Archeological Survey Report

**Project Name:** US 377 Reconstruct and Widening

**From:** BU 377 H (South) **To:** 3000 feet North of FM 167

**District(s):** Fort Worth

**County(s):** Hood

**CSJ Number(s):** 0080-04-081 / 0080-03-049 / 0080-04-094 / 0080-03-060

**Principal Investigator and Firm/Organization:** Melanie Johnson, TxDOT

**Antiquities Permit No.** 31029

**Report Completion Date:** May 5, 2023

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 12-09-19, and executed by FHWA and TxDOT.
Abstract

On behalf of the Texas Department of Transportation (TxDOT), AmaTerra Environmental, Inc. (AmaTerra) conducted an intensive archeological survey within existing and proposed new Right-of-Way (ROW) associated with improvements to United States Highway (US) 377. Improvements would occur from Holmes Drive to 3,000 feet north of Farm to Market Road (FM) 167 (Fall Creek Highway), a distance of approximately 9 miles, and State Highway (SH) 144 from Autumn Ridge Road to FM 51 (Paluxy Road), a distance of approximately 0.4 miles, in the city of Granbury, Hood County, Texas (Attachments 1 and 2). The total Area of Potential Effects (APE) for the proposed project encompasses approximately 279 acres. The proposed project would require 26 acres of new ROW and 3.4 acres of permanent drainage easements. The typical depth of impacts is approximately 3 feet (0.9 meters [m]) and the maximum depth of impacts is expected to be 30 feet (9.1 m) below present ground surface.

A desktop review determined that 266.1 acres of the APE did not require archeological survey due to impacts from suburban and commercial development. Of the 12.9 acres of the APE recommended for survey, 3.1 acres is within the existing ROW, Right of Entry (ROE) was granted for 5.6 acres of proposed ROW, and ROE was not granted for 4.2 acres of the APE.

The survey was completed in compliance with Section 106 of the National Historic Preservation Act (Section 106) and the Antiquities Code of Texas (ACT) under TAC Permit No. 31029. Field investigations were conducted by AmaTerra archeologists on March 10, 2023 and consisted of intensive pedestrian survey and shovel testing of the proposed ROW where ROE was granted. AmaTerra staff excavated 12 shovel tests within a 5.6-acre Survey Area and no cultural materials were documented within the APE. Additionally, investigators visually assessed all of the recommended survey areas where ROE was not granted. Based on the results of the desktop review, intensive archeological survey of accessible portions of the APE, and visual assessment of proposed ROW where ROE was not granted, certain portions of the APE that could not be sufficiently assessed have the potential to contain shallowly or deeply buried, intact archeological materials, and further archeological work including shovel testing and deep mechanical prospection is recommended within these areas. All photographs and records generated during fieldwork will be kept on file in the AmaTerra office in Austin, Texas.
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Management Summary and Introduction

• Management Summary

Projects that receive funding or sponsorship by TxDOT are considered undertakings of a political subdivision of the state and subject to the Antiquities Code of Texas, whose guidelines are outlined under 12 TAC 26. Therefore, this project is subject to jurisdictional review by the Texas Historical Commission (THC). The proposed project will also receive federal funding administered through TxDOT and is therefore subject to review under Section 106 of the National Historic Preservation Act (as amended).

Travis Trahan served as Project Archeologist and field director, and Noel Steinle assisted with fieldwork. Field investigations including pedestrian survey and shovel testing were conducted on March 10, 2023, and approximately 16 person hours were invested in field operations.

• Introduction

On behalf of TxDOT, AmaTerra has prepared this report of the results of archeological investigations of 9.8 acres of the Area of Potential Effects (APE) defined below. TxDOT proposes improvements to United States Highway (US) 377 from Holmes Drive to 3,000 feet north of Farm to Market Road (FM) 167 (Fall Creek Highway), a distance of approximately 9 miles, and State Highway (SH) 144 from Autumn Ridge Road to FM 51 (Paluxy Road), a distance of approximately 0.4 miles, in the city of Granbury, Hood County, Texas (Attachments 1 and 2). The APE for the proposed project encompasses approximately 279 acres. The proposed project would require 26 acres of new ROW and 3.4 acres of permanent drainage easements. The typical depth of impacts is approximately 3 feet (0.9 meters [m]) and the maximum depth of impacts is expected to be 30 feet (9.1 m) below present ground surface.

The project proposes to convert US 377 from a rural highway to an urban highway through the addition of raised medians, enclosed drainage, and curbs from Holmes Drive to SH 144. The project will also reconstruct and widen US 377 from SH 114 to 3,000 feet north of FM 167. In this section, two additional lanes will be added upgrading the facility from a four-lane to a six-lane highway. The proposed project also includes improvements to cross street intersections, ramps, driveway connections, signalization and drainage, and the addition of ten-foot wide shared-use paths in each direction to accommodate bicycles and pedestrians. The drainage system will be converted from open drainage ditches to an enclosed urban storm drain system through most of the corridor.
Project Information

- **This survey is:**
  - ☒ the initial survey for this project.
  - ☐ a continuation of previous survey(s) due to:
    - ☐ access issues and/or
    - ☐ design changes.

Identify previous investigation(s):

- **Report Completion Date:** 05/05/2023
- **Date(s) of Survey:** 03/10/2023
- **Archaeological Survey Type:**
  - ☐ Reconnaissance  ☒ Intensive
- **Report Version:**
  - ☐ Draft  ☒ Final
- **Report Author(s) and Affiliation:** Travis M. Trahan and Matthew R. Carter, AmaTerra Environmental
- **Estimated Percentage of Time that the Principal Investigator was in the Field:** 0%
Area of Potential Effects and Survey Area

- **Area of Potential Effects (APE)**
  
  The APE is defined to encompass the limits of the existing right of way; proposed, new project right of way; permanent and temporary easements; and any project-specific locations and utility relocations designated by TxDOT. Note: the APE encompasses the entirety of the project area, regardless of the extent of prior archeological investigations, the particular locations subject to field investigations, or the portion of a project added through a design change. If impacts are not known, worst-case impacts are assumed in defining the APE.

  The APE for the archeological resources would cover a distance of 9.4 miles with an existing typical ROW width of 230 feet, comprising an area of approximately 279 acres. The proposed project would require 26 acres of new ROW and 3.4 acres of permanent drainage easements. The typical depth of impacts is approximately 3 feet (0.9 meters [m]) and the maximum depth of impacts is expected to be 30 feet (9.1 m) below present ground surface. See Attachment 1 for a map of the APE, which is based on the project information attached as Attachment 2.

- **No Survey Area**
  
  Based on a previous archeological background study, 266.1 acres of the 279-acre APE were determined not to require archeological survey.

- **Access Denied Area:**
  
  The Access Denied Area consists of 4.2 acres of proposed new ROW where ROE was denied in the following areas: three recommended survey areas between the US 377/Business 377 split and Pirate Drive (parcels R0000043195 and R000043543; R000043343, R000043208, and R000043207; R000043172, R000099279, and R000099986); one recommended survey area on US 377 between Pirate Drive and N. Meadows Street (parcel R000102164); and one recommended survey area on the north side of US 377 immediately southwest of Corporate Drive (parcels R000012201, R000044075, and R000044077). See Attachments 1b-1d for maps of the recommended survey areas in the Access Denied Area.

- **Survey Area:**
  
  The Survey Area comprises 5.6 acres of proposed new ROW between FM 51 (Paluxy Rd) and SH 144 (S Morgan St) on parcels R000043222, R000099097, and R000093988 where ROE was granted (Attachment 1e). Atwood (2022) recommended survey on an additional 3.06 acres of the APE within TxDOT ROW immediately east of the Brazos River (Attachment 1f).

- **Project Area Ownership:**
  
  The survey for the proposed project took place on existing ROW owned by TxDOT and on privately owned property.
**Project Setting**

- **Natural Setting**
  - **Topography:**
    The APE falls within the Limestone Cut Plain Level IV ecoregion which is a subregion of the Cross Timbers level III ecoregion (Griffith et al. 2007). The Cross Timbers level III ecoregion is the transitional zone between the western prairies and the eastern forests. The Limestone Cut Plain level IV ecoregion consists of stairstep topography with mesas alternating with broad intervening valleys and eroded sideslopes (Griffith et al. 2007).
  - **Geology:**
    The APE spans four geologic formations. From west to east, they are the Glen Rose Formation (Kgr), Fluviatile terrace deposits (Qt), the Paluxy Formation (Kpa), and Walnut Clay (Kwa). The Survey Area is underlain by the Glen Rose Formation and Fluviatile terrace deposits (Attachment 3). The Glen Rose Formation is made up primarily of Cretaceous aged limestone along with sand, marl, and clay. Fluviatile terrace deposits consist of Pleistocene aged clay, silt, sand, and gravel (USGS 2023).
  - **Soils:**
    There are 29 mapped soil series across the APE, all of which are tabulated on Attachment 4a. Soil series mapped within the Survey Area include Krum silty clay, Aledo gravelly clay loam, Granbury very fine sandy loam, Windthorst very fine sandy loam, and Thurber clay (Attachment 4b). Krum silty clay consists of clayey alluvium formed on stream terraces on dissected river floodplains. Aledo gravelly clay loam consists of gravels and loam formed in Cretaceous limestone and marl. Granbury soils are well drained and formed in loamy alluvium derived from sandstone and siltstone over limestone. Windthorst soils are very deep, moderately well drained, and formed in sandy and clayey residuum weathered from Cretaceous-age claystone and sandstone. Thurber clay is a very deep, moderately well drained, and formed in clayey slope alluvium derived from claystone of Pennsylvanian age (USDA-NRCS 2023).
  - **Potential Archeological Liability Map:**
    The PALM indicates that the APE has a highly variable potential to contain archeological deposits. The APE is scored as having a negligible, low, moderate, and high potential to contain shallow and deep cultural deposits (Attachment 5a). The Survey Area is scored as a 1 (low archaeological potential), 4 (moderate shallow potential, low deep potential), and a 5 (moderate shallow and moderate deep potential) on the PALM. Most of the Survey Area is classified under PALM Zones 1 and 4 (Attachment 5b).
  - **Historic Land Use:**
    The earliest available topographic map dates to 1889 and shows that part of the APE was developed with roads. The map also shows the Fort Worth and Rio Grande Railroad. Most of the project area near the Brazos River and Lambert Branch are shown as undeveloped.
Topographic maps from 1923 and 1961 show that much of the project area was developed with roads at this point and that several structures were present. A 1987 topographic map shows US 377 in its current iteration (Atwood 2022).

A 1981 historical aerial of the APE shows the area as being well developed with many roads. US377 is shown as it is today with the exception that it appears to be narrower than it currently is (Atwood 2022).

− Land Use:

The APE surrounds a major arterial highway through the rapidly developing Granbury area. The entire length of the APE is flanked by suburban residential, commercial, and recreational development. The Survey Area is raw land. There was evidence of clearing activity and multiple utilities present nearby including a power line, a fiber cable, and a gas line.

− Vegetation:

Historically the Limestone Cut Plain Level IV ecoregion is made up of oak savannas and grasslands with tall, mid, and short grasses, though some consider it a tallgrass prairie. Tree species include the plateau live oak, post oak, Texas ash, bur oak, and Texas persimmon (Griffith et al. 2007).

− Estimated Ground Surface Visibility:

Ground Surface Visibility typically ranged between 10–30% with mixed grasses covering much of the surveyed area.

• Previous Investigations and Known Archeological Sites:

Four previous archeological investigations overlap with the APE, none of which intersect with the Survey Area or the recommended survey areas without ROE (THC 2023; see Attachment 6a). No previously recorded archeological sites overlap the APE. The archeological site nearest the APE is approximately 320 meters due west of the easternmost recommended survey area without ROE (site 41HD96; see Attachment 6d). Site 41HD96 was recorded in 2020 as a twentieth century farmstead with modern components and was determined ineligible for SAL or NRHP listing by the THC in that same year (THC 2023).

• Evaluation of Project Setting:

The project is in a heavily developed suburban setting adjacent to US 377 in Granbury. Land use near the project area primarily includes commercial businesses and residential neighborhoods. The APE is located on gently sloping uplands near the Brazos River, a historically reliable water source. This area would have been conducive to human occupation. Most of the APE has been disturbed by road construction, utilities, and clearing activity. In a desktop background study, Atwood (2022) recommends intensive survey in areas that appear to remain relatively undisturbed (recommended survey areas). These five areas – detailed
above as the Survey Area, Access Denied Area(s), and the 3.06 acres recommended for survey in the existing US 377 ROW just east of the Brazos River – are located alongside tributaries of the Brazos River or adjacent to the river itself, or soil and geology data show a higher probability for cultural materials to remain intact in the area (i.e., in alluvial settings).

**Survey Methods**

- **Surveyors:**
  Travis M. Trahan (Project Archeologist) and Noel Steinle

- **Description of Methods:**
  Shovel testing was conducted within the Survey Area where soils were not significantly disturbed by past land use, installation of utilities, and/or construction of roadways. Methods met or exceeded the Council of Texas Archeologists (CTA) minimum standards for linear surveys. Shovel testing was conducted at 30-meter intervals along a 30-meter wide transect in the narrower portion of the Survey Area, and an additional transect was surveyed in the wider western portion of the Survey Area. Shovel tests were 30 centimeters (cm) wide on a side and were excavated in arbitrary 20-cm vertical levels. Shovel tests were excavated to a depth of 80 centimeters below surface (cmbs), culturally sterile subsoil, or physical impediments such as bedrock or compact soils. Sediments excavated from shovel tests were screened through ¼-inch mesh or troweled through if they were too compact to screen. All tests were marked using a GPS device and data collector, which logged coordinates and recorded profile characteristics, depth, and contents. Investigators took photographs of the landscape and various disturbances within and near the APE.

  AmaTerra’s desktop survey of the surrounding geology, soils, and topography indicates that deep Holocene-age deposits are unlikely within the surveyed portion of the APE. According to the PALM there is low potential for deeply buried archeological deposits within the surveyed portion of APE. Backhoe trenching was not recommended in advance of the proposed project, and shovel testing was sufficient for evaluating the area.

- **Subsurface Probes**
  Based on results from a background study and due to limited ROE, all subsurface probes in the APE (n = 12) were conducted in the 5.6-acre Survey Area.
### Table 1: Subsurface Probes

<table>
<thead>
<tr>
<th>Method</th>
<th>Quantity in Existing ROW</th>
<th>Quantity in Proposed New ROW</th>
<th>Quantity in Proposed New Easements</th>
<th>Total Number per Acre</th>
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<tbody>
<tr>
<td>Shovel Test Pits</td>
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<td>12</td>
<td>0</td>
<td>2.14</td>
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<tr>
<td>Power Auger Probes</td>
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<td>0</td>
</tr>
<tr>
<td>Mechanical Trenches/Scrapes</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Other Methods:**

ROE was denied for four recommended survey areas: between the US 377/Business 377 split and Pirate Drive; on US 377 between Pirate Drive and N. Meadows Street; the north and south sides of US 377 east of the Brazos River; and an area on the north side of US 377 immediately southwest of Corporate Drive. As such, AmaTerra visually assessed the recommended survey areas, determining that two of the areas could not be adequately evaluated without intensive survey. Investigators also visually assessed the 3.06 acres of existing TxDOT ROW immediately east of the Brazos River and determined intensive survey was not warranted in that area.

- **Collection and Curation:** ☒ NO ☐ YES

Project records will be held at AmaTerra’s offices in Austin, Texas.

- **Comments on Methods:**

Disturbances were thoroughly photo-documented in lieu of conducting subsurface testing for parcels that were denied ROE.

### Survey Results

AmaTerra conducted fieldwork on March 10, 2023, including pedestrian survey and shovel testing where investigators had ROE to three parcels comprising the 5.6-acre Survey Area (Attachments 7 and 8). The remaining parcels where survey is recommended were visually assessed from the public ROW.

- **Survey Area Description:**

The Survey Area spans a gently sloping upland terrace in an open field with mixed grasses and occasional trees (Attachment 9a). A transmission line enters the Survey Area from the west, then crosses US 377 to the northeast from the Survey Area’s northwestern corner. A buried gas line runs north to south near the center of the Survey Area and a fiberoptic cable line is marked...
east to west just north of the Survey Area along the US 377 roadway (Attachment 9b). There are residential neighborhoods southeast and southwest of the project area and commercial businesses to its east along SH 144 (Attachment 9c).

AmaTerra archeologists conducted intensive survey within the Survey Area, including pedestrian survey and shovel testing. Investigators excavated a total of 12 shovel tests in the Survey Area, all of which were negative for cultural materials (see Attachments 7 and 8). Shovel test density exceeded CTA standards, with 2.14 shovel tests per acre excavated within the Survey Area. Soil profiles within shovel tests typically consisted of 5YR 2.5/2 sandy clay loam 0-12 cmbs above 7.5YR 3/4 sandy clay which became more compact with depth (Attachment 9d). Most shovel tests were terminated at sterile subsoil with a few being terminated due to compact soils and one due to bedrock. Shovel tests closer to the existing US 377 roadway encountered disturbance from road and utility ROW construction.

- **Potential Buffer Zone Description:**
  The above description of the survey area also applies to any potential buffer zone within 50 feet of the Survey Area.

- **Archeological Materials Identified and Archeological Site Description:**
  AmaTerra archeologists did not identify any archeological materials or sites within the APE.
Recommendations

• Results Valid Within (check all that apply to define the buffer zone):

<table>
<thead>
<tr>
<th>No Survey Area (NSA)</th>
<th>Survey Area</th>
<th>Either</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒ 50 feet of NSA</td>
<td>☒ 50 feet of survey area</td>
<td>☒ Variable, see map</td>
</tr>
<tr>
<td>☐ __ feet of NSA</td>
<td>☐ __ feet of survey area</td>
<td></td>
</tr>
</tbody>
</table>

• The Definition and Evaluation of this Horizontal Buffer Zone Is Based on One or More of the Following Considerations (check all that apply):

- ☒ The integrity of the areas has been affected by prior development, modern land use practices, or other disturbances.
- ☐ The areas are unlikely locations for past human activity.
- ☒ The survey shows that archeological materials are unlikely to exist in this area.
- ☒ The survey shows that areas may contain intact archeological sites or the survey results cannot preclude the possibility of such sites.
- ☒ Other (specify) The Horizontal Buffer Zone is appropriate only surrounding the Survey Area, the No Survey Area, and portions of the recommended survey areas where AmaTerra determined that no additional work is warranted, as described below.

• Archeological Site Evaluations:

No archeological sites or historic resources were documented within the APE.

• Further Work:

No further work is recommended within the Survey Area and a 50-foot buffer zone as reported above. Additionally, AmaTerra recommends no further work in recommended survey areas and their 50-foot buffer zones comprising the following locations and parcels:

The recommended survey area north of the Business 377 roadway between the US 377/Business 377 split and Howard Clemmons Drive (parcels R0000043195 and R000043543; Attachment 10a); the disturbed areas within the recommended survey area on US 377 between Pirate Drive and N. Meadows Street (parcel R000102164; Attachment 10b); and 3.06 acres of the APE within existing TxDOT ROW immediately east of the Brazos River (Attachment 10c).

AmaTerra could not make a sufficient assessment and recommends additional survey in the following locations and parcels:
The recommended survey area between the US 377/Business 377 split and Pirate Drive (parcels R000043207, R000043208, and R000043343; see Attachment 10a), the recommended survey area south of the US 377/Business 377 split (parcels R000043172, R00099279, and R000099986), an area flanking an unnamed drainage within the recommended survey area on US 377 between Pirate Drive and N. Meadows Street (parcel R000102164; see Attachment 10b); and the recommended survey area west of the intersection of US 377 and Corporate Drive (parcels R000012201, R000044075, and R000044077; Attachment 10d). Evidence supporting AmaTerra archeologists’ assessment of these areas can be found in Attachment 11.

Design changes that either extend beyond the buffer zone or result in potential impacts deeper than the impacts considered in this report would require additional review. The project may proceed with no need for further field investigations except in areas where AmaTerra could not make a sufficient assessment as to the likelihood of cultural materials occurring within the APE. In the unlikely event that archeological resources are inadvertently encountered, work should cease and consultation with a professional archeologist and/or the THC is recommended.

- **Justification:**

  No cultural materials were documented within the survey area, and the potential for intact cultural materials to be present within or immediately adjacent to the sufficiently visually assessed portions of the APE is low due to past impacts from land use and prolific suburban development in the area.
References Cited

Atwood, Kirsten M
2022  US 377 from BU 377 H (South) to 3000’ North of FM 167 in Hood County. Archeological Background Study.

Griffith, G., S. Bruce, J. Omernik, and A. Rogers
2007  Ecoregions of Texas. Project report to the Texas Commission on Environmental Quality.

Maxar

Texas Historical Commission (THC)

United States Department of Agriculture Natural Resources Conservation Service

United States Geological Survey
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Attachment 1. Project Location.

Attachment 1a. Map of entire APE.
Attachment 1b-1d. Recommended survey areas in the APE without ROE.
Attachment 1e. Survey Area.
Attachment 1f. Recommended survey area within TxDOT ROW.
Attachment 2 – Project information
Project Name: US 377 Reconstruct and Widening

Anticipated Environmental Classification: CE

Criterion: Open-Ended D

Is this an FHWA project that normally requires an EIS per 23 CFR 771.115(a)?

Project Association(s)

Manually Associate CSJ:

CSJ: 0080004094
Type: NH ( )

DCIS: 008003049
Type: Federal, State

DCIS: 008003060
Type: Federal, State

DCIS Project Funding and Location

Funding

DCIS Funding Type:
- Federal
- State
- Local
- Private

Location

DCIS Project Number: HP 2012(763)
Highway: US 377

District: FORT WORTH
County: HOOD

Project Limit -- From: FM 4
Project Limit -- To: OVERSTREET BOULEVARD

Begin Latitude: +32.455481
End Latitude: +32.8341546

Begin Longitude: -97.726802
End Longitude: -97.7893674

DCIS & P6 Letting Dates

DCIS District: 09/33
DCIS Approved: 
DCIS Actual: 
P6 Ready To Let: 
P6 Proposed Letting: 

DCIS Project Description

Type of Work: Spec

Layman’s Description: WIDEN ROAD - ADD LANES

DCIS Project Classification: WNF - WIDEN NON-FREeway
Design Standard: 4R - New Location and Reconstruction
Roadway Functional Classification: 3 - Rural principal arterial
Jurisdiction

- Does the project cross a state boundary, or require a new Presidential Permit or modification of an existing Presidential Permit?
  - No

- Who is the lead agency responsible for the approval of the entire project?
  - FHWA - Assigned to TxDOT
  - TxDOT - No Federal Funding
  - FHWA - Not Assigned to TxDOT

- TXDOT

- Who is the project sponsor as defined by 43 TAC 2.7?
  - No

- Is a local government's or a private developer's own staff or consultant preparing the CE documentation, EA or EIS?
  - Yes

- Does the project require any federal permit, license, or approval?
  - USACE
  - IBWC
  - USCG
  - NPS
  - IAJR
  - Other

- Does the project occur, in part or in total, on federal or tribal lands?

Environmental Clearance Project Description

<table>
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<th>Project Area</th>
<th>Typical Depth of Impacts: 3 (Feet)</th>
<th>Maximum Depth of Impacts: 30 (Feet)</th>
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<td>New ROW Required: 26 (Acres)</td>
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<td></td>
</tr>
<tr>
<td>New Perm. Easement Required: 3.4 (Acres)</td>
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</tr>
<tr>
<td>New Temp. Easement Required: 0.0 (Acres)</td>
<td></td>
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</tbody>
</table>

Project Description

Describe Limits of All Activities:

The Texas Department of Transportation (TxDOT) Fort Worth District is proposing improvements to United States Highway (US) 377 from Holmes Drive to 3,000 feet north of Farm to Market Road (FM) 167 (Fall Creek Highway), a distance of approximately 9 miles, in the City of Granbury, Hood County, Texas. The project has the potential to be constructed in phases, with improvements to US 377 between Pirate Drive and Overstreet Boulevard, including the US 377 interchanges with FM 51 and State Highway (SH) 144, being completed during the first phase of construction.

US 377 between Holmes Drive and SH 144 would remain a four-lane highway and would be converted from a rural highway to an urban highway through the addition of a raised median, enclosed drainage and curbs where appropriate. The proposed project would reconstruct and widen US 377, from SH 144 to north of FM 167 (Fall Creek Highway), from a four-lane divided highway to a six-lane divided highway with a raised median that would either be concrete-paved or vegetated to provide opportunities for landscaping. The proposed project also includes improvements to cross street intersections, ramps and driveway connections, the addition of shared-use paths in each direction to accommodate bicyclists and pedestrians, signalization, and drainage improvements.

Proposed improvements to cross streets and connector streets are anticipated. Improved driveway connections are also proposed at Meadows Drive, Whitehead Drive, Calinco Drive, Warnick Court/CR 331, Granbury Court, and Corporate Drive.

The proposed project would require 26 acres of new ROW and 3.4 acres of permanent drainage easements.

The proposed project would potentially displace eight commercial structures that include an AutoZone Auto Parts (Schematic ID 154), McDonald's (Schematic ID 161), Rancher's Feed Beef Butcher Shop (Schematic ID 217), Conoco gas station (Schematic ID 295), Cross Tire and Automotive Granbury shop (Schematic ID 297), Texas Car Title and Payday Loan Services (Schematic ID 298), Cheerful Heart Gifts & Boutique (Schematic ID 309), and Cowboy Marketplace & 377 RV Park-Campgrounds office (Schematic ID 434). Three other non-commercial/non-residential displacements include vehicle canopies at Jerry Durant Chevrolet Buick GMC (Schematic ID 306), the patio of Los Nares Mexican Restaurant (Schematic ID 338), and a historical marker located within the existing US 377 ROW near FM 167 (Fall Creek Highway/N&M Ranch Road).

Describe Project Setting:

The proposed project is located within the city of Granbury, Hood County, Texas. Adjacent land use is predominantly comprised of commercial properties, community facilities, residences and undeveloped land. The Granbury Municipal Airport is located north of BUS 377 (West Pearl Street) east of Archer Court, and the Granbury High School is located at the intersection of Pirate Drive/BUS 377 (West Pearl Street). Lake Granbury Medical Center is located at the southwest corner of FM 51 (Paluxy Road)/US 377. One National Register of Historic Places property, the Wright-Henderson-Duncan House, is located at the northwest corner of US 377/SR 144 however, no ROW or easements are required from the property. Additionally, three historical markers are located adjacent to the proposed project at the First Christian Church of Granbury, the Wright-Henderson-Duncan House, and along northbound US 377 identified as the Crockett, Elizabeth Three Miles to the Grave. It is anticipated that the Elizabeth Crockett marker would be relocated. The Fort Worth & Western Railroad parallels and is adjacent to US 377 to the east of BUS 377 (East Pearl Street). The proposed project is located within the Cross Timbers Ecoregion. The following TPWD EMST MOU types are within or immediately adjacent to the project area: Urban; Edwards Plateau Savannah, Woodland, and Shrubland; Floodplain; Crosstimbers Woodland and Forest; Riparian; and Agriculture. The project also crosses Lambert Branch near US 377/BUS 377 (West Pearl Street) and the Brazos River.
Describe Existing Facility:

Within the project limits, the existing US 377 highway is a four-lane divided highway with 12-foot-wide travel lanes (two in each direction) and typical 10-foot wide outside shoulders. There are sections of US 377 with either a depressed median, raised median or a center two-way left turn lane. The section of US 377 from Holmes Drive to the east end of the US 377 bridge over the Brazos River, and from FM 167 (Fall Creek Highway) to 3,000 feet north of FM 167, has a depressed median. The section of US 377 from the east end of the US 377 bridge over the Brazos River to east of Whitehead Drive has a raised median. The section of US 377 from east of Whitehead Drive to FM 167 (Fall Creek Highway) has a 16-foot wide continuous center two-way left turn lane. There are currently no bicycle or pedestrian facilities within the project limits, and existing drainage consists of open drainage ditches. The existing ROW throughout the project limits varies from 120 feet to 371 feet.

The existing BUS 377 (West Pearl Street) highway is a two-lane highway (one 12-foot wide lane in each direction) with 4 to 6-foot wide outside shoulders, divided by a 14-foot wide center turn lane, with at-grade connections to US 377. The US 377 northbound mainlanes include a ramp that transitions into the northbound BUS 377 lane, and the southbound BUS 377 lane connects to the southbound US 377 mainlanes. This intersection is controlled through stop signs.

The existing FM 51 (Paluxy Road) roadway is a two-lane roadway (one 12-foot wide lane in each direction) and 10 to 12-foot wide outside shoulders and passes over US 377. There are currently no frontage roads or ramp connections to and from FM 51 (Paluxy Road) and US 377. No traffic controls are present at this intersection.

The existing SH 144 highway is a four-lane highway with two 12-foot wide travel lanes in each direction, one 12-foot wide center turn lane and 10-foot wide outside shoulders along the US 377 overpass. There are currently ramp connections to and from SH 144 and US 377. This intersection is currently signalized.

The existing BUS 377 (East Pearl Street) highway is a two-lane highway (one 12-foot wide lane in each direction) with 10-foot wide outside shoulders in each direction. There are currently ramp connections to and from BUS 377 (East Pearl Street) and US 377. The southbound US 377 mainlanes are elevated above the ramp connecting BUS 377 (East Pearl Street) to the northbound US 377 mainlanes. No traffic controls are present at this intersection.

The existing FM 167 (Fall Creek Highway/M&M Ranch Road) roadway is a two-lane roadway (one 12-foot wide lane in each direction) with an at-grade signalized intersection at US 377. FM 167 (Fall Creek Highway) transitions to a two-lane roadway with a dedicated right turn lane as it approaches US 377 from the south. This intersection is currently signalized.

The remaining cross streets where improvements would take place (Holmes Drive/Archer Drive; Southwest Parkway; Pirate Drive; Overstreet Boulevard; Old Cleburne Road/Waters Edge Drive [CR 301]; Hill Boulevard; Harbour Lakes Drive; Mustang Trail; Old Acton Highway; Portal Drive/Eastridge Road; Old Granbury Road; Davis Road; Business Boulevard; Shady Grove Drive; Cleveland Road [CR 323]; FM 4/Meander Road; Peck Road; James Road; Shannons Run; Daisy Drive; FM 167 [Temple Highway]/Saratoga Boulevard; Sardius Boulevard) primarily consist of two to four 12-foot wide travel lanes and are all at-grade intersections with US 377. Of these intersections, signals are currently present at Pirate Drive, Overstreet Boulevard, Old Cleburne Road/Waters Edge Drive (CR 301), Hill Boulevard, Harbour Lakes Drive, Old Acton Highway, David Road, FM 4/Meander Road, James Road and FM 167 (Temple Highway)/Saratoga Boulevard. The remaining intersections are controlled through stop signs.
Describe Proposed Facility:

US 377 between Holmes Drive and SH 144 would remain a four-lane (two 12-foot wide travel lanes in each direction) divided highway and be converted from a rural highway to an urban highway through the addition of raised medians, enclosed drainage and curbs where appropriate. The project would reconstruct and widen US 377, from SH 144 to 3,000 feet north of FM 167 (Fall Creek Road), from a four-lane divided highway to a six-lane divided highway (three 12-foot wide travel lanes in each direction) with a raised median that would be concrete-paved or vegetated. The median width would vary between 8 and 165 feet. Frontage roads would be provided along US 377 at these locations: from 600 feet west of FM 51 (Paluxy Road) to SH 144, and from 300 feet west of FM 167/M&M Ranch Road to 0.5-mile east of FM 167/M&M Ranch Road on the southbound side of US 377. Dedicated left and right turn lanes would be provided as necessary. The proposed ROW width would vary between 120 and 625 feet.

The proposed project also includes improvements to cross street intersections, ramps, driveway connections, signalization and drainage, and the addition of 10-foot wide shared-use paths in each direction to accommodate bicycles and pedestrians. The drainage system would be converted from open drainage ditches to an enclosed urban storm drain system through most of the corridor.

Improvements to BUS 377 (West Pearl Street) include reconstruction of the at-grade intersection with US 377 to a signalized "T" intersection. The existing US 377/BUS 377 (West Pearl Street) connections would be demolished. A signal is proposed at this intersection.

Improvements to FM 51 (Paluxy Road) include reconstruction and the addition of one mainlane in each direction, connections to proposed US 377 frontage roads and ramps, and the addition of two 10-foot wide shared use paths (one in each direction) along FM 51 (Paluxy Road). Signals are proposed at this intersection.

Improvements to SH 144 include reconstruction of the existing overpass to a diverging diamond interchange design with two to three 12-foot wide travel lanes in each direction. The existing ramps to and from US 377 would be reconstructed. Signals are proposed at this intersection.

Improvements to BUS 377 (East Pearl Street) include construction of a grade-separated interchange. BUS 377 (East Pearl Street) would consist of two 12-foot wide lanes each direction in a double roundabout design from north of the US 377 mainlanes to south of the US 377 mainlanes to connect to North Plaza Drive. The US 377 mainlanes would bridge over BUS 377 (East Pearl Street). Entrance and exit ramps would be constructed in each direction and existing connections to Crawford Avenue and North Plaza Drive would be reconstructed. Traffic would be controlled through yield conditions approaching the double roundabout.

Improvements to FM 167 (Fall Creek Highway/M&M Ranch Road) include replacement of the at-grade signalized intersection with a grade-separated interchange, with two 12-foot wide lanes in each direction. The US 377 mainlanes would pass under FM 167/M&M Ranch Road, entrance and exit ramps would be provided in each direction. Short segments of one-way frontage roads would be constructed on each side of US 377 in each direction. East of this intersection, US 377 would transition from six lanes to four lanes to match existing conditions. Signals are proposed at this intersection.

Turn lanes and transitional pavement connections to US 377 are proposed at Holmes Drive/Archer Drive, Southwest Parkway, Pirate Drive, Overstreet Boulevard, Old Cleburne Road/Waters Edge Drive (CR 301); Hill Boulevard, Harbour Lakes Drive, Mustang Trail, Old Acton Highway, Portal Drive/Eastridge Road, Old Granbury Road, Davis Road, Business Boulevard, Shady Grove Drive, Cleveland Road (CR 323), FM 4/Weafer Road, Peck Road, James Road, Shannons Run, Daisy Drive, FM 167 (Temple Highway)/Saratoga Boulevard, and Sardius Boulevard.
Attachment 3 – Geology underlying Survey Area

Survey Area

Geologic Units
- Kgr - Glen Rose Formation
- Qt - Fluvialite terrace deposits
- Wa - water

Archeology Survey US 377 Granbury
Hood County, Texas

Data Source: Geologic Atlas of Texas (2020)
Aerial Source: Mavis (2023)
Date: 3/15/2023
### Attachment 4 – Mapped soils in the APE

Attachment 4a. All mapped soils occurring in the APE.

<table>
<thead>
<tr>
<th>Soil Unit Number(s)</th>
<th>Soil Unit Name</th>
<th>Soil Type</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Aledo-Bolar association, 1 to 8 percent slopes</td>
<td>Residuum</td>
</tr>
<tr>
<td>2</td>
<td>Bastrop loamy fine sand, 1 to 5 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>3</td>
<td>Bastrop fine sandy loam, 0 to 1 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>4</td>
<td>Bastrop fine sandy loam, 1 to 3 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>5</td>
<td>Bastrop fine sandy loam, 3 to 5 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>9</td>
<td>Blanket clay loam, 1 to 3 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>10</td>
<td>Bolar clay loam, 1 to 3 percent slopes</td>
<td>Residuum</td>
</tr>
<tr>
<td>11</td>
<td>Bolar clay loam, 3 to 5 percent slopes</td>
<td>Residuum</td>
</tr>
<tr>
<td>14</td>
<td>Bunyan fine sandy loam, occasionally flooded</td>
<td>Alluvium</td>
</tr>
<tr>
<td>17</td>
<td>Decordova loamy fine sand, 0 to 5 percent slopes</td>
<td>Alluvium</td>
</tr>
<tr>
<td>21</td>
<td>Duffau loamy fine sand, 1 to 5 percent slopes</td>
<td>Residuum</td>
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<td>Residuum</td>
</tr>
<tr>
<td>24</td>
<td>Duffau fine sandy loam, 1 to 5 percent slopes, eroded</td>
<td>Residuum</td>
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<td>26</td>
<td>Frio silty clay, 0 to 1 percent slopes, occasionally flooded</td>
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<td>28</td>
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<td>30</td>
<td>Krum clay, 0 to 1 percent slopes</td>
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<td>Krum clay, 1 to 3 percent slopes</td>
<td>Residuum</td>
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<td>Residuum</td>
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<tr>
<td>57</td>
<td>Windthorst fine sandy loam, 1 to 5 percent slopes, eroded</td>
<td>Residuum</td>
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</tbody>
</table>
Attachment 4b. Mapped soils in the Survey Area.
Attachment 5 – PALM Maps

Attachment 5a. Palm map of entire APE.
Attachment 5b. PALM map of Survey Area.
Attachment 6 – Cultural Resources Within 1 km of the APE.

RESTRICTED SITE LOCATION INFORMATION - FIGURES REMOVED
Attachment 7. Survey Results Map
<table>
<thead>
<tr>
<th>Shovel Test Number</th>
<th>Depth (cmbs)</th>
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<th>Sediment Texture</th>
<th>Cultural Material</th>
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<td>Depth (cmbs)</td>
<td>Sediment color (Munsell)</td>
<td>Sediment Texture</td>
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</table>
Attachment 9. Survey Area Photos

Attachment 9a. Overview of Survey Area, facing south.

Attachment 9b. Gas utility running north-south near center of Survey Area, facing south.
Attachment 9c. Overview showing commercial businesses to the east of the Survey Area, facing east.

Attachment 9d. Typical shovel test profile in the Survey Area.
Attachment 10. Results of visual assessment of recommended survey areas.

Attachment 10a. Results of visual assessment of Access Denied Area around the US 377 and Business 377 split.
Attachment 10b. Results of visual assessment of Access Denied Area along US 377 between Pirate Drive and N. Meadows Street.
Attachment 10c. Results of visual assessment of Access Denied Area along existing US 377 ROW immediately east of the Brazos River.
Attachment 10d. Results of visual assessment of Access Denied Area southwest of the intersection of US 377 and Corporate Drive.
Attachment 11. Evidence supporting visual assessment of recommended survey areas

Twelve of 15 of the parcels within the APE were not surveyed due to denied ROE. Archeologists observed these areas from outside of the property boundaries, took photos, notes, and determined which would be worth returning to survey at a future date and which are too disturbed to have intact archeological deposits. These parcels are summarized below.

Parcels R000043207, R000043208, and R000043343
While the southern portion of parcel R000043343 appears disturbed by a drainage and a utility line, AmaTerra recommends additional survey within this parcel. AmaTerra could not sufficiently assess parcels R000043207 and R000043208, and recommends additional survey within these parcels.

Middle portion of parcel R000043343, facing east.
Southern portion of parcel R000043343, facing west.

Apparent water catchment area in western end of parcel R000043343, facing north.
Parcels R000043195 and R000043543
The APE within these parcels is located in a channelized and heavily modified stretch of Lambert Branch and is not recommended for archeological survey.

Cut drainage ditch occupying most of the proposed new ROW in parcel R000043195 and extending northeast along road berm in parcel R000043542 into existing ROW, facing northwest.

Box culvert extending along modified stretch of Lambert Branch into proposed ROW in parcel R000043195, facing south.
Parcels R000099986, R000099279, and R000043172
These parcels are located in a sloping wooded area bisected by Lambert Branch. Portions of the APE within these parcels appear to be disturbed by road construction, though AmaTerra recommends additional survey in the wooded portions of these parcels.

Sloping, wooded area across parcels R000099986, R000099279, and R000043172, facing south.

Northern edge of parcels R000099986, R000099279, and R000043172, facing west. Cleared area is mostly existing ROW.
Parcel R000102164
Most of the APE within this parcel is located immediately adjacent to a power line and partially in a drainage ditch at the base of a steep slope in an area that has been heavily modified. Utilities are present as well and some portions are saturated; no further survey is recommended for these areas. AmaTerra does recommend additional work adjacent to the unnamed tributary of Lambert Branch that crosses the APE in this parcel, extending at least 10 meters south-southwest of the existing ROW to the southern edge of the APE.
Berm, drainage ditch, and utilities within or adjacent to parcel R000102164, facing east.

Utility line marker within or immediately adjacent to parcel R000102164, facing south.
Saturated area within parcel R000102164, facing southwest.

Steep berm in foreground, cleared land and terrain modification visible behind brush line in parcel R000102164, facing southeast.
**Existing TxDOT ROW (no parcel data)**

The APE within these parcels is located entirely within two drainage ditches in the existing ROW near the Brazos River and is heavily disturbed. AmaTerra does not recommend additional survey in these areas.

**Drainage ditch and saturation in recommended survey area south of the US 377 roadway, facing north.**

**Road berm and drainage ditch in recommended survey area north of the US 377 roadway, facing west.**
Parcels R000012201, R000044075, and R000044077

AmaTerra could not visually assess most of these parcels and recommends additional survey. The area appears relatively undisturbed, with the exception of a modified drainage in the southeast corner of the survey area.

Overview of parcels R000012201, R000044075, and R000044077, facing west.

Modified drainage in parcels R000012201 and R000044077, facing west.
Modified drainage in parcels R000012201 and R000044077, facing south.
This report was written on behalf of the Texas Department of Transportation by:

![AmaTerra Environmental Inc. Logo]

11842 Rim Rock Trail
Austin, Texas 78737