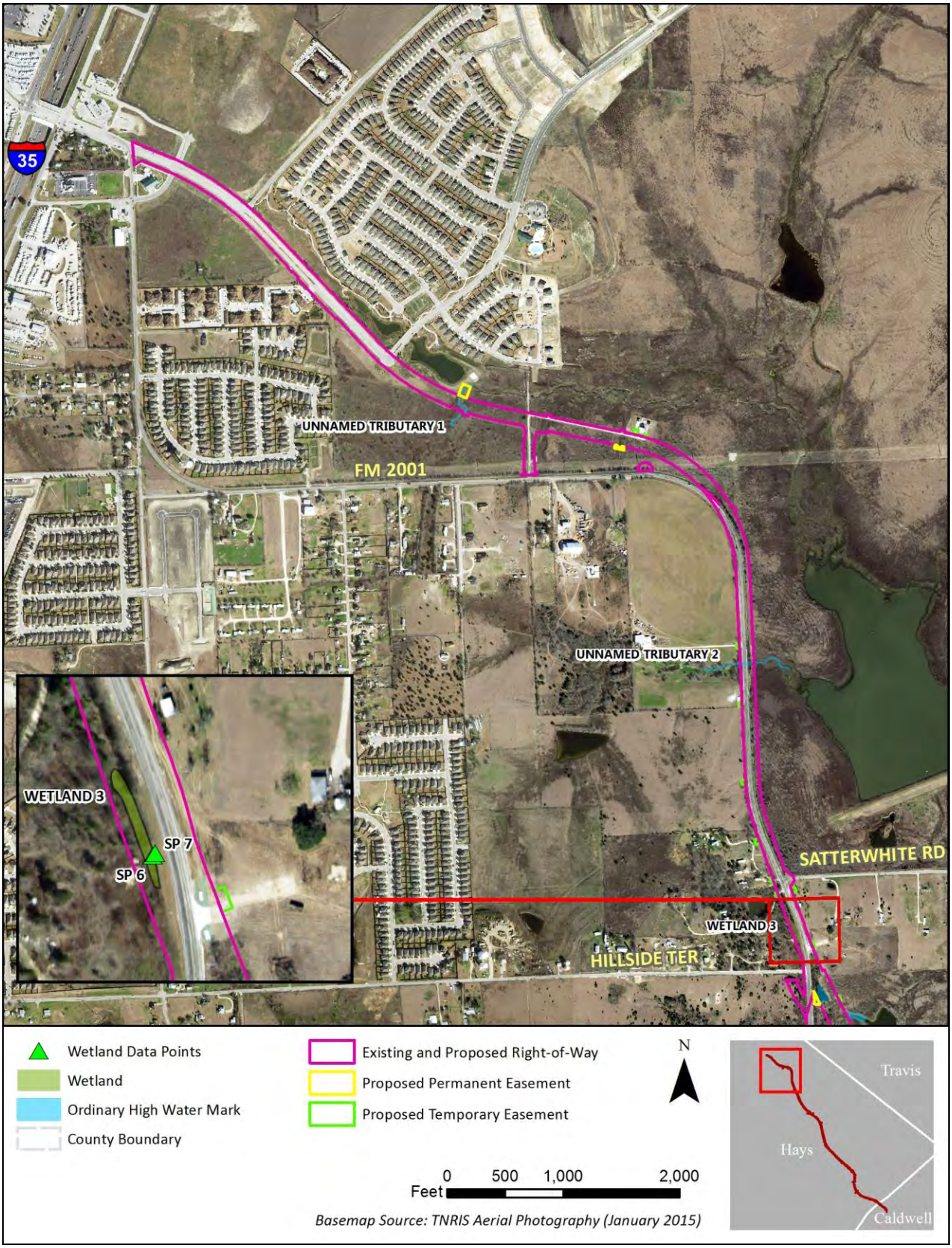

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Figure 4.8-4: Waters of the U.S. and Wetlands within the Project Area (Map 2 of 5)

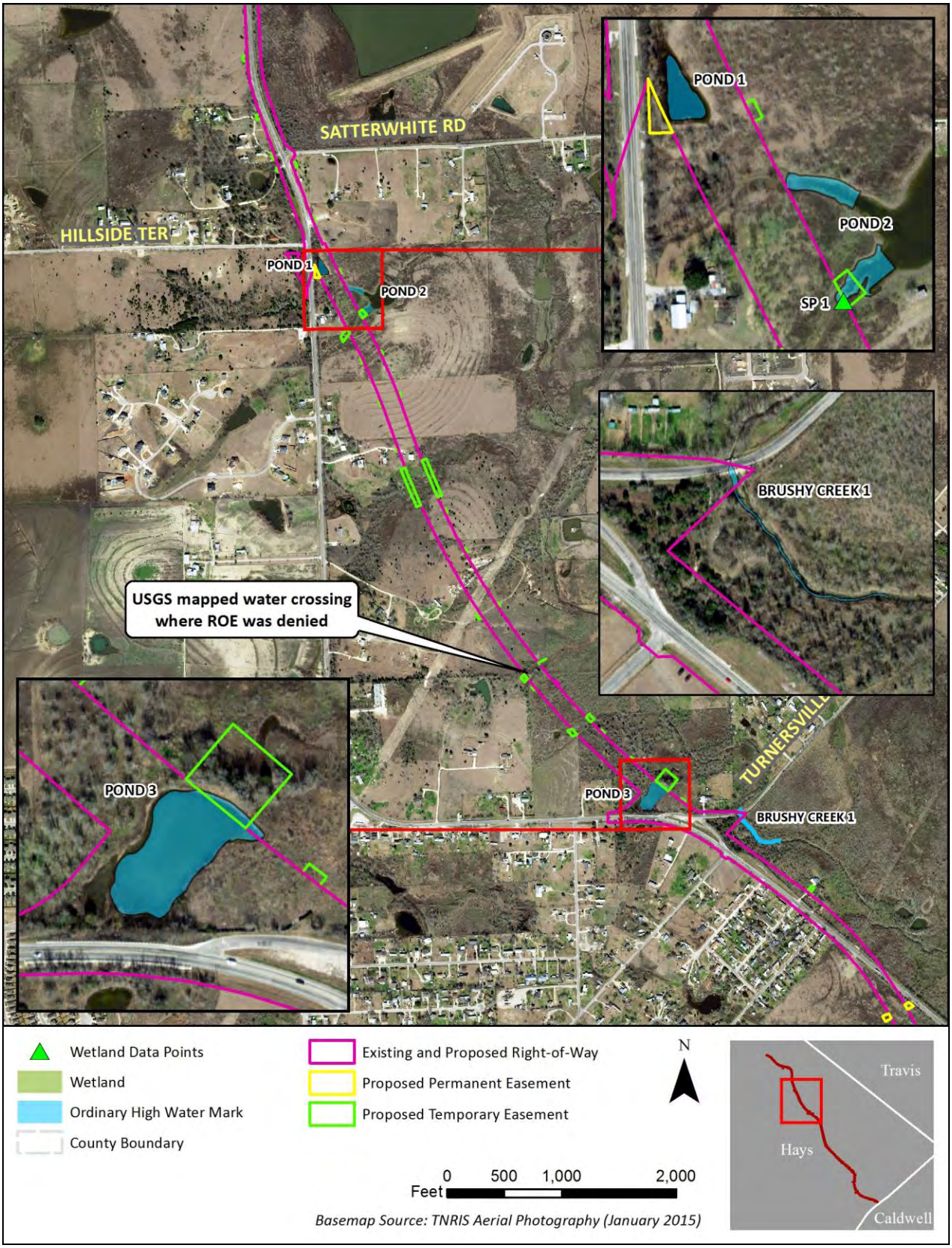

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Figure 4.8-5: Waters of the U.S. and Wetlands within the Project Area (Map 3 of 5)

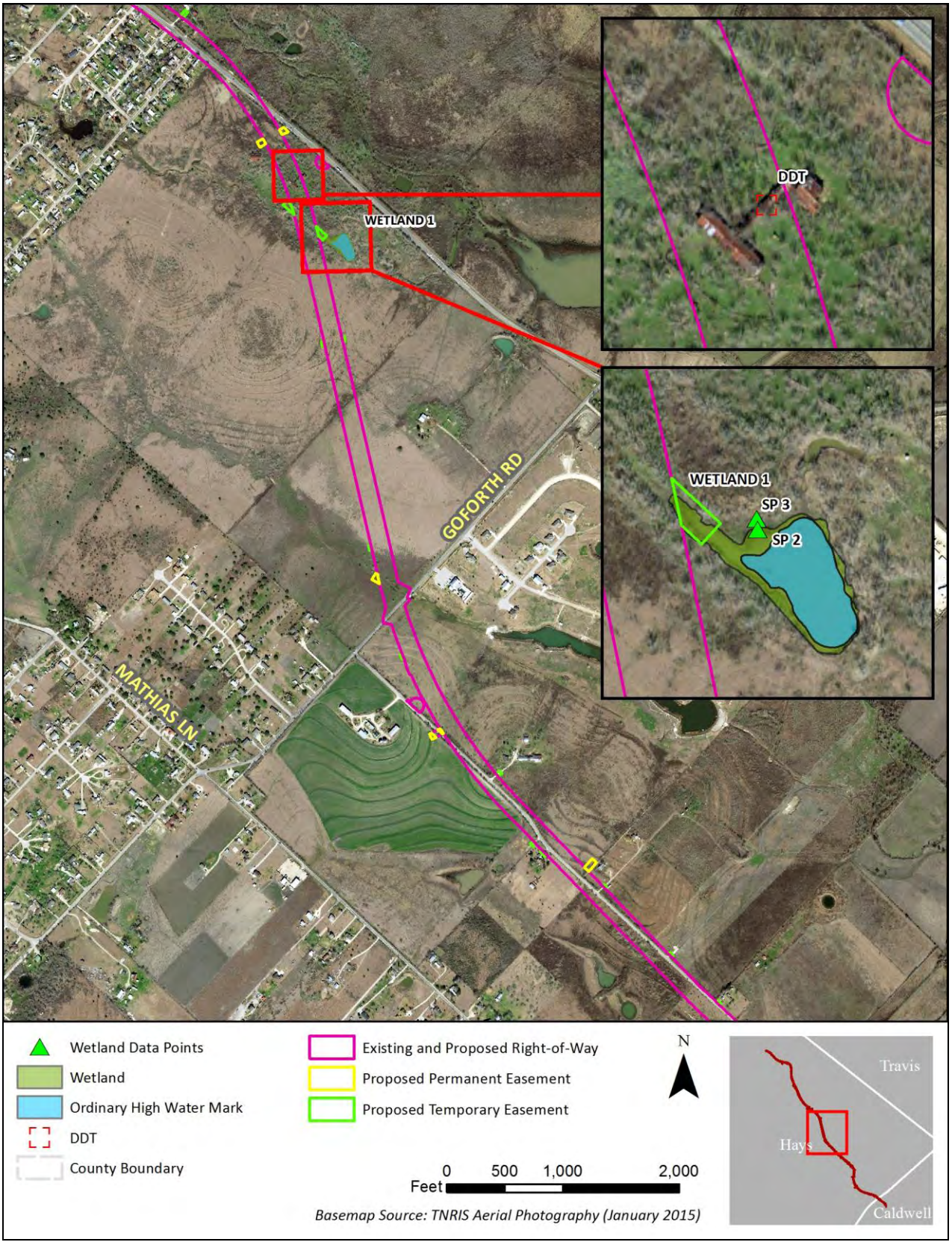

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Figure 4.8-6: Waters of the U.S. and Wetlands within the Project Area (Map 4 of 5)

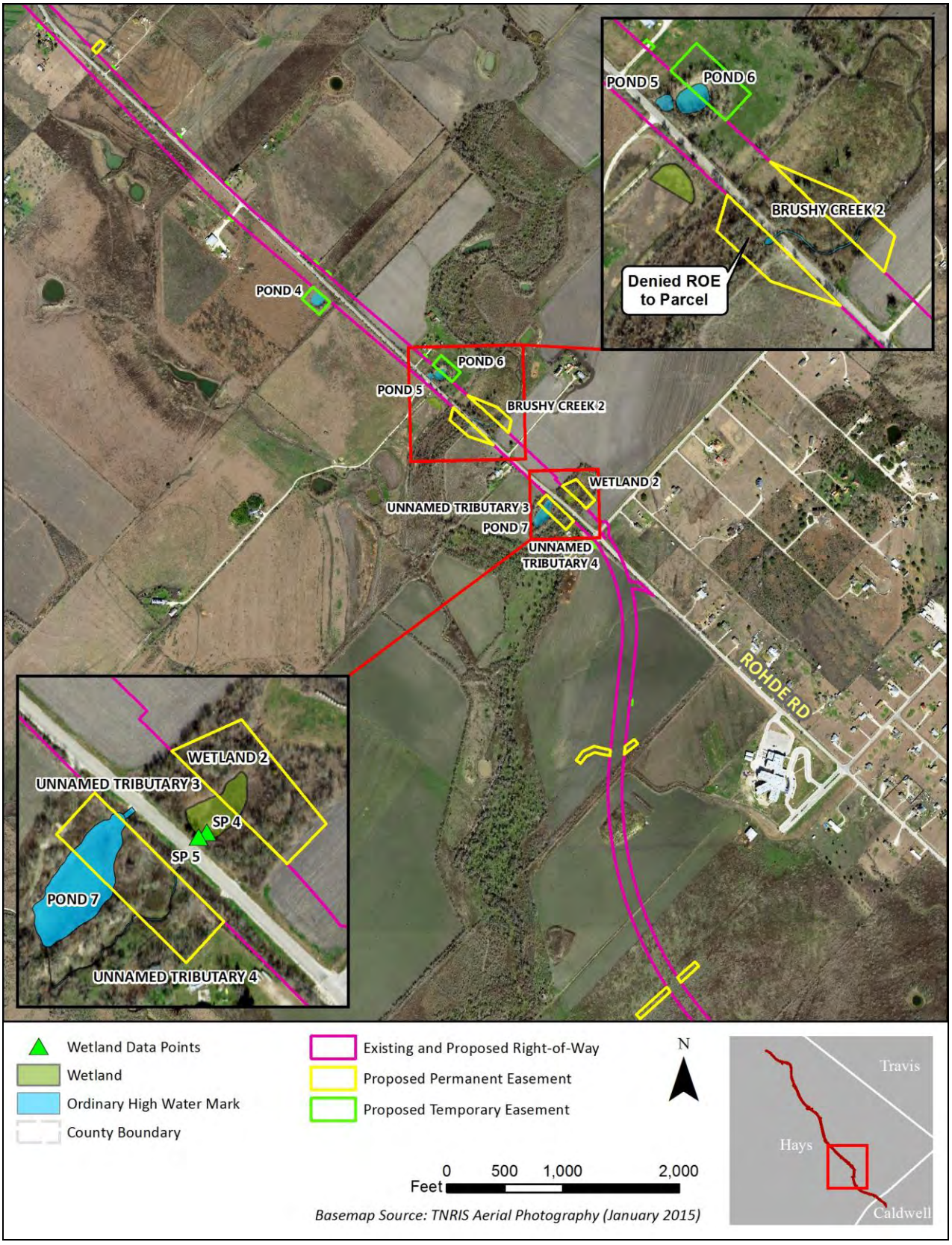

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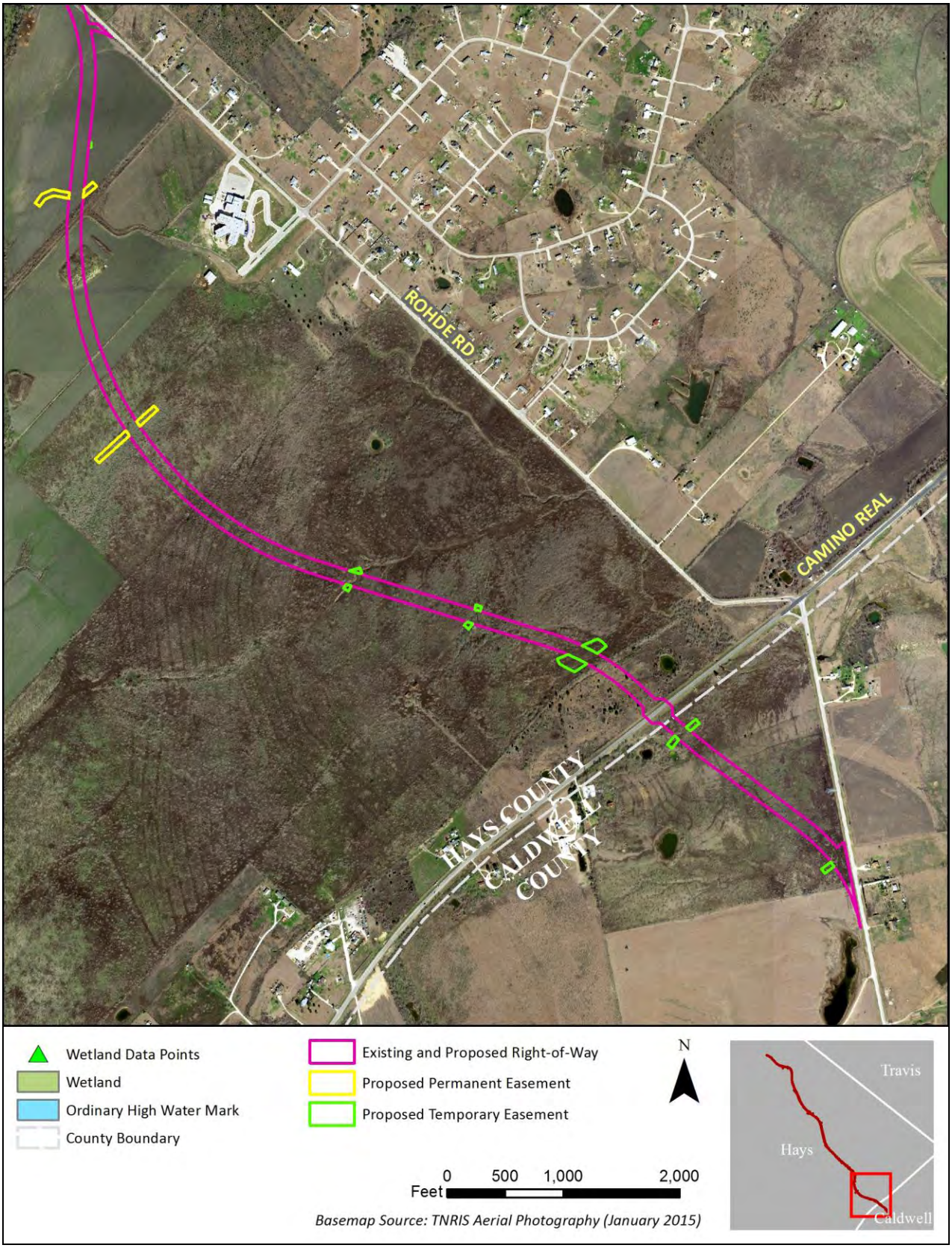
Figure 4.8-7: Waters of the U.S. and Wetlands within the Project Area (Map 5 of 5)



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As shown in **Table 4.8-3**, the Build Alternative would impact waters of the U.S., including potentially jurisdictional creeks, ponds, and wetlands. Three project area ponds (Ponds 1, 3, and 4) and one wetland (Wetland 3) were determined to be potentially non-jurisdictional based on the lack of a surface hydrological connection to Brushy Creek or one of its tributaries.

Nationwide Permit (NWP) 14 for Linear Transportation Projects would be the appropriate permit for potential impacts to waters of the U.S. from the proposed project. A Pre-Construction Notification (PCN) would be required if there would be more than 0.10 acre of permanent impacts to waters of the U.S. or if wetland areas are impacted. In the event that wetlands areas are impacted, mitigation may be required. If more than 0.50 acres of waters of the U.S. at a single and complete water crossing are permanently impacted, an Individual Permit (IP) would be required for the project. Based on the current project design, the Build Alternative would be covered under a NWP 14 with PCN. No IP would be required. An approved jurisdictional determination from the USACE would be required to confirm that Wetland 3 and Ponds 1, 3, and 4 (see **Table 4.8-3**) would not be considered jurisdictional.

Waters crossed by the project area are not considered navigable waterways. Therefore, a navigational clearance under the General Bridge Act of 1946 and Sections 9/10 of the Rivers and Harbors Act of 1899 would not be required as the proposed project would not construct a bridge across a navigable waterway.

EO 11990 (Protection of Wetlands), requires federal agencies to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. Pursuant to EO 11990, alternatives were considered that would avoid wetland impacts. It was determined that to avoid wetland impacts would result in additional ROW, higher project costs, and potentially more displacements. Unavoidable impacts to wetlands resulting from the Build Alternative would be minimized to the extent practicable.

No-Build Alternative

Under the No-Build Alternative, no impacts to waters of the U.S., including wetlands would occur.

4.8.2.3 Water Quality

Build Alternative

As previously stated, storm water runoff from the proposed construction would flow into Brushy Creek and Elm Creek, which both flow into Plum Creek (TCEQ Segment 1810) within the Guadalupe River Basin. Plum Creek is designated as impaired in the 2014 CWA Section 303(d) list. However, the impaired segment of Plum Creek is located greater than five miles downstream of the proposed project area; therefore, coordination with TCEQ is not required for total maximum daily loads.

Projects that utilize NWPs from the USACE under Section 404 of the CWA must use at least one of the best management practices (BMPs) from each category listed in the TCEQ Section 401 Water Quality Conditions for NWPs. The categories are erosion control, post-construction total suspended solids control, and sediment control. The proposed project would require a Section 404 permit; therefore Section 401 Water Quality BMPs would be incorporated into the project plans. Temporary BMPs would include rock filter dams, sediment control fences, soil retention blankets, and sandbags. Permanent water quality BMPs would include grass-lined ditches.

The proposed project would disturb more than five acres of land; therefore, TxDOT is required to comply with the TCEQ Texas Pollutant Discharge Elimination System General Permit for Construction Storm Water Discharges. A Storm Water Pollution Prevention Plan (SW3P) would be in place prior to the start of construction and would be maintained until the site is stabilized. A notice of intent (NOI) stating that a SW3P has been developed would be filed with the TCEQ prior to beginning construction.

The proposed project is not located within the boundaries of a regulated Municipal Separate Storm Sewer System.

No permanent water quality impacts are expected as a result of the proposed project. Measures would be taken to prevent and correct erosion that may develop during construction. Temporary erosion controls would be in compliance with TxDOT Standard Specifications and would be in place, according to the construction plans, prior to commencement of construction. They would be inspected on a regular basis to ensure maximum effectiveness.

No-Build Alternative

No construction or operational related water quality impacts would occur as a result of the No-Build Alternative.

4.8.2.4 Groundwater

Build Alternative

The project area falls over the Trinity Aquifer. Due to the extremely slow recharge rate of the Trinity Aquifer, storm water runoff from the Build Alternative is not anticipated to affect the aquifer. Additionally, since no water wells are located within or adjacent to the project area, no water well impacts would occur.

No-Build Alternative

No adverse impacts to groundwater or the Trinity Aquifer would occur with the No-Build Alternative.

4.9 Ecological Resources

4.9.1 Existing Conditions

4.9.1.1 Vegetation

Based on a review of the Ecological Mapping System of Texas (EMST) database, there are a total of 13 vegetation types within the project area (**Figure 4.9-1**). The project area is primarily dominated by disturbed and tame grasslands of the Blackland Prairie, cropland, urban areas, and riparian and floodplain vegetation of Central Texas (TPWD, 2013a). **Table 4.9-1** provides information on the acreage of each vegetation type within the project area, as mapped by EMST.

Table 4.9-1: EMST Vegetation Types Within the Project Area

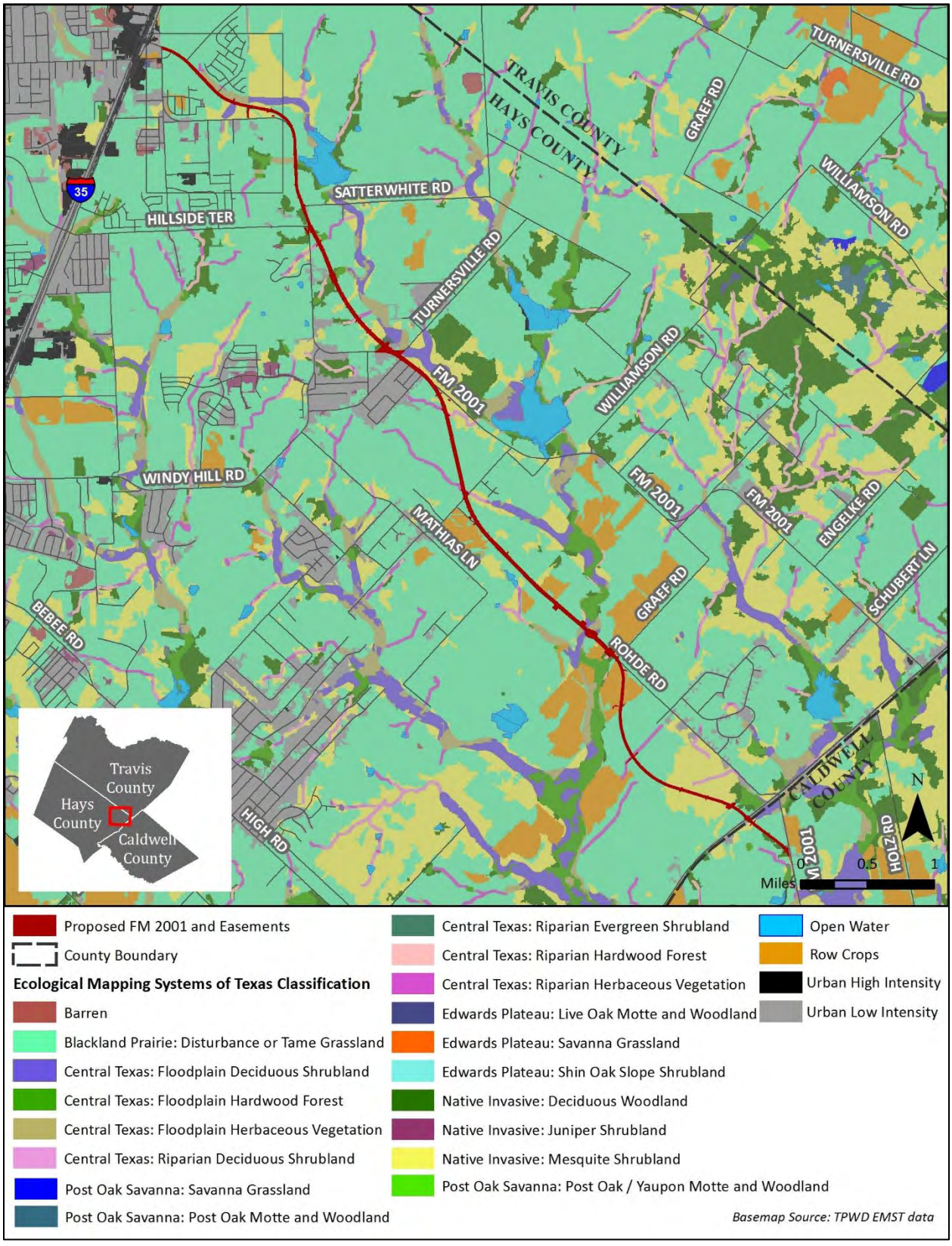
Vegetation Type	Acreage
Blackland Prairie: Disturbance or Tame Grassland	94.8
Central Texas: Floodplain Deciduous Shrubland	3.0
Central Texas: Floodplain Hardwood Forest	1.7
Central Texas: Floodplain Herbaceous Vegetation	4.8
Central Texas: Riparian Deciduous Shrubland	0.5
Central Texas: Riparian Hardwood Forest	1.5
Central Texas: Riparian Herbaceous Vegetation	2.9
Edwards Plateau: Live Oak Motte and Woodland	<0.1
Edwards Plateau: Shin Oak Slope Shrubland	0.5
Native Invasive: Deciduous Woodland	8.3
Native Invasive: Mesquite Shrubland	23.1
Row Crops	7.2
Urban Low Intensity	8.0
TOTAL	156.2

A field survey of the project area was conducted on June 10 and June 16, 2014 and September 29, 2016. The vegetation observed was generally consistent with that described by the EPA ecoregions and EMST data. Tree and shrub species observed in the project area included mesquite (*Prosopis glandulosa*), common hackberry (*Celtis laevigata*), black willow (*Salix nigra*), Chinese tallow (*Triadica sebifera*), cedar elm (*Ulmus crassifolia*), retama (*Parkinsonia aculeata*), live oak (*Quercus fusiformis*), and prickly pear (*Opuntia engelmannii*). Herbaceous vegetation included curly dock (*Rumex crispus*), frogfruit (*Phyla nodiflora*), goldenrod (*Solidago sp.*), horsemint (*Monarda citriodora*), Indian blanket (*Gaillardia pulchella*), purple thistle (*Cirsium texanum*),

pink evening primrose (*Oenothera speciosa*), sunflower (*Helianthus annuus*), western ragweed (*Ambrosia psilostachya*), Bermudagrass (*Cynodon dactylon*), bristlegrass (*Setaria sp*.), and Johnsongrass (*Sorghum halepense*). Vines observed included grape (*Vitis sp*.) and Virginia creeper (*Parthenocissus quinquefolia*).

During the June 2014 and September 2016 surveys, the project area was searched for unusually large mature trees. The majority of the project area was dominated by mesquite and other smaller species of trees. No unusually large, mature trees were observed during the surveys.

Figure 4.9-1: EMST Vegetation Types within Project Area



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Unusual Vegetation and Special Habitat Features

The Memorandum of Agreement (MOA) between TxDOT and TPWD requires that characterization of vegetation in environmental documents include consideration of unusual vegetation and special habitat features. Unusual vegetation features are defined in the MOA to include unmaintained vegetation, trees or shrubs along a fence line adjacent to a field (fencerow vegetation), riparian vegetation, trees unusually larger than others in the area, and unusual stands of vegetation. Special habitat features are defined in the MOA to include bottomland hardwoods, caves, cliffs and bluffs, native prairies, ponds, seeps or springs, snags, water bodies, and bridges with bird or bat colonies. Unusual vegetation and special habitat features were searched for within the FM 2001 project area concurrently with the vegetation surveys performed during the dates mentioned above.

4.9.1.2 Threatened and Endangered Species

Federally-listed threatened and endangered species are protected by the Endangered Species Act (ESA; 7 U.S.C. § 136, 16 U.S.C. § 1531 et seq.). State-listed threatened and endangered species are protected by state law within Texas. According to the USFWS, 14 federally-endangered, 3 federally-threatened species, and 5 federal candidate species are known to occur or may potentially occur in Hays and Caldwell Counties (USFWS, 2016). According to TPWD, 13 state-endangered and 16 state-threatened species could potentially occur in Hays and Caldwell Counties (TPWD, 2016) (**Table 4.9-2**).

The potential for habitat to occur in the project area was analyzed based on a review of Texas Natural Diversity Database (TxNDD) data, USFWS designated critical habitat, aerial photos, and September 2013, June 2014 and September 2016 field surveys within and adjacent to the project area.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Amphibians					
Austin blind salamander	*Eurycea waterlooensis*	LE	SGCN	Mostly restricted to subterranean cavities of the Edwards Aquifer; dependent upon water flow/quality from the Barton Springs segment of the Edwards Aquifer; only known from the outlets of Barton Springs (Sunken Gardens (Old Mill) Spring, Eliza Spring, and Parthenia (Main) Spring which forms Barton Springs Pool); feeds on amphipods, ostracods, copepods, plant material, and (in captivity) a wide variety of small aquatic invertebrates	No – The project area does not fall over the Edwards Aquifer, which feeds Barton Springs.
Barton Springs salamander	*Eurycea sosorum*	LE	E	Known from outlets of Barton Springs and subterranean water-filled caverns; found under rocks, in gravel, or among aquatic vascular plants and algae, as available.	No – The project area does not fall over the Edwards Aquifer, which feeds Barton Springs.
Blanco blind salamander	*Eurycea robusta*	--	T	Water-filled subterranean caverns; may inhabit deep levels of Balcones aquifer to the north and east of the Blanco River.	No – The project area occurs outside of the Blanco aquifer and the Blanco River drainage.
San Marcos salamander	*Eurycea nana*	LT	T	Known from the headwaters of the San Marcos River to 0.5 miles past I-35; water over gravelly substrate characterized by dense mats of algae (*Lyng bya*) and aquatic moss (*Leptodictym riparium*), and water temperatures of 21° to 22° Celsius (C).	No – The San Marcos River does not flow through the project area.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Texas blind salamander	*Eurycea rathbuni*	LE	E	Water-filled subterranean caverns along a six mile stretch of the San Marcos Spring Fault, in the vicinity of San Marcos.	No – The project area occurs approximately 15 miles northeast of San Marcos.
Birds					
American Peregrine Falcon	*Falco peregrinus anatum*	DL	T	Nests in tall cliff eyries; also, migrant across state from more northern breeding areas, winters along coast and farther south; occupies wide range of habitats during migration, including urban concentrations along coast and barrier islands; stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No - Possible migrant through project area; no appropriate stopover habitat.
Bald Eagle	*Haliaeetus leucocephalus*	DL	T	Found primarily near rivers and large lakes; nests in tall trees or on cliffs near water.	No - Possible migrant through project area; no appropriate stopover habitat.
Black-capped Vireo	*Vireo atricapilla*	LE	E	Oak-juniper woodlands with distinctive patchy, two-layered aspect; shrub and tree layer with open, grassy spaces; requires foliage reaching to ground level for nesting cover; deciduous and broad-leaved shrubs and trees provide insects for feeding.	No – The habitat observed during field surveys was dominated by mesquite with few if any broad-leaved shrubs.
Golden-cheeked Warbler	*Dendroica chrysoparia*	LE	E	Required juniper-oak woodlands; dependent on Ashe juniper (aka cedar) for long, fine bark strips only available from mature trees, used in nest construction; nests in a variety of trees and only requires a few mature junipers for nesting materials.	No – No juniper-oak woodlands exist within the project area.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Peregrine Falcon	*Falco peregrinus*	DL	T	Nests in tall cliff eyries; also, migrant across state from more northern breeding areas, winters along coast and farther south; occupies wide range of habitats during migration, including urban concentrations along coast and barrier islands; stopovers at leading landscape edges such as lake shores, coastlines, and barrier islands.	No - Possible migrant through project area; no appropriate stopover habitat.
Whooping Crane	*Grus americana*	LE	E	Potential migrant via plains throughout most of the state to coast; winters in coastal marshes of Aransas, Calhoun, and Refugio counties.	Yes - Possible migrant through project area; potential appropriate stopover habitat.
Least Tern	*Sterna antillarum*	LE	E	Subspecies is listed only when inland (more than 50 miles from a coastline); nests along sand and gravel bars within braided streams, rivers; also know to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc); eats small fish and crustaceans, when breeding forages within a few hundred feet of colony.	No – Habitat within the project area was observed to primarily be pastureland, no gravel bars or braided streams available. No habitat for this species was observed.
Piping Plover	*Charadrius melodus*	LT	T	Wintering migrant along the Texas Gulf Coast; beaches and bayside mud or salt flats.	No – Habitat within the project area was observed to primarily be pastureland. No habitat for this species was observed.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Red Knot	*Calidris canutus rufa*	LT	SGCN	Red knots migrate long distances in flocks northward through the contiguous United States mainly April-June, southward July-October. Prefers the shoreline of coast and bays and also uses mudflats during rare inland encounters. Primary prey items include coquina clam (*Donax* spp.) on beaches and dwarf surf clam (*Mulinia lateralis*) in bays, at least in the Laguna Madre. Wintering Range includes Aransas, Brazoria, Calhoun, Cameron, Chambers, Galveston, Jefferson, Kennedy, Kleberg, Matagorda, Nueces, San Patricio, and Willacy. Habitat: Primarily seacoasts on tidal flats and beaches, herbaceous wetland, and tidal flat/shore.	No – Habitat within the project area was observed to primarily be pastureland. No habitat for this species was observed.
Sprague's Pipet	*Anthus spragueii*	C	SGCN	Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grassland, uncommon to rare further west; sensitive to patch size and avoid edges.	No – Habitat within the project area was observed to primarily be pastureland, much of which was overgrazed. No habitat for this species was observed.
Wood Stork	*Mycteria americana*	--	T	Forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water, including salt-water; roosts communally in tall snags.	No – No portion of the proposed alignment within Caldwell County contains foraging habitat for the species. The species is not listed in Hays County.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Zone-tailed Hawk	*Buteo albonotatus*	--	T	Arid, open country including open deciduous or pine-oak woodland, mesa, or mountain country; often found near water courses, wooded canyons, and tree-lined rivers along middle-slopes of desert mountains; nests in sites ranging from small trees in lower desert, giant cottonwoods in riparian areas, and mature conifers in high mountain regions.	No - Possible migrant through project area; no appropriate stopover habitat.
Crustaceans					
Peck's Cave amphipod	*Stygobromus pecki*	LE	E	Small, aquatic crustacean; lives underground in the Edwards Aquifer, collected at Comal Springs and Hueco Springs.	No – The project area does not fall over the Edwards Aquifer, Comal Springs or Hueco Springs.
Fishes					
Fountain darter	*Etheostoma fonticola*	LE	E	Known only from the San Marcos and Comal rivers; springs and spring-fed streams in dense beds of aquatic plants growing close to bottom, which is normally mucky.	No – The San Marcos and Comal Rivers do not flow through the project area.
San Marcos gambusia	*Gambusia georgei*	LE	E	Extinct; formerly known from upper San Marcos River; restricted to shallow, quiet, mud-bottomed shoreline areas without dense vegetation in thermally constant main channel.	No – Extinct.
Blue sucker	*Cycleptus elongates*	--	T	Larger portions of major rivers in Texas; usually in channels and glowing pools with moderate current; bottom type usually of exposed bedrock, perhaps in combination with hard clay, sand, and gravel.	No – There are no major rivers within the project area.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Insects					
Comal Springs dryopid beetle	*Stygoparnus comalensis*	LE	E	Dryopids usually cling to objects in a stream; dryopids area sometimes found crawling on stream bottoms or along shores; adults may leave the stream and fly about, especially at night; most larvae area vermiform and live in soil or decaying wood. Occurs in Comal Springs.	No – There are no known spring-fed streams within the project area. Project area does not encroach upon Comal Springs.
Comal Springs riffle beetle	*Heterelmis comalensis*	LE	E	Known only from Comal and San Marcos Springs.	No – Comal and San Marcos Springs do not occur within the project area.
Edwards Aquifer diving beetle	*Haideoporus texanus*	UR	SGCN	Habitat poorly known; known from artesian well in Hays County.	No – There are no known artesian wells within the project area.
Mammals					
Red wolf	*Canis rufus*	LE	E	Extirpated; formerly known throughout eastern half of Texas in brushy and forested areas, as well as coastal prairies.	No – Extirpated from Texas.
Mollusks					
False spike mussel	*Quadrulla mitchelli*	UR	T	Possibly extirpated in Texas; probably medium to large rivers; substrates vary from mud through mixtures of sand, gravel, and cobble; formerly known from Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins.	No – There are no large or medium rivers within the project area.
Golden orb	*Quadrula aurea*	C	T	Sand and gravel in some locations and mud at others; found in lentic and lotic; Guadalupe, San Antonio, Lower San Marcos, and Nueces River basin.	No – The creeks and tributaries within the project area are intermittent.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Texas fatmucket	*Lampsilis bracteata*	C	T	Streams and rivers on sand, mud, and gravel substrates; intolerant of impoundment; broken bedrock and course gravel or sand in moderately flowing water; Colorado and Guadalupe River basins.	No – The creeks and tributaries within the project area are intermittent.
Texas pimpleback	*Quadrula petrina*	C	T	Mud, gravel and sand substrates, generally in areas with slow flow rates; Colorado and Guadalupe river basins.	No – The creeks and tributaries within the project area are intermittent.
Plants					
Texas wild-rice	*Zizania texana*	LE	E	Texas endemic; spring-fed rivers, in clear, cool, swift water mostly less than 1 meter deep, with coarse sandy soils rather than finer clays.	No – No spring-fed rivers exist within the project area.
Bracted twistflower	*Streptanthus brateatus*	C	SGCN	Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and canyon bottoms.	No – There are no oak juniper woodlands within the project area.
Shinner's sunflower	*Helianthus occidentalis ssp plantagineus*	UR	SGCN	Mostly in prairies on the Coastal Plain, with several slight disjunct populations in the Piney Woods and South Texas Brush Country.	No – The project area does not fall within the Coastal Plain, Piney Woods, or South Texas Brush Country ecoregions.

Table 4.9-2: Federally- and State-Listed Species of Potential Occurrence in Hays and Caldwell Counties

Common Name	Scientific Name	Federal Status	State Status	Habitat	Potential for Habitat to Occur in Project Area
Reptiles					
Cagle's map turtle	*Graptemys caglei*	--	T	Endemic; Guadalupe River System; shallow water with swift to moderate flow and gravel or cobble bottom, connected by deeper pools with slower flow rate and silt or mud bottom; gravel bar riffles and transition areas between riffles and pools especially important in providing insect prey.	No – Streams within the project area are part of Guadalupe River System. However, streams within project area are listed as intermittent. Streams observed during field surveys were narrow, shallow, and slow moving. No gravel bars or riffle areas were observed.
Texas horned lizard	*Phrynosoma cornutum*	--	T	Open, arid and semi-arid regions with sparse vegetation, including grass, cactus, scattered brush or scrubby trees; soil may vary in texture from sandy to rocky; burrows into soil, enters rodent burrows, or hides under rock when inactive.	No – Appropriate habitat found in open areas throughout project area. However, no sign of harvester ants, their primary prey species, were observed during field surveys.
Spot-tailed earless lizard	*Holbrookia lacerate*	UR	SGCN	Moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eggs laid underground.	Yes - Appropriate habitat observed throughout project area.
Timber/Canebrake rattlesnake	*Crotalus horridus*	--	T	Swamps, floodplains, upland pine and deciduous woodlands, riparian zones, abandoned farmland; limestone bluffs, sandy soil, or black clay; prefers dense ground, i.e., grapevines or palmetto.	Yes – May occur in potential riparian areas and floodplains in the project area.

Source: USFWS, 2016; TPWD, 2016

LT/LE – Federally listed threatened/endangered; T/E– State listed threatened/endangered; C – Federal candidate; DL – delisted, UR – under review

Evaluation of the USFWS Critical Habitat Portal indicates that no critical habitat for any of the listed species was identified within the vicinity of the project area. A desktop review of suitable habitat was conducted for each federally- and state- listed species in Hays and Caldwell Counties. A review of TxNDD data was conducted in January 2016. There are no known sightings of any of the above species within the vicinity (five miles) of the project area. However, because TPWD is not able to perform comprehensive surveys for most listed species and species of concern, absence of elements of occurrence from a particular area does not necessarily mean absence of occurrence. Given the small proportion of public versus private land in Texas, the TxNDD does not include a representative inventory of rare resources in the state. Data from the TxNDD therefore do not provide a definitive statement as to the presence, absence, or condition of special species, natural communities, or other significant features within the project area.

One federally listed species, one species under USFWS review, and one state listed species have habitat within the project area, as discussed below.

Whooping Crane

The Whooping Crane is the tallest bird in North America. The species breeds in wetlands in Wood Buffalo National Park in northern Canada and winters on the Texas coast at Aransas National Wildlife Refuge. The southern migration begins in mid-September and the northern migration begins in late March or early April. Appropriate stopover habitat for this species during migration includes ponds, lakes, and prairie potholes.

There is appropriate stopover habitat for this species in numerous pond and wetlands areas found within the project area. However, Whooping Cranes tend to avoid human disturbances, so areas in close proximity to existing FM 2001 and other human developments would likely be avoided by this species even if otherwise suitable habitat exists.

Spot-tailed earless lizard

The spot-tailed earless lizard is listed as “under review” by the USFWS. This species’ habitat includes moderately open prairie-brushland and fairly flat areas free of vegetation or other obstructions, including disturbed areas. Much of the project area contains open prairie and brushlands. It is possible that this species uses the project area as habitat.

Timber/canebrake rattlesnake

The timber/canebrake rattlesnake is found in upland woods and rocky ridges in the eastern third of Texas. They prefer moist lowland forests and hilly woodlands or thickets near permanent water sources such as rivers, lakes, ponds, streams, and swamps where tree stumps, logs, and branches provide refuge. It is possible that the timber/canebrake rattlesnake may occur within the project

area. Suitable habitat may exist in the riparian corridors and floodplains at the creeks and tributaries and around the ponds and wetlands. It should be noted that ROE was not granted to the properties in the Caldwell County section so observations of potential habitat were made from existing rights-of-way.

4.9.1.3 State Species of Greatest Conservation Need

In addition to the above listed threatened, endangered, and candidate species, there are 47 state species of greatest conservation need (SGCN) occurring in Hays and Caldwell Counties (TPWD, 2016). The term "species of greatest conservation need" is an informal term used for species whose populations are declining in number or appear to otherwise be in need of conservation to prevent becoming listed as threatened or endangered. These SGCNs are not afforded special regulatory status or protection under the ESA. However, some of the below listed species may be otherwise protected, such as migratory bird species which are afforded federal protection under the Migratory Bird Treaty Act (MBTA). The SGCN as determined by TPWD are presented in **Table 4.9-3**.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
Amphibians			
Blanco River Springs salamander	*Eurycea pterophila*	Known from springs and caves in the Blanco River drainage.	No – The project area does not fall within the Blanco River drainage.
Arachnids			
Bandit Cave spider	*Circurina bandida*	Subterrestrial, subterranean obligate.	No – There is no suitable karst or cave habitat known to occur in the project area.
Birds			
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Subspecies of the American Peregrine Falcon. See **Table 4.8-2** for habitat description.	No - Possible migrant through project area; no appropriate stopover habitat.
Henslow's Sparrow	*Ammodramus henslowii*	Found in weedy fields or cut-over areas where lots of bunch grasses occur along with vines and brambles; a key component is bare ground for running/walking.	Yes – Weedy fields with areas of bare ground were found throughout project area.
Mountain Plover	*Charadrius montanus*	Nests on high plains or shortgrass prairie, on ground in shallow depression; shortgrass plains and bare, dirt (plowed) fields.	No– Habitat within the project area was observed to primarily be pastureland, much of which was overgrazed. No short grass prairies or plowed fields were observed within the project area.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
Spragues's Pipit	*Anthus spragueii*	Only in Texas during migration and winter, mid-September to early April; short to medium distance, diurnal migrant; strongly tied to native upland prairie, can be locally common in coastal grassland, uncommon to rare further west; sensitive to patch size and avoid edges.	No– Habitat within the project area was observed to primarily be pastureland, much of which was overgrazed. No habitat for this species was observed.
Western Burrowing Owl	*Athene cunicularia hypugaea*	Open grasslands, especially prairie, plains, and savanna, sometimes in open areas such as vacant lots near human habitation or airports; nests and roosts in abandoned burrows.	Yes – Open areas, including vacant properties, were observed throughout the project area.
Crustaceans			
A cave obligate crustacean	*Monodella texana*	Subaquatic, subterranean obligate; underground freshwater aquifers.	No – There is no suitable karst or cave habitat known to occur in the project area.
Balcones Cave amphipod	*Stygobromus balconis*	Subaquatic, subterranean obligate amphipod.	No – There is no suitable karst or cave habitat known to occur in the project area.
Ezell's cave amphipod	*Stygobromus flagellates*	Known only from artesian wells.	No – There is no suitable karst or cave habitat known to occur in the project area. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
Texas cave shrimp	*Palaemonetes antrorum*	Subterranean sluggish streams and pools.	No – There is no suitable karst or cave habitat known to occur in the project area. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
Texas troglobitic water slater	*Lirceolus smithii*	Subaquatic, subterranean obligate, aquifer.	No – There is no suitable karst or cave habitat known to occur in the project area. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
Fish			
Guadalupe bass	*Micropterus treculii*	Endemic to perennial streams of the Edward's Plateau region; introduced in Nueces River system.	No – The project area does not fall within the Edwards Plateau region or within the Nueces River system.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
Ironcolor shiner	*Notropis chalybaeus*	Big Cypress Bayou and Sabine River basins; pools and slow runs of law gradient small acidic streams with sandy substrate and clear well vegetated water.	No – Big Cypress Bayou does not occur within the project area; the project area does not occur in the Sabine River basin.
Insects			
Edwards Aquifer diving beetle	*Haideoporus texanus*	Habitat poorly known; known from artesian well in Hays County.	No – There are no known artesian wells within the project area.
Flint's net-spinning caddisfly	*Cheumatopsyche flinti*	Very poorly known species with habitat description limited to "a spring".	No – There are no known springs within the project area. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
San Marcos saddle-case caddisfly	*Protoptila arca*	Known from an artesian well in Hays County; locally very abundant; swift, well-oxygenated warm water about 1-2 meters deep.	No – There are no known artesian wells within the project area. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
Texas austrotinodes caddisfly	*Austrotinodes texensis*	Appears endemic to the karst springs and spring runs of the Edwards Plateau region; flow in type locality swift but may drop significantly during periods of little drought; substrate coarse and ranges from cobble and gravel to limestone bedrock; many limestone outcroppings also found along the streams.	No – The project area does not occur within the Edwards Plateau region. The project area does not fall over the Edwards Aquifer where aquatic habitat for this species is known to occur.
Mammals			
Cave myotis	*Myotis velifer*	Roosts in rock crevices, old buildings, carports, under bridges, and in abandoned Cliff Swallow (*Hirundo pyrrhonota*) nests; hibernates in limestone caves of Edwards Plateau and gypsum cave of Panhandle during winter.	Yes – Potential habitat in bridges and old buildings throughout project area.
Plains spotted skunk	*Spilogale putorius interrupta*	Open fields, prairies, croplands, fence rows, farmyards, forest edges, and woodlands; prefers wooded, brushy areas and tallgrass prairie.	Yes – Appropriate habitat observed throughout project area.
Reptiles			
Spot-tailed earless lizard	*Holbrookia lacerate*	Moderately open prairie-brushland; fairly flat areas free of vegetation or other obstructions, including disturbed areas; eggs laid underground.	Yes - Appropriate habitat observed throughout project area.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
Texas garter snake	*Thamnophis sirtalis annectens*	Wet or moist microhabitats are conducive to the species occurrence, but it is not necessarily restricted to them; hibernates underground or in or under surface cover.	Yes - Potential for habitat throughout project area. TxNDD indicates species has once occurred in the northwestern portion of project area.
Plants			
Bracted twistflower	*Streptanthus brateatus*	Texas endemic; shallow, well-drained gravelly clays and clay loams over limestone in oak juniper woodlands and associated openings, on steep to moderate slopes and canyon bottoms.	No – There are no oak juniper woodlands within the project area.
Hill Country wild-mercury	*Argythamnia aphoroides*	Texas endemic; mostly in bluestem-grama grasslands associated with plateaus live oak woodlands on shallow to moderately deep clays and clay loams over limestone on rolling uplands; also in partial shade of oak-juniper woodlands in gravelly soils on rocky limestone slopes.	No – There are no live oak woodlands within the project area.
Warnock's coral-root	*Hexalectris warnockii*	In leaf litter and humus in oak-juniper woodlands on shaded slopes and intermittent, rocky creekbeds in canyons; found in oak-juniper woodlands on limestone slopes.	No – There are no oak-juniper woodlands within the project area.
Green beebalm	*Monarda viridissima*	Endemic to Carrizo Sands; deep, well-drained sandy soils in openings of post oak woodlands.	No – Carrizo Sands do not occur within the project area.
Sandhill woollywhite	*Hymenopappus carrizoanus*	Texas endemic; disturbed or open areas in grasslands and post oak woodlands on deep sands derived from the Carrizo Sand and similar Eocene formations.	No – there are no post oak woodlands within the project area and the Carrizo Sand does not occur within the project area.
Shinner's sunflower	*Helianthus occidentalis ssp plantagineus*	Mostly in prairies on the Coastal Plain, with several slight disjunct populations in the Piney Woods and South Texas Brush Country.	No – The project area does not fall within the Coastal Plain, Piney Woods, or South Texas Brush Country ecoregions.
Plateau milkvine	*Matelea edwardsensis*	Occurs in various types of juniper-oak and oak-juniper woodlands; Perennial; Flowering March-Oct; Fruiting May-June	No – There are no oak-juniper woodlands within the study area.
Gravelbar brickellbush	*Brickellia dentate*	Essentially restricted to frequently-scoured gravelly alluvial beds in creek and river bottoms; Perennial; Flowering June-Nov; Fruiting June-Oct	No – There are no frequently-scoured gravelly alluvial beds in the project area.
Narrowleaf brickellbush	*Brickellia eupatorioides gracillima*	Moist to dry gravelly alluvial soils along riverbanks but also on limestone slopes; Perennial; Flowering/Fruiting April-Nov	No – There are no riverbanks or limestone slopes in the project area.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
Texas barberry	*Berberis swaseyi*	Shallow calcareous stony clay of upland grasslands/shrublands over limestone as well as in loamier soils in openly wooded canyons and on creek terraces; Perennial; Flowering/Fruiting March-June	No – There are no shallow soils or wooded canyons in project area.
Heller's marbleseed	*Onosmodium helleri*	Occurs in loamy calcareous soils in oak-juniper woodlands on rocky limestone slopes, often in more mesic portions of canyons; Perennial; Flowering March-May	No – There are no oak-juniper woodlands within the study area.
Tree dodder	*Cuscuta exaltata*	Parasitic on various *Quercus, Juglans, Rhus, Vitis, Ulmus*, and *Diospyros* species as well as *Acacia berlandieri* and other woody plants; Annual; Flowering May-Oct; Fruiting July-Oct	Yes – Species of *Ulmus, Vitis*, and *Quercus* occur in the project area.
Hall's prairie clover	*Dalea hallii*	In grasslands on eroded limestone or chalk and in oak scrub on rocky hillsides; Perennial; Flowering May-Sept; Fruiting June-Sept	No – There is no oak scrub or rocky hillsides in the project area.
Net-leaf bundleflower	*Desmanthus reticulatus*	Mostly on clay prairies of the coastal plain of central and south Texas; Perennial; Flowering April-July; Fruiting April-Oct	Yes – The project area occurs over clay prairies in central Texas.
Plateau loosestrife	*Lythrum ovalifolium*	Banks and gravelly beds of perennial (or strong intermittent) streams on the Edwards Plateau, Llano Uplift and Lampasas Cutplain; Perennial; Flowering/Fruiting April-Nov	No – There are no perennial streams in the project area. The project area does not occur in the Edwards Plateau, Llano Uplift, or Lampasas Cutplain.
Scarlet leather-flower	*Clematis texensis*	Usually in oak-juniper woodlands in mesic rocky limestone canyons or along perennial streams; Perennial; Flowering March-July; Fruiting May-July	No – There are no oak-juniper woodlands or rocky limestone canyons within the study area.
Osage Plains false foxglove	*Agalinis densiflora*	Most records are from grasslands on shallow, gravelly, well drained, calcareous soils; Prairies, dry limestone soils; Annual; Flowering Aug-Oct	No – There are no shallow soils in the project area.
Texas seymeria	*Seymeria texana*	Found primarily in grassy openings in juniper-oak woodlands on dry rocky slopes but sometimes on rock outcrops in shaded canyons; Annual; Flowering May-Nov; Fruiting July-Nov	No – There are no oak-juniper woodlands within the study area.
Sycamore-leaf snowbell	*Styrax platanifolius*	Rare throughout range, usually in oak-juniper woodlands on steep rocky banks	No – There are no oak-juniper woodlands within the study area.

Table 4.9-3: State-Listed Species of Greatest Conservation Need for Hays and Caldwell Counties

Common Name	Scientific Name	Habitat	Potential for Habitat to Occur in Project Area
		and ledges along intermittent or perennial streams, rarely far from some reliable source of moisture; Perennial; Flowering April-May; Fruiting May-Aug	
Texas amorpha	*Amorpha roemeriana*	Juniper-oak woodlands or shrublands on rocky limestone slopes, sometimes on dry shelves above creeks; Perennial; Flowering May-June; Fruiting June-Oct	No – There are no juniper-oak woodlands or rocky limestone slopes within the study area.
Glass Mountains coral-root	*Hexalectris nitida*	Apparently rare in mixed woodlands in canyons in the mountains of the Brewster County, but encountered with regularity, albeit in small numbers, under *Juniperus ashei* in woodlands over limestone on the Edwards Plateau, Callahan Divide and Lampasas Cutplain; Perennial; Flowering June-Sept; Fruiting July-Sept	No – There are no oak-juniper woodlands within the study area and the study area does not occur within the Edwards Plateau, Callahan Divide, or Lampasas Cutplain
Texas fescue	*Festuca versuta*	Occurs in mesic woodlands on limestone-derived soils on stream terraces and canyon slopes; Perennial; Flowering/Fruiting April-June	No - There are no mesic woodlands or canyon slopes in the project area.
Buckley tridens	*Tridens buckleyanus*	Occurs in juniper-oak woodlands on rocky limestone slopes; Perennial; Flowering/Fruiting April-Nov	No – There are no oak-juniper woodlands or rocky limestone slopes within the study area.
Texas sandmint	*Thododon ciliatus*	Open sandy areas in the Post Oak Belt of east-central Texas; Annual; Flowering April-Aug; Fruiting May-Aug	No – The project area does not occur in the Post Oak Belt.
Texas tauschia	*Tauschia texana*	Occurs in loamy soils in deciduous forests or woodlands on river and stream terraces; Perennial; Flowering/Fruiting Feb-April	No – There are no loamy soils in the project area.

Source: TPWD, 2016

The bird species listed above as having a potential to occur within the project area (Henslow's Sparrow and Western Burrowing Owl) would likely do so in undeveloped grassland areas or in agricultural areas within the project area. The cave myotis bat may use the bridges and old buildings in the project area as roosting habitat and the riparian corridors for foraging habitat. The plains spotted skunk may occur in the open fields of the project area. The spot-tailed earless lizard may occur in the open field and brushy areas of the project area. The Texas garter snake has the potential to occur in wet or moist habitats found near the project area ponds, wetlands, and creeks. According to TxNDD data, the garter snake is known to occur in the northernmost portion of the

project area. Tree dodder is a parasite that grows on various woody trees such as oak, elm, walnut, pecan, and sumac. Since the project area contains many of these woody species, it is assumed that the project area contains suitable habitat for tree dodder. Lastly, the project area occurs over clay prairies and is located in central Texas; therefore, it may contain suitable habitat for the net-leaf bundleflower.

4.9.1.4 Migratory Bird Treaty Act

The MBTA of 1918 states it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, or egg in part or in whole, without a federal permit issued in accordance with the Act's policies and regulations. The project area is located within Central Texas, which is situated within the Central Flyway, a major migratory pathway for bird species flying north and south between Canada, the U.S., and Mexico (USFWS, 2013a).

Texas provided important habitat for Nearctic-Neotropical species of birds. Nearctic-Neotropical birds are species that breed in temperate latitudes in the U.S. and Canada but overwinter in tropical latitudes farther south in Central and South America. Of the 338 species that are listed as Nearctic-Neotropical migrants in North America, 333 have been recorded in Texas. Furthermore, approximately 54 percent of the birds that occur in Texas fall within this category (TPWD, 2013b).

Based on this information, the potential exists for numerous migratory bird species to pass through the project area. However, the agrarian and developed nature of the land within the project area has reduced the stopover potential for many migratory bird species.

4.9.2 Environmental Consequences

4.9.2.1 Vegetation

Build Alternative

Under the Build Alternative, impacts to vegetation in the project area would result from the construction of the proposed project. **Table 4.9-4** below shows the acreage of each EMST vegetation type and associated Memorandum of Understanding (MOU) habitat type that could be impacted as a result of the proposed project.

Table 4.9-4: Impacts to MOU Habitat from the Proposed Project

Vegetation Type	MOU Habitat Type	Acreage within Proposed ROW*	Acreage within Permanent Easements	Acreage within Temporary Easements	Total Acreage Impacted
Blackland Prairie: Disturbance or Tame Grassland	Tallgrass Prairie, Grassland	92.36	0.60	1.86	94.82
Central Texas: Floodplain Deciduous Shrubland	Floodplain	2.12	0.71	0.18	3.01
Central Texas: Floodplain Hardwood Forest	Floodplain	1.25	0.00	0.49	1.74
Central Texas: Floodplain Herbaceous Vegetation	Floodplain	4.19	0.60	0.004	4.79
Central Texas: Riparian Deciduous Shrubland	Riparian	0.41	0.00	0.10	0.51
Central Texas: Riparian Hardwood Forest	Riparian	0.85	0.63	0.01	1.49
Central Texas: Riparian Herbaceous Vegetation	Riparian	1.99	0.70	0.18	2.87
Edwards Plateau: Live Oak Motte and Woodland	Edwards Plateau Savanna, Woodland, and Shrubland	0.00	0.00	0.003	0.003
Edwards Plateau: Shin Oak Slope Shrubland	Edwards Plateau Savanna, Woodland, and Shrubland	0.52	0.00	0.00	0.52
Native Invasive: Deciduous Woodland	Disturbed Prairie	6.97	0.55	0.73	8.25
Native Invasive: Mesquite Shrubland	Disturbed Prairie	21.65	0.09	1.34	23.09
Row Crops	Agriculture	6.34	0.79	0.04	7.17
Urban Low Intensity	Urban	7.93	0.01	0.08	8.02
TOTAL ACREAGE		**146.58**	**4.68**	**5.02**	**156.28**

**Proposed ROW contains existing ROW (including roadways). New ROW that would need to be acquired under the Build Alternative amounts to 113.9 acres out of the total 146.6 acres.*

The 2013 TxDOT/TPWD MOU states that any project that exceeds the threshold acreages for certain MOU habitat types needs to be coordinated with TPWD. In the Texas Blackland Prairie

ecoregion, the threshold for impacts to tallgrass prairie grassland is 2.0 acres, floodplain is 0.5 acre, riparian is 0.1 acre, and disturbed prairie is 3.0 acres. As shown in **Table 4.9-4**, these thresholds are exceeded and therefore, coordination with TPWD was required. Coordination was initiated on December 15, 2014 and completed on May 21, 2015 (see **Appendix G**).

No-Build Alternative

Under the No-Build Alternative, no permanent or temporary impacts to existing vegetation communities would occur.

4.9.2.2 Threatened and Endangered Species and State Species of Greatest Conservation Need

Build Alternative

Table 4.9-5 provides a list of the federally- and state-listed species with the likelihood to occur within the project area, along with a determination of effect/impact for each species. Species that were determined to be unlikely to occur within the project area due to lack of suitable habitat were not carried forward for further analysis. Determination of impacts are based on TxNDD data, USFWS critical habitat designations, review of aerial photography, the September 2013 survey of the existing ROW, and the June 2014 survey of the project area.

Table 4.9-5: Potential for Direct Impacts to Threatened and Endangered Species

Common Name (*Scientific Name*)	Federal Status	State Status	Determination of Impact
Whooping Crane *(Grus americana)*	LE	E	No Effect – Though there is potential habitat for the species within the project area, it is unlikely that the species uses habitat within or adjacent to the project area due to human disturbance. Furthermore, there are no TxNDD occurrences for this species within or near the project area. Additionally, Ebird.org does not list any detections for this species within or adjacent to the project area. Therefore, no effect to this species is anticipated.
Spot-tailed earless lizard (*Holbrookia lacerate)*	UR	SGCN	May Impact - Construction of the proposed project would impact potential habitat for this species. However, the project is not anticipated to threaten the continued existence of this species.
Timber/canebrake rattlesnake (*Crotalus horridus)*	--	T	May Impact – Right-of-entry was not granted to the portions of the project area that fall within Caldwell County. Based on aerial maps and the portion of the properties that could be seen from Highway 21 there is appropriate habitat near potential riparian areas on these properties. However, field surveys were unable to confirm this without right-of-entry.

Based on the above analyses, the project may impact the spot-tailed earless lizard and the timber/canebrake rattlesnake. The Best Management Practices Programmatic Agreement between TxDOT and TPWD under the 2013 MOU outlines specific BMPs to implement to avoid and/or minimize impacts to the spot-tailed earless lizard and timber/canebrake rattlesnake. According to the Agreement, contractors would be advised of potential occurrence in the project area and to avoid harming the species if encountered.

Table 4.9-6 provides a list of the state SGCN species with the likelihood to occur within the project area. Species that were determined to be unlikely to occur due to lack of suitable habitat within the project area in **Section 4.8.1.2** were not carried forward for further analysis.

Table 4.9-6: Potential for Direct Impacts to Species of Greatest Conservation Need

Common Name (*Scientific Name*)	Determination of Impact	Justification
Birds		
Henslow's Sparrow *(Ammodramus henslowii)*	May Impact	Weedy fields with bare ground exist throughout the project area. Some of these weedy fields would be impacted by the construction of the proposed project.
Western Burrowing Owl *(Athene cunicularia hypugaea)*	May Impact	Habitat for this species was observed throughout the project area and would be impacted by construction of the proposed project. However, no burrows or other sign of this species were observed in the project area.
Mammals		
Cave myotis *(Myotis velifer)*	No Impact	No roosting habitat (bridges, old structures, etc.) would be impacted by the project.
Plains spotted skunk (*Spilogale putorius interrupta)*	May Impact	This species may be impacted by clearing of vegetation and construction of the proposed project.
Plants		
Tree dodder (*Cuscuta exaltata)*	May Impact	Some woody trees would be impacted by the project. Should this species be living on those trees, it too would be impacted.
Net-leaf bundleflower (*Desmanthus reticulatus)*	May Impact	Should this species occur in the areas of new right-of-way or easements, it would be impacted by construction activities.
Reptiles		
Spot-tailed earless lizard (*Holbrookia lacerate)*	May Impact	Construction of the proposed project could impact potential habitat for this species.
Texas garter snake (*Thamnophis sirtalis annectens)*	May Impact	Based on TxNDD data, this species is known to occur in the northern portion of the project area. Appropriate habitat for this species was observed throughout the project area and would be impacted by construction of the proposed project.

Based on the analyses above, the proposed project has the potential to impact seven SGCN. Appropriate BMPs from the programmatic agreement under the 2013 MOU would be implemented to the greatest extent possible to avoid and/or minimize impacts to these SGCN.

Bird BMPs would be implemented to avoid impacts to the Henslow's Sparrow and Western Burrowing Owl. These include the following BMPs: not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season; avoiding the removal of unoccupied, inactive nests, as practicable; preventing the establishment of active nests during the nesting season on TxDOT-owned and operated facilities and structures proposed for replacement or repair; and not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.

For the plains spotted skunk, contractors would be advised of potential occurrence in the project area and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens. For the spot-tailed earless lizard and Texas garter snake, contractors would be advised of potential occurrence in the project area and to avoid harming the species if encountered. No BMPs currently exist for the tree dodder or the net-leaf bundleflower.

No-Build Alternative

Under the No-Build Alternative, no federally listed threatened or endangered species would be affected and no state-listed species or state SGCN would be impacted.

4.9.2.3 Species Protected by the Migratory Bird Treaty Act

Build Alternative

Bird nests were observed in trees throughout the project area. However, none of them appeared to be active at the time of the survey. No nests were observed in culverts on existing roadways.

As shown in **Table 4.9-4**, woody vegetation would be impacted by the Build Alternative. This vegetation has the potential to be used regularly by species protected by the MBTA. In the event that migratory birds are encountered on-site during project construction, every effort would be made to avoid take of the protected birds, active nests, eggs, and/or young to the maximum extent practicable. The contractor would remove all old migratory bird nests between September 1 and January 31 from any structure where work would be done. In addition, the contractor would be prepared to prevent migratory birds from building nests between February 1 and August 31. All methods would be approved by the Austin District Biologist well in advance of planned use.

No-Build Alternative

Under the No-Build Alternative, no bird species provided protection by the MBTA would be affected.

4.10 Archeological Resources

Archeological resources are sites and locales containing interpretable material traces of past human activity in the form of artifacts, ruins, structural remnants, or other human-made feature remains either on the surface or buried below ground. Archeological resources include materials and artifacts ranging in age from more than 10,000 years old to 50 years old.

4.10.1 Regulatory Framework

NEPA requires consideration of important historic, cultural, and natural aspects of our national heritage. Important aspects of our national heritage that may be present in the project corridor have been considered under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. This act requires federal agencies to "take into account" the "effect" that an undertaking would have on "historic properties." Historic properties are those that are listed in, or that are eligible for listing in, the NRHP, and may include structures, buildings/districts, objects, cemeteries, and archeological sites. In accordance with the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties (36 CFR 800.4), federal agencies are required to locate, evaluate and assess the effects that the undertaking would have on such properties. These steps shall be completed under terms of the December 2005 First Amended Programmatic Agreement (PA-TU) between FHWA, the State Historic Preservation Officer (SHPO), the ACHP, and TxDOT. The identification of potential historic properties has been undertaken for structures, buildings/districts, objects, cemeteries, and archeological sites found within the project corridor.

This project also falls under the purview of the Antiquities Code of Texas (ACT), because it may involve "lands owned or controlled by the State of Texas or any city county, or local municipality thereof." As the project would involve lands belonging to TxDOT, historic properties under jurisdiction of the ACT would also be considered under provisions of the MOU between the SHPO and TxDOT. The ACT allows for all such properties to be considered as State Archeological Landmarks (SALs), and requires that each be examined in terms of possible "significance." Significance standards for the code are clearly outlined under Chapter 26 of the Texas Historical Commission's (THC) Rules of Practice and Procedure (13 TAC 26.7–26.10) and closely follow those of the Secretary of Interior's Standards and Guidelines.

4.10.2 Existing Conditions

The archeological Area of Potential Effect (APE) for the proposed project includes the existing state-owned ROW for FM 2001, proposed new ROW sections, and easements (temporary and permanent). The improvements include widening portions of the roadway as well as construction of new-location roadway. The entire footprint is approximately 8.5 miles long with a maximum

ROW width of 160 feet. The APE therefore covers an area of approximately 156 acres. Depth of impact would typically be 2 feet deep with depths of up to 16 feet at culvert locations.

4.10.2.1 Previous Investigations

A review of THC's Archeological Sites Atlas (Atlas) was conducted to identify previous archeological investigations, previously recorded archeological sites, archeological sites listed on the NRHP, SALs, and historic cemeteries located within the vicinity of the project area. There are no known cemeteries or historic districts within or adjacent to the proposed project APE. According to Atlas survey coverage data, the APE has not been surveyed previously. There are, however, ten small archeological surveys and eight sites recorded within the one-mile buffer zone that surrounds the APE (**Table 4.10-1**). The small surveys include one for TxDOT by Horizon in 2005 at FM 2001 and I-35 (Owens 2006), one by Lower Colorado River Authority (LCRA) staff along FM 2001 below SH 21, as well as multiple small surveys for the NRCS performed in the 1980s (THC, 2014). No cultural resources were identified during any of these surveys. The LCRA archeological staff conducted a survey for the proposed Clear Springs to Hutto transmission line in 2009, with a portion of it located near the south end of this project APE (Prikryl et al., 2010). Only one site, 41CW126, was identified on the section within the FM 2001 project APE buffer area. A survey conducted by Antiquities Planning Consulting in 2007 for the proposed Stagecoach Park for the City of Buda recorded archeological site 41HY433, falling in the buffer area as well (Godwin, 2007). Site 41CW35 was recorded as part of the All American Pipeline in 1985; no other information was forthcoming.

Several other sites that fall within the one-mile buffer were recorded, although not necessarily surveyed and recorded under the purview of a federal or state entity. These sites include 41HY19, 41HY190, 41HY262, and 41HY413. Hicks and Company conducted a follow-up visit of the Heep Trust Property and conducted a reconnaissance and damage assessment of Early to Late Archaic site 41HY19, originally recorded by E. Mott Davis in 1963. Also recorded during that reconnaissance was site 41HY262 (Davis and Jones, 1994; Hicks and Company, 1994). Other than its location, no other information was forthcoming for site 41HY190. In 2006, Horizon Environmental Services, Inc. recorded site 41HY413 while surveying the Horton property.

Site 41HY436 is recorded within about 136 meters of the project APE. 41HY436 is described as a temporary camp site of unknown age with a surficial scatter of tested cobbles, primary and secondary flakes, scrapers, and choppers (Iruegas, 2007). The site was identified during a 2006 survey of the 79-acre Hays Consolidated Independent School District (CISD) future high school tract conducted by GTI Environmental Consultants, and was determined ineligible (THC, 2014).

Table 4.10-1: Previous Archeological Investigations

Project	Sponsor/ Client	Site(s) Discovered or Revisited Within or Adjacent to Proposed Project APE	Approximate Distance to ROW Sections within the Proposed Project APE	Reference(s)
FM 2001 and I-35 Overpass; 2005	Texas Department of Transportation	None	This survey extended along FM 2001 to the westernmost terminus of this current project.	Owens 2006
Several pond and ancillary surveys	Soil Conservation Service	None	Surveys are clustered approximately 2.1 km northeast of this current project approximately 2.6 km from the project eastern terminus	None as per Texas Archeological Sites Atlas (2014)
Heep Trust Property	Heep Trust	41HY19; Henderson Site	Site is 1.6 km north of the western terminus of this current project	Davis and Jones 1994; Hicks and Company 1994
Unknown	Unknown	41HY190	Site is 1.65 km northwest of the western terminus of this current project	Texas Archeological Sites Atlas
Heep Trust Property	Heep Trust	41HY262; Rylander Site	Site is 1.3 km north of the western terminus of this current project	Davis and Jones 1994; Hicks and Company 1994
Horton Property	Unknown	41HY413	Site is 1.7 km northwest of the western terminus of this current project	Texas Archeological Sites Atlas 2014
Stagecoach Park Tract 1	City of Buda	41HY433	Site is 1.5 km southwest of the western terminus of this current project	Godwin 2007
Hays County High School; 2006	Hays Consolidated Independent School District	41HY436	Site is 130 m north of the proposed new ROW behind new high school	Iruegas 2007
All American Pipeline	All American Pipeline	41CW35	Site is 1.6 km south of the eastern terminus of this current project	None as per Texas Archeological Sites Atlas (2014)
Transmission Line; 2009	Lower Colorado River Authority	None	Survey is 1.6 km south of the eastern terminus of this current project	None as per Texas Archeological Sites Atlas (2014)
Clear Springs to Hutto Transmission Line; 2009	Lower Colorado River Authority	41CW126	Site is 1.85 km northeast of the eastern terminus of this current project	Prikryl et al. 2010

4.10.2.2 Previously Recorded Archeological Sites

Of the eight known archeological sites within the APE or within the one-mile buffer of the APE, two sites (41HY19 and 41HY436) are prehistoric, two sites (41HY262, 41HY413) contain prehistoric and historic components, four sites (41HY413, 41HY433, 41CW35, and 41CW126) are historic, and for one site (41HY190) no temporal information was available (see **Table 4.10-2**). One of the sites, Site 41HY433, is a late 19th century historic house and post office that is listed in the NRHP and as a SAL. The site is located 1.5 kilometers (km) southwest of the western terminus of the APE. One site, Site 41HY436, has been determined as ineligible for the NRHP and for SAL designation. The remaining six sites have no eligibility determinations for SAL designation or inclusion in the NRHP.

Table 4.10-2: Previously Recorded Archeological Sites

Site	Documentation Date(s)	Site Description	SAL/ NRHP Eligibility	Approximate Distance to ROW Sections within the Proposed Project APE
41HY19; Henderson Site	1964 and 1994	Early, Middle, and Late Archaic occupations	No SAL or NRHP eligibility recommendation	Site is 1.6 km north of the western terminus of the APE
41HY190	Unknown	Unknown	Unknown	Site is 1.65 km northwest of the western terminus of the APE
41HY262, Rylander Site	1994	Historic house site and prehistoric lithic scatter; early 20th century and unknown prehistoric age	No SAL or NRHP eligibility recommendation	Site is 1.3 km north of the western terminus of the APE
41HY413	2006	Historic farmstead complex and prehistoric isolated artifact; late 19th-early 20th centuries and unknown prehistoric age	No SAL or NRHP eligibility recommendation	Site is 1.7 km northwest of the western terminus of the APE
41HY433	2007	Historic house and post office; late 19th century	Listed on NRHP and as SAL	Site is 1.5 km southwest of the western terminus of the APE
41HY436	2007	Temporary camp with surficial prehistoric lithic scatter; unknown prehistoric age	Determined not eligible; 2009	Site is 130 m north of the APE
41CW35	1985	Historic cistern, early 20th century	No SAL or NRHP eligibility recommendation	Site is 1.6 km south of the eastern terminus of the APE
41CW126	2008	Historic trash dump, mid-20th century	No SAL or NRHP eligibility recommendation	Site is 1.85 km northeast of the eastern terminus of the APE

Source: Atlas, 2014

4.10.2.3 Results of Current Investigation

Two newly recorded sites (41HY493 and 41HY494) were identified during the current project (see **Table 4.10-3**). Due to their primarily surficial character or late occupation, the two of the sites within the proposed project APE lack research potential; therefore, neither of these sites is recommended as eligible for listing on the NRHP or for SAL designation.

Table 4.10-3: Archeological Sites Recorded for Current Investigation

Site	Documentation Date(s)	Site Description	SAL/ NRHP Eligibility	Approximate Distance to ROW Sections within the Proposed Project APE
41HY493	2014	Historic house site artifact scatter; late 19th-turn of 20th centuries	Recommended not eligible	Only 10% of site falls within the APE
41HY494	2014	Historic ranching building complex and domestic artifact scatter; early and mid-20th century	Recommended not eligible	About 60% of the site falls within the APE

4.10.3 Environmental Consequences

4.10.3.1 Build Alternative

Direct impacts to archeological resources within the proposed project APE would occur at the portions of historic sites 41HY493 and 41HY494 which overlap with the FM 2001 proposed ROW. Neither of these sites is eligible for listing on the NRHP. The remaining sites adjacent to the APE would not be impacted from the proposed project.

On January 8, 2015, the SHPO concurred with the findings that sites 41HY493 and 41HY494 are not eligible for listing on the NRHP and do not warrant status as SALs. Additionally, the SHPO concurred with the finding that no historic properties or SALs would be affected and that construction may proceed (see **Appendix G**).

4.10.3.2 No-Build Alternative

Under the No-Build Alternative, no project-related direct impacts to archeological resources within the proposed project APE would occur.

4.11 Historical Resources

4.11.1 Existing Conditions

Qualified cultural resource personnel conducted an on-site historic resource survey of the project area in July 2014. The purpose of the survey was to identify, document, and evaluate all buildings,

structures, objects, and potential districts constructed in 1971 or earlier that are located within the project's APE. As stipulated in Section IX.D(1)b of the PA-TU among FHWA, the ACHP, the Texas SHPO and TxDOT, the APE is considered to extend 300 feet from the proposed ROW for the road re-alignment project. The APE, based on the proposed new alignment, includes all parcels that are located entirely or in part within the 300-foot buffer area around the proposed ROW, within any existing ROW, or within the proposed ROW. The Historic-Age Survey Cut-off Date is considered 1971, based on the letting date of 2016. This Historic-Age date provides for the identification of buildings that are 45 years or older. The historic period of significance is considered 1870–1955.

According to the Texas Historical Commission's Site Atlas, there are no NRHP-listed properties, National Historic Landmark (NHL) properties, Recorded Texas Historic Landmarks, or Official Texas Historical Markers (OTHM) within the APE or 1,300-foot historic survey study area. The El Camino Real de Los Tejas incorporates SH 21, which runs through a portion of the APE. The section of the El Camino Real (or Old San Antonio Road) is considered a National Historic Trail; however, it has not been evaluated for eligibility for listing in the NRHP. The section of SH 21 that runs through the APE is a two lane, asphalt highway through Niederwald (Caldwell County) and is void of any Daughters of the American Revolution markers. The section of SH 21 is not included in the NRHP-listed Old Austin to San Antonio Post Road Historic District (listed in 2006). The section of the roadway that falls within the APE is not considered eligible for listing in the NRHP for this study.

The survey resulted in the identification of a total of sixteen historic-age primary resources (with numerous associated outbuildings) within the APE, and a portion of the previously identified Camino Real (SH 21). There are no resources in the APE that have been previously determined eligible or that are recommended eligible for inclusion in the NRHP. Of the total historic-age resources documented (total 38), none are considered to be historically significant or eligible for listing in the NRHP. Though most of the 38 resources fall within the established period of significance, all of the resources do not meet NRHP criterion or they lack integrity in which to convey significance. Each identified resource was evaluated for NRHP eligibility using the National Register Criteria for Evaluation by professionals meeting the Secretary of the Interior's Professional Qualification Standards (36 CFR 61). These assessments were conducted on an individual resource-by-resource basis. The evaluations were based on information gathered to reconnaissance-level standards and did not include comprehensive surveys.

4.11.2 Potential Impacts to Historic Properties

In compliance with the PA-TU, a TxDOT historian determined on December 5, 2014 that project activities have no potential for effects (see **Appendix G**). The APE for the proposed project is 300 feet from the project ROW. Individual project coordination with SHPO was not required

4.12 Hazardous Materials/Waste

The primary federal laws regulating hazardous waste issues include the Resource Conservation and Recovery Act (RCRA), initially enacted in 1976, and RCRA's companion law, the Comprehensive Response, Compensation, and Liability Act (CERCLA), passed in 1980. RCRA defines a hazardous waste as "a solid waste, or combination of solid wastes, which because of its quantity; concentration; or physical, chemical, or infectious characteristics may - (a) cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed" (ASTM, 2005). Dealing with past mismanagement of hazardous wastes is covered under CERCLA. Known also as Superfund, CERCLA was established to regulate the remediation of inactive and abandoned hazardous waste sites. CERCLA requires that the EPA place sites or facilities needing CERCLA response on the National Priorities List, whereas RCRA deals with materials that are currently destined for disposal or recycling (EPA, 2006).

4.12.1 Existing Conditions

A review of selected environmental regulatory databases published by federal and state agencies was conducted, in general accordance with TxDOT standards, to determine the potential for hazardous materials in the vicinity of the proposed project. In addition, an Initial Site Assessment (ISA) consisting of a windshield and walking survey of the project limits and surrounding area was conducted to confirm the location of the listed facilities and to observe the existing general environmental conditions at these facilities and within the project limits.

The regulatory databases reviewed were prepared by GeoSearch LP (GeoSearch). The environmental databases provide information on regulated facilities that are listed as having a past or present record of actual or potential environmental impact. These "regulatory listings" are limited, and include only those sites that are known to the regulatory agencies at the time of publication to be contaminated or in the process of evaluation for potential contamination (GeoSearch, 2016).

The regulatory databases were searched in general accordance with the recommended minimum search distances and criteria referenced in the ASTM Standard Practice E 1527-13. **Table 4.12-1**

lists the federal and state agency databases reviewed for this study that contained sites within the specified search radius of the project area.

Table 4.12-1: Federal and State Agency Databases

Database	Description	Search Radius (miles)	Sites Identified
Federal			
Facility Registry System	The EPA's Office of Environmental Information developed the Facility Registry System as the centrally managed database that identifies facilities, sites or places subject to environmental regulations or of environmental interest. The Facility Registry System replaced the Facility Index System database.	Property	11
State			
Industrial and Hazardous Waste Sites	Owner and facility information is included in this database of permitted and non-permitted industrial and hazardous waste sites. Industrial waste is waste that results from or is incidental to operations of industry, manufacturing, mining, or agriculture. Hazardous waste is defined as any solid waste listed as hazardous or possesses one or more hazardous characteristics as defined in federal waste regulations. The IHW database is maintained by the TCEQ.	0.25	1
Leaking Petroleum Storage Tanks	The Leaking Petroleum Storage Tank (LPST) listing is derived from the Petroleum Storage Tank (PST) database and is maintained by the Texas Commission on Environmental Quality. This listing includes aboveground and underground storage tank facilities with reported leaks.	0.50	1
Petroleum Storage Tanks	The Petroleum Storage Tank database is administered by the TCEQ. Both Underground storage tanks and Aboveground storage tanks are included in this report. Petroleum Storage Tank registration has been a requirement with the TCEQ since 1986.	0.25	4
Spills Listing	The Spills database is provided by the Texas Commission on Environmental Quality. This database includes releases of hazardous or potentially hazardous materials into the environment.	Property	1

Source: GeoSearch (September 29, 2016)
A full listing of databases reviewed can be found in the regulatory database search, which is on file at TxDOT Austin District

In addition to the review of the above regulatory databases, an ISA consisting of a windshield and limited walking survey of the project limits and surrounding area was conducted to confirm the location of the listed facilities and to observe the existing general environmental conditions at selected facilities within the project limits.

During a field survey on July 16, 2014, an abandoned complex of farm buildings with at least one solution jar of dichlorodiphenyltrichloroethane (DDT) inside was found by the field team. Further investigation of the site revealed that the outbuildings of the farm may have been used as cattle dipping vats in the 1960s. This site is identified on **Figure 4.8-5**. No other areas of concern were identified during site reconnaissance.

The regulatory database report, as well as the completed Hazardous Materials ISA Report, is on file at the TxDOT Austin District office.

4.12.1.1 Oil/Gas Wells and Pipelines

The Railroad Commission of Texas (RRC) Public GIS Map Viewer was reviewed in October 2016 to determine the presence of pipelines and registered oil and gas wells within the proposed project area. Three pipeline systems, a gas gathering pipeline and two gas transmission pipelines, were identified that cross the project area. All three pipelines are owned by Enterprise Products Operating LLC.

No oil/gas wells or other pipelines were documented by the RRC within or immediately adjacent to the project area.

4.12.2 Environmental Consequences

4.12.2.1 Build Alternative

Federal and state regulatory environmental databases were searched in general conformance with the recommended search distances referenced in ASTM Practice E 1527-13. As shown in **Table 4.12-1**, a total of 18 sites were identified by the regulatory database search within the specified search radii. Upon review of these site locations relative (distance and gradient) to the project area, it was determined that none of the sites pose a risk to ROW acquisition or construction of the proposed facility.

The field survey on July 16, 2014, revealed a solution jar of DDT inside an abandoned complex of farm buildings located within the proposed ROW (see **Figure 4.8-5**). Further investigation of the site revealed that the outbuildings of the farm may have been used as cattle dipping vats in the 1960s (see **Appendix B – Photo 12**). According to the CDC (2002), DDT and related chemicals can persist in soil for a very long time, potentially hundreds of years. DDT generally binds very closely to soil particles and will be found primarily in the top layer of soils in contaminated areas. In temperate areas DDT can linger in the soil for thirty years or more (CDC, 2002). The level of potential contamination at the site is unknown at this time. Additional investigation in the farm outbuildings would be required to confirm if contamination would be encountered during construction. If contamination were confirmed, then TxDOT would develop appropriate soils and/or groundwater management plans for activities within these areas.

During the preliminary investigations, one pipeline was found to bisect the project area. Negotiations would be conducted with the pipeline owners to properly relocate or deepen the affected pipeline. No oil/gas wells were documented; therefore, no impacts would occur.

The storage and use of hazardous materials would be necessary during construction of the proposed project. Use and handling of hazardous materials associated with construction machinery and equipment would likely pose a minimal risk to the environment if appropriate safety measures and BMPs were applied. On-site storage of hazardous materials within the proposed project area would be short-term and closely monitored.

Debris piles were observed in the state-owned ROW during the field surveys. Some of these piles may contain or have contained petroleum products. However, the quantities of these products would likely have been small and would not have resulted in significant contamination of soil or groundwater. Debris piles would be removed prior to construction. If contaminated soil is encountered, it would be removed from the proposed project area and disposed of according to applicable local, state, and federal laws.

4.12.2.2 No-Build Alternative

If no improvements were made to the project area, there would be no project-related impacts to regulated state/federal hazardous material sites, oil/gas wells or pipelines, as conditions would remain unchanged.

4.13 Visual and Aesthetic Qualities

FHWA's Technical Advisory T6640.8A recommends that whenever a potential for visual impacts exists from a proposed transportation project, the environmental study should identify the potential visual impacts to the adjacent land uses as well as measures to avoid, minimize, or mitigate these potential visual impacts. The process used to assess the visual and aesthetic impacts for the proposed project generally follows the guidelines outlined in FHWA's *Visual Impact Assessment for Highway Projects* (1988).

4.13.1 Existing Conditions

4.13.1.1 Project Setting

The visual environment resource area establishes the general visual environment of the proposed project. The following description of the visual environment addresses both land form and land cover.

The visual environment resource area falls within the Texas Blackland Prairies Level III ecoregion. This region contains a higher percentage of cropland than adjacent regions. Large areas of the regions are being converted for urban and industrial uses. The Texas Blackland Prairie contains

three Level IV ecoregions: Northern Blackland Prairie, Southern Blackland Prairie, and Floodplains and Low Terraces. The visual environment resource area falls within the Northern Blackland Prairie Level IV ecoregion which is characterized by rolling to nearly level plains. Most of the prairie has been converted to cropland, non-native pasture, and expanding urban uses around Dallas, Waco, Austin, and San Antonio (EPA, 2004).

4.13.1.2 Landscape Units

A landscape unit is a portion of the regional landscape of the resource area and can be thought of as an outdoor room that exhibits a distinct visual character. A landscape unit would often correspond to a place or district that is commonly known among local viewers. These landscape units provide the framework for analyzing the effects of the proposed project. The landscape units for the proposed project are shown in **Figure 4.13-1** and include the Open Space Landscape Unit and the Urban/Suburban Landscape Unit, which are described in **Section 4.13.1.4**.

4.13.1.3 Project Viewshed

A viewshed is a subset of a landscape unit and is comprised of all the surface areas visible from an observer's viewpoint. It also includes the locations of viewers likely to be affected by visual changes brought about by project features and its limits are the visual limits of the views located to and from the proposed project. Potential viewsheds extend out into the surrounding area. The viewsheds for the proposed project include locations within the two landscape units where viewers are likely to be affected by visual changes brought about by the project features. For the purposes of the analysis, the project's viewsheds have been defined by the boundaries of the two landscape units.

4.13.1.4 Existing Visual Resources and Quality

The quality of the existing visual resources was evaluated by identifying the vividness, intactness, and unity present in the viewshed. This approach is particularly useful in transportation planning because it does not presume that a roadway project is necessarily an eyesore. This approach to evaluating visual quality can also help identify specific methods for mitigating specific impacts that may occur as a result of a project. The three criteria for evaluating visual quality are as follows:

- **Vividness** is the visual power or memorability of landscape components as they combine in distinctive visual patterns.

- **Intactness** is the visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as in natural settings.

- **Unity** is the visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape.

Open Space Landscape Unit

The visual quality of this landscape unit is "high" due to the natural state of the landscape. A majority of the visual environment resource area is comprised of open space and undeveloped property. The majority of the open space landscape unit within the visual environment resource area is composed of agricultural land primarily used to graze livestock. The remainder of this landscape unit is undeveloped and is not currently being used for agriculture.

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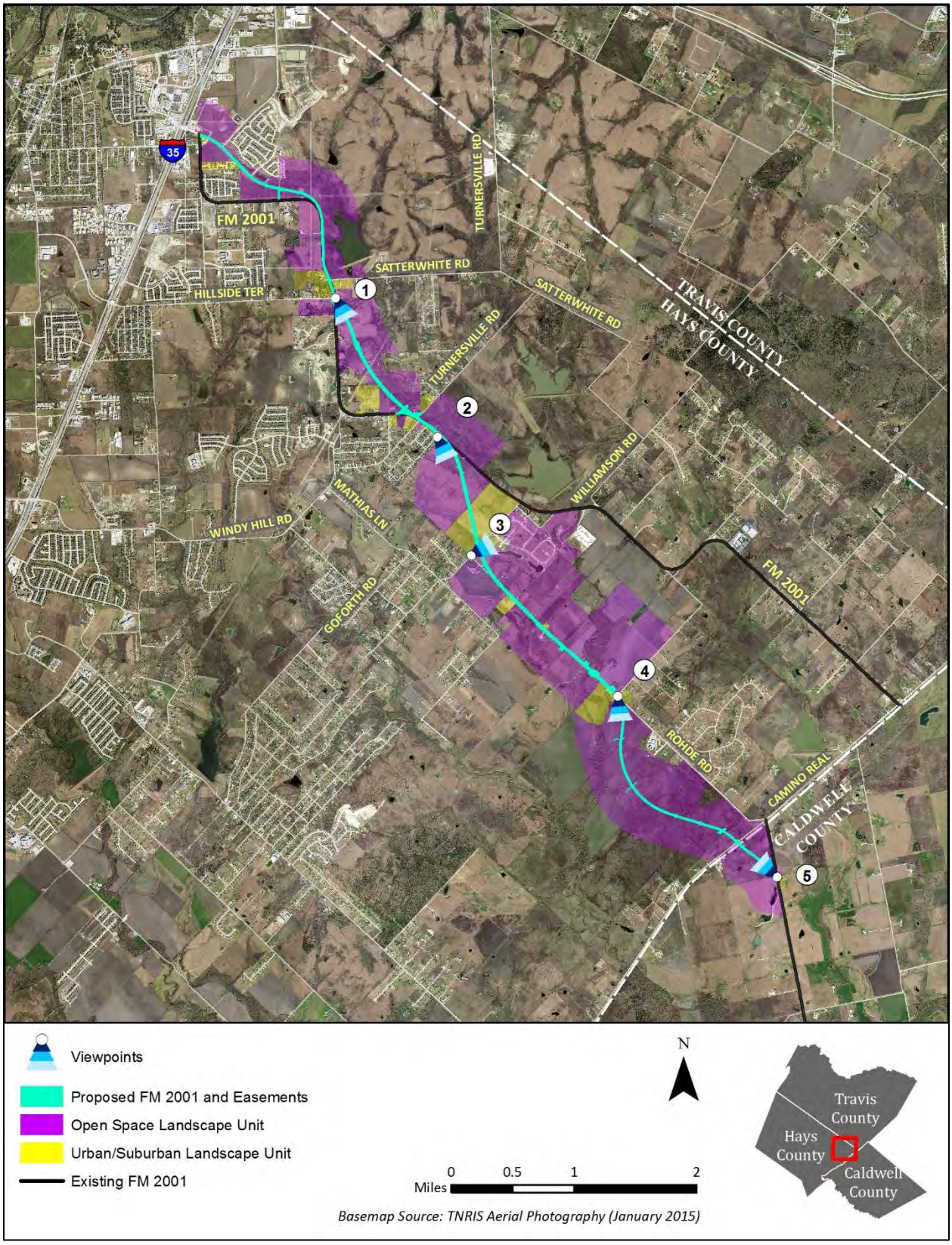
Figure 4.13-1: Key Viewpoints



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Urban/Suburban Landscape Unit

The visual quality of this landscape unit is "moderate." The area is characterized by a mix of civic, religious, commercial, and educational development centered around residential land uses. In general, there is a sense of intactness and unity within the developed areas. Most of the larger residential developments are centered around the natural landscape. The northern section of the visual environment resource area is the most urbanized, characterized by large lot and standard lot single family subdivisions, with some multifamily developments close to I-35. Other, smaller residential communities are found along the existing FM 2001 ROW and Rohde Road in the southern portion of the proposed project area.

4.13.2 Environmental Consequences

4.13.2.1 Build Alternative

Visual impacts of the proposed project are determined by assessing changes to the visual resource from the proposed project and viewer response to that change. A change in the visual resources would be analyzed based on the sum of the change in visual character and quality as a result of the proposed project. There are three steps in determining visual resource change:

1. Assess the compatibility of the proposed project with the visual character of the existing landscape as described in the existing conditions description in **Section 4.13.1** of this report;

2. Compare the visual quality of the existing visual resource with the visual quality of the resource after the proposed project is constructed;

3. Determine the viewer response to the proposed project, which is a combination of viewer exposure and viewer sensitivity to the proposed project.

These three steps assess the degree of impact to the visual resource based on the severity of the change to the visual resource and the degree to which people would likely be opposed to that change.

Five key viewpoints were chosen for analysis in order to evaluate changes to the visual resource resulting from the proposed project. They are shown in **Figure 4.13-1** and described in **Table 4.13-1**.

Table 4.13-1: Key Viewpoints

Key View Number	Key View	Description
1	Looking southeast from the intersection of Old Goforth Road and existing FM 2001.	Representative view of the proposed project from an adjacent roadway in a mix of the Urban/Suburban and Open Space landscape units.
2	Looking east-southeast from adjacent to the residences on Quail Run South.	Representative view of the proposed project from an adjacent residential area in a mix of the Urban/Suburban and Open Space landscape units.
3	Looking northeast from the intersection of Rohde Road and Goforth Road.	Representative view of the proposed project from an adjacent residential area located within in Urban/Suburban landscape unit immediately adjacent to the Open Space landscape unit.
4	Looking south-southeast from the intersection of Rohde Road and Graef Road.	Representative view of the proposed project from an adjacent residential area located within an Urban/Suburban landscape unit immediately adjacent to the Open Space landscape unit.
5	Looking northwest from existing FM 2001 south of Camino Reale Road.	Representative view of the proposed project from an adjacent residential area located within an Urban/Suburban landscape unit immediately adjacent to the Open Space landscape unit.

The visual impact for each key view was assessed and rated according to the level of impact anticipated from the proposed project (Low, Moderate, Moderately High, and High). The visual impact levels for each key view are shown in **Table 4.13-2** and are defined as follows:

- Low – Minor adverse change to the existing visual resource, with low viewer response to change in the visual environment. May or may not require mitigation.
- Moderate – Moderate adverse change to the visual resource with moderate viewer response. Impact can be mitigated within five years using conventional practices.
- Moderately High – Moderate adverse visual resource change with high viewer response or high adverse visual change with moderate viewer response. Extraordinary mitigation practices may be required. Landscape treatment required would generally take longer than five years to mitigate.
- High – A high level of adverse change to the resource or a high level of viewer response to the visual change such that architectural design and landscape treatment cannot mitigate the impacts. Viewer response level is high. An alternative project design may be required to avoid highly adverse impacts.

Table 4.13-2: Visual Assessment

Key Viewpoint Number	Visual Quality – Existing Conditions			Visual Quality – With Project			Viewers Response			Resulting Visual Impact		
	Low	Mod	High	Low	Mod	High	Low	Mod	High	Low	Mod	High
1		X			X			X		X		
2		X			X		X			X		
3		X			X			X			X	
4		X			X		X			X		
5		X			X			X			X	

Key View # 1

Key View #1 is looking southeast from the intersection of Old Goforth Road and existing FM 2001. This area is a mixture of commercial and residential development as well as open space. The proposed project would cross an area of open space, resulting in low changes as parts of the open space area would be converted to a developed roadway. Residents and businesses within the area would see the proposed project crossing the open area. The proposed project would result in minor changes to the visual environment as several roads, including existing FM 2001 and Old Goforth Road, already exist within the area. Viewer response to changes from the proposed project from this key view is anticipated to be moderate as open space would be converted to a road but multiple roadways already exist within the area. The overall visual impact to Key View #1 from the proposed project is anticipated to be low.

Key View #2

Key View #2 is looking east-southeast from adjacent to the residences on Quail Run South. Sight distance looking towards the proposed project is limited by dense vegetation. The proposed project is anticipated to be at grade, resulting in minor changes to visual quality looking southeast as the proposed roadway would be obscured by vegetation. Therefore, visual quality of this view would likely remain unchanged. Viewer response to the proposed project is anticipated to be low as residents would likely be unable to see the proposed project from most angles. The overall visual impact to Key View #2 from the proposed project is anticipated to be low.

Key View #3

Key View #3 is looking northeast from the intersection of Rohde Road and Goforth Road. The proposed project would cross open space to intersect with Goforth Road before crossing another area of open space near several residences. This would have a moderate impact on this key view as the proposed project would cross a substantial amount of open space in an area with few other

roads that are only lightly used. Viewer response is likely to be moderate among residents who have their view of the Open Space landscape unit from their property altered by the proposed project. The overall visual impact to Key View #3 from the proposed project is anticipated to be moderate.

Key View #4

Key View #4 is looking south-southeast from the intersection of Rohde Road and Graef Road. Sight distances from Rohde Road and adjacent residences would mostly be obscured by thick vegetation with some large gaps allowing views of the proposed project crossing open space. This would result in a low impact to residents who would primarily be shielded from the proposed project by vegetation. Viewer response to the change is anticipated to be low except among residents that have their view of the Open Space landscape unit changed. These residents are expected to have a moderate response, but they are anticipated to be in the minority. The overall visual impact to Key View #4 from the proposed project is anticipated to be low.

Key View #5

Key View #5 is looking northwest from existing FM 2001 south of Camino Real Road. The proposed project would cross a large area of open space in full visual view of several residences and motorists utilizing Camino Real Road. This would have a moderate impact on this key view as there are no other major roads other than Camino Real Road in this area and a substantial area of intact Open Space would be affected. Viewer response is likely to be low from motorists on Camino Real Road to moderate from residents whose view of the intact Open Space landscape unit would be affected. The overall visual impact to Key View #5 from the proposed project is anticipated to be moderate.

4.13.2.2 No-Build Alternative

Under the No-Build Alternative, there would be no impacts to the visual and aesthetic quality of the visual environment resource area resulting from the proposed project.

4.14 Indirect and Cumulative Impacts

4.14.1 Indirect Impacts

Indirect impacts are those which are caused by a proposed action and are later in time or farther removed in distance than direct impacts, but are still reasonably foreseeable (40 CFR 1508.8; CEQ, 1977). Indirect effects may include growth inducing effects or other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air, water, or other natural systems, including ecosystems (40 CFR 1508.8).

The purpose of this section is to assess the indirect impacts related to the proposed improvements to FM 2001 between I-35 and SH 21, a distance of approximately 8.5 miles. The indirect impact analysis was conducted in accordance with TxDOT's *Revised Guidance on Preparing Indirect and Cumulative Impact Analyses* (2010) and the National Cooperative Highway Research Program (NCHRP) Report 466, *Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects* (2002). TxDOT's guidance specifies a seven-step process for determining indirect effects:

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

4.14.1.1 Step One: Scoping

Scoping is used to determine the extent of the analysis needed and to define the indirect impacts study area, also called the Area of Influence (AOI). Scoping establishes the context for the indirect impacts analysis. Scoping for the project, including indirect impacts, was conducted in the following ways:

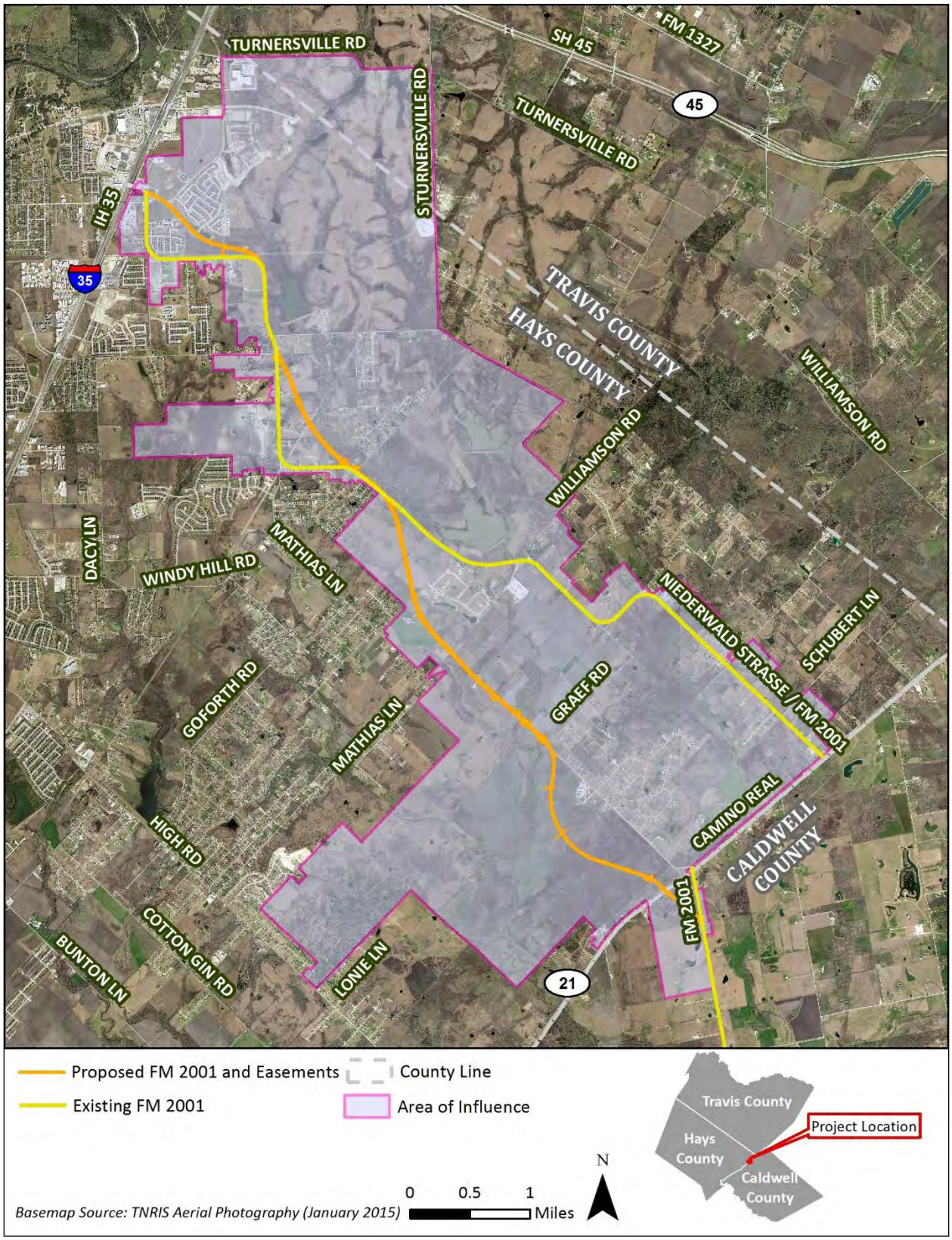
- Regular coordination among the project team, sponsors and stakeholders
- Public involvement through public information meetings
- Distribution of a questionnaire to local governmental agencies and water supply corporations (described in **Section 4.14.1.5**).

The public and stakeholder meetings were used to introduce the project to the general public and solicit comments and input on the project. The questionnaire was designed to obtain specific information related to indirect impacts from the jurisdictions and organizations that have knowledge of the current and future development potential of the land within the project's AOI.

Indirect impacts could occur with potential changes in the rate or location of development or changes to land use within the AOI. These changes would be associated with the increase in accessibility resulting from the Build Alternative. The AOI was defined as adjacent parcels on both the existing and proposed FM 2001 alignments and all parcels between the two alignments,

as these parcels would be most likely to experience a change in accessibility resulting from the proposed project (**Figure 4.14-1**). Land encompassed by planned and proposed subdivisions with some portion adjacent to the proposed alignment was also included in the AOI. The AOI spans approximately 12,201 acres. As part of the scoping process, recipients of the indirect effects questionnaire were also asked to provide input on the boundaries of the AOI. No substantial changes were requested.

Figure 4.14-1: Area of Influence



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4.14.1.2 Step Two: Identify the Area's Goals and Trends

The AOI is located largely within Hays County, with a small portion in Caldwell County where the proposed alignment ties back into the existing FM 2001 alignment south of SH 21. Portions of the AOI are also located in the cities and ETJs of Buda and Niederwald. The goals and trends data were primarily derived from the latest comprehensive plans and zoning ordinances from these cities and the transportation plans for Hays and Caldwell Counties, as well as Census data.

Goals

City of Buda

Approximately 21.8 percent (2,659.8 acres) of the AOI lies within the City of Buda's jurisdiction or ETJ. Buda's long range plan, *Buda 2030 Comprehensive Plan*, emphasizes limiting growth in the more environmentally sensitive western portion of the city (the "green growth district") and instead focusing development along the I-35 corridor and existing arterials (the "emerging growth district," including portions of the proposed project's AOI). Goals related to transportation include planning roadway improvements for existing conditions and future demand. In terms of housing, Buda will ensure that new housing developments promote connectivity and walkability.

The *Buda Transportation Master Plan Update* (2013) includes the following goals: planning roadway improvements for existing conditions and future demand, improving connectivity, promoting non-motorized forms of travel, pursuing traffic management, and exploring public transportation options to Austin and San Marcos.

Hays County

Approximately 17.8 percent (2,174.1 acres) of the AOI lies outside the boundaries of cities or ETJs in Hays County. Texas counties do not have the authority to create zoning or land use plans, but the *HCTP* and the *Hays County Parks, Open Space, and Natural Areas Master Plan* provide information on county policy regarding land conservation and development in the AOI.

The *HCTP* recognizes that population and employment growth will continue to occur in the county, requiring the development of additional transportation facilities to deal with increased traffic congestion. Goals of the plan include increasing accessibility, mobility, and safety for motorized and non-motorized transportation users, as well as enhancing connectivity and promoting consistency between transportation improvements and planned growth and economic development goals.

The *Hays County Parks, Open Space, and Natural Areas Master Plan* was developed to help guide decision making with regard to parks and open space facilities and programming in the county. The plan acknowledges Hays County's continued growth as a major reason for proactively protecting open space. Goals of the plan include conserving land with environmental value

(habitat, watershed health, heritage or scenic value) and providing a range of recreational activities for users through large facilities connected by trails, greenways, and parks.

Hays County also adopted a Regional Habitat Conservation Plan (RHCP) in 2013 to comply with the Endangered Species Act by offering "mitigation credits for otherwise lawful development on land where there could be 'incidental takings' of protected species" (Hays County, 2014). The RHCP can be used to protect the two federally endangered species found in Hays County (Golden-cheeked Warbler and Black-capped Vireo) and as many as 56 additional species considered rare or threatened.

Approximately 53.3 percent (6,509.4 acres) of the AOI is located within Niederwald's city limits or ETJ in Hays County. The city does not have a comprehensive plan or a long range transportation plan.

Caldwell County

Roughly two percent (253.6 acres) of the AOI is within Caldwell County, in either Niederwald's city limits or ETJ. The *Caldwell County Transportation Plan* (2013) enumerates several goals for transportation planning in the county, including improving transportation safety, considering multiple transportation modes, identifying current and future needs, preserving and protecting the environment, and considering and incorporating future land use and development plans. The plan calls for future roadway projects that improve connectivity across the county, link existing dead-end county roads, and provide connectivity between I-35 and SH 130.

Travis County

Five percent (approximately 604.4 acres) of the AOI are located in Travis County, within the Sunfield development. Travis County's Department of Transportation and Natural Resources is responsible for transportation and open space planning, land development review, floodplain management, and environmental protection, among other duties. The Travis County Capital Improvement Projects list does not include any projects in the AOI (Travis County, September 2015).

The *Travis County Land, Water & Transportation Plan* (2014) seeks to provide a system of connected parks and natural areas as well as opportunities for passive and active recreation. The parks plan does not indicate any proposed capital improvements in the project's AOI.

Capital Area Metropolitan Planning Organization

CAMPO is responsible for transportation planning in the six-county region, including Hays, Travis, and Caldwell Counties. CAMPO adopted the 2040 long range transportation plan on May 11, 2015. The goal of the current plan (*2040 RTP*) is to "develop a comprehensive, multimodal, regional transportation system that safely and efficiently addresses mobility needs over time, is

economically viable, cost-effective and environmentally sustainable, supports regional quality of life, and promotes travel options" (CAMPO, 2015). The plan includes widening FM 2001 from I-35 to Rolling Hills Road to a four-lane major divided roadway. The proposed project is included in the current 2040 RTP.

Trends

City of Buda

Buda's long range plan, the Buda 2030 Comprehensive Plan (2011) provides information on demographic and land use trends for the city of Buda. The following information on Buda's existing and projected population and land use is excerpted from this plan:

> *Primarily rural and residential even in the 1980s, Buda has grown rapidly over the past three decades, driven by population and employment growth in the Austin area. Due to rising housing costs in Austin and Buda's large stock of undeveloped land, growth is continuing in Buda. From 2000 to 2010, population growth in the city of Buda increased at a higher rate than growth in the county overall. In 2010, over 25 percent of residential building permits were located in Buda. A substantial amount of residential growth has also occurred in Buda's ETJ; the city plans to annex portions of the burgeoning Sunfield development as well. Population growth and residential development are expected to continue into the future.*

Hays County

The population of Hays County has grown substantially since the 1980s with the expansion of the Austin area. Population in the county is concentrated along the I-35 corridor, although several smaller communities do exist in the western portion of the county as well. From 1980 to 2010, Hays County experienced the second highest growth rate among the five counties in the Austin-Round Rock MSA (U.S. Census, 1980–2010). Annual growth in the county in the last decade peaked in 2006 with six percent growth; annual growth rates since 2010 have ranged from three to four percent (Hays County, 2013; U.S. Census, 2013). Caldwell County has also grown steadily since 1980, although at a slower rate – it was the slowest-growing county in the MSA, growing 61 percent over the thirty-year period (U.S. Census, 1980-2010).

Development patterns in Hays County have resulted in urban development concentrated along the I-35 corridor, with lower density development occurring between the cities located along the highway. Land farther from this corridor remains largely rural. Urban development in Hays County cities tends to be dominated by residential (mostly single family) uses (Hays County, 2013). According to the *HCTP,* future development is expected to occur near existing urban areas and

along the I-35 corridor. Land conservation is expected to be concentrated in areas west of I-35 (Hays County, 2013).

The city of Niederwald contained 565 people in 2010, a decrease of 19 people since 2000 (U.S. Census, 2000, 2010). Niederwald was incorporated in 1990 with 233 residents, although the community was founded in the nineteenth century (Greene, 2010).

Caldwell County

Caldwell County's population in 2010 was 28,066 (U.S. Census, 2010). The *Caldwell County Transportation Plan* (2013) acknowledges that the county has experienced less population growth than the other counties in the Austin metro region, but future growth is expected as a result of economic development and mobility efforts. The county's population and employment are concentrated in Lockhart, the county seat (located approximately nine miles southeast of the AOI), and Luling, located in the southeastern corner of the county. Future population and employment growth is expected to follow this distribution. Existing land use in the county is dominated by agriculture and ranching. Future land use, as estimated by cities' future land use plans and the locations of planned developments in the county, may include several new residential developments in the northwest of the county between San Marcos, Lockhart, and Niederwald.

Travis County

Travis County has experienced some of the highest growth in the Austin region over the last several decades, its population increasing by 144 percent between 1980 and 2010 (U.S. Census, 1980, 2010). Future growth is anticipated; the county's population is projected to reach 1,732,860 people by 2040, an increase of 69 percent over 2010 figures (TWDB, 2014). Most of the developed land in the county lies within the City of Austin's boundaries. Development has moved east, away from the environmentally sensitive areas in the western portion of the county, causing agricultural and rural land uses to transition to low density residential and commercial land uses (Travis County, 2010).

4.14.1.3 Step Three: Inventory Notable Features

NCHRP Report 466 defines "notable features" as specific, valued, vulnerable, or unique elements of the environment. Notable features may include:

- Sensitive species and habitats – ecologically valuable species and habitat, as well as those vulnerable to impacts;

- Valued environmental components – characteristics or attributes of the environment that society seeks to use, protect, or enhance;

- Valued landscape components – those with relative uniqueness, long recovery times after disturbance, and unusual landscape features; and

- Vulnerable elements of the population – vulnerable elements of the population, including members of low-income and/or minority groups (NCHRP, 2002).

Based on the impacts identified as part of this EA, notable features within this project's AOI include EJ populations and Water Resources.

EJ Populations

Six block groups are located in whole or in part within the AOI; in all of these block groups, minority residents make up over 50 percent of the population (U.S. Census, 2012). The AOI encompasses 132 census blocks within these block groups, 70 of which contain residents. Of these 70 populated blocks, 41 contain over 50 percent minority residents. No block groups have median incomes below $24,300, the DHHS poverty guideline used by FHWA to determine the presence of low-income populations. Therefore, the EJ populations located within the AOI are classified as such based on their minority status, not economic status. These minority residents are overwhelmingly Hispanic or Latino, making up 92 percent of all minority residents in these block groups.

Water Resources

Water resources in the AOI include Brushy Creek and Elm Creek as well as their tributaries and several ponds and wetlands of various sizes. Brushy Creek is located in the Brushy Creek-Plum Creek subwatershed; Elm Creek is located in the Elm Creek-Plum Creek subwatershed. Both of these subwatersheds are within the Plum Creek watershed. Due to its proximity to the proposed project, Brushy Creek is the main water body potentially directly or indirectly impacted by the proposed project. Brushy Creek, the stream and its tributaries that would be most affected by the proposed project, feeds Plum Creek, the main stream of the watershed. Brushy Creek is only an area of secondary focus for management of pollutants from livestock operations. However, it is an area of primary focus for pollutants from cropland operations (PCWP, 2008).

4.14.1.4 Step Four: Identify Impact-Causing Activities of Proposed Improvements

The NCHRP Report 466 identifies ten general categories of impact-causing activities that may be associated with a transportation project. **Table 4.14-1** summarizes those categories that would be anticipated as a result of the Build Alternative.

Table 4.14-1: Impact-Causing Activities

Type of Activity	Project Specific Activity	Relevant Information
Modification of Regime	Removal of vegetation	Up to 124 acres of vegetation would be impacted.*
	Alteration of surface drainage	Best Management Practices would be put in place to reduce and minimize any adverse impacts to water quality.
Land Transformation and Construction	Direct impacts from construction; construction noise and vibration	Existing land uses would be converted to roadway uses. Noise and vibration would result from construction equipment trenching, excavation, backfilling, grading, and pavement laying activities.
Resource Extraction	Excavation	Surface and subsurface excavation could be required throughout the project limits for construction.
Processing	Storage of construction materials including aggregate, concrete pipes, traffic control barricades, steel rebar, road signs, etc., temporary construction office trailers equipped with temporary utility service including some means of sanitary waste disposal	Material storage areas and construction office trailers are commonly located within the project ROW during construction. BMPs would be put in place.
Land Alteration	Erodible materials exposed to surface runoff	Erosion Control and Sedimentation Control BMPs would be implemented and maintained until construction is complete. Post-Construction Total Suspended Solids Control BMPs would be implemented.
	Landscaping	Landscaping would occur in accordance with TxDOT specifications.
Access Alteration	Changes in traffic patterns on adjacent roadways; new access created to parcels	Portions of proposed roadway on new alignment could result in changes in traffic patterns on existing FM 2001 and adjacent roadways and would create additional access to parcels adjacent to the roadway
Chemical Treatment	Fertilization	When used, fertilizers are generally only used during the revegetative phase of the project, after which the use of fertilizers is discontinued.
	Deicing	TxDOT typically uses inert sand materials for ice control, and these are applied only on bridges and pavement over culverts.

**This figure includes new ROW and easements. New ROW totals 113.9 ac, temporary easements 5.02 ac, and permanent easements 4.68 ac.*

4.14.1.5 Step Five: Identify Potentially Substantial Indirect Effects for Analysis

This step determines which effects are potentially substantial and merit subsequent detailed analysis. Types of indirect effects considered here include: encroachment-alteration effects, induced growth, and effects related to induced growth.

Encroachment-Alteration Effects

Encroachment-alteration effects are linked to the impact-causing activities identified in Step Four. They alter the behavior and functioning of the physical or human environments. Encroachment-alteration effects fall into two categories: ecological effects and socioeconomic effects.

Ecological Effects

The baseline biological conditions were inventoried as part of the existing conditions analysis and are discussed in **Section 4.9.1** of this document. Based on this analysis and a field survey of the project area, no federally-listed threatened, endangered, or candidate species are anticipated to experience indirect effects for the proposed project. The AOI for the proposed project would occur in a primarily agricultural area that has been widely disturbed by human activities. The AOI does not fall over the Edwards Aquifer Recharge Zone; therefore no project-related indirect effects to listed species in the aquifer are anticipated. State-listed and SGCN species were not carried forward for analysis as there are no regulatory protections in place.

Water Quality and Waters of the U.S.

Indirect impacts to water quality within the AOI and downstream of the proposed FM 2001 project would result from fill material being placed in a water of the U.S., disturbance of ground, pavement and/or vegetation, and providing vehicular use of the roadway. These effects may have the potential to be substantial and will be addressed in Step 6.

Socioeconomic Effects

The proposed project would create new access to parcels and would alter access and travel patterns along the existing FM 2001. Changes in access due to the proposed project could be substantial to the affected community and will be discussed in Step 6.

Induced Growth

Induced growth effects, also known as access-alteration effects, are those impacts associated with new or improved access to adjacent land or that may reduce the time-cost of travel, increasing the attractiveness of the surrounding land for development.

The AOI includes a great deal of undeveloped land, and population growth trends for this area south of Austin indicate that continued growth and development are likely. Due to this growth trend and the new access to developable land created by the proposed project, induced growth effects may have the potential to be substantial and will be discussed in Step 6.

Effects Related to Induced Growth

Socioeconomic Effects

Effects related to induced growth could include impacts to the provision of community services. Based on the information gathered from the questionnaires completed by local agencies, no constraints to development, such as water supply, or other concerns about induced development, were identified. Therefore, impacts from the proposed project related to induced growth have the potential to be substantial and will be addressed in Step 6.

Water Resources

Due to the amount of potentially developable land within the AOI, induced growth effects to water resources, such as increased flooding or decreased water quality due to increased impervious cover, have the potential to be substantial. However, future developments occurring as a result of induced growth that may impact water resources would be required to obtain permits through the appropriate agencies such as the USACE, TCEQ, and EPA before the projects can proceed. Therefore, impacts from the proposed project related to induced growth have the potential to be substantial and will be addressed in Step 6.

Air Quality

Due to the amount of potentially developable land within the AOI, induced growth effects could contribute to MSAT levels in the area; however, vehicular emissions would likely be lower than present levels in future years as a result of the EPA's national control regulations (i.e., new light duty and heavy duty on road fuel and vehicle rules, the use of low sulfur diesel fuel). Even with an increase in VMT and possible temporary emission increases related to construction activities, the EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions of on road emissions, MSATs, volatile organic compounds and nitrous oxide. Other potential induced development impacts on air quality could occur with increased industrial development in the AOI. However, industrial facilities that emit air pollutants would generally be governed and permitted through the TCEQ. Therefore, air quality impacts related to induced growth are not anticipated and further discussion in Steps 6-7 is not necessary.

4.14.1.6 Step Six: Analyze Indirect Effects and Evaluate Results

Changes in Access and Travel Patterns

The Build Alternative would cause changes in travel patterns along existing roadways in the AOI. Three cul-de-sacs and one road termination are planned along the existing roadways which would alter travel patterns slightly. The first cul-de-sac is located on existing FM 2001 at STA 84+00. Access to the proposed project in this area would be provided by nearby CR 118. The second cul-de-sac is located on existing FM 2001 at STA 239+00. Access to the proposed project in this area

would be provided by Goforth Road. The third cul-de-sac is located on the existing Rohde Road at STA 147+00. Access to the proposed project would be provided by Goforth Road. The road termination would occur near the terminus of the proposed project along the existing FM 2001 at approximately STA 26+00. Access to the proposed project would be provided by a new connection identified on schematic plans as "Connect 4." Due to these changes in the existing roadways in the AOI, travel patterns for some individuals within the AOI would change; these changes, however, are not anticipated to have a significant impact on drivers in the area, as the new roadway access points would be near the existing access points in the areas in which existing development is located. In the case of the second cul-de-sac, the adjacent land is not developed, and thus the change in access for this section of the existing FM 2001 west of Goforth Road would not result in a significant impact. Due to the change in travel patterns at Goforth Road, traffic on Goforth Road between existing FM 2001 and Rohde Road would likely increase; however, the proposed project is included in the current regional transportation plan and model, so the associated changes in travel patterns are being taken into account in traffic forecasting efforts. Traffic along the existing FM 2001 in general would likely decrease, because it would no longer be a continuous through roadway, and the proposed project would provide a more efficient route from SH 21 to I-35 with a continuous intersection over SH 21 and without 90-degree turns. The existing FM 2001 would likely serve predominantly local traffic rather than through traffic if the proposed project were to be constructed.

Water Resources

There are over 58,000 linear feet of NHD streams and approximately 50 acres of NWI wetlands on developable land within the AOI. These surface water features have the potential to be impacted by encroachment-alteration effects and induced growth due to the proposed project. Water quality could be changed due to sedimentation resulting from erosion of soils that have been disturbed or from which vegetation has been removed. Hazardous materials spills could occur if vehicles using the roadway were involved in a crash. Engine fluids or transported hazardous materials may run off-site into soils or water bodies and could affect water quality.

Any fill that goes below the OHWM of a water of the U.S., or within a jurisdictional wetland, would have to be coordinated with and potentially permitted by the USACE. Additionally, any action that would impact greater than 1,500 linear feet of a water of the U.S. would need to be permitted through the TCEQ. Therefore, there are expected to be no substantial impacts to waters of the U.S. from encroachment-alteration effects and induced growth from the proposed project.

Induced Growth Effects

The proposed project would provide new access to developable land adjacent to the proposed alignment. To identify where potential effects of project-influenced development might occur, the Planning Judgment and Cartographic Techniques approaches were employed. A questionnaire was

sent to agencies, organizations, governmental jurisdictions, and water supply corporations within the project's AOI to obtain input on the areas in which local planning experts would expect the proposed project to induce development. The questionnaires were emailed to points of contact at each organization on July 18, 2014 and July 21, 2014, and follow up telephone calls were made to those recipients who had not responded by July 28, 2014. **Table 4.14-2** lists the recipients of the questionnaire. The questionnaire is located in **Appendix H**.

Table 4.14-2: Indirect Effects Questionnaire Recipients

Organization	Primary Point of Contact	Response Received*
City of Buda	Chance Sparks, Planning Director	8/14/2014
City of Niederwald	Richard Crandal, City Administrator	
Hays County Development Services Department	Clint Garza, Development Services Director	8/1/2014
Caldwell County	Michael Aulick, Transportation Consultant	
Hays CISD	Rod Walls, Director of Facilities and New Construction	
Lockhart CISD	Larry Ramirez, Asst. Superintendent of Administration & Operations	
CAMPO	Lisa Weston, Planner	7/31/2014
Sunfield MUD 4	Dennis Guerra, General Manager	7/29/2014
Goforth SUD	Mario Tobias, General Manager	
County Line SUD	Daniel Heideman, General Manager	8/1/2014
Southwest Water Company	Gary Rose, Texas Utilities West Director of Operations	7/23/2014

**Blank fields indicate that a response was not received.*

Based on the respondents' input, the proposed project would be expected to induce development and affect the rate of development occurring within much of the AOI; the City of Buda does not anticipate that the project would induce or accelerate development in its jurisdiction. Two of the water supply corporations (WSCs) that responded to the questionnaire stated that there is space for additional development within the portions of their service areas encompassed by the AOI. While no expansions are currently planned for the area served by County Line Special Utility District ([SUD] in the AOI, from the Caldwell County line south to where the proposed alignment would tie back in with existing FM 2001), the SUD indicated that this portion of the service area, which is currently already served by a four-inch water line, would likely see induced growth as a result of the project. The Sunfield Municipal Utility District (MUD) 4 expects significant development to occur as construction on the Sunfield neighborhood and commercial developments continues. Currently, the MUD serves 433 residential lots (approximately 380 of which are developed), approximately 300 multifamily units, and over 100 acres of retail and commercial space. The MUD anticipates serving over 5,000 residential units and over 700 acres of commercial and retail

space once the development is completed. The MUD estimates development will occur at a pace of approximately 300 residential units per year. Neither WSC cited any limits on water supply in the area.

Respondents from agencies with land use and transportation planning jurisdiction indicated that the proposed project is generally consistent with local plans, including the *HCTP* (2013) – although the alignment for the proposed project shown in the transportation plan differs slightly from the Build Alternative. The project has also been included in CAMPO's 2040 long range transportation plan update, approved in May 2015.

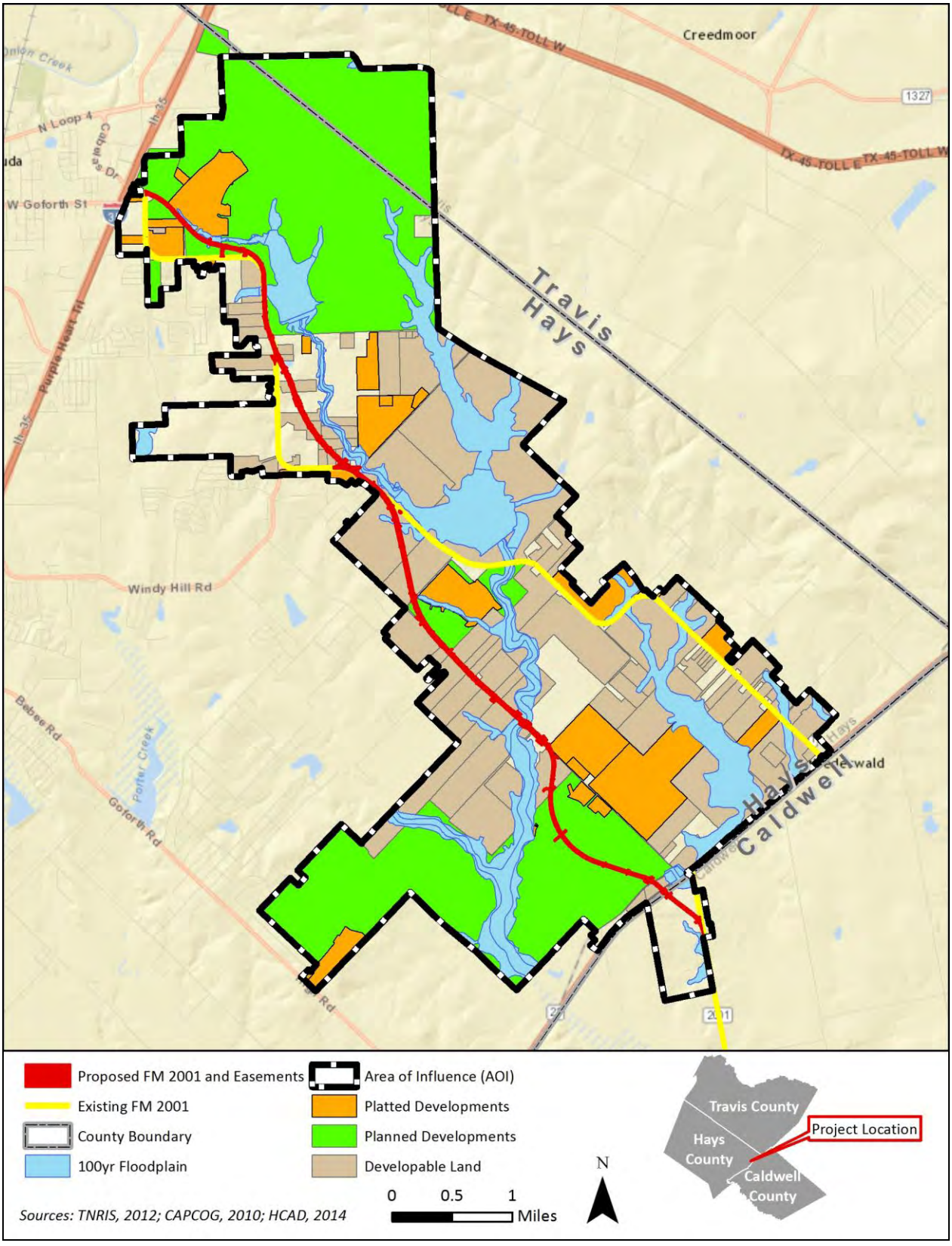
Respondents expect the proposed project would benefit local and through traffic traveling between SH 21 and I-35. Hays County Development Services expects the project would reduce the traffic currently using High and Bebee Roads to reach I-35. The City of Buda anticipates traffic relief on Old Goforth Road. Eventually, respondents such as CAMPO and Hays County expect the project would also benefit regional traffic; CAMPO states that regional traffic would benefit as development occurs south of the AOI and as improvements are extended out to SH 130. As part of CAMPO's regional transportation plan, the proposed project would be expected to facilitate the more efficient movement of goods and people in the Austin area.

Respondents did not cite many factors that would be expected to limit future growth in the AOI. Although floodplains associated with Brushy and Elm Creeks span the AOI, respondents did not cite zoning or land use controls, conservation easements, limited water supply, or other factors that might constrain development. Therefore, based on the results of the questionnaire, it is likely that the proposed project would induce growth in the AOI.

To determine the extent to which this induced growth might be expected to occur, cartographic analysis was used to identify developable lands within the AOI. Developable lands are classified as parcels that are vacant or coded as agricultural or range land in the state land use code, outside of floodplains. Protected open space, such as parkland, is not categorized as developable land. This analysis shows that approximately 30 percent (3,701 acres) of land within the AOI is developable and has not been platted or planned for development. Land that has been platted or planned for development accounts for 44 percent (5,305 acres) of the AOI. Undevelopable land (either open space, parkland, or land in the 100-year floodplain) accounts for 15 percent of the AOI, and the remaining 11 percent of land in the AOI is developed. Developable land in the AOI is also shown graphically on **Figure 4.14-2**. Much of the developed land in the AOI reflects a low density pattern of development. With the improved access expected from the project, currently developed areas within the AOI could be redeveloped at higher densities and intensities of use. Noise impacts to 10 residences that would not be mitigated could also lead to the conversion of low-density residential uses to other uses less sensitive to noise, such as commercial and retail uses.

The parcels that would be most likely to experience development induced by the proposed project would be those adjacent to the proposed project. These parcels fall primarily in three categories: areas that would be newly accessible as a result of being bisected by the proposed project; parcels, such as those on Rohde Road, that would be newly exposed to increased traffic and through traffic; and parcels that are located along portions of the existing FM 2001 that would become part of the proposed project. Sunfield, Studio Estates, and Camino Real are the three major, planned developments along the proposed corridor, as shown in **Figure 4.2-1**. Much of the remaining land adjacent to the proposed project is developable, as shown in **Figure 4.14-2**.

Figure 4.14-2: Developable Land in the AOI



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4.14.1.7 Step Seven: Assess Consequences and Consider Mitigation

The following subsections present mitigation measures or regulations implemented by other agencies that would decrease indirect impacts of the Build Alternative on notable features. No substantial indirect effects are anticipated.

Socioeconomic Effects

Changes to access and travel patterns as a result of the project would not be significant, as new connections between existing roads and the proposed project have been included in the design near locations of proposed cul-de-sacs and a proposed road termination.

Any development in the AOI, whether induced by the proposed project or not, would be required to be permitted and approved by the municipalities with jurisdiction over development in the AOI. This process would provide the opportunity to ensure that future development aligns with the goals and policies of the municipality.

Water Resources

Effects from encroachment-alteration and induced growth would be mitigated through the use of BMPs, such as blankets/matting, silt fences, rock berms, and grassy swales. These BMPs would ensure that water quality downstream of construction is not degraded. Local developers that could develop land within the AOI would also be required to adhere to TCEQ and EPA water quality regulations and obtain necessary permits. Therefore, the proposed project would not have the potential to substantially affect water quality.

Conclusion

Based on the amount of developable land in the AOI and the input from local agencies and WSCs, the Build Alternative may lead to induced growth in the area. Few constraints, in the form of conservation easements, protected lands, or floodplains, exist in the AOI to limit this growth. Induced growth could have some effect on water resources due to the amount of potentially developable land. However, future developments would be required to comply with permitting regulations that limit impacts to waters of the U.S. and water quality. Therefore, indirect impacts from the proposed project on water resources are not anticipated to be substantial.

4.14.2 Cumulative Impacts

Cumulative impacts 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 private individual undertakes these other actions. Cumulative impacts can result from individually minor but collectively noteworthy actions taking place over a period of time (40 CFR 1508.7). Cumulative impacts also include the effects of direct and reasonably foreseeable indirect

impacts on resources, ecosystems, or communities. Direct impacts associated with the proposed project are discussed by resource in **Section 4**. Indirect impacts are discussed in **Section 4.14**.

Courts have defined "reasonably foreseeable" as an action that is "sufficiently likely to occur, that a person of ordinary prudence would take it into account in making a decision" (Sierra Club v. Marsh, 976 F.2d 763, 767 [1st Cir. 1992] [Sierra Club IV]). Reasonably foreseeable events, although uncertain, must also be probable. Effects that are possible but not probable may be excluded from consideration. Factors that indicate whether an action or project is "reasonably foreseeable" for the purposes of cumulative impacts analysis include: 1) whether the project has been federally approved; 2) whether there is funding pending before any agency for the project; and 3) whether there is evidence of active preparation to make a decision on alternatives to the project (Clairton Sportsmen's Club v. Pennsylvania Turnpike Commission, 882 F. Supp 455 [W.D. Pa 1995]).

TxDOT's Cumulative Effects Analysis Guidelines (2014) specifies five components required under a cumulative effects analysis:

1. Resources to be Analyzed
2. Direct and Indirect Effects on Each Resource from the Proposed Project
3. Past, Present, and Reasonably Foreseeable Actions and their Effects on Each Resource
4. Overall Effects of the Proposed Project Combined with Other Actions
5. Mitigation of Cumulative Effects

According to NCHRP (2006), "if a project will not cause direct or indirect impacts on a resource, it will not contribute to a cumulative effect on that resource." Therefore, the only resources carried forward for cumulative impact analysis, are waters of the U.S. and land use and community character, due to the potential for substantial induced development.

4.14.2.1 Review of Resources Analyzed for Direct and Indirect Effects

Table 4.14-3 describes each resource analyzed for potential direct, indirect, and cumulative effects. Those resources that would experience direct and indirect impacts are carried forward for analysis of potential cumulative effects.

Based on the analyses of direct and indirect impacts, the following resources will be carried forward for cumulative impact analysis: land use and community character and waters of the U.S.

Table 4.14-3: Resources Analyzed for Cumulative Effects

Resource	Would the resource be directly impacted?	Would the resource be indirectly impacted?	What is the current health of the resource? Is it in decline or stable?	Is the resource included in the cumulative effects analysis (if no, why not)?
Land Use and Community Character	Yes; approximately 114 acres of new ROW would be required. The Build Alternative would displace one residence.	Yes; because much of this roadway is new location, providing new and additional access in the area, and due to the large amount of developable land in the AOI, induced growth would be anticipated.	The resource is currently healthy, with the goals of various local planning jurisdictions focused on preserving environmentally sensitive areas, concentrating development in denser areas, and providing adequate connectivity to destinations. However, the Austin area has experienced substantial development over the last thirty years, so the amount of open space and agricultural land is decreasing due to development.	Yes
Environmental Justice Populations	Yes; the Build Alternative is located in blocks and block groups with over 50 percent minority residents. Four of ten impacted noise receivers are located in blocks with over 50 percent minority residents. Additionally, ROW acquisition (including two bisected large tracts) would occur in blocks containing EJ populations.	Induced growth that may occur in the area of the project would not necessarily adversely impact EJ residents classified as such based on race; rising property values would more likely displace low-income residents, and there are no low-income communities as defined by FHWA within the project's AOI.	EJ populations are comprised of vulnerable populations, including minorities and low-income persons. EJ communities in the area are classified as such based on their minority status (with the dominant group being Hispanic or Latino). EO 12898 and Title VI of the Civil Rights Act afford protections for EJ populations.	No; the Build Alternative would not bisect any existing EJ neighborhoods or eliminate existing access to these neighborhoods. Induced growth would not be expected to adversely impact EJ populations.
Threatened and Endangered Species	No; species-specific BMPs would be used to avoid effects/impacts to listed species that may occur in the project area.	No; There are no anticipated indirect effects to this resource from the proposed project. The AOI for this project encompasses land that has been disturbed by human activities, limiting the habitat potential in the area.	Threatened and endangered species are by definition considered to be in decline. However, there are no anticipated impacts to this resource from the proposed project.	No; no significant direct or indirect impacts would occur.

Table 4.14-3: Resources Analyzed for Cumulative Effects

Resource	Would the resource be directly impacted?	Would the resource be indirectly impacted?	What is the current health of the resource? Is it in decline or stable?	Is the resource included in the cumulative effects analysis (if no, why not)?
Soils and Geology	Soils and geologic resources may be subject to erosion and sedimentation due to the proposed project; however, these impacts would be minimized through the use of BMPs.	No	The project is not located in the sensitive karst areas of the Edwards Aquifer Recharge Zone. The soils and geology of the project area and AOI are considered to be stable.	No; no significant direct or indirect impacts would occur.
Groundwater	No	No	The resource is considered stable; the project is not located over the Edwards Aquifer.	No; no significant direct or indirect impacts would occur.
Waters of the U.S.	Yes. Of the approximately 2 acres of waters (creeks, ponds, wetlands) identified in the project area that have the potential to be impacted by the project, approximately 0.75 acre are considered potential waters of the U.S.	Yes; there are over 58,000 linear feet of NHD streams and approximately 50 acres of NWI wetlands within the AOI that fall on developable land. These features have the potential to be impacted by encroachment-alteration and induced growth effects.	Waters of the U.S. are considered to be in decline in the area of the proposed project as land use changes continue to remove wetlands and negatively impact streams.	Yes

Table 4.14-3: Resources Analyzed for Cumulative Effects

Resource	Would the resource be directly impacted?	Would the resource be indirectly impacted?	What is the current health of the resource? Is it in decline or stable?	Is the resource included in the cumulative effects analysis (if no, why not)?
Air Quality	Yes; direct impacts on air quality and MSATs from the project are primarily those associated with the increased capacity and accessibility, as well as the resulting projected increases in VMT. Localized areas of increase or decrease in auto emissions may occur. However, if increases do occur, they would be substantially reduced in the future due to implementation of EPA's vehicle and fuel regulations.	No; increases in congestion that can lead to air quality decline are expected to be offset by increases in fuel efficiency and vehicle technology.	The Austin-Round Rock-San Marcos MSA is currently in attainment for all air pollutants under the National Ambient Air Quality Standards (NAAQS). Air quality is considered stable. EPA's new fuel and vehicle standards projected to reduce emissions of air pollutants and MSATs are expected to offset impacts resulting from the increases in VMT. These net emissions reductions are expected to contribute to continued maintenance and improvement of air quality and MSAT levels in the AOI.	No; the potential indirect impacts on air quality and MSATs are primarily related to any expected development/redevelopment resulting from the project's increased accessibility to the area. However, any increased air pollutant emissions resulting from potential development or redevelopment must meet regulatory emissions limits established by the TCEQ and EPA, and obtain appropriate authorization from the TCEQ. Regulatory emission limits set by TCEQ and EPA are established to attain and maintain the NAAQS by assuring any emissions sources resulting from new development or redevelopment would not cause or contribute to a violation of those standards. Therefore, because the project's potential direct and indirect impacts on air quality and MSATs are projected to be offset by federal fuel and vehicle control programs or state and federal regulatory programs, negative impacts on air quality are not anticipated.

Table 4.14-3: Resources Analyzed for Cumulative Effects

Resource	Would the resource be directly impacted?	Would the resource be indirectly impacted?	What is the current health of the resource? Is it in decline or stable?	Is the resource included in the cumulative effects analysis (if no, why not)?
Archeological and Historic Resources	Direct impacts to archeological resources within the proposed project APE would occur at the portions of historic sites 41HY493 and 41HY494 which overlap with the FM 2001 proposed ROW. There are no historic-age resources located within the project APE that are recommended eligible for listing in the NHRP.	No	The two sites within the proposed project APE lack research potential and have been recommended ineligible. The remaining sites adjacent to the APE would not be impacted from the proposed project. This resource is considered stable.	No; direct impacts are not considered substantial and no indirect impacts would be anticipated.
Vegetation and Habitat	Under the Build Alternative, impacts to vegetation in the project area would result from the construction of the proposed project. Approximately 123.61 acres of vegetation could be impacted by the Build Alternative. (113.9 ac would be required for new ROW; 9.7 ac for easements)	Induced development related to the project could result in additional loss and fragmentation of vegetation and habitat types on developable lands within the AOI.	There is similar habitat found throughout the project area and the AOI. Based on EMST data, there are no rare vegetation types found within the state-owned ROW or in the surrounding project area.	No; no rare vegetation would be impacted as a result of the proposed project.

4.14.2.2 Resources to be Analyzed for Cumulative Effects

Cumulative effects are analyzed within a geographic area termed a Resource Study Area (RSA). Each RSA is delineated differently based on the resource being studied.

Land Use and Community Character

Due to the potential for substantial induced growth to occur in the AOI, land use and community character was carried forward for the cumulative effects analysis.

The geographic RSA for land use and community character mirrors the area encompassed by the AOI (see **Figure 4.14-1**) as this is the area most likely to be impacted by the induced growth generated by the proposed project. The temporal RSA for cumulative effects to this resource is 1980 (based on when the area began to see growth) through 2040 (the horizon year for CAMPO's current long range transportation plan).

Current Conditions and Trends

Current land use in the RSA is dominated by rural uses, including agricultural and ranch lands. Hays County is rapidly transitioning from a mostly rural county to a suburban one, with formerly agricultural land along the I-35 corridor being developed into residential and commercial uses (City of Buda, 2011). Caldwell County is less populated, although it too has experienced steady development since 1980 (Caldwell County, 2013). Farm and ranch uses and agricultural land make up the vast majority of land uses in the Caldwell County portion of the RSA and in the county as a whole. The completion of the SH 130 toll road through Caldwell County south to I-10 is expected to spur significant development in Caldwell County in the future (ibid).

Both the city of Buda, located in the northern portion of the AOI along I-35, and Hays County have grown substantially since 1980. Buda has also grown in land area: the city annexed nearly 2,900 acres of land between 1980 and 2010 (City of Buda, 2011). Caldwell County has also experienced growth in the past four decades, although its growth rate has not been as high as Hays County's.

Building permit activity shows a similar trend: between 2004 (the year the city started tracking building permits) and 2009, Buda's share of the total number of permits issued in Hays County steadily rose, reaching 40 percent of all county permits in 2009 (ibid). Between 2008 and 2014, the number of subdivisions in Hays County increased by 15 percent (Hays County, 2008, 2014).

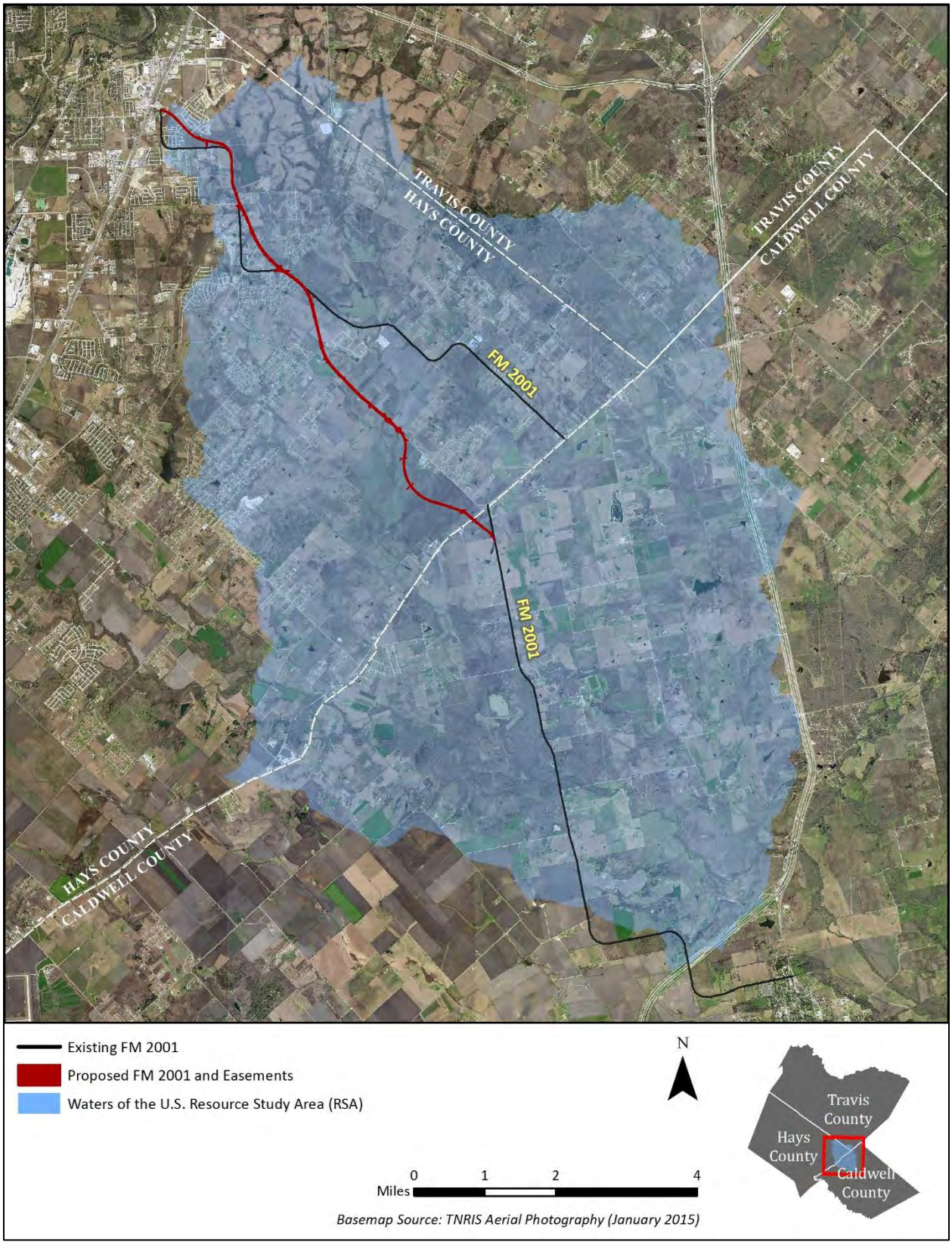
Waters of the U.S.

Due to the potential for substantial induced growth to occur in the AOI, waters of the U.S. was carried forward for the cumulative effects analysis.

The waters of the U.S. RSA is comprised of the Brushy Creek-Plum Creek subwatershed and the Elm Creek-Plum Creek subwatershed (**Figure 4.14-3**). Both subwatersheds are located within the Plum Creek watershed. Covering approximately 76 square miles, these subwatersheds encompass the following cities either in whole or in part: Uhland, Lockhart, Buda, Mustang Ridge, Creedmoor, and Niederwald.

The project team determined the temporal boundary to extend from 1980 to 2040 because the area began to experience growth in 1980 and the horizon year for the current regional plan is 2040.

Figure 4.14-3: Waters of the U.S. RSA



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Current Conditions and Trends

The direct and indirect effects to waters of the U.S. have been determined to be insignificant (**Section 4.8** and **Section 4.14**); however, the resource is in declining health. Therefore, cumulative impacts to waters of the U.S. are analyzed. The discussion of cumulative effects to waters of the U.S. will focus on the Brushy Creek-Plum Creek subwatershed as this is the subwatershed where Brushy Creek, the main water body potentially directly and indirectly impacted by the proposed project, falls. The Elm Creek-Plum Creek subwatershed is also included because, although the proposed project does not cross Elm Creek, it does cross into this subwatershed, meaning runoff from the project could impact Elm Creek.

Brushy Creek begins two miles southeast of Buda in Hays County and flows to Plum Creek, approximately 14.5 miles southeast (TSHA, 2010a). The stream is intermittent according to National Hydrography Dataset records, but is dammed a mile upstream of its confluence with Plum Creek (ibid). Brushy Creek is only an area of secondary focus for management of pollutants from livestock operations. However, it is an area of primary focus for pollutants from cropland operations (PCWP, 2008).

Elm Creek begins three miles north of Niederwald in Hays County and flows 14 miles southeast to Plum Creek in Caldwell County (TSHA, 2010b). Elm Creek is also intermittent and is not designated as a stream segment by TCEQ. Elm Creek near Niederwald is an area of primary focus for management of pollutants from livestock operations (PCWP, 2008).

The Brushy Creek-Plum Creek and Elm Creek-Plum Creek subwatersheds, both located in eastern Hays County, are experiencing growth and development associated with Austin's expansion, although currently impervious cover, and therefore runoff, are limited (GBRA, 2005).

TCEQ has designated Plum Creek, into which Brushy Creek and Elm Creek flow, as Segment 1810 for aquatic life, contact recreation, general, and fish consumption uses. Plum Creek was historically shallow and intermittent, running dry in droughts and during summer, but flowing after heavy rains. Due to the construction of wastewater treatment plants and their resulting discharges, Plum Creek now flows year-round over almost its entire length (PCWP, 2008).

Based on routine water quality sampling, TCEQ listed portions of Plum Creek for high nutrient concentrations in 1998, and in 2002, E. coli bacteria levels were identified as a concern. By 2004, E. coli data indicated that Plum Creek no longer supported the designated use of human contact recreation, and additional sections of the stream were identified as having high nutrient levels. While not all E. coli cause disease, their presence can indicate a potential health threat in the water. When nutrients are present at high levels, excessive growth of algae and aquatic plants can occur and result in damage to aquatic habitat, loss of recreation opportunities, and fish kills (PCWP,

2008). Potential sources of pollutants in the Plum Creek watershed are presented in **Table 4.14-4**. Though not regulated as a water quality pollutant, trash and solid waste are major problems in portions of the Plum Creek watershed as well.

Table 4.14-4: Potential Pollutant Sources in the Plum Creek Watershed

Potential Sources		Bacteria	Nutrients	Other
Urban	Urban Runoff	X	X	X
	Pet Waste	X	X	
Wastewater	Septic Systems	X	X	X
	Wastewater Treatment Facilities	X	X	X
Agriculture	Sheep and Goats	X	X	
	Horses	X	X	
	Cattle	X	X	
	Cropland		X	X
Wildlife	Deer	X	X	
	Feral Hogs	X	X	X
Oil and Gas Production				X

Source: PCWP, 2008

Through a partnership with the EPA, TCEQ, Guadalupe-Brazos River Authority, Texas A&M AgriLife Extension, and TSSWCB, the Plum Creek Watershed Protection Program (PCWPP) was developed using a stakeholder process driven by public participation to provide a foundation for restoring water quality in Plum Creek and its tributaries (including Brushy and Elm Creeks). By identifying key water quality issues in the Plum Creek watershed and determining the factors contributing to these issues, management programs and public outreach efforts will be targeted to restore and protect the vital water resource of this watershed. Stakeholders such as citizens, businesses, municipalities, county governments, river authorities, nonprofit organizations, and state agencies use the PCWPP to become more familiar with the Plum Creek watershed and actively make a difference in the quality and health of their streams through voluntary management practices. It is a starting point to focus restoration efforts and enable financial and technical assistance to facilitate improvements to the watershed.

4.14.2.3 Direct and Indirect Effects on Each Resource from the Proposed Project

Land Use and Community Character

The Build Alternative would result in the displacement of one residence. Under the Build Alternative, approximately 32.6 acres of the proposed roadway would be located on existing

transportation ROW. Therefore, for this portion of the roadway, no direct impacts to land use would occur. 113.9 acres of the proposed roadway would be on new ROW, however, requiring the conversion of this land to a transportation use. Of these 113.9 acres, approximately 7 percent is residential, approximately 51 percent is agricultural/range land, and approximately 40 percent is vacant. The remaining two percent is comprised of open space (non-park/recreational) and commercial uses.

As previously stated, the proposed project would result in only one residential displacement; therefore, it is not anticipated to cause significant impacts to community cohesion. Existing access to public facilities in the AOI would not be removed.

Indirect effects related to land use and community character would include changes in access and travel patterns and induced growth. Three cul-de-sacs and one road termination that would change access and travel patterns in the AOI are planned as part of the proposed project. These changes would not be significant, as new connections between existing roads and the proposed project have been included in the design near locations of proposed cul-de-sacs and a proposed road termination. Due to the change in travel patterns at Goforth Road resulting from two of the proposed cul-de-sacs, traffic on Goforth Road between existing FM 2001 and Rohde Road would likely increase; however, the proposed project is included in the current regional transportation plan and model, so the associated changes in travel patterns are being taken into account in traffic forecasting efforts. Traffic along the existing FM 2001 in general would likely decrease, because it would no longer be a continuous through roadway, and the proposed project would provide a more efficient route from SH 21 to I-35 without 90-degree turns and with a continuous intersection over SH 21. The existing FM 2001 would likely serve predominantly local traffic rather than through traffic if the proposed project were to be constructed.

Induced growth is also anticipated as an indirect effect of the proposed project. The alignment of the proposed FM 2001 facility would create new access to parcels as 113.9 acres would be acquired for new ROW. Approximately 30 percent (3,701 acres) of land within the AOI is developable and has not been platted or planned for development. Land that has been platted or planned for development accounts for 44 percent (5,305 acres) of the AOI. Undevelopable land (either open space, parkland, or land in the 100-year floodplain) accounts for 15 percent of the AOI; the remaining 11 percent of land in the AOI is developed. Developable land in the AOI is also shown graphically on **Figure 4.14-2**. Much of the developed land in the AOI reflects a low density pattern of development. With the improved access expected from the project, currently developed areas within the AOI could be redeveloped at higher densities and intensities of use. Noise impacts to 10 residences that would not be mitigated could also lead to the conversion of low-density residential uses to other uses less sensitive to noise, such as commercial and retail uses.

The parcels that would be most likely to experience development induced by the proposed project would be those adjacent to the proposed project. These parcels fall primarily in three categories: areas that would be newly accessible as a result of parcels being bisected by the proposed project; parcels, such as those on Rohde Road, that would be newly exposed to increased traffic and through traffic; and parcels that are located along portions of the existing FM 2001 that would become part of the proposed project. Sunfield, Studio Estates, and Camino Real are the three major, planned developments along the proposed corridor, as shown in **Figure 4.2-1**. Much of the remaining land adjacent to the proposed project is developable, as shown in **Figure 4.14-2**.

Although the project can be expected to induce growth in the RSA, this growth is anticipated and is being provided for in the long range plans governing infrastructure development in the area. Therefore, the induced growth anticipated as a result of the Build Alternative is not expected to be out of character with the growth pattern planned and envisioned for the area.

Waters of the U.S.

The Build Alternative would result in impacts to approximately 0.75 acre of potential waters of the U.S. Of this amount, 0.12 acre would be from creeks (i.e., exhibiting an OHWM), 0.24 acre from wetlands and 0.39 acre from ponds. An additional 1.21 acres of potentially non-jurisdictional ponds and wetlands would also be impacted by the Build Alternative (see **Table 4.8-3**).

There are over 58,000 linear feet of NHD streams and approximately 50 acres of NWI wetlands on developable land within the AOI. These surface water features have the potential to be impacted by encroachment-alteration effects and induced growth due to the proposed project. Water quality could be changed due to sedimentation resulting from erosion of soils that have been disturbed or from which vegetation has been removed. Hazardous materials spills could occur if vehicles using the roadway were involved in a crash. Engine fluids or transported hazardous materials may run off-site into soils or water bodies and could affect water quality. However, any fill that goes below the OHWM of a water of the U.S., or within a jurisdictional wetland, would have to be coordinated with and potentially permitted by the USACE. Additionally, any action that would impact greater than 1,500 linear feet of a water of the U.S. would need to be permitted through the TCEQ. Therefore, there are expected to be no substantial impacts to waters of the U.S. from encroachment-alteration effects and induced growth from the proposed project.

4.14.2.4 Past, Present, and Reasonably Foreseeable Future Actions and their Effects on Each Resource

According to TxDOT's 2013 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 probably, rather than merely possible" (TxDOT 2013, FHWA 2003). 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 Niederwald and Buda as well as Hays and Caldwell counties. Additional research was conducted to identify transportation plans and future land use plans.

One overarching trend that provides a backdrop for resource-specific analysis is population growth in the jurisdictions within the RSA. **Table 4.14-5** shows historical and projected population in jurisdictions in the RSAs. The table indicates substantial population growth has occurred and is expected to continue.

Table 4.14-5: Historical and Projected Population for Jurisdictions in the RSA

Jurisdiction	Total Population				% Change from 1980-2010	Projected Population Growth, 2040
	1980	1990	2000	2010		
City of Buda	597	1,795	2,404	7,295	1,122%	22,195
City of Niederwald	N/A*	233	584	565	142%**	1,257
Hays County	40,594	65,614	97,589	157,107	287%	398,384
Caldwell County	23,637	26,392	32,194	38,066	61%	67,955
Travis County	419,573	576,407	812,280	1,024,266	144%	1,732,860

**Population for Niederwald not available in 1980 Census.*
***% Change Calculated from 1990-2010*
Source: TWDB, 2014; U.S. Census, 1980-2010

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 RSAs. **Table 4.14-6** lists planned roadway projects in the combined RSAs. Subdivisions that have been platted in the combined RSAs through October 2016 are shown in **Table 4.14-7**. Various types of commercial and retail nodes are envisioned by CAMPO and the City of Buda (see **Section 4.2.1.3** and **Figure 4.2-2**). Proposed Land Uses and Local Plans and Policies are discussed extensively in **Sections 4.2.1.2** and **4.2.1.3**.

Table 4.14-6: Roadway Projects Planned in the RSAs

Project	Location
SH 21	Caldwell Co Line to Posey Rd
FM 150 W	FM 3237 to Kyle Loop SW
FM 150 W	Kyle Loop SW to FM 2770
FM 150 W	FM 2770 to W Center St at Rebel Dr
FM 150 W	Rebel Dr to I-35
FM 967	FM 1626 to Main St
FM 967	Main St to W Goforth
FM 967	W Goforth to I-35
FM 1626	FM 2770 to I-35
FM 2770/Jack C Hays Trl	FM 1626 to FM 150
FM 2770/Jack C Hays Trl	FM 967/Main to FM 1626
Bebee/High Rd	I-35 to SH 21
Bunton Creek Rd	I-35 to Kyle Pkwy
CR 158	I-35 to Turnersville Road Ext
Dacy Ln/Goforth	Hillside Terr to I-35
Goforth	FM 2001 to Hillside Terr
Goforth St W	FM 967 to I-35
Hillside Terr	I-35 to FM 2001
Kohlers Xing	FM 2770 to I-35
Kyle Crossing	I-35 to Kohler Xing
Kyle Crossing	Kohler Xing to I-35 at Old Bridge Trl
Kyle Loop W	FM 1626 to I-35 at Yarrington Rd
Kyle Pkwy	I-35 to SH 21
Lehman Rd	Goforth to FM 150
Marketplace Ave	FM 967 to I-35 at Burleson
Old Goforth Rd	FM 2001 to Hillside Terr
Old San Antonio Rd	Travis Co Line to Cabelas
Old Stagecoach Rd	Post Road to FM 150
CR 132	I-35 to FM 2770
Satterwhite Rd	FM 2001-Turnersville
Shadow Creek Blvd	Hillside Terr to Bebee Rd
Williamson Rd	FM 2001 to Travis Co
Windy Hill Rd	I-35 to Turnersville Ext

Source: Hays County, 2013; CAMPO, 2015

Many subdivisions have also been platted in the area, beginning in the 1970s and continuing through today. These platted subdivisions are shown in **Table 4.14-7**.

Table 4.14-7: Platted Subdivisions in the RSA

Subdivision Name	Lots	Acres		Subdivision Name	Lots	Acres
CALVIN LYNCH	7	10		ANGEL HILL	13	18
GREEN PASTURES	821	887		FOSTER PLACE	7	16
ROLLING HILLS ESTATES	65	242		COLLINS HEIGHTS	7	11
TRIPLE R RANCHETTES	15	227		OUR PLACE	4	4
VIEWPOINT ESTATES	6	33		SUMMER SUN	34	38
KAI VISTA	114	265		PENA ADDITION	2	5
APPALOOSA ACRES	35	99		HARLOW	2	4
HOLMAN MEADOWS	15	75		GRIST MILL PARK	8	9
WINDRIDGE	27	43		WOODBROOK	41	46
SUNNY RIDGE	20	22		THE PARKLANDS	98	60
OLD WEST TRAIL	58	45		ELM CREEK RANCH	19	133
GOFORTH VILLAGE	108	74		MEADOW PARK	100	44
IKE WRANITZKY	6	49		LITTLE HILLS	4	8
COUNTRY ACRES	8	6		SHADOW CREEK	869	356
BRUSHY CREEK	49	104		CORONADO HILLS	13	31
WEBB	1	5		GREEN MEADOWS	105	82
THREE G RANCH AND CATTLE	18	271		NOGUEZ	5	5
THE RIDGE	9	32		PALOMINO PARK	3	14
UHLAND ESTATES 2	2	116		BON TON	2	5
CROSS VALLEY	9	35		CARL DIETZ	6	20
ENGLEKE	4	46		SUNFIELD	159	171
GOFORTH ESTATES	50	69		TRAILS OF CAMINO REAL	1	16
35 SOUTH RANCHES	46	160		STUDIO ESTATES	8	112
SAVANNAH RIDGE	30	37		HALLET-INTJER	2	13
NESTER ESTATES	27	64		KYLE PROJECT LLC	1	3
THE RAILYARD	78	92		SATTERWHITE RIDGE	0	43
CIRCLE N RANCH	149	315		ROCK RANCH	2	5
CAMINO CREST	25	58		STONERIDGE	127	27
HUBER ESTATES	48	76		EVANS ACRES	3	10
GREAT HILLS	174	106		ROLLING MEADOWS	32	31
MEADOW VISTA	200	59		THE SANCTUARY	4	94
DREAM RANCH	3	11		RANCHITOS OF BUDA	6	6

Source: Hays County, 2016

4.14.2.5 Overall Effects of the Proposed Project Combined with Other Actions

Land Use and Community Character

Driven by the rapid population growth that has been taking place in the RSA (as is discussed in the sections above), development is expected to continue in the area, with or without the proposed project. The proposed project could accelerate developments that are already planned in the RSA and induce growth within the RSA, however the county and city transportation and land use plans reviewed as part of this indirect and cumulative effects analysis indicate that substantial development is anticipated to continue and that infrastructure will be planned and constructed to funnel this growth to more environmentally appropriate areas (City of Buda, 2011; Hays County, 2013; Caldwell County, 2013; CAMPO, 2015), such as the lands east of I-35 encompassed by this RSA. The potential cumulative impacts of past, present, and reasonably foreseeable future actions on the land use and community character of the RSA include a shift from a rural setting to a suburban setting, bringing higher densities, increasing populations, more retail and commercial uses, new roadways, expanded roadways, and more traffic. Each new roadway expansion, residential, development, or retail center on its own does not result in significant changes to the character of the RSA; combined over time, however, these past, present, and reasonably foreseeable future actions would have a significant impact on the land use and community character of the RSA. The growth trend in the RSA is anticipated and is being provided for in the long-range plans governing infrastructure development and land-use planning in the area, and the proposed project is consistent with these long-range plans. Therefore, the induced growth anticipated as a result of the Build Alternative combined with past, present, and reasonably foreseeable future actions is not expected to be out of character with the growth pattern planned and envisioned for the area.

Waters of the U.S.

As discussed in **Section 4.14.2.3,** the Build Alternative would result in impacts to approximately 0.75 acre of potential waters of the U.S., including wetlands and ponds.

There are over 250,000 linear feet of NHD streams and approximately 296 acres of NWI wetlands that have the potential to be impacted by development on developable lands within the RSA. However, impacts from potential development due to indirect effects from the proposed project as well as projects discussed in **Section 4.14.2.4** are not anticipated to be substantial as any project within the RSA that may impact surface water resources would be required to coordinate with appropriate agencies such as USACE, EPA, and TCEQ.

Table 4.14-8: Overall Project Effects

Resource	Past Impacts	Project Impacts	Reasonably Foreseeable Actions
Land Use and Community Character	Past developments (roadway, residential, commercial) resulted in a shift from a rural, agricultural setting to a suburban setting, bringing higher densities, increasing populations, more retail and commercial uses, new roadways, expanded roadways, and more traffic.	Direct - The Build Alternative would require approximately 114 acres of new ROW and would displace one residence. Indirect - Induced development anticipated along new location sections of the Build Alternative due to the new and additional access and large amount of developable land in the AOI.	Substantial population growth anticipated, with associated increase and expansion in transportation facilities, traffic, and residential, retail and commercial developments
Waters of the U.S.	Brushy Creek and Elm Creek watersheds have been subject to pollutants from past cropland production and livestock operations, and impacts associated with Austin's expansion Plum Creek (outfall for Brushy Creek and Elm Creek), contains high nutrient and E. coli concentrations due to past construction of wastewater treatment plants and their resulting discharge into the creek.	Direct - Of the approximately 2 acres of waters (creeks, ponds, wetlands) identified in the project area that have the potential to be impacted by the Build Alternative, approximately 0.75 acre are considered potential waters of the U.S. Indirect - There are over 58,000 linear feet of NHD streams and approximately 50 acres of NWI wetlands within the AOI that fall on developable land. These features have the potential to be impacted by encroachment-alteration and induced growth effects.	250,000 linear feet of NHD streams and approximately 296 acres of NWI wetlands that have the potential to be impacted by development on developable lands within the RSA

4.14.2.6 Mitigation of Cumulative Effects

According to TxDOT guidance, the sponsoring agency may be required to mitigate for direct or indirect effects caused by a proposed action, but the sponsoring agency is not required to mitigate for effects caused by others (TxDOT, 2013). Mitigation for potential effects from proposed projects or actions is solely the responsibility of the entity implementing that project. Therefore, mitigation for cumulative effects as a result of the reasonably foreseeable actions is only a recommendation. Consideration of potential mitigation measures as specified in 40 CFR 1508.20 for this project include the following:

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

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;

c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

d) Reducing or eliminating the impact over time by preservation and maintenance operations during the action; and

e) Compensating for the impact by replacing or providing substitute resources or environments.

Land Use and Community Character

All 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. These municipal codes include:

- City of Buda Unified Development Code
- City of Niederwald Zoning Ordinance
- Hays County Subdivision and Development Regulations
- Travis County Development Regulations
- Caldwell County Development Ordinance and Amendments

Waters of the U.S.

Impacts to water quality due to other projects within the RSA would be the responsibility of the agencies and jurisdictions implementing those projects. Depending on the acreage of impacts, the quality of wetlands/waters of the U.S. and the presence of federally-listed species in the vicinity, coordination with the USACE may be necessary. If these impacts require an IP or PCN, a mitigation plan would be submitted to the USACE. BMPs, SW3P, and any necessary permits would be prepared, obtained, or implemented to minimize or mitigate impacts to any waters. In coordination with these resource agencies, the responsible agencies would need to employ efforts to minimize impacts to water quality in the RSA.

Impacts to water quality due to other projects within the AOI would be the responsibility of the agencies and jurisdictions implementing those projects. Depending on the acreage of impacts, the quality of wetlands/waters of the U.S. and the presence of federally-listed species in the vicinity, coordination with the USACE may be necessary. If these impacts require an IP or PCN, a mitigation plan would be submitted to the USACE. BMPs, SW3P, and any necessary permits would be prepared, obtained, or implemented to minimize or mitigate impacts to any waters of the U.S. In coordination with these resource agencies, the responsible agencies would need to employ efforts to minimize impacts to water quality in the AOI.

5 PUBLIC INVOLVEMENT

Public involvement has been on-going concurrently with the development of this EA. Efforts to date have included a public meeting, as described below. Since the public meeting, a copy of the draft Alignment Map Exhibit has been available in the County Commissioner's office for the public to review. In addition, information about the project was available on the Hays County website under Road Projects – Precinct 2, Hays-TxDOT Partnership Program.

To facilitate public input in the development of the EA for FM 2001 from I-35 to SH 21, the project team developed an informal Public Involvement Plan for the project. The plan identified strategies to inform, engage and respond to stakeholders in a transparent, meaningful and constructive process.

Public Meeting

An open house public meeting was held as part of the EA process. Hays County, in conjunction with TxDOT held the open house on January 16, 2014, to share project information and gather public input on several preliminary alternatives to be considered during project development. The meeting was held from 5:30–7:30 p.m. in the Studio Estates Clubhouse, 6880 Goforth Road, Kyle, Texas. The meeting was designed to be casual and informal, with a come-and-go format which allowed citizens to review project materials, speak to TxDOT officials and the project team on a one-on-one basis. The public meeting summary report for this open house is on file at the TxDOT Austin District office.

Prior to the open house, an English and Spanish open house flyer was distributed to students at Tom Green Elementary School, Camino Real Elementary School and Santa Cruz Catholic School and inserted into bulletins at Santa Cruz Catholic Church. A total of 2,860 flyers were distributed.

Hays County issued a press release on January 7, 2014 inviting the public to attend the open house. Hays County Commissioner Mark Jones distributed an e-blast to 699 Precinct 2 and corridor stakeholders to invite them to the open house. The e-blasts were distributed on December 12, 2013, December 16, 2013, January 2, 2014, and January 6, 2014.

Legal notices for the open house were published in the *Austin American-Statesman* on Sunday, December 15, 2013 and Sunday, January 5, 2014, the *Hays Free Press* on Wednesday, December 11, 2013 and Wednesday, January 1, 2014, and *Ahora Si!* on Thursday, December 12, 2013 and Thursday, January 2, 2014.

Upon arrival at the open house, a registration table was set up inside the main doors to allow members of the public to sign-in. They were provided a set of handouts which included:

- Welcome Letter
- Project Overview Sheet
- FM 2001 – Preliminary Alternatives
- Typical Sections Diagram
- Right-of-Way Acquisition and Relocation Assistance Sheet
- Comment Sheet
- Purchase of Right-of-Way by Counties and Cities Booklet

Two sets of the Constraints Map were displayed in the room for public viewing. Two sets of the Preliminary Alternatives Maps were displayed on tables for the public to view. Attendees were invited to mark or place sticky notes on the maps to identify specific concerns or missing information.

Project team members served as guides to direct the public on where they could view project information and provide feedback on the alternatives. Project team members were available to answer questions, facilitate discussion and gather input on the alternatives.

Tables were arranged on one end of the room so attendees could fill out comment forms and leave them in a comment box stationed near the exhibit area. A court reporter was also available to transcribe comments from attendees who preferred to give their input verbally. Additionally, project team members along with an interpreter were available to provide information and answer questions.

A total of 26 comments were received during the official public comment period, which occurred from January 16, 2014 through January 27, 2014. Alternative A received the most support, followed by Alternatives B and C. Common themes included safety, impacts to property, construction impacts on traffic and addressing congestion at the intersection of I-35 and FM 2001. Some commenters would like to see street lighting, sidewalks and bike lanes added into the new roadway design. Other suggestions included building a new road between the Shell station and Burger King to relieve traffic congestion entering the I-35 northbound frontage road.

Public Hearing

A public hearing on FM 2001 from I-35 to SH 21 would be scheduled subsequent to approval of the Draft EA.

6 RECOMMENDATION OF PREFERRED ALTERNATIVE

6.1 Rationale for Recommending the Preferred Alternative

The Build and No-Build Alternatives were evaluated throughout the EA in terms of their effects on the natural and human environments, as well as their ability to meet the proposed project's purpose and need. The following criteria were utilized to evaluate the Build and No-Build alternatives:

- Ability to meet the project's purpose and need;
- Input of citizens and other stakeholders; and
- Projected impacts on mobility and safety.

The Build Alternative was selected as the Preferred Alternative because it:

- Satisfies the project's purpose and need, as described in **Section 2**;
- Responds to public comments;
- Improves bicycle/pedestrian mobility and safety by incorporating wider shoulders for bicycles and providing sidewalks and ROW for future sidewalk construction;
- Improves mobility and safety by increasing the operational efficiency of the facility by removing 90-degree turns and creating a continuous intersection at SH 21.

6.2 Environmental Permits, Issues, and Commitments

The following sections identify mitigation and permitting that would likely be required for the implementation of the Build Alternative.

6.2.1 Construction Management

Construction activities would temporarily affect vehicular traffic along Overpass Road, FM 2001, and Rohde Road. As part of the construction contract requirements, the contractor would be required to maintain the necessary number of barricades, signs, flags, and traffic barriers to direct vehicular traffic away from construction areas. A detailed traffic control plan would be developed to minimize traffic disruption. Access to adjacent properties would remain open through all phases of construction. During construction of the proposed project and its connections to Overpass Road, FM 2001, and Rohde Road, existing traffic lanes would remain open at all times with the exception of short-term, off-peak periods as necessary to provide for the safe implementation of traffic control devices or short-term construction activities. Expedited bridge building techniques such as prefabrication and night-time working hours could be used if necessary to minimize impacts on

traffic. At this time, no detours are anticipated to be required during the construction of the proposed project. However, if a detour is determined to be necessary, approval from TxDOT would be obtained prior to implementing traffic control measures.

6.2.2 Air Quality

During the construction phase of this project, temporary increases in PM and MSAT emissions may occur from construction activities. The primary construction-related emissions of PM are fugitive dust from site preparation, and the primary construction-related emissions of MSAT are diesel PM from diesel powered construction equipment and vehicles.

The potential impacts of PM emissions would be minimized by using fugitive dust control measures contained in standard specifications, as appropriate. The Texas Emissions Reduction Plan (TERP) provides financial incentives to reduce emissions from vehicles and equipment. TxDOT encourages construction contractors to use this and other local and federal incentive programs to the fullest extent possible to minimize diesel emissions. Information about the TERP program can be found at: http://www.tceq.state.tx.us/implementation/air/terp/.

However, considering the temporary and transient nature of construction-related emissions, the use of fugitive dust control measures, the encouragement of the use of TERP, and compliance with applicable regulatory requirements; it is not anticipated that emissions from construction of this project would have any significant impact on air quality in the area.

6.2.3 Traffic Noise

Construction normally occurs during daylight hours when occasional loud noises are more tolerable. No extended disruption of normal activities is expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems. Following completion of the project design and utility evaluations, TxDOT will poll adjacent property owners to determine if the proposed Noise Barrier #1 will be incorporated into the project design.

6.2.4 Water Resources

6.2.4.1 Water Quality

The proposed project would disturb more than five acres of land and therefore, would require compliance with the Texas Pollutant Discharge Elimination System. Compliance would entail applying for coverage under the Construction General Permit (CGP). As part of the CGP application, a SW3P would be prepared and a NOI would be filed before construction begins.

Based on design information, it is anticipated that FM 2001 would impact waters of the U.S. and would require a Section 404 permit. As such, Section 401 Water Quality BMPs would be incorporated into the project plans.

Measures would be taken to prevent and correct erosion that may develop during construction. Temporary erosion controls would be in compliance with TxDOT Standard Specifications and would be in place, according to the construction plans, prior to commencement of construction. Temporary BMPs would include rock filter dams, sediment control fences, soil retention blankets, and sandbags. They would be inspected in accordance with the SW3P to ensure maximum effectiveness. Permanent water quality BMPs would include grass-lined ditches.

Once construction is complete and disturbed areas have been revegetated, silt fences and accumulated sediments would be removed to reduce wildlife barriers and hazards.

The use of equipment in streams and riparian areas would be minimized during construction. Where possible, equipment access would be from creek banks or bridge decks.

Rubbish (excluding brush piles and snags) found near bridges on TxDOT ROW would be removed and disposed of properly to minimize the risk of pollution.

6.2.4.2 Jurisdictional Waters of the U.S. (Section 404 Permitting)

Under Section 404 of the CWA, a permit is required from the USACE for any activity involving the discharge of dredged or fill material into waters of the U.S., including wetlands. Potential waters of the U.S. present in the project area that would be impacted include two wetlands, six creeks (Brushy Creek and its tributaries) and four ponds. Therefore, a Section 404 permit (NWP 14) would be required prior to commencing construction. Additionally, because wetlands would be impacted, a PCN would be required.

Placing riprap across stream channels would be avoided. Alternative stabilization such as biotechnical stream bank stabilization methods, including live native vegetation or a combination of vegetative and structural materials, would be used instead. When riprap or other bank stabilization devices are necessary, their placement should not impede the movement of aquatic and terrestrial wildlife underneath the bridge. In some instances, riprap may be buried, back-filled with topsoil and planted with native vegetation. Any unavoidable, temporary stream crossings would be removed once they are no longer needed, and banks/soils around the crossing would be stabilized.

Bridges would be designed for adequate vertical and horizontal clearances under the roadway to allow for terrestrial wildlife to safely pass under the road.

6.2.5 Ecological Resources

6.2.5.1 Vegetation and Wildlife Habitat

Of the approximately 123.61 acres of vegetation that would be impacted either permanently or temporarily through the laying of new pavement, clearing of trees and brush, and construction equipment staging areas, approximately 94.82 acres consist of tallgrass prairie, approximately 14.42 acres consist of riparian and floodplain vegetation and 0.52 acre consists of woodland.

Upon completion of construction activities associated with the proposed project, disturbed areas would be restored and seeded according to TxDOT's Vegetation Management Guidelines.

The removal of native vegetation, particularly mature native trees and shrubs, would be avoided to the greatest extent practicable. Wherever practicable, impacted vegetation would be replaced with in-kind, on-site replacement/restoration of native vegetation. The use of non-native vegetation in landscaping and revegetation is discouraged. Locally adapted native species would be used. The use of seed mix that contains seeds from only locally adapted native species would occur.

Construction staging would be scheduled to avoid impacts to active nests of migratory birds or migratory bird breeding seasons to the maximum extent practicable, and to avoid the potential to disturb any breeding cave myotis bats. Prior to any construction activities, particular attention would be paid to the potential for birds and bats to be roosting in culverts, under bridges, and in old or abandoned houses and other structures.

Appropriate measures including the following would be taken to avoid adverse impacts on migratory birds: between October 1 and February 15, the contractor would remove all inactive migratory bird nests from any structures that would be affected by the proposed project, and complete any necessary vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests between February 15 and October 1, per the plan sheets. In the event that migratory birds are encountered on-site during project construction, adverse impacts to protected birds, active nests, eggs, and/or young would be avoided.

The use of cable median barriers, instead of concrete traffic barriers, would be considered when feasible to increase permeability for animals encountering barriers.

6.2.5.2 Threatened and Endangered Species

No direct effects to federally listed, proposed, or candidate species would be anticipated. One species that is under USFWS review (spot-tailed earless lizard) is unlikely to be adversely impacted by the project due to the implementation of species-specific BMPs. Contractors would be advised of its potential occurrence and would be advised to avoid impacts to this species.

Karst surveys have not been conducted in the portions of Hays and Caldwell Counties where the proposed project is located. There is anticipated to be no karst habitat with the project area. In the unlikely event that significant subsurface void space is encountered during the construction phase, work at that location would be halted immediately and the feature would be inspected promptly by a qualified karst biologist to determine the potential of that feature to provide habitat for listed karst species. Work at that location would not resume until the feature is verified to not provide suitable habitat for endangered karst invertebrates or until authorization to disturb the feature has been obtained from the USFWS through Section 7 consultation.

No terrestrial state-listed species or state species of concern are known to occur in the project area. No permanent loss of suitable habitat for any state-listed species or species of concern is expected as a result of the proposed project. One state-threatened species, the timber/canebrake rattlesnake, may occur in the project area. Contractors would be advised of its potential occurrence and would be advised to avoid impacts to this species. In general, temporary disturbance of normal behavior patterns of local animals and birds would be caused by the noise and physical activities of work crews.

The proposed project could impact several SGCN. Species-specific BMPS would be implemented to minimize the potential of impacts to these species. In general, temporary disturbance of normal behavior patterns of local animals and birds would be caused by the noise and physical activities of work crews. However, no permitting or mitigation is necessary for these species as there are no regulatory protections in place for these species.

Disturbances to unlisted or otherwise unprotected wildlife species would not necessitate mitigation above and beyond that currently proposed.

6.2.6 Archeological Resources

In the unlikely event that evidence of archeological deposits is encountered during construction, work in the immediate area would cease and TxDOT archeological staff would be contacted to initiate accidental discovery procedures under the provisions of the PA among TxDOT, the THC, the FHWA, and the ACHP, and the MOU between TxDOT and the THC.

The undertakings area of potential effects has been subject to a 100% pedestrian survey investigation that was conducted by professional archeologists under Texas Antiquities Permit No. 6936. This investigation culminated in the discovery of two archeological sites (41HY493 and 41HY494) located within the project area. An analysis of features, artifacts, and historical documents resulted in the determination that these two sites are not significant. On January 18, 2015, the Texas State Historic Preservation Officer concurred with TxDOT recommendations that the portions of sites 41HY493 and 41HY494 overlapping onto the project area do not contribute

to either site's eligibility for listing on the National Register of Historic Places and do not warrant designation as State Antiquities Landmarks. In addition the Texas State Historic Preservation Officer also concurred with TxDOT recommendations that the inventory of the undertaking's area of potential effects is complete, for a finding of "no historic archeological properties affected", no further work or consultation is required, and the project may proceed with construction. A copy of the Section 106 and Antiquities Code of Texas correspondence is attached to this Environmental Assessment in **Appendix G**.

6.2.7 Hazardous Materials

During a field survey of the proposed project ROW on July 16, 2014, an abandoned complex of farm buildings with at least one solution jar of DDT inside was found by the field team (see **Figure 4.8-5**). Further investigation of the site revealed that the outbuildings of the farm may have been used as cattle dipping vats in the 1960s. Additional investigation in the farm outbuildings would be required to confirm if contamination would be encountered during construction. If contamination were confirmed, then TxDOT would develop appropriate soils and/or groundwater management plans for activities within these areas.

If hazardous constituents are unexpectedly encountered in the soil and/or shallow groundwater during construction operations, appropriate measures for the proper assessment, remediation, and management of the contamination would be initiated in accordance with applicable federal, state, and local regulations. Appropriate soils and/or groundwater management plans for activities within these areas would be developed. Special provisions or contingency language would be included in the proposed project's plans, specifications, and estimates (PS&E) to handle hazardous materials and/or petroleum contamination according to applicable state, federal, and local regulations per TxDOT Standard Specifications. Hazardous items that require special handling would be removed only by certified and licensed abatement contractors having documentation of prior acceptable work.

The contractor would take appropriate measures to prevent, minimize, and control the spill of fuels, lubricants, and hazardous materials in the construction staging areas. All spills, including those of less than 25 gallons, would be cleaned immediately and any contaminated soil would be immediately removed from the site and be disposed of properly. Designated areas would be identified for spoils disposal and materials storage. The areas would be protected from inflow and runoff. All materials being removed and/or disposed of by the contractor would be done in accordance with state and federal laws and by the approval of the TxDOT Project Engineer.

The project's PS&E would disclose areas of asbestos and lead-based paint which could be disturbed. Special provisions would be developed in the PS&E for asbestos-related activities, notifications, required licenses, and monitoring in accordance with Texas Asbestos Health

Protection (TAHPA) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) regulations. Should asbestos-containing materials or lead-based paint be unexpectedly encountered, then appropriate sampling, abatement and disposal activities would be performed in accordance with the TAHPA, NESHAPS, TCEQ and EPA regulations.

6.3 Recommendation for Alternative Selection and Finding of No Significant Impact

The engineering, social, economic, and environmental investigations conducted thus far on the proposed project indicate that it would result in no significant impacts to the quality of the natural and human environment. A Finding of No Significant Impact (FONSI) is anticipated.

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8 LIST OF ABBREVIATIONS

AADT	Annual Average Daily Traffic
AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
ACT	Antiquities Code of Texas
AMSL	Above Mean Sea Level
AOI	Area of Influence
APAR	Affected Property Assessment Report
APE	Area of Potential Effect
ASTM	American Society for Testing and Materials
BMP	Best Management Practice
CAA	Clean Air Act
CAC	Clean Air Coalition
CALF	Closed & Abandoned Landfill Inventory
CAMPO	Capital Area Metropolitan Planning Organization
CAPCOG	Capital Area Council of Governments
CARTS	Capital Area Rural Transportation System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CGP	Construction General Permit
CISD	Consolidated Independent School District
CMP	Congestion Management Process
COC	Chemical of Concern
CR	County Road
CWA	Clean Water Act

dB	Decibels
dB(A)	A-Weighted Decibels
DDT	Dichlorodiphenyltrichloroethane
DFIRM	Digital Flood Insurance Rate Map
DHHS	Department of Health and Human Services
EA	Environmental Assessment
EAC	Early Action Compact
EJ	Environmental Justice
EMST	Ecological Mapping System of Texas
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETJ	Extraterritorial Jurisdiction
FEMA	Federal Emergency Management Agency
FM	Farm-to-Market
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
HCTP	Hays County Transportation Plan
HEI	Health Effects Institute
I-	Interstate Highway
IP	Individual Permit
IRIS	Integrated Risk Information System
ISA	Initial Site Assessment
LCRA	Lower Colorado River Authority
LEP	Limited English Proficiency
Leq	Equivalent Sound Level

LOS	Level of Service
LPST	Leaking Petroleum Storage Tank
LWCA	Land and Water Conservation Act
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emission Simulator
MPH	Miles per Hour
MSA	Metropolitan Statistical Area
MSAT	Mobile Source Air Toxics
MUD	Municipal Utility District
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NATA	National Air Toxics Assessment
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NHD	National Hydrography Dataset
NHL	National Historic Landmark
NOV	Notice of Violations
NRCS	Natural Resources Conservation Service
NOI	Notice of Intent
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWP	Nationwide Permit
OHWM	Ordinary High Water Mark
O3	Ozone

PA-TU	Programmatic Agreement for Transportation Undertakings
PCN	Pre-Construction Notification
PCWPP	Plum Creek Watershed Protection Plan
PM	Particulate Matter
PS&E	Plans, Specifications & Estimates
PST	Petroleum Storage Tank
RCRA	Resource Conservation and Recovery Act
RHCP	Regional Habitat Conservation Plan
ROE	Right-of-Entry
ROW	Right-of-Way
RRC	Railroad Commission of Texas
RSA	Resource Study Area
RTP	Regional Transportation Plan
SAL	State Antiquities Landmark
SGCN	Species of Greatest Conservation Need
SH	State Highway
SHPO	State Historic Preservation Officer
SUD	Special Utility District
SW3P	Stormwater Pollution Prevention Plan
TAC	Texas Administrative Code
TAHPA	Texas Asbestos Health Protection
TCEQ	Texas Commission on Environmental Quality
TCMP	Texas Coastal Management Program
TERP	Texas Emissions Reduction Plan
TES	Texas Engineering Solutions
THC	Texas Historical Commission
TIP	Transportation Improvement Program

TPWD	Texas Parks and Wildlife Department
TRRP	Texas Risk Reduction Program
TSSWCB	Texas State Soil and Water Conservation Board
TxDOT	Texas Department of Transportation
TxNDD	Texas Natural Diversity Database
TXSDC	Texas State Data Center
TWDB	Texas Water Development Board
UR	Under Review
USACE	U.S. Army Corp of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VCP	Voluntary Cleanup Program
VMT	Vehicle Miles Travelled
VPD	Vehicles Per Day
WSC	Water Supply Corporation

9 LIST OF PREPARERS

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APPENDIX A
PLANNING DOCUMENTS

Road Projects (continued)

ID	Sponsor	Cosponsor	County	Project	Limits/Location	Description	Let Year	YOE Cost (Millions)	Funding Source
179	Buda		Hays	FM 2001	IH 35 - SH 21	Widen to 4-lane divided	2017	$15.6	Local
180	Lockhart		Caldwell	FM 2001 Expansion / Silent Valley Rd	.14 Miles south of SH 142 - Silent Valley Rd	Northward extension of City Line Road from a point .14 miles south of SH 143 to intersect Silent Valley Road	2040	$1.2	Local
181	Travis		Travis	FM 2304 (Manchaca Rd)	FM 1626 - Ravenscroft Drive	Improve to MAD-4	2020	$12.0	Regional
182	Hays	San Marcos	Hays	FM 2439 / Hunter Rd	Bishop - RM 12/Wonder World Dr	MAD-2	2020	$3.6	Local
183	San Marcos		Hays	FM 2439 / Hunter Rd	SH 80 - Bishop	MNR-2	2020	$4.4	Local
184	Hays		Hays	FM 2439 / Hunter Rd	Centerpoint Rd - Comal County Line	MAD-4	2025	$5.2	Local
185	Buda		Hays	FM 2770	FM 1626 - Main St	Widen to 4-lane undivided	2024	$20.4	Local
186	Kyle		Hays	FM 2770	FM 1626 - FM 150	MAD-4	2025	$20.5	Local
187	Travis		Travis	FM 3238 (Hamilton Pool Rd)	east side of Pedernales River - RM 12	Improve to MAD-2	2018	$23.1	Local
188	Travis		Travis	FM 3238 (Hamilton Pool Rd)	RM 12 - SH 71 W	Improve to MAD-2	2025	$40.0	Local
189	Williamson		Williamson	FM 3405	US 183 - RM 2338	Widen from 2 lanes to 4 lanes	2015	$24.8	Local
190	Hays		Hays	RM 12	FM 150 W - Winters Mill Pkwy	MAD-2	2025	$61.0	Local
191	Hays		Hays	RM 12	FM 3237 - RM 32	MAD-2	2025	$24.5	Local
192	Hays		Hays	RM 12	Fitzhugh Rd - FM 150 W	MAD-4	2025	$5.8	Local
193	Hays		Hays	RM 12	FM 2439/Hunter Rd - SH 123	MAD-6	2025	$4.5	Local
194	Hays		Hays / Travis	RM 12	FM 3238 - Fitzhugh Rd	MAD-2	2025	$11.6	Local
195	Hays		Hays	RM 12	Winters Mill - FM 3237	MAD-2; designate as BR 12	2025	$11.7	Local
196	Hays		Hays	RM 12	RM 32 - Old RR 12/SH 80	PKWY-4	2025	$96.2	Local
197	Wimberley		Hays	RM 12 and FM 3237 Intersection Improvement	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	2016	$0.4	Regional
198	Hays		Hays	RM 32	Comal County Line - RM 12	MAD-2	2030	$25.9	Local
199	Cedar Park	TxDOT	Williamson	RM 620	Pecan Park Blvd - Anderson Mill Road	Improve to MAD-6	2025	$25.0	Regional
200	Travis		Travis	RM 620	Anderson Mill Rd. - SH 71 W	Widen to MAD-6	2025	$52.0	Regional
201	Travis		Travis	RM 620 Bypass	620 - RR 2222	3 lanes, 2-lane west, 1 east	2020	$8.0	Local
202	Buda	TxDOT	Hays	RM 967	Goforth Rd - IH 35	Widen to 4-lane undivided	2017	$17.3	Local
203	Williamson		Williamson	RM 1431	Sam Bass - IH 35	Reconstruct and widen to 6 lane divided	2025	$39.8	Regional

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
AUSTIN	HAYS	1776-02-900	FM 2001	C,E,R	City of Buda	Hays County	**$34,626,340**

PROJECT TYPE: Roadway

REV DATE:
MPO PROJECT ID:
FUNDING CATEGORY:
MTP REFERENCE:

LIMITS FROM: IH 35
LIMITS TO: SH 21
TIP DESCRIPTION: Widen to 4-lane divided and realign

REMARKS: Map ID 20: Approved in the Pass Through Finance Program for $16,000,000
BICYCLE/PEDESTRIAN: Sidewalks and wide outside lanes on urban section from IH 35 to east of Hillside Terrace. Bicycles on shoulders for rural section east of Hillside Terrace to SH 21.

Project History:

Total Project Cost Information:		**Cost of Approved Phases:**
Preliminary Engineering:	$1,000,000	
Right Of Way:	$840,200	
Construction:	$28,022,400	**$34,626,340**
Construction Engineering:	$1,961,500	
Contingencies:	$2,802,240	
Indirects:		
Bond Financing:		
Total Project Cost:	**$34,626,340**	

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	**Funding By Category**
12	$12,800,000	$3,200,000				$16,000,000
Local				$18,626,340		$18,626,340
Funding by Share:	$12,800,000	$3,200,000		$18,626,340		**$34,626,340**

DISTRICT	COUNTY	CSJ	HWY	PHASE	CITY	PROJECT SPONSOR	YOE COST
AUSTIN	HAYS	3542-02-900	FM 110	C,E,R	City of San Marcos	Hays County	**$61,500,000**

PROJECT TYPE: Roadway

REV DATE:
MPO PROJECT ID:
FUNDING CATEGORY:
MTP REFERENCE:

LIMITS FROM: IH 35 @ Yarrington
LIMITS TO: SH 123
TIP DESCRIPTION: Construct 2 lanes with shoulders and grade separations

REMARKS: Map ID 22: Seeking $48 million loan from the State Infrastructure Bank
BICYCLE/PEDESTRIAN: Bicycles accommodated on shoulders. Sidewalks will be provided by developers as required.

Project History:

Total Project Cost Information:		**Cost of Approved Phases:**
Preliminary Engineering:	$5,000,000	
Right Of Way:	$8,500,000	
Construction:	$48,000,000	**$61,500,000**
Construction Engineering:		
Contingencies:		
Indirects:		
Bond Financing:		
Total Project Cost:	**$61,500,000**	

Authorized Funding by Category/Share:

	Federal	State	Regional	Local	Local Contribution	**Funding By Category**
12-SIB		$48,000,000				$48,000,000
Local				$13,500,000		$13,500,000
Funding by Share:		$48,000,000		$13,500,000		**$61,500,000**

APPENDIX B
PHOTO LOG

APPENDIX B – PHOTO LOG

Photo 1: Typical upland vegetation near a small riparian area in the northwestern portion of the proposed ROW.

Photo 2: Typical upland vegetation in the northwestern portion of the proposed ROW.

Photo 3: The majority of the undeveloped portions of the project area are used for grazing livestock. Many areas appear overgrazed or otherwise disturbed.

Photo 4: Typical upland habitat in the proposed ROW.

Photo 5: Several small streams pass beneath the existing ROW in culverts.

Photo 6: Many of these streams do not have continuous OHWMs and would therefore not be considered jurisdictional.

Photo 7: Mesquite scrublands were common throughout the proposed ROW.

Photo 8: Wetland areas were generally associated with stock ponds.

Photo 9: Erosion of existing streams was observed throughout the proposed and existing ROW.

Photo 10: Typical upland habitat in the southeastern portion of the proposed ROW.

Photo 11: Typical upland habitat in the southeastern portion of the proposed ROW.

Photo 12: The interior of a building that may have been used as a cattle dipping facility where it is probable that DDT was used.

APPENDIX C
EXISTING AND PROPOSED TYPICAL SECTIONS

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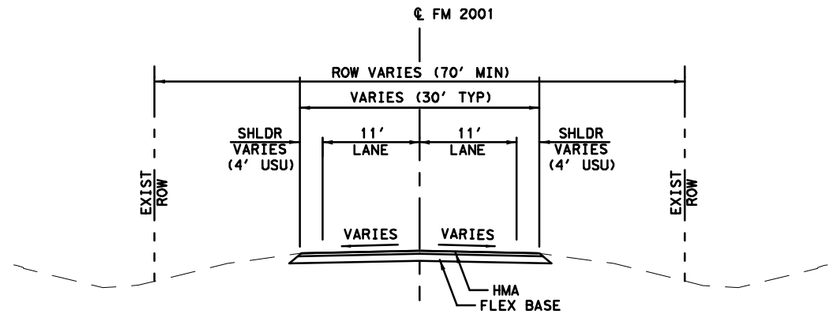

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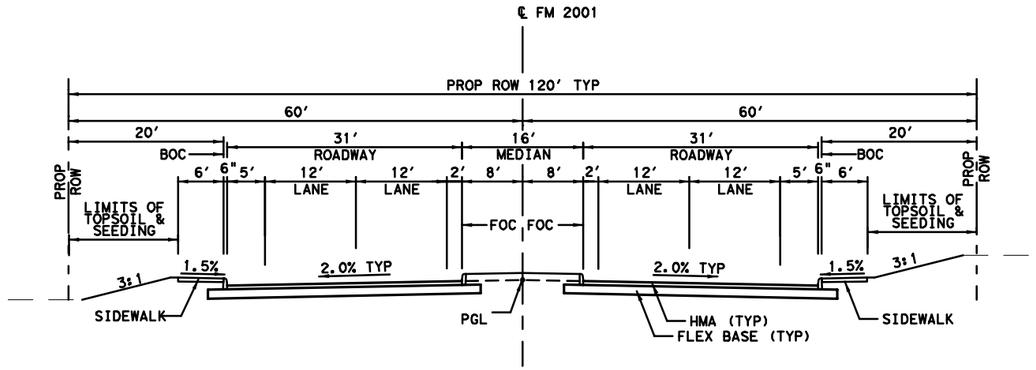
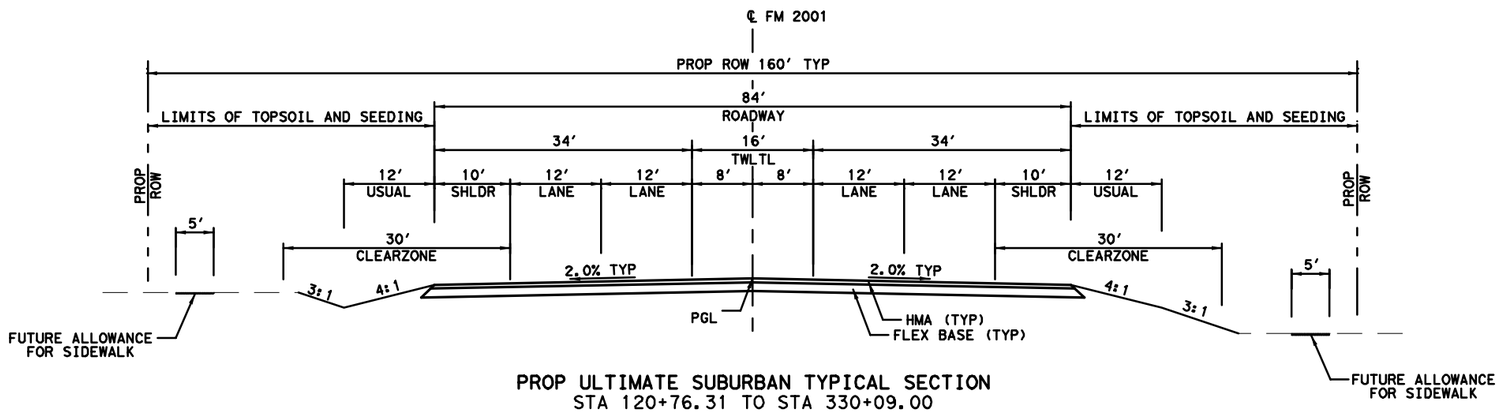


PROP ULTIMATE URBAN TYPICAL SECTION
STA 47+30.94 TO STA 120+76.31
STA 330+09.00 TO STA 435+65.00



PROP ULTIMATE SUBURBAN TYPICAL SECTION
STA 120+76.31 TO STA 330+09.00

PRELIMINARY
FOR REVIEW ONLY
Not for construction, bidding, or permit purposes.
Kimley»Horn
Firm Registration No: 928
Engineer: BRIAN C. BOECKER
P.E. No. 94886 Date: 9/27/2016

TEXAS FIRM F-928
Kimley»Horn

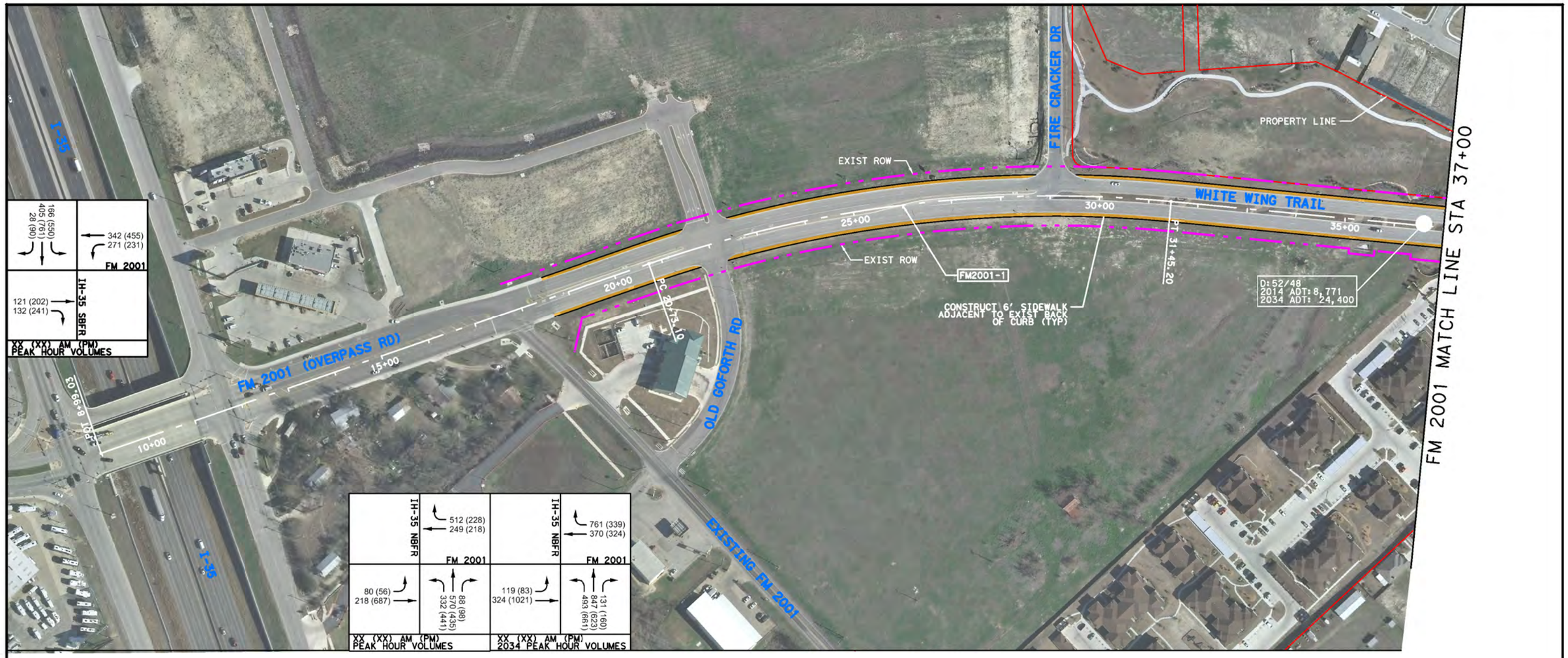
Texas Department of Transportation

FM 2001

TYPICAL SECTIONS

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6			FM 2001
STATE	DIST.	COUNTY	SHEET NO.
TEXAS	AUSTIN	HAYS	
CONT.	SECT.	JOB	
1776	02	018	

APPENDIX D
PROPOSED SCHEMATIC



LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

0 100 200

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TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
BEGIN PROJECT
TO
STA 37+00

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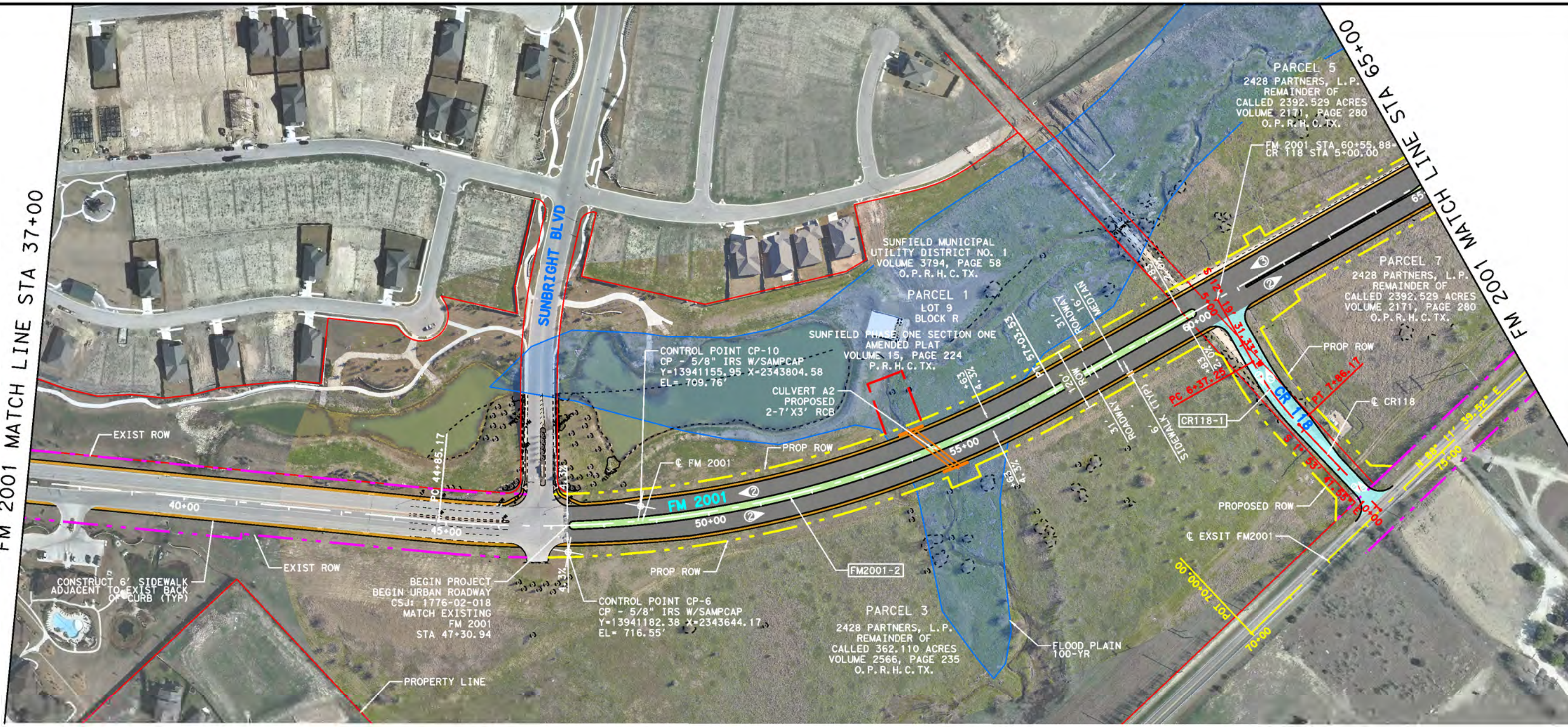

LEGEND	
	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

N

0 100 200

TEXAS FIRM F-928

Kimley»Horn

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FM 2001
PRELIMINARY SCHEMATIC
STA 37+00
TO
STA 65+00

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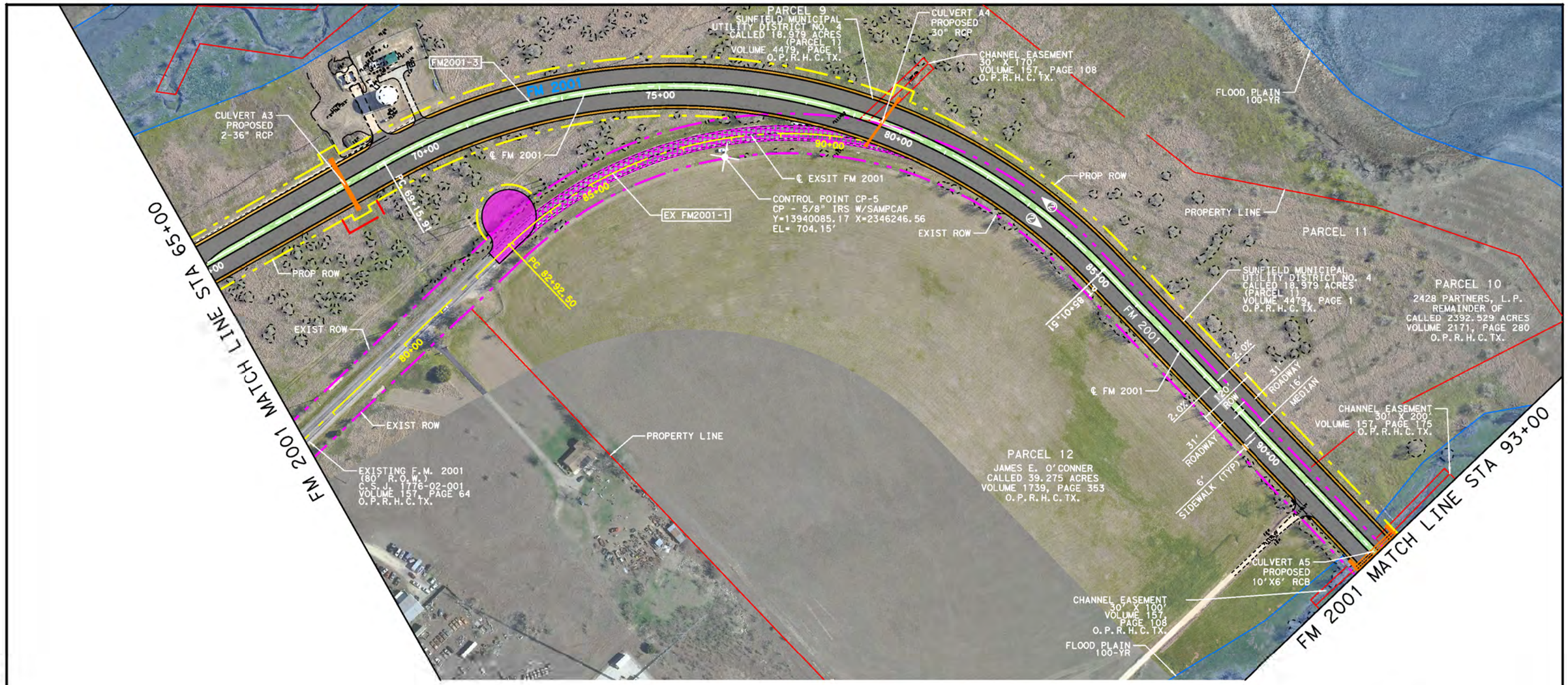

LEGEND	
	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

0 100 200

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TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
STA 65+00
TO
STA 93+00

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FM 2001 MATCH LINE
STA 93+00
PROPERTY LINE
SUNFIELD MUNICIPAL UTILITY DISTRIC NO. 4 CALLED 0.224 ACRE (PARCEL 2) VOLUME 4479, PAGE 1 O.P.R.H.C.TX.
FLOOD PLAIN 100-YR
PROP ROW
CHANNEL EASEMENT 30' X 100' VOLUME 157, PAAGE 108 O.P.R.H.C.TX.
EXIST ROW
PARCEL 17
2428 PARTNERS, L.P. REMAINDER OF CALLED 2392.529 ACRES VOLUME 2171, PAGE 280 O.P.R.H.C.TX.
95+00
100+00
105+00
110+00
115+00
120+00
PC 102+78.13
PT 106+86.80
FM2001-4
6' SIDEWALK (TYP)
31' ROADWAY
16' MEDIAN
120' ROW
2.0%
FM 2001
℄ FM 2001
SATTERWHITE
SAT-1
℄ SAT
POT 10+00.00
CARL DOUGLAS GOULD CALLED 0.68 ACRE VOLUME 1061, PAGE 203 O.P.R.H.C.TX.
FM 2001 STA 111+90.48= SATTERWHITE STA 13+63.28
PARCEL 21
PT 13+44.41
PARCEL 22
ETHEL JOHNSON GOULD CALLED 7.25 ACRES (SHARE NO. ONE) VOLUME 459, PAGE 741 R.P.R.H.C.TX.
PARCEL 26
WILLIAM M. JOHNSON CALLED 7.24 ACRES (SHARE NO. TWO) VOLUME 459, PAGE 741 R.P.R.H.C.TX.
FM2001-5
END URBAN ROADWAY
BEGIN SUBURBAN ROADWAY
STA 120+36.21
FM 2001 STA 119+94.44= HILLSIDE STA 22+04.51
PC 20+38.87
EX FM2001-2
HIL-1
℄ HIL
CN1-1
℄ CN-1
HILLSIDE TERRACE
PARCEL 19
JAMES B. OLIVER CALLED 20.00 ACRES VOLUME 371, PAGE 824 D.R.H.C.TX.
PARCEL 20
MARK JAN ENDICOTT AND WIFE, NASARIA ENDICOTT CALLED 5.255 ACRES (TRACT ONE) VOLUME 305, PAGE 751 VOLUME 305, PAGE 756 D.R.H.C.TX.
PARCEL 23
WILLIE C. DAVILLA EMMA G. DAVILLA CALLED 5.45 ACRES VOLUME 565, PAGE 253 R.P.R.H.C.TX.
PARCEL 24
DANNY D. DAVILLA CALLED 1.00 ACRE VOLUME 855, PAGE 529 O.P.R.H.C.TX.
PARCEL 25
DANNY D. DAVILLA REGINA DAVILLA CALLED 5.00 ACRE VOLUME 4110, PAGE 793 O.P.R.H.C.TX.
PARCEL 28
THOMAS M. HATFIELD CALLED 38.137 ACRES (PARCEL ONE) VOLUME 2262, PAGE 495 O.P.R.H.C.TX.
FM 2001 MATCH LINE STA 122+00
0 100 200

LEGEND

	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

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Kimley»Horn TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
STA 93+00
TO
STA 122+00

PROPERTY LINE

PARCEL 27
WILLIAM M. JOHNSON
JAMES D. PFLUGER
CALLED 5.00 ACRES
VOLUME 570, PAGE 147
R.P.R.H.C.TX.

PARCEL 29
TOPE DEVELOPMENT, L.P.
CALLED 101.996 ACRES
VOLUME 2823, PAGE 265
O.P.R.H.C.TX.

PARCEL 32
NELL D. SYKES
CALLED 19.095 ACRES
VOLUME 1208, PAGE 196
O.P.R.H.C.TX.

PARCEL 33
BILLIE JO WILSON
CALLED 65.47 ACRES
VOLUME 886, PAGE 832
O.P.R.H.C.TX.

PARCEL 33
BILLIE JO WILSON
CALLED 7.61 ACRES
VOLUME 886, PAGE 832
O.P.R.H.C.TX.

FM 2001 MATCH LINE STA 122+00

FM 2001 MATCH LINE STA 149+00

FM2001-5

FM2001-6

FM2001-7

CHANNEL EASEMENT
30' X 200'
VOLUME 157, PAGE 116
O.P.R.H.C.TX.

CULVERT C2
PROPOSED
8'X4' RCB

CULVERT C3
PROPOSED
5'x3' RCB

CULVERT C4
PROPOSED
5'x4' RCB

℄ FM 2001

℄ EXIST FM 2001

EXIST ROW

PROP ROW

EXIST STRUCTURE TO BE DEMOLISHED

FM 2001

CONNECT 1

CN1-2

PC 128+84.55

PT 125+36.55

PC 139+25.40

PT 136+11.99

PI 146+56.94

25+00

130+00

135+00

140+00

145+00

+70 2.0%

+10 2.5%

+51 2.5%

+88 2.0%

+83 2.0%

84' ROADWAY

160' ROW

0 100 200

LEGEND

	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

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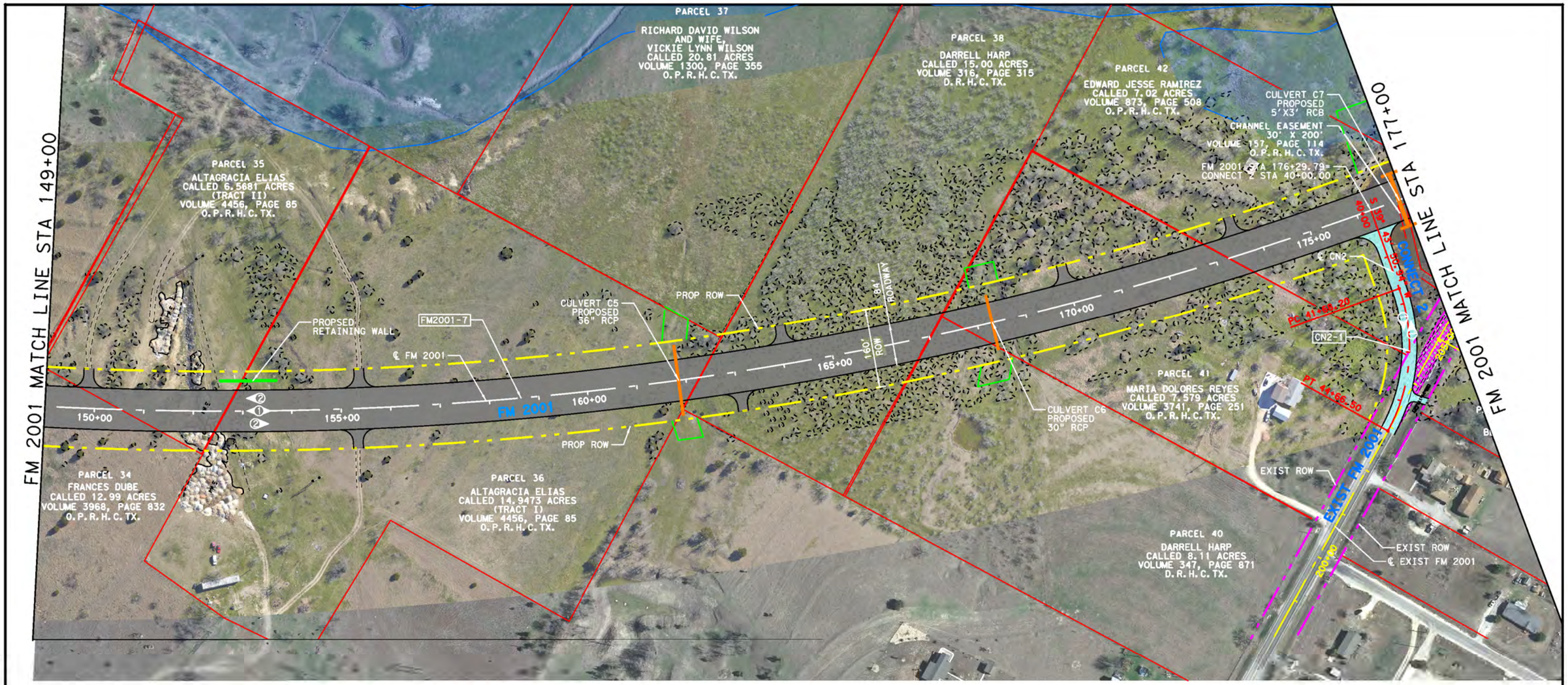
Kimley»Horn
TEXAS FIRM F-928

Texas Department of Transportation

FM 2001
PRELIMINARY SCHEMATIC
STA 122+00
TO
STA 149+00



LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

0 100 200

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FM 2001
PRELIMINARY SCHEMATIC
STA 149+00
TO
STA 177+00

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PARCEL 56
DAVID CUDDY
CALLED 54.142 ACRES
(TRACT 1)
VOLUME 2806, PAGE 90
O.P.R.H.C.TX.

CHANNEL EASEMENT
30' X 200'
VOLUME 157, PAGE 413
O.P.R.H.C.TX.

EX FM2001-4

PC 231+02.33

PT 240+33.68

℄ EXIST FM 2001

245+00

240+00

PROP ROW

FLOOD PLAIN
100-YR

EXIST ROW

135+00

CULVERT C9
PROPOSED
30" RCP

℄ FM 2001

CULVERT C10
PROPOSED
2-8'X4' RCB

205+00

210+00

+14
28.5

+09
2.0%

FM2001-8

PROP ROW

FM 2001

215+00

PT 213+93.25

+14
3.8%

+09
2.0%

220+00

84'
ROADWAY

160'
ROW

PROP ROW

225+00

D:50/50
2014 ADT: 11,699
2034 ADT: 21,600

FM 2001 MATCH LINE STA 202+00

FM 2001 MATCH LINE STA 227+00

PARCEL 58
DAVID CUDDY
CALLED 190.258 ACRES
(TRACT 2)
VOLUME 2806, PAGE 90
O.P.R.H.C.TX.

FLOOD PLAIN
100-YR

LEGEND

	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

0 100 200

Kimley»Horn
TEXAS FIRM F-928

Texas Department of Transportation

FM 2001
PRELIMINARY SCHEMATIC
STA 202+00
TO
STA 227+00

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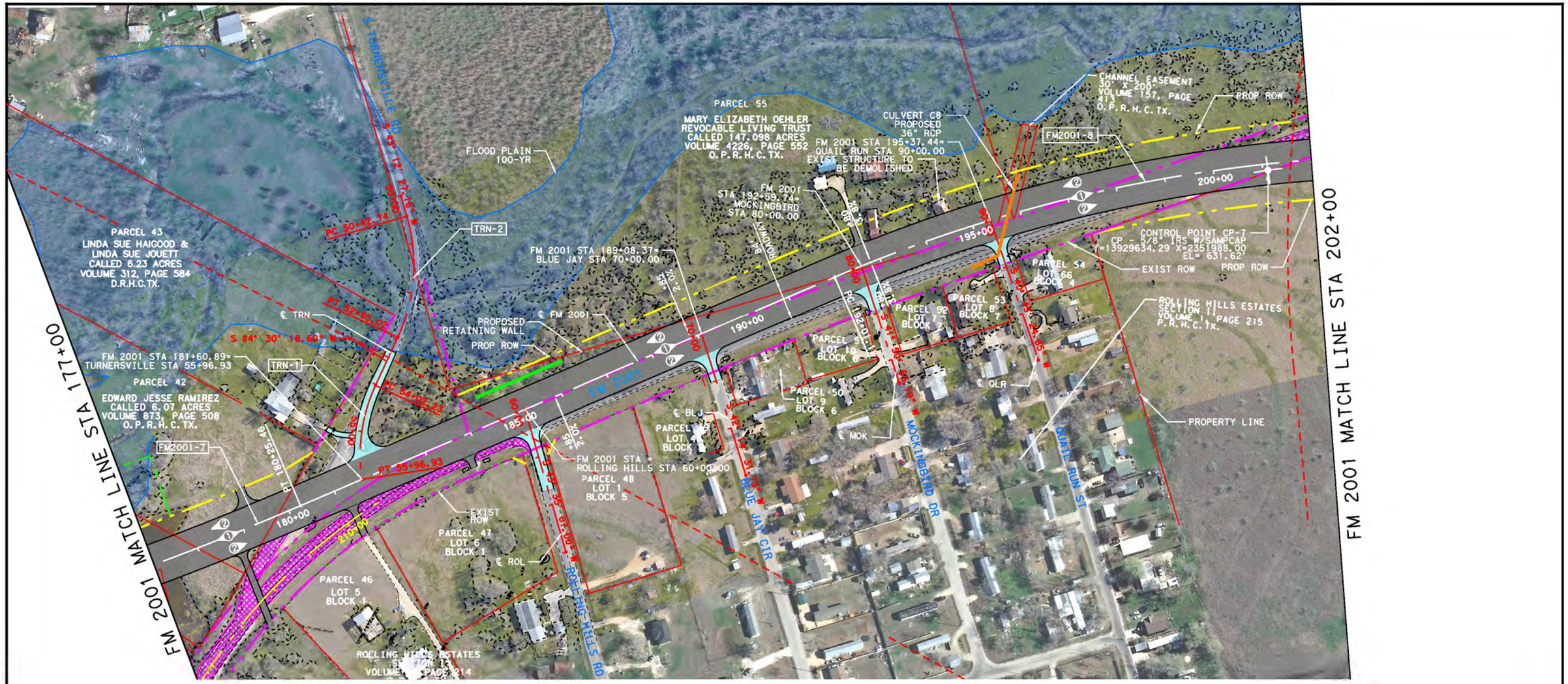

LEGEND

	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

Kimley»Horn
TEXAS FIRM F-928

Texas Department of Transportation

FM 2001
PRELIMINARY SCHEMATIC
STA 177+00
TO
STA 202+00

FILENAME: G:\069226901\FM 2001\DESIGN\ENV\cut sheets for EA\2001env07.dgn
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FM 2001 MATCH LINE
STA 227+00

PARCEL 59
STUDIO ESTATES, LLC
CALLED 102.87 ACRES
VOLUME 2556, PAGE 138
O.P.R.H.C.TX.

CONTROL POINT CP-3
CP - 5/8" IRS W/SAMPCAP
Y=13925574.59 X=2353648.98
EL= 618.74'

PARCEL 60
LOT 2
BLOCK C
STUDIO ESTATES SECTION 1
VOLUME 15, PAGE 185
P.R.H.C.TX.

GOFORTH RD

230+00
235+00
240+00
245+00
250+00
255+00

FM 2001

PROP ROW

PROPERTY LINE

2.0%
160' ROW
84' ROADWAY
2.0%

+05 2.0%
+05 2.0%

PC 244+77.49

+46 3.0%
+46 3.0%

FM 2001 STA 247+64.39=
GOFORTH STA 102+63.84

PROP ROW

FM2001-9

CULVERT D2
PROPOSED
3-7'X3' RCB

℄ GOF

℄ ROH

BOHDE RD

FM 2001 MATCH LINE STA 257+00

LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

0 100 200

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TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
STA 227+00
TO
STA 257+00

FILENAME: G:\069226901-FM 2001\DESIGN\ENV\cut sheets for EA\2001env09.dgn
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FM 2001 MATCH LINE STA 257+00

FM 2001 MATCH LINE STA 281+00

PARCEL 64
STEPHEN L. HOPKINS
CALLED 51.00 ACRES
VOLUME 281, PAGE 34
D.R.H.C.TX.

PARCEL 65
DAVID CUDDY
CALLED 150.58 ACRES
VOLUME 3188, PAGE 786
O.P.R.H.C.TX.

PARCEL 63
THOMAS E. BLACK, JR., TRUSTEE
CALLED 9.75 ACRES
VOLUME 2557, PAGE 728
O.P.R.H.C.TX.

PARCEL 62
H.C. KYLE III, TRUSTEE
CALLED 79.9 ACRES
VOLUME 144, PAGE 770
D.R.H.C.TX.

℄ FM 2001

FM 2001

FM2001-9

CULVERT D3
PROPOSED
24" RCP

CULVERT E
PROPOSED
30" RCP

CULVERT F
PROPOSED
30" RCP

CULVERT G
PROPOSED
24" RCP

PROP ROW

EXIST ROW

84' ROADWAY

160' ROW

260+00

265+00

270+00

275+00

280+00

R=1167+56.44

+88 3.0%

+29 2.0%

PROPERTY LINE

LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

N

0 100 200

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Kimley»Horn

Texas Department of Transportation
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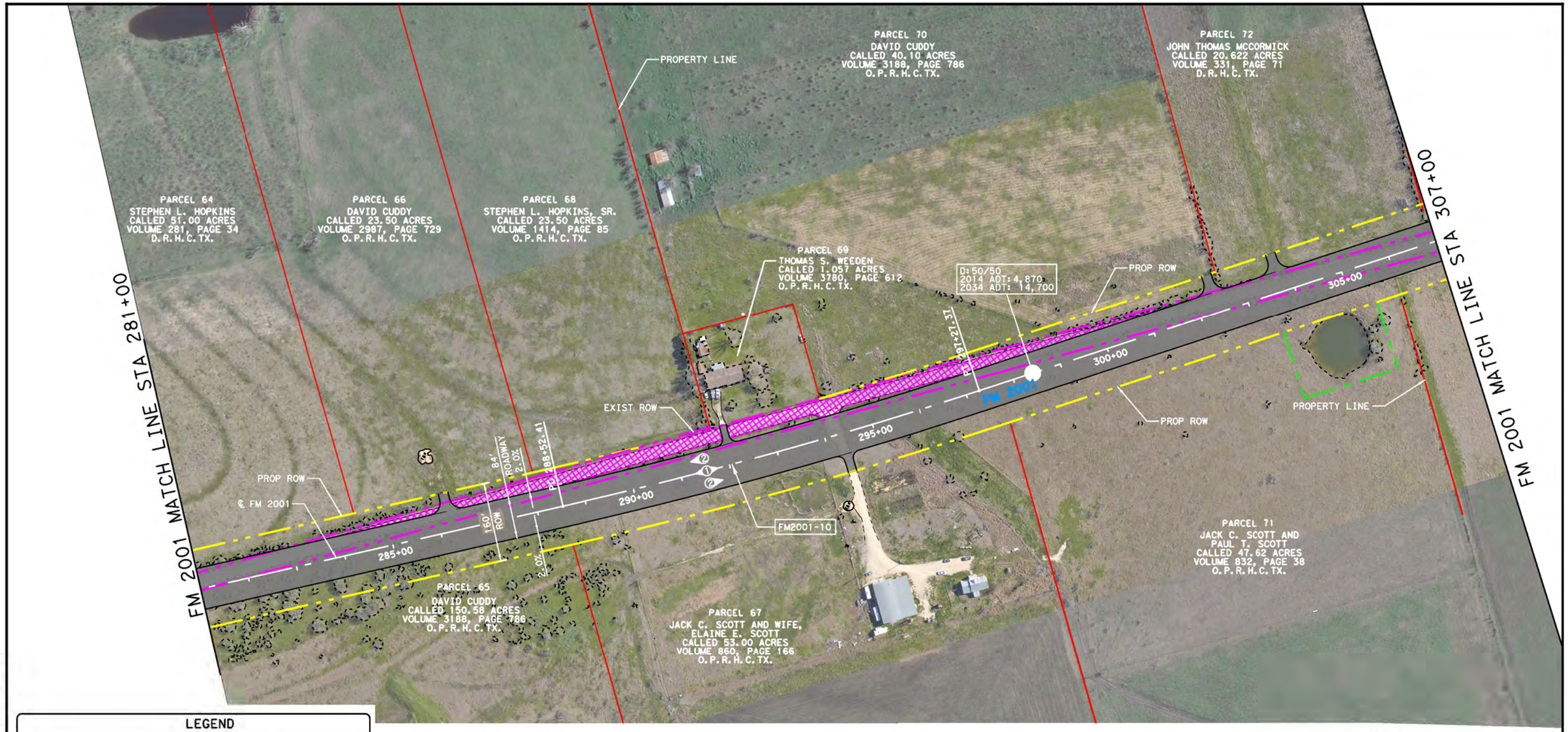
FM 2001
PRELIMINARY SCHEMATIC
STA 257+00
TO
STA 281+00



LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

0 100 200

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Texas Department of Transportation
© 2015

FM 2001
PRELIMINARY SCHEMATIC
STA 281+00
TO
STA 307+00

FILENAME: G:\069226901-FM 2001\DESIGN\ENV\out sheets for EA\2001env11.dgn
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FLOOD PLAIN 100-YR

BRUSHY CREEK

PARCEL 74
BEVERLY ELLIOTT AND RODNEY & DIANNE DUPREE
CALLED 41.244 ACRES
VOLUME 256, PAGE 617
D.R.H.C.TX.

PARCEL 74
BEVERLY ELLIOTT AND RODNEY & DIANNE DUPREE
CALLED 20.622 ACRES
VOLUME 265, PAGE 812
D.R.H.C.TX.

PARCEL 76
ERVIN EWALD ESTATE

FLOOD PLAIN 100-YR

CULVERT H
PROPOSED
2-36" RCP

END SUBURBAN ROADWAY
BEGIN URBAN ROADWAY
STA 330+18.55

℄ FM 2001

FM2001-11

FM 2001

EXIST ROW

CULVERT D1
PROPOSED
4-10'X'6 RCB

PROP ROW

PROP ROW

2.0%

2.0%

160' ROW

84' ROADWAY

PC=317+52.88

R=2121.66

BRUSHY CREEK

PARCEL 81A
LESLEY M. SIMPSON
CALLED 38.265 ACRES
VOLUME 709, PAGE 725
R.P.R.H.C.TX.

PARCEL 77
JOHN THOMAS MCCORMICK AND WIFE, CYNTHIA POTTS MCCORMICK
CALLED 13.00 ACRES
VOLUME 294, PAGE 223
D.R.H.C.TX.

PARCEL 75
JACK A. MAXWELL AND WIFE, BETTY JO MAXWELL
CALLED 125.52 ACRES
VOLUME 1749, PAGE 689
O.P.R.H.C.TX.

FM 2001 MATCH LINE STA 307+00

FM 2001 MATCH LINE STA 332+00

307+00
310+00
315+00
320+00
325+00
330+00

LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

N

0 100 200

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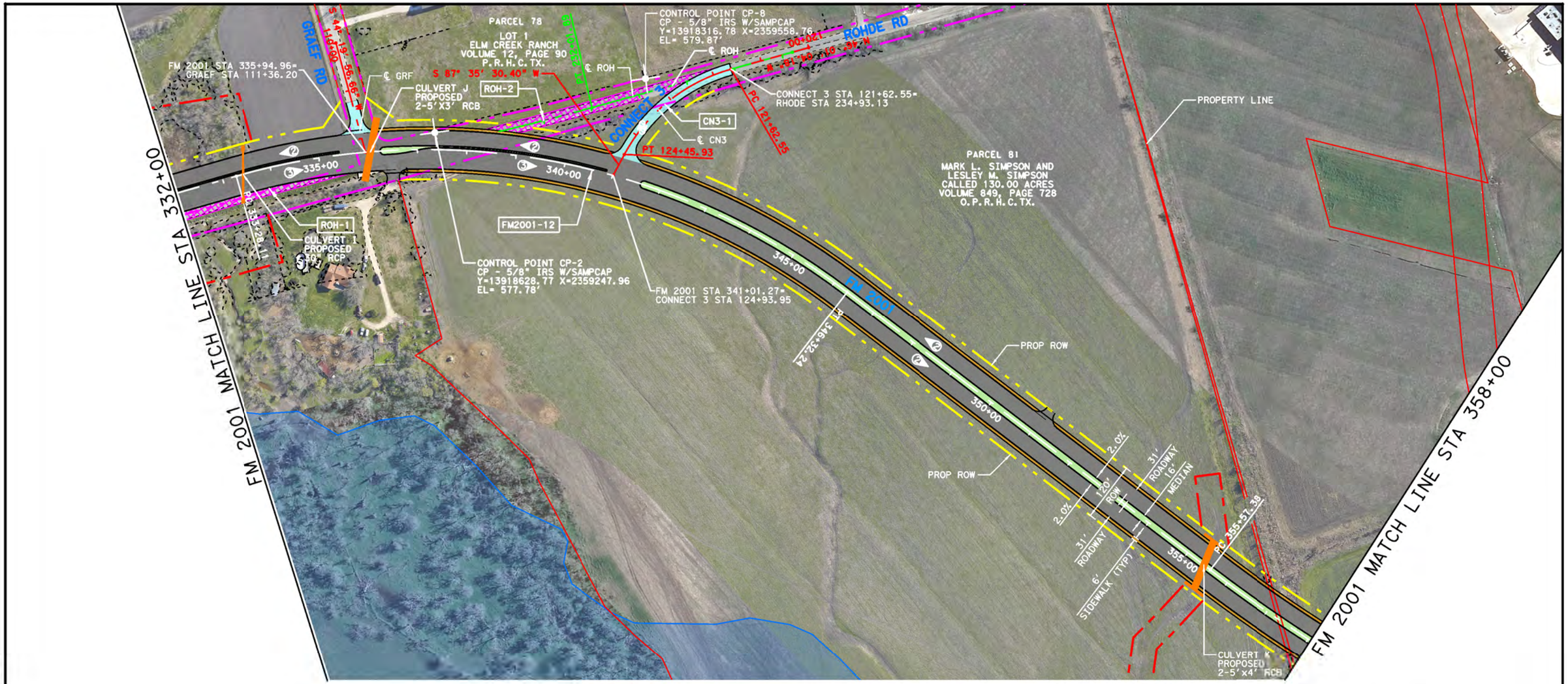
TEXAS FIRM F-928
Kimley»Horn

Texas Department of Transportation

FM 2001
PRELIMINARY SCHEMATIC
STA 307+00
TO
STA 332+00



LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

0 100 200

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TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
STA 332+00 TO STA 358+00

FILENAME: G:\069226901*FM 2001\DESIGN\ENV\out sheets for EA\2001env13.dgn
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FM 2001 MATCH LINE STA 358+00

FM 2001 MATCH LINE STA 386+00

PARCEL 82
WALTON TEXAS, LP
CALLED 532.84 ACRES
VOLUME 3410, PAGE 274
O.P.R.H.C.TX.

FUTURE LAS BRISAS BLVD

℄ FM 2001

360+00

365+00

370+00

375+00

380+00

385+00

FM2001-13

2.0%

120' ROW

31' ROADWAY

6' MEDIAN

6' SIDEWALK (TYP)

℄ LAB

TO BE CONSTRUCTED BY OTHERS

PROP ROW

CULVERT L
PROPOSED
2-5'X3' RCB

D: 60/40
2014 ADT: 5,275
2034 ADT: 12,220

FLOOD PLAIN
100-YR

PROPERTY LINE

PARCEL 83
CITY OF NIEDERWALD
CALLED 5.36 ACRES
VOLUME 1890, PAGE 190
O.P.R.H.C.TX.
THE WOODS OF BRUSHY CREEK
SECTON ONE, BLOCK P
VOLUME 10, PAGE 118
P.R.H.C.TX.

LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

N

0 100 200

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TEXAS FIRM F-928

Texas Department of Transportation
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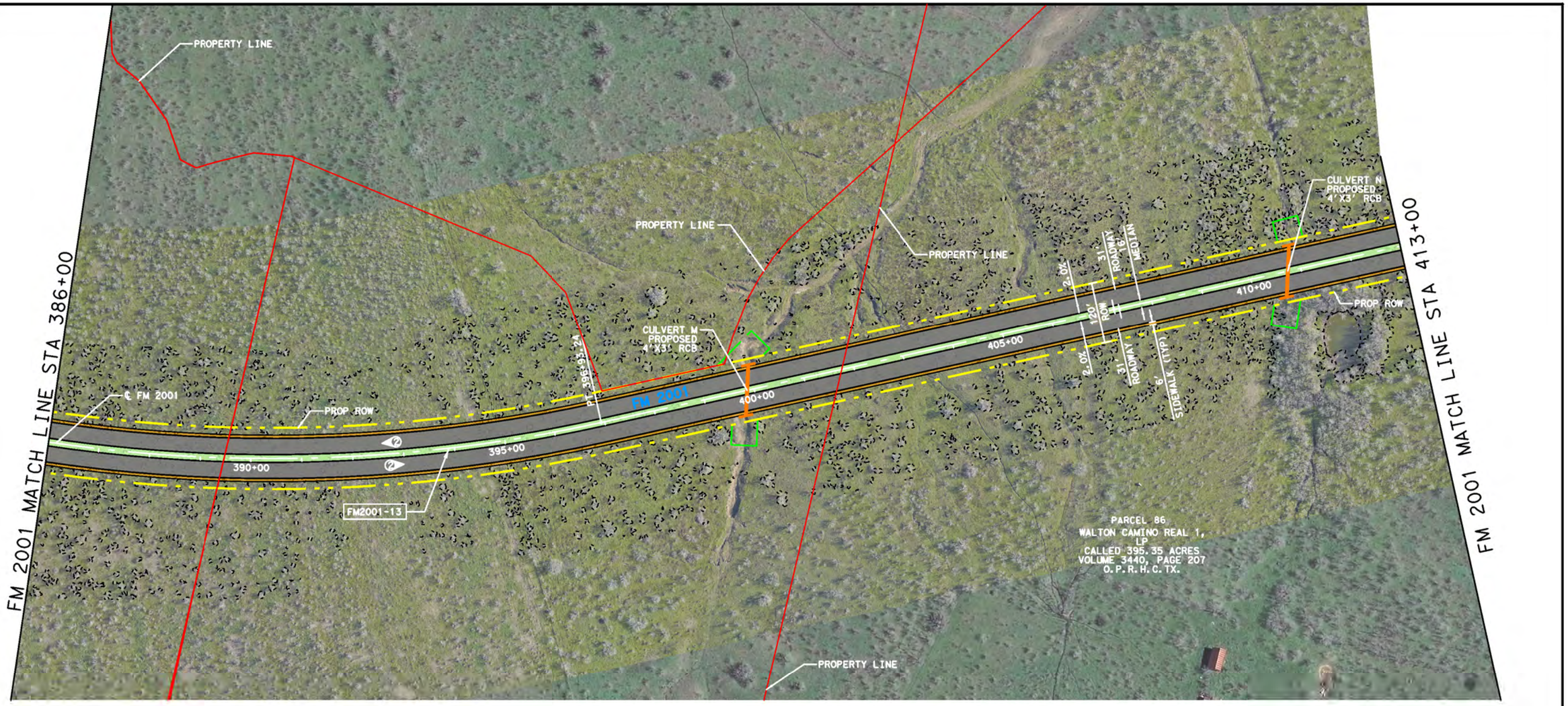
FM 2001
PRELIMINARY SCHEMATIC
STA 358+00
TO
STA 386+00



LEGEND

	PROPOSED PAVEMENT
	PROPOSED SIDEWALK
	PROPOSED CUL-DE-SAC
	PROPOSED CROSS STREET
	PROPOSED RAISED MEDIAN
	APPROX. 100 YEAR FLOOD PLAIN
	REMOVE EXISTING PAVEMENT
	EXISTING ROW
	PROPOSED ROW
	PROPOSED EASEMENT
	TEMPORARY EASEMENT

0 100 200

Kimley»Horn TEXAS FIRM F-928

Texas Department of Transportation

FM 2001
PRELIMINARY SCHEMATIC
STA 386+00
TO
STA 413+00

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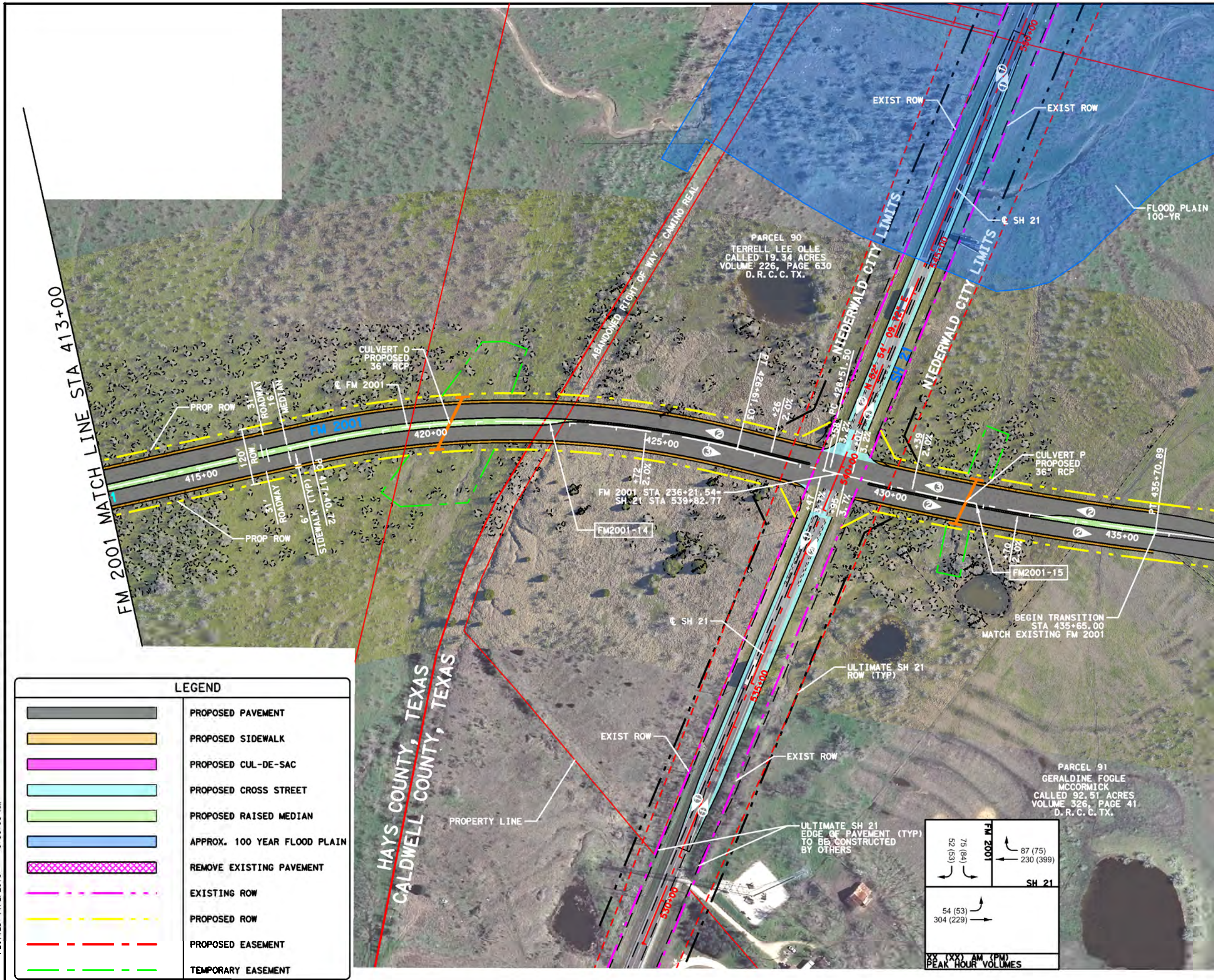

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TEXAS FIRM F-928

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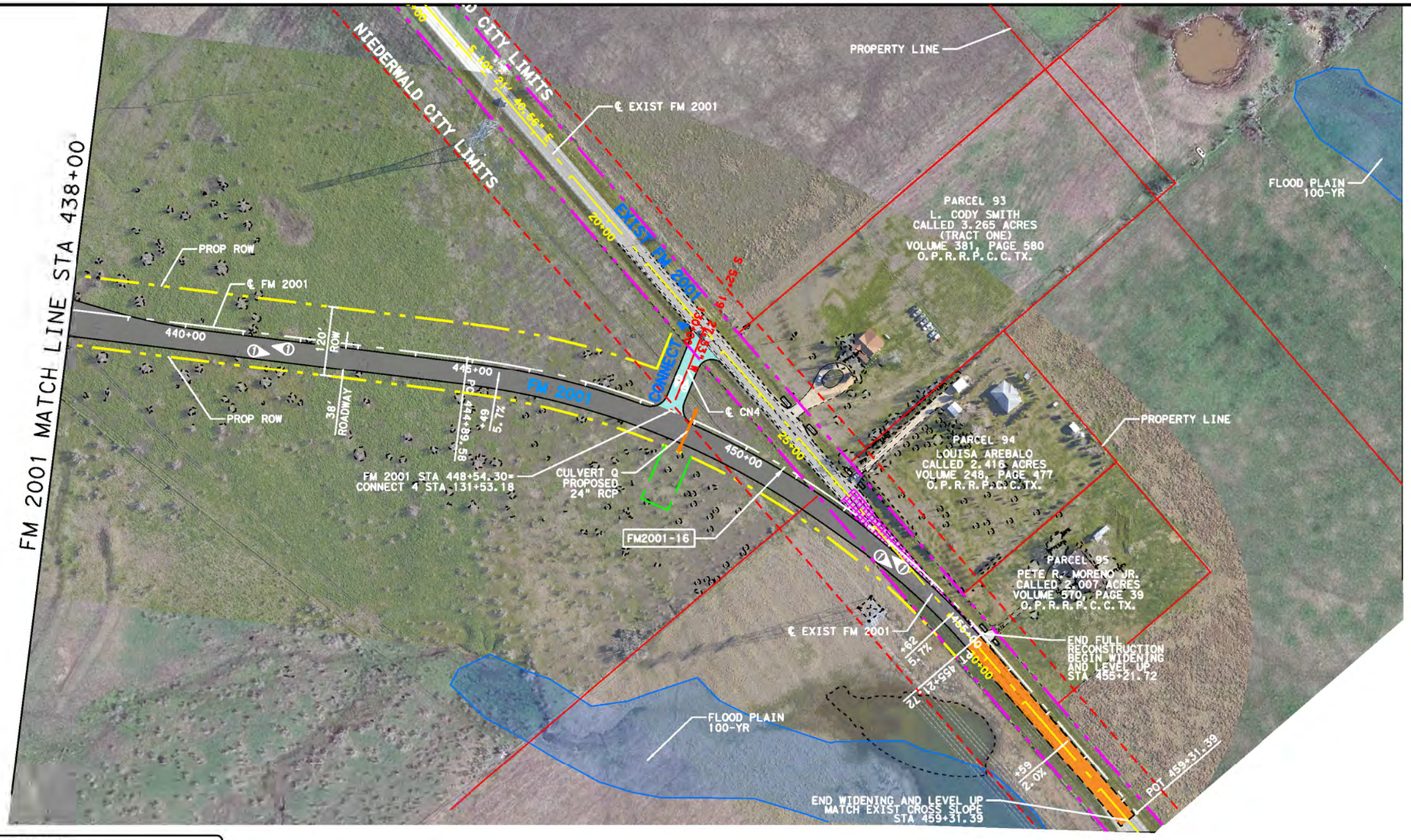
FM 2001
PRELIMINARY SCHEMATIC
STA 413+00
TO
STA 438+00



LEGEND

- PROPOSED PAVEMENT
- PROPOSED SIDEWALK
- PROPOSED CUL-DE-SAC
- PROPOSED CROSS STREET
- PROPOSED RAISED MEDIAN
- APPROX. 100 YEAR FLOOD PLAIN
- REMOVE EXISTING PAVEMENT
- EXISTING ROW
- PROPOSED ROW
- PROPOSED EASEMENT
- TEMPORARY EASEMENT

N

0 100 200

Kimley»Horn
TEXAS FIRM F-928

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FM 2001
PRELIMINARY SCHEMATIC
STA 438+00
TO
STA 458+00

FILENAME: G:\069226901\FM 2001\DESIGN\ENV\out sheets for EA\2001env17.dgn
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APPENDIX E
FARMLAND CONVERSION IMPACT RATING FORM
(AD-1006)

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request October 18, 2016	
Name of Project FM 2001 Roadway Improvements	Federal Agency Involved FHWA	
Proposed Land Use Transportation	County and State Hays and Caldwell Counties, Texas	
PART II *(To be completed by NRCS)*	Date Request Received By NRCS	Person Completing Form:

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☐	NO ☐	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %		Amount of Farmland As Defined in FPPA Acres: %	
Name of Land Evaluation System Used	Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	156.2			
B. Total Acres To Be Converted Indirectly	0			
C. Total Acres In Site	156.2			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)				

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	9			
2. Perimeter In Non-urban Use	(10)	7			
3. Percent Of Site Being Farmed	(20)	4			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	5			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	0			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	5			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	35	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	35	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	35	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☑ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \text{ X } 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

APPENDIX F
WETLAND DATA FORMS

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: June 16, 2014

Applicant/Owner: TxDOT State: TX Sampling Point: SP 1

Investigator(s): Mary Tibbets and Sarah Itz, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): J Lat: 30.056979 Long: -97.802341 Datum: NAD 83

Soil Map Unit Name: Water (W) NWI classification: PUBHh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 15')			
1. Ludwigia palustris	90	Y	OBL
2. Eleocharis montevidensis	5	N	FACW
3. Sagitarria sp.	1	N	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 4% (open water)	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 2	x 1 = 2
FACW species 1	x 2 = 2
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 3 (A)	4 (B)

Prevalence Index = B/A = 1.33

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	none					clayey loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Several holes were dug to check for the presence of hydric soil indicators. However, none were found in any of the soil pits.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 1”

Water Table Present? Yes X No ____ Depth (inches): 16”

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 16”

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: June 16, 2014

Applicant/Owner: TxDOT State: TX Sampling Point: SP 2

Investigator(s): Mary Tibbets and Sarah Itz, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): Concave Slope (%): 2

Subregion (LRR): J Lat: 30.037717 Long: -97.786384 Datum: NAD 83

Soil Map Unit Name: Heiden clay, 3 to 5 percent slopes, eroded (HeC3) NWI classification: PUBHh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 15')			
1. Eleocharis montevidensis	90	Y	FACW
2. Cyperus odorata	3	N	FACW
3. Juncus effuses	2	N	OBL
4. Helianthus annuus	1	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	96 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 4% (open water)	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 1	x 1 = 1
FACW species 2	x 2 = 4
FAC species _____	x 3 = _____
FACU species 1	x 4 = 4
UPL species _____	x 5 = _____
Column Totals: 4 (A)	9 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	85	10YR 3/6	15	C	PL, M		clayey loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes X No ____ Depth (inches): 6”

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0”

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: June 16, 2014

Applicant/Owner: TxDOT State: TX Sampling Point: SP 3

Investigator(s): Mary Tibbets and Sarah Itz, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): Convex Slope (%): 4

Subregion (LRR): J Lat: 30.037773 Long: -97.786399 Datum: NAD 83

Soil Map Unit Name: Heiden clay, 3 to 5% slopes, eroded (HeC3) NWI classification: PUBHh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1. Prosopis glandulosa	40	Y	FACU
2.			
3.			
4.			
5.			
	40 = Total Cover		
Herb Stratum (Plot size: 15')			
1. Cynodon dactylon	20	Y	FACU
2. Phyla nodiflora	20	Y	FAC
3. Ratibida columnifera	10	N	NI
4. Monarda punctata	10	N	UPL
5. Helianthus annuus	5	N	FACU
6. Gaillardia pulchella	5	N	UPL
7. Nassella leucotricha	5	N	NI
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 5%	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species 1	x 3 =	3
FACU species 3	x 4 =	12
UPL species 2	x 5 =	10
Column Totals: 6 (A)		25 (B)

Prevalence Index = B/A = 4.17

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1	100	none					clayey loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: June 16, 2014

Applicant/Owner: TxDOT State: TX Sampling Point: SP 4

Investigator(s): Kaci Blaney and Sarah Itz, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): J Lat: 30.011688 Long: -97.767299 Datum: NAD 83

Soil Map Unit Name: Branyon clay, 1 to 3% slopes (ByB) NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 15')			
1. Eleocharis montevidensis	85	Y	FACW
2. Xanthium strumarium	10	N	FAC
3. Helianthus annus	2	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	97 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 3% (open water)	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 1	x 2 = 2
FAC species 1	x 3 = 3
FACU species 1	x 4 = 4
UPL species _____	x 5 = _____
Column Totals: 3 (A)	9 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	Gley1 4/N	100	none					loamy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0.5”

Water Table Present? Yes X No ____ Depth (inches): 2”

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 16”

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: June 16, 2014

Applicant/Owner: TxDOT State: TX Sampling Point: SP 5

Investigator(s): Kaci Blaney and Sarah Itz, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): None Slope (%): 0

Subregion (LRR): J Lat: 30.011658 Long: -97.767348 Datum: NAD 83

Soil Map Unit Name: Branyon clay, 1 to 3% slopes (ByB) NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis occidentalis	40	Y	FACU
2.			
3.			
4.			
5.			
	40 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. Ulmus crassifolia	2	Y	FAC
2. Fraxinus pennsylvanica	2	Y	FAC
3.			
4.			
5.			
	4 = Total Cover		
Herb Stratum (Plot size: 10')			
1. Juncus effusus	20	Y	OBL
2. Ambrosia trifida	20	Y	FAC
3. Smilax bona-fox	5	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 20%	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 1	x 1 = 1
FACW species _____	x 2 = _____
FAC species 3	x 3 = 9
FACU species 2	x 4 = 8
UPL species _____	x 5 = _____
Column Totals: 6 (A)	18 (B)

Prevalence Index = B/A = 3.0

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: SP 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/1	100	none					loamy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: September 29, 2016

Applicant/Owner: TxDOT State: TX Sampling Point: SP 6

Investigator(s): Darren Dodson, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): Concave Slope (%): 1

Subregion (LRR): J Lat: 30.06 Long: -97.804 Datum: NAD 83

Soil Map Unit Name: Heiden clay, 5-8% slopes, eroded NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

This sampling point location tested positive for all three wetland criteria; therefore, this area is a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix nigra*	15	Y	FACW+
2.			
3.			
4.			
5.			
	15 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 15')			
1. *Eleocharis montevidensis*	80	Y	FACW+
2. *Iva annua*	8	N	FAC
3. *Verbena brasiliensis*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	93 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 7%	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation was present at this sample point location.

SOIL

Sampling Point: SP 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	Gley1 6/N	100	none					loamy clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Hydric soils were present at this sample point location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 2”

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology was present at this sample point location.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: FM 2001 City/County: Buda/Hays Co Sampling Date: September 29, 2016

Applicant/Owner: TxDOT State: TX Sampling Point: SP 7

Investigator(s): Darren Dodson, CP&Y, Inc. Section, Township, Range: N/A

Landform (hillslope, terrace, etc.): None Local relief (concave, convex, none): None Slope (%): 3

Subregion (LRR): J Lat: 30.06 Long: -97.804 Datum: NAD 83

Soil Map Unit Name: Heiden clay, 5-8% slopes, eroded NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

This sampling point location lacked wetland hydrology and hydric soils; therefore, this area is not a wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Celtis occidentalis*	35	Y	FAC
2. *Ulmus crassifolia*	8	N	FAC
3.			
4.			
5.			
	43 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10')			
1. *Celtis occidentalis*	10	Y	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: 10')			
1. *Cynodon dactylon*	40	Y	FACU+
2. *Ambrosia trifida*	35	Y	FAC
3. *Smilax bona-fox*	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 20%	0 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No _____

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation was present at this sample point location.

SOIL

Sampling Point: SP 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/2	100	none					clay

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Hydric soils were not present at this sample point location.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology was present at this sample point location.

APPENDIX G
AGENCY COORDINATION

From: Jon Geiselbrecht <Jon.Geiselbrecht@txdot.gov>
Sent: Thursday, May 21, 2015 1:19 PM
To: Darren Dodson; Andy A. Atlas
Cc: Laura Harris (lharris@hntb.com) (lharris@hntb.com); Shirley Nichols
Subject: FW: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: TPWD early coordination response

TPWD early coordination is now complete. Please update the EA with the coordination efforts....

From: Cal Newnam
Sent: Thursday, May 21, 2015 1:11 PM
To: Laura.Zebehazy@tpwd.texas.gov
Cc: Jon Geiselbrecht
Subject: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: TPWD early coordination response

Laura,

Below in blue are TXDOT responses to comments.

Thank you for your review and comments.

Cal

Cal Newnam, Ph.D.
District Biologist
Austin District
512.832.7179

From: "Laura Zebehazy" <Laura.Zebehazy@tpwd.texas.gov>
To: "Jon Geiselbrecht" <Jon.Geiselbrecht@txdot.gov>
Subject: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: TPWD early coordination response

Good afternoon, Jon,

Thank you for providing the FM 2001 Improvements and New Location project from IH-35 to SH 21 in Hays and Caldwell Counties (CSJ 1776-02-018) for early coordination with TPWD. I really appreciate your efforts to provide me with as much detail as possible to facilitate my review of the proposed project. Based on the Biological Evaluation Form and attached information, as well as our email correspondence, TPWD would like to offer the following information, comments, and recommendations to avoid or minimize impacts to fish and wildlife resources.

TxDOT Commitments

TxDOT has committed to the following actions to avoid and minimize impacts to the State's fish and wildlife resources and their habitats:

- The TxDOT-TPWD BMP PA - Bird BMPs will be implemented to avoid or minimize impacts to all birds protected by the Migratory Bird Treaty Act.
- The proposed project will be in compliance with Executive Order 13112 on Invasive Species. TPWD supports and appreciates the use of the recommended native seed mixes for the Austin District included on Table 1 of Item 164 – Seeding for Erosion Control in Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges adopted by TxDOT on November 1, 2014.
- 2013 TxDOT-TPWD BMP PA species-specific BMPs for the timber rattlesnake, Texas garter snake, spot-tailed earless lizard, and plains spotted skunk will be implemented.
- 2013 TxDOT-TPWD BMP PA Bridge Bat and Cave Bat BMPs will be implemented for the cave myotis.
- 2013 TxDOT-TPWD BMP PA Section 2: Standard Recommendations: see attached document for project-specific BMPs TxDOT has committed to implementing for Vegetation, Water Quality, Stream Crossings, and Wildlife Crossings.
- See email string below for an additional commitment regarding revegetation and project plans.

TXDOT confirms the above listed commitments.

Federally Protected Species

According to the Biological Evaluation Form, the proposed project does not contain any suitable habitat for federally protected species, including the whooping crane. TPWD concurs that suitable whooping crane habitat does not appear to occur within and/or adjacent to the proposed project area. However, any occurrence of the whooping crane in the project area would likely be during migration, as the project is located within the center of the 200-mile migratory corridor of this species. Whooping cranes use a variety of habitats during migration including croplands, stock ponds, shallow wetlands, and palustrine (marshy) wetlands.

TPWD Recommendation:

- During construction, TPWD recommends that TxDOT monitor the project area for whooping cranes during migration (northern migration - approximately late March through early June and southern migration - approximately mid-September through late December) and to make contractors aware of potential whooping crane stopovers. If whooping cranes are encountered on or adjacent to the project, the US Fish and Wildlife Service should be contacted for further guidance.

TXDOT Response: TXDOT will notify the contractor and inspectors to report any sightings to the Austin District Biologist.

State-listed Species and Species of Greatest Conservation Need (SGCN)

TPWD Recommendations:

- TxDOT indicated potentially suitable habitat for the Texas horned lizard occurred within areas accessed during preliminary site visits; however no harvester ant mounds were observed. Also, portions of the proposed project area did not have right-of-entry granted by the landowners (particularly in Caldwell County), so TxDOT was unable to assess if potential suitable habitat and harvester ant mounds were available for the Texas horned lizard. Based on these findings, TPWD recommends that TxDOT implement the species-specific BMPs for the Texas horned lizard published in the 2013 TxDOT-TPWD MOU BMP PA in order to avoid and minimize potential impacts to this species.

TXDOT Response: TXDOT will implement the referenced BMP for the Texas horned lizard.

- TPWD recommends the judicious use and placement of sediment control fence to exclude wildlife, including rare and protected herpetofauna, from the construction area and away from areas of potential vehicle-wildlife collisions. In many cases, sediment control fence placement for the purposes of controlling erosion and protecting water quality can be modified minimally to also provide the benefit of excluding wildlife access to construction areas. The exclusion fence should be buried at least six inches and be at least 24 inches high or following TxDOT's sediment control fence installation specifications. The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated. Construction personnel should be encouraged to examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.

TXDOT Response: Silt fence will be installed as required by the TCEQ Stormwater Pollution Prevention Plan (SWPPP). Excess silt fence would not be installed for this project.

- TPWD recommends that any open trenches or excavation areas be covered overnight and/or inspected every morning to ensure no reptiles, amphibians or other wildlife species have been trapped. Also, inspect excavation areas for trapped wildlife prior to refilling.

TXDOT Response: This is not practicable for this project and therefore will not be implemented.

- For soil stabilization and/or revegetation of disturbed areas within the proposed project area, TPWD recommends that TxDOT utilize erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. The netting found in many erosion control blankets or mats poses an entanglement hazard to wildlife, particularly snakes; therefore TPWD recommends the use of hydromulching and/or hydroseeding to reduce entanglement risks to wildlife. If erosion control blankets or mats will be used during this project, TxDOT should utilize products that contain no netting or contain loosely woven, natural fiber netting in which the netting design allows the threads to move, therefore allowing expansion of the netting openings. Overall, plastic netting should be avoided.

TXDOT Response: The contractor is allowed to determine the type of soil erosion control materials from the TXDOT approved types that will achieve the specifications of TXDOT and the SWPPP. Some materials on that list contain netting. It is impracticable to restrict the use for this project.

Please confirm that TxDOT's commitments are correctly identified above and respond to indicate whether TxDOT will commit to implementing the additional recommendations provided. Again, thank you for coordinating with TPWD regarding your project. Please do not hesitate to call me if you have any questions regarding these recommendations.

Sincerely,

Laura Zebehazy
Transportation Conservation Coordinator
TPWD – Wildlife Habitat Assessment Program
Phone: (512)389-4638

From: Jon Geiselbrecht [mailto:Jon.Geiselbrecht@txdot.gov]
Sent: Tuesday, January 27, 2015 1:21 PM
To: Laura Zebehazy
Cc: 'Andy Atlas'; Darren Dodson; Laura Harris (lharris@hntb.com) (lharris@hntb.com); brian.boecker@kimley-horn.com

Subject: FW: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: Request for additional information

Laura, please see additional responses in red below. Thanks, Jon

From: Laura Zebehazy <Laura.Zebehazy@tpwd.texas.gov>
Date: January 16, 2015 at 15:23:05 CST
To: Jon Geiselbrecht <Jon.Geiselbrecht@txdot.gov>
Subject: RE: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: Request for additional information

Good afternoon, Jon,

Thank you for the additional information – it has helped me in my review of the FM 2001 project. I have a couple of questions and suggestions for you to consider before I submit my overall recommendations for this project:

- Are there any specific plans for revegetating the areas where the existing roadway will be removed? If not, is it possible for TxDOT to plant native, ecoregion appropriate grasses, forbs, shrubs, and/or trees in these areas to offset impacts from the new roadway construction?

  All areas where the existing roadbed is to be removed and areas disturbed by construction activities will be vegetated. A note in the construction documents can be added to specify native grasses to be used.

- In the memo you provided January 8, 2015, Table 1 lists two crossings on Brushy Creek, but during my review of the preliminary site plans, I only observed one. Where is the additional crossing?

  The first Brushy Creek crossing is within the ROW at the connection of proposed FM 2001 with S. Turnersville Road (approx. Station 183). The second Brushy Creek crossing is at Station 322.

- I have noted all of the BMPs that TxDOT will be implementing during this project – thank you. Will TxDOT also be willing to implement appropriate Standard recommendations from Section 2 of the BMP PA? If so, can you identify which ones? I am particularly interested in the type of curbs that will be installed, if TxDOT will be able to use a spanning bridge or install culverts (at Brushy Creek specifically) that allow adequate vertical and horizontal clearances under the roadway so wildlife can continue to use that riparian corridor as safe passage through the project area, and what measures will be taken to avoid wildlife-vehicle collisions at open water/detention ponds along the roadway.

  See the attached showing (in highlights) those BMPs that will be conducted for the project. The current schematic only proposes curb and gutter in the proposed urbanized areas at beginning and end of the project. The TxDOT Type II curb is typically used in these areas to help convey drainage to the proposed storm drain inlets and culvert outfalls. The proposed Brushy Creek Steam Crossing has been preliminarily designed to be 4-10' wide by 6' tall box culverts.

Please call or email if you have any questions.

Sincerely,

Laura Zebehazy
Transportation Conservation Coordinator
TPWD – Wildlife Habitat Assessment Program
Phone: (512)389-4638

From: Jon Geiselbrecht [mailto:Jon.Geiselbrecht@txdot.gov]
Sent: Thursday, January 08, 2015 12:45 PM
To: Laura Zebehazy
Cc: Shirley Nichols; Darren Dodson; brian.boecker@kimley-horn.com; Laura Harris (lharris@hntb.com) (lharris@hntb.com)
Subject: RE: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: Request for additional information

Please see the attached memo. I'll send a separate link for the maps. Please let me know if you need anything else. Thanks, Jon

From: Laura Zebehazy [mailto:Laura.Zebehazy@tpwd.texas.gov]
Sent: Wednesday, December 31, 2014 3:24 PM
To: Jon Geiselbrecht
Subject: CSJ 1776-02-018 FM 2001 Widening and New Location project in Hays and Caldwell Counties: Request for additional information

Good afternoon, Jon,

I am responsible for reviewing the early coordination request for the FM 2001 Widening and New Location project (CSJ 1776-02-018) in Hays and Caldwell Counties. To assist my review, can you please provide detailed project description and description of temporary and permanent impacts? Also, if preliminary site plans are available – can you provide a copy of those as well?

Thank you in advance for any additional information that you provide.

Sincerely,

Laura Zebehazy
Transportation Conservation Coordinator
Wildlife Division – Wildlife Habitat Assessment Program
Texas Parks and Wildlife Department
4200 Smith School Road
Austin, TX 78744
Phone: (512)389-4638

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January 8, 2015

RE: Section 106 and Antiquities Code of Texas Consultation: FM 2001 from East of IH 35 to East of SH 21 in Hays and Caldwell Counties: Austin District: CSJ: 1776-02-018: Cox/McClain Intensive Survey Report
Texas Antiquities Permit No. 6936

Patricia A. Mercado-Allinger
Division of Archeology
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Ms. Mercado-Allinger:

In accord with the First Amended Programmatic Agreement among the Federal Highway Administration, the Texas Department of Transportation, the Texas State Historic Preservation Officer (TSHPO), and the Advisory Council on Historic Preservation Regarding the Implementation of Transportation Undertakings (PA-TU), as well as the Memorandum of Understanding (MOU) between the Texas State Historic Preservation Officer and TxDOT, we are initiating Section 106 and Antiquities Code of Texas consultation for the proposed undertaking.

This undertaking proposes to improve approximately 8.86 miles of FM 2001 located east of IH 35 near the community of Buda in Hays County, Texas. The existing roadway currently consists of two 11 foot wide travel lanes. The proposed roadway would consist of a two six foot wide sidewalks, two 12 foot and two 15 foot wide travel lanes, curbs, gutters, and a 15 foot wide median for the urban setting. For the rural setting the roadway would consist of two 4 to 10 foot wide shoulders, two 12 foot wide travel lanes, and a 16 foot wide median. Some new and existing cross drainage structures would be installed and widened. Approximately 114.6 acres of proposed new right of way (ROW), 15.5 acres of proposed new easements, and 0.8 acres of a temporary easement would be required. This includes new location for extension portions of the proposed roadway.

The undertaking's area of potential effects (APE) is defined as the proposed 120 to 160 foot wide FM 2001 ROW beginning east of IH 35 at Overpass Road in the community of Buda and extending southeast approximately 8.86 miles east to 2,592 feet (790 meters) east of SH 21. In addition, the APE includes approximately 114.6 acres of proposed new ROW, 15.5 acres of proposed new easements, and a 0.8 acre temporary easement (please see the plan views imbedded in the attached report for location details). Based upon the project design, the depth of impacts is estimated to be up to 16 feet below the current ground surface for cross drainage structures and up to 2 feet in depth for the remainder of the project. The project incorporates a total of approximately 156.5 acres.

Your office issued Texas Antiquities Permit No. 6936 to Cox/McClain Environmental Consulting (CMEC) to conduct an intensive archeological survey of the project area. They have recently completed their assessment and report. Their investigation resulted in the identification of two historic-aged archeological sites (41HY493 and 41HY494) within the APE.

The portion of 41HY493 located within the APE consists of a few glass fragments observed on the ground surface, seven glass/ceramic fragments, and two pieces of metal gleaned from shovel tests. The majority of the site was observed to be located outside the current APE. As per CTA/THC Standards, a total of six shovel tests were excavated to delineate the site boundaries within the APE. In four of the six shovel tests, 3 undecorated whiteware/ironstone sherds, 3 manganese solarized glass sherds, 1 amber glass sherd, and 2 metal fragments (possible tin can fragments) were observed extending no deeper than 20 centimeters below the current ground surface. The investigators concluded that the manufacture of these artifacts could date to as early as 1850 but could also extend into modern times.

Deed research conducted for the 41HY493 site area revealed that the APE was once part of the 1838 J.B. Eaves Survey, but was not subdivided until 1871. Deed records indicate that the site area was initially deeded to J.F. and Amanda C. Rogers (no date). In 1878, the parcel was granted to James P. Michael and then to Robert Michael in 1881. In 1889 the parcel was deeded to Thomas Frank who owned it until 1920. Based upon the deed research, it appears unlikely anyone was living on the site prior to 1870. Based upon the nondescript nature of the artifacts recorded within the APE, the deed research not revealing any ownership prior to 1870, or any site relationship to anyone important in the development of Hays County, the investigators have concluded that the portion of 41HY493 overlapping onto the APE is not significant.

Site 41TV494 is also a historic-age site primarily composed of a complex of buildings associated with mid-twentieth century cattle ranching. The complex is made up of a barn, a building with a sub-floor feature (possibly a livestock dipping vat), a cattle chute, holding pens, watering tanks, the remains of a silo base, stock tank, pump house, and well. South of the complex, a historic-age artifact scatter was observed within the APE that appears to have been associated with an earlier twentieth century occupation.

Artifacts observed within the APE associated with the later 41TV494 cattle complex include window glass, miscellaneous metal, fence wire, and cinder block fragments. In addition, machined glass amber colored bottle glass fragments were also observed in the vicinity of the possible dipping vat. Some of these fragments contained colored labels identifying the bottles as containing DDT (for livestock dipping). Artifacts observed within the APE associated with the earlier twentieth century 41TV494 occupation include unmarked brick fragments, clear and cobalt glass sherds, and iron stone ceramic sherds. The investigators have observed that none of these artifacts contained any diagnostic markings and could date from the early to middle twentieth century. Due to the relatively recent nature of the site, the possibility of contaminated soil due to the DDT for cattle dipping, and the site boundaries extending beyond the APE, the investigators concluded that shovel testing was not warranted to delineate the site boundaries. In addition, based upon the early to middle twentieth century manufacture date for the observed

artifacts and features, the investigators have recommended that the portion of the site overlapping onto the APE is also insignificant. No other archeological sites were identified within the APE.

During their fieldwork, the investigators were informed that there may be an early twentieth century infant burial located within a few meters of the APE. This burial was reportedly located on private property under a painted rubber tractor tire. However, this tire is located outside of the APE and will not be impacted. The investigators have recommended that no further work is warranted for the APE. A copy of their report is attached for your review.

TxDOT has reviewed the CMEC intensive archeological survey report and agree with their recommendations. TxDOT seeks TSHPO concurrence for the following recommendations:

1. The portions of the archeological sites 41HY493 and 41HY494 overlapping onto the APE do not contribute to the sites' eligibility for listing on the National Register of Historic Places and do not warrant status as State Antiquities Landmarks.
2. That the archeological inventory of the undertaking is complete.
3. For a finding of "no historic properties affected", no State Antiquities Landmarks affected.
4. No further work or TSHPO consultation is required.
5. Construction may proceed.

Please signify your concurrence by signing on the signature line provided below.

In the event that archeological materials are discovered during construction, construction in the immediate area shall cease, your office will be contacted to initiate accidental discovery procedures in accordance of the terms of the PA-TU and MOU. If you have any questions, please contact me at 416-2640. Thank you for your consideration in this matter.

Sincerely,

J. Budd

Jon Budd, TxDOT Staff Archeologist

Concurrence by; Mark Wolfe Date: 1-8-15

For Mark Wolfe, State Historic Preservation Officer and Executive Director

Attachments

INTENSIVE ARCHEOLOGICAL SURVEY FOR PROPOSED IMPROVEMENTS TO FM 2001 BETWEEN I-35 AND SH 21, HAYS AND CALDWELL COUNTIES, TEXAS (CSJ #1776-02-018)

[REVISED DRAFT]

Prepared by
Haley Rush, MA, RPA (Project Archeologist)
Melissa M. Green, MA, RPA (Principal Investigator)
Cox | McLain Environmental Consulting, Inc.
6010 Balcones Drive, Suite 210
Austin, TX 78731

For
Hays County
P.O. Box 1180
Kyle, TX 78640

Under
Texas Antiquities Permit 6936

DRAFT REPORT ACCEPTABLE
by
for Mark Wolfe
Executive Director, THC
Date 1-8-15
Track#

Cox | McLain Environmental Consulting, Inc. Archeological Report 075 (CMEC-AR-075)

COX | McLAIN
Environmental Consulting

December 8, 2014

This report contains archeological site location information (not for public disclosure).

From: Jon Geiselbrecht <Jon.Geiselbrecht@txdot.gov>
Sent: Monday, December 15, 2014 8:06 AM
To: Andy A. Atlas; Darren Dodson; Laura Harris (lharris@hntb.com) (lharris@hntb.com); brian.boecker@kimley-horn.com
Cc: Shirley Nichols
Subject: FW: cleared: FM 2001 (CSJ 1776-02-018) realignment

FYI, cleared for Historic Resources. Also, Bio-Eval form will go to TPWD today....

From: Mark Brown
Sent: Monday, December 08, 2014 11:41 AM
To: Jon Geiselbrecht
Subject: cleared: FM 2001 (CSJ 1776-02-018) realignment

Plz delete the 9/10/14 task in ECOS: Review - Intensive Survey Report

Cleared for non-archeological cultural resources on 12/5/14.

Recommended NEPA language: In compliance with the PA-TU, a TxDOT historian determined project activities have no potential for effects. The APE for the proposed project is 300 feet from the project right-of-way. Individual project coordination with SHPO is not required. See attached documentation.

Give the Gift of a Sober Ride this Holiday Season.

Texas Department of Transportation

MEMO

December 1, 2014

To: TxDOT-ENV Administrative Record, CSJ#: 0320-03-083

From: Mark M. Brown MMB
Historian, Historical Studies Branch, Environmental Affairs

Subject: Section 106 Coordination

District: Austin
County: Hays and Caldwell
CSJ#: 1776-02-018
Highway: FM 2001
Project Limits: FROM I 35 TO SH 21
Project Description: Stipulation VI, Appendix 4. Widen and realign roadway. 130.9 acres new ROW and easements. No historic properties present.

The Texas Department of Transportation – Austin District proposes to widen and realign the roadway to create a four-lane divided highway and improve the now-limited line of sight in the current configuration of FM 2001. A total of 114.6 acres of additional right-of-way (ROW), 15.5 acres of permanent easements, and 0.8 acres of temporary easements would be required. See maps and schematics in attached survey report.

A review of the National Register of Historic Places (NRHP), the list of State Antiquities Landmarks (SAL), and the list of Recorded Texas Historic Landmarks (RTHL) indicated that no historically significant resources have been previously documented within the area of potential effects (APE). It has been determined through consultation with the State Historic Preservation Officer (SHPO) that the APE for the proposed project is 300 feet from the project ROW. Within the APE there are 38 historic-age (built prior to 1971) resources on 16 numbered sites. Approximately 12 of these are residential resources and the remaining resources are agricultural or farmsteads. TxDOT historians determined that none of these resources are NRHP eligible. Please see the attached survey report.

The Hays County Historical Commission was invited to participate in the Section 106 process on Novemebr 4, 2014 and November 19, 2014 but did not respond.

TxDOT historians have evaluated the surveyed properties through the application of the Criteria of Eligibility for listing in the National Register of Historic Places and have determined that Resource #1a-16f are **not eligible** for listing in the National Register of Historic Places. They *are not known* to be associated with a significant historical event, or associated with a person of transcendent importance, or embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master. Therefore, all historic-age resources in the APE are determined **not eligible** for listing in the National Register of Historic Places. An inventory indicating individual NRHP evaluations is provided in the attached survey report.

Pursuant to Stipulation VI "Undertakings with Potential to Cause Effects" of the First Amended Statewide Programmatic Agreement for Transportation Undertakings (PA-TU) between the Federal Highway Administration (FHWA), the Texas State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation, and the Texas Department of Transportation (TxDOT) and the Memorandum of Understanding (MOU), TxDOT historians determined that the historic-age resources are **not** eligible for listing in the National Register of Historic Places. Since the resources are not NRHP eligible, the project would have no effects to historic properties and individual project coordination with SHPO is not required.

Lead Reviewer MMS for TxDOT 12/1/14

Initials Date

Approved by _____ for TxDOT 12-5-14

Bruce Jensen Date

CC: ECOS, THC
Shirley Nichols, Austin District

Mark Brown

From: Mark Brown
Sent: Wednesday, November 19, 2014 1:28 PM
To: katejhalifax@aol.com
Cc: 'lilaknight@verizon.net'
Subject: resend: FM 2001 (CSJ 1776-02-018) realignment

From: Mark Brown
Sent: Tuesday, November 04, 2014 3:16 PM
To: 'kw1988@aol.com'
Subject: FM 2001 (CSJ 1776-02-018) realignment

Kate Johnson, Chair
Hays County Historical Commission

Hi Kate,
Hope this finds you and yours well and in good spirits.

I'm in the process of reviewing the non-archeological survey report for the FM 2001 project. Realignment of FM 2001 (SE of Buda) would require more than 130 acres of new right-of-way and permanent easements.

I'm writing to see if the hays County CHC would like to formally review and comment.

The report documents numerous modest agricultural outbuildings, farmstead clusters, and residences with integrity issues.
It recommends none of them NRHP eligible and I expect to agree.

Here are some options:
-I coordinate the project with you under 30 day review.
-I send you a courtesy copy to you and coordinate via an internal memo to Bruce and a subsequent hard copy to Linda Henderson if Bruce agrees with me.
-I don't send you a courtesy copy of the report, but do coordinate via internal memo that Bruce reviews.

Please let me know what works best for you,
Mark
512.416.2600

From: Mark Brown
Sent: Friday, July 18, 2014 2:19 PM
To: 'Kate Johnson'; Kathryn St. Clair (kstclair@cpyi.com)
Cc: 'lilaknight@verizon.net'
Subject: Hays County CHC contacts | FM 2001 (CSJ 1776-02-018) realignment

Kathryn St. Clair
Architectural Historian
CP&Y
13809 Research Boulevard, Suite 300
Austin, Texas 78750
512-340-9800 Direct | 512-293-6895 Cell

Hi Kathryn,

While I review your research design for the FM 2001 realignment project near Goforth and Niederwald, I thought I might introduce you to two important and most helpful contacts.

By copy of this email, I introduce you to:
Kate Johnson, Chair Hays County Historical Commission and
Lila Knight, historian and long-time Hayes County resident

Best of Luck,
Mark
512.416.2600

From: brian.boecker@kimley-horn.com [mailto:brian.boecker@kimley-horn.com]
Sent: Monday, July 14, 2014 1:23 PM
To: Jon Geiselbrecht
Cc: Andy.VanLeeuwen@kimley-horn.com; kstclair@cpyi.com; trey.neal@kimley-horn.com; lharris@hntb.com; 60801_FM2001_ReAlign@HNTB.com
Subject: FM 2001 (CSJ 1776-02-018) Research Design

Jon,

Please see attached for FM 2001 Research Design for TxDOT approval (prior to historical resources survey). Please let us know if any questions or comments or when we are approved to proceed with the historic resources survey.

Thanks,

Kimley»Horn
Brian Boecker, P.E. (TX, OK)
Kimley-Horn | 10814 Jollyville Road, Avallon IV, Suite 300 | Austin, TX 78759
Direct: 512 418 4533 | Mobile: 512 810 1695 | www.kimley-horn.com

We've Moved! Please note our new address above.

APPENDIX H
INDIRECT IMPACTS QUESTIONNAIRES

FM 2001 Environmental Assessment Questionnaire

The Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), and Hays County are conducting an Environmental Assessment (EA) for the proposed improvement of Farm-to-Market Road (FM) 2001 from I-35 to SH 21 (Camino Real) in Hays and Caldwell Counties.

The proposed project would re-align the existing two-lane roadway and widen it to a four-lane, divided roadway. The intersection with Camino Real would also be realigned, with a short transition extending south of Camino Real on FM 2001. The purpose of the proposed project is to improve safety and mobility and to provide system linkage on FM 2001 north and south of its intersection with Camino Real in order to improve travel times for commuters and emergency vehicles using the roadway.

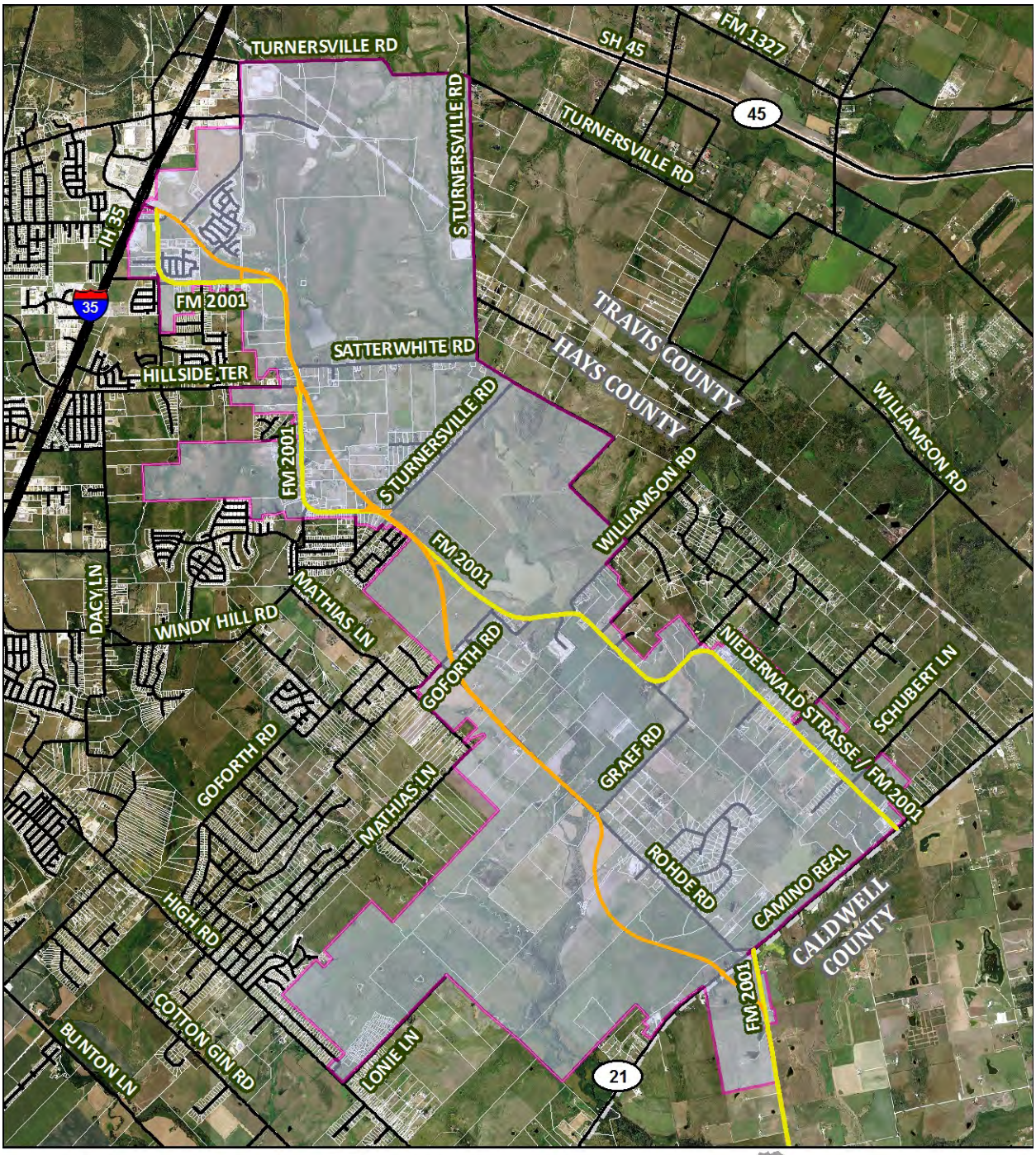
Under TxDOT guidance, the potential indirect effects of the project must be addressed in the environmental assessment process. Indirect effects are defined as those reasonably foreseeable impacts caused by the proposed project, but that occur later in time and farther away than direct impacts, which are directly caused by the action and occur at the same time and place as the action. Indirect effects may include induced land development and the changes in population density or growth rate that result from this increased development. To aid in assessing the potential direct and indirect impacts of the project, we are contacting your agency/organization to obtain your insight on how the project may affect your community or the region.

We have attached a map of the project area showing the proposed roadway and our proposed Area of Influence for indirect effects analysis. Guidance from TxDOT requires that we assess potential indirect and cumulative effects out to the planning horizon, which has been established as 2035 in conjunction with the Capital Area Metropolitan Planning Organization's Regional Transportation Plan. A key component of this requirement is determining whether or not a project would have indirect effects, such as induced growth and land use development. We are seeking to identify any areas where potential development could occur (whether or not it is currently planned) within the planning horizon that could be attributed at least in part to the roadway improvement.

Please complete the following questionnaire to the best of your knowledge; if you are not the best person to answer the questions, please forward this to the appropriate person or persons within your organization. Please return your answers to the following address (electronic responses are welcomed with legible marked up maps) by **Monday, July 28, 2014:**

Lauren Avioli, Environmental Planner
CP&Y, Inc.
13809 Research Blvd, Suite 300
Austin, TX 78750
(512)-492-6848
lavioli@cpyi.com

We recognize that the people who are most knowledgeable about how projects might affect a community are the local experts. We appreciate your time and input in this process.


TURNERSVILLE RD
SH 45
FM 1327
45
TURNERSVILLE RD
S TURNERSVILLE RD
IH 35
35
FM 2001
SATTERWHITE RD
HILLSIDE TER
TRAVIS COUNTY
HAYS COUNTY
WILLIAMSON RD
S TURNERSVILLE RD
FM 2001
WILLIAMSON RD
FM 2001
DACY LN
MATHIAS LN
WINDY HILL RD
GOFORTH RD
NIEDERWALD STRASSE / FM 2001
SCHUBERT LN
GOFORTH RD
GRAEF RD
MATHIAS LN
ROHDE RD
CAMINO REAL
CALDWELL COUNTY
HIGH RD
FM 2001
COTTON GIN RD
BUNTON LN
LONIE LN
21
Proposed Right-of-Way
Existing FM 2001
Parcels
Roads
County Line
Area of Influence
Sources: TNRIS, 2012; CAPCOG, 2010; HCAD, 2014
0
0.5
1
Miles
N
Travis County
Hays County
Caldwell County
Project Location

Questionnaire

1. Are you aware of any substantial proposed land developments within your jurisdiction or area? If so, please mark the areas on the attached map and provide the location, type, and size (e.g. acres, density, number of units) of any planned developments.

2. On the attached map, please identify parcels (if any) that you think would likely be developed by 2035 as a result of the proposed realignment of FM 2001 that would not otherwise be developed. *(Please distinguish from developments identified in question 1)*.

3. Would the proposed project affect the rate or intensity of land development in your jurisdiction?

4. Is the proposed project consistent with local planning efforts (i.e. master or comprehensive plans, growth management plans, zoning or land use policies, etc)?

5. Are there other capital improvement projects – such as water or sewer infrastructure, school or hospital construction, or roadway improvements – that are planned for the area which might affect development in the project vicinity?

6. Are there any factors that could limit growth in the area, such as floodplains, current development, conservation easements, protected lands, etc?

7. How would the proposed project be expected to impact travel patterns in the area? Which roadways would benefit from the proposed project?

8. What type of traffic would you anticipate to use this facility (i.e. local traffic, regional commuters, through traffic)?

9. In your opinion, are there areas not encompassed by the Area of Influence (AOI) shown on the attached map that would be indirectly impacted by the project and should be included in the AOI?

FM 2001 Environmental Assessment Questionnaire

The Texas Department of Transportation (TxDOT), the Federal Highway Administration (FHWA), and Hays County are conducting an Environmental Assessment (EA) for the proposed improvement of Farm-to-Market Road (FM) 2001 from I-35 to SH 21 (Camino Real) in Hays and Caldwell Counties.

The proposed project would re-align the existing two-lane roadway and widen it to a four-lane, divided roadway. The intersection with Camino Real would also be realigned, with a short transition extending south of Camino Real on FM 2001. The purpose of the proposed project is to improve safety and mobility and to provide system linkage on FM 2001 north and south of its intersection with Camino Real in order to improve travel times for commuters and emergency vehicles using the roadway.

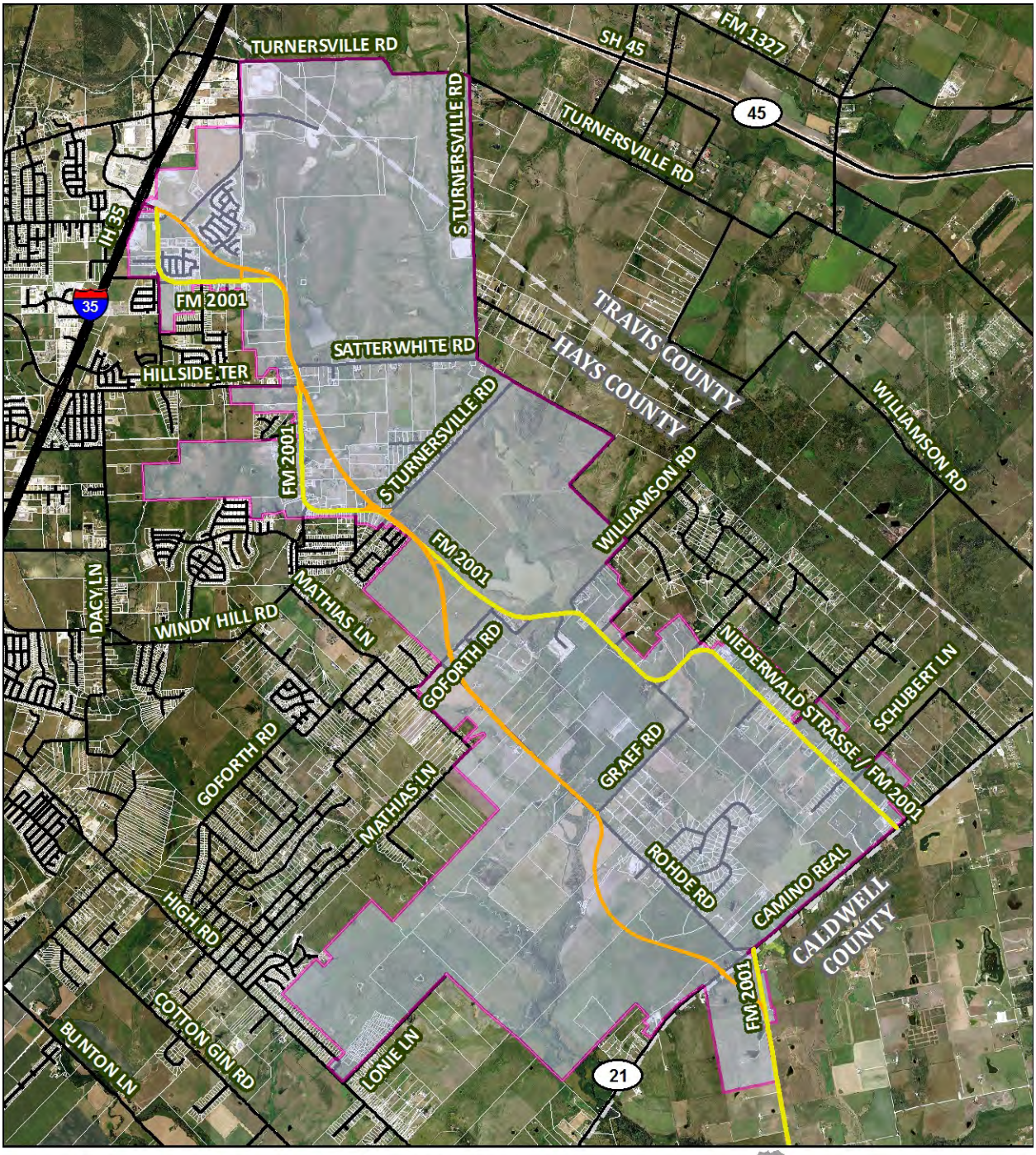
Under TxDOT guidance, the potential indirect effects of the project must be addressed in the environmental assessment process. Indirect effects are defined as those reasonably foreseeable impacts caused by the proposed project, but that occur later in time and farther away than direct impacts, which are directly caused by the action and occur at the same time and place as the action. Indirect effects may include induced land development and the changes in population density or growth rate that result from this increased development. To aid in assessing the potential direct, indirect, and cumulative impacts of the project, we are contacting your agency/organization to obtain your insight on how the project may affect your community or the region.

We have attached a map of the project area showing the proposed roadway and our proposed Area of Influence for indirect effects analysis. Guidance from TxDOT requires that we assess potential indirect and cumulative effects out to the planning horizon, which has been established as 2035 in conjunction with the Capital Area Metropolitan Planning Organization's Regional Transportation Plan. A key component of this requirement is determining whether or not a project would have indirect effects, such as induced growth and land use development. We are seeking to identify any areas where potential development could occur (whether or not it is currently planned) within the planning horizon that could be attributed at least in part to the roadway improvement.

Please complete the following questionnaire to the best of your knowledge; if you are not the best person to answer the questions, please forward this to the appropriate person or persons within your organization. Please return your answers to the following address (electronic responses are welcomed with legible marked up maps) by **Monday, July 18, 2014:**

Lauren Avioli, Environmental Planner
CP&Y, Inc.
13809 Research Blvd, Suite 300
Austin, TX 78750
(512)-492-6848
lavioli@cpyi.com

We recognize that the people who are most knowledgeable about how projects might affect a community are the local experts. We appreciate your time and input in this process.


TURNERSVILLE RD
SH 45
FM 1327
45
TURNERSVILLE RD
S TURNERSVILLE RD
IH 35
35
FM 2001
SATTERWHITE RD
HILLSIDE TER
TRAVIS COUNTY
HAYS COUNTY
WILLIAMSON RD
S TURNERSVILLE RD
FM 2001
WILLIAMSON RD
FM 2001
DACY LN
MATHIAS LN
WINDY HILL RD
GOFORTH RD
NIEDERWALD STRASSE / FM 2001
SCHUBERT LN
GOFORTH RD
GRAEF RD
MATHIAS LN
ROHDE RD
CAMINO REAL
HIGH RD
CALDWELL COUNTY
FM 2001
COTTON GIN RD
BUNTON LN
LONIE LN
21
Proposed Right-of-Way
Existing FM 2001
Parcels
Roads
County Line
Area of Influence
Sources: TNRIS, 2012; CAPCOG, 2010; HCAD, 2014
0
0.5
1
Miles
N
Travis County
Hays County
Caldwell County
Project Location

Questionnaire

1. Is your service area largely built out, or is there still room for additional development? (*Please indicate on the attached map areas within your service area that are still open to development.)*

2. Is your organization planning any expansion projects within the area that might affect development in the project vicinity? (*Please indicate the locations of these projects on attached map, taking care to differentiate from any areas marked as part of Question 1.*)

3. Would the proposed project affect the rate or intensity of land development in your service area?

4. Are there any factors that could limit growth in the area, such as floodplains, current development, conservation easements, protected lands, limited water supply, etc?