Appendix J

Historic, Architectural, and Non-Archaeological Cultural Resources Technical Study

Texas Department of Transportation

TEXAS-OKLAHOMA PASSENGER RAIL STUDY

Historic, Architectural, and Non-Archaeological Cultural Resources

Technical Study

Prepared by

Texas Department of Transportation

U.S. Department of Transportation
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Acronyms and Abbreviations

CCSD&RG	Corpus Christi, San Diego, and Rio Grande Railway
CFR	Code of Federal Regulations
CONV	conventional rail
EIS	environmental impact statement
ENV	TxDOT Environmental Affairs Division
FRA	Federal Railroad Administration
GC&SF	Gulf, Colorado, and Santa Fe Railway
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HrSR	higher-speed rail
HSR	high-speed rail
IH-30	Interstate Highway 30
IH-35	Interstate Highway 35
KCS	Kansas City Southern
mph	miles per hour
n.d.	no date
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRHP	National Register of Historic Places
Program	Texas-Oklahoma Passenger Rail Program
SHPO	State Historic Preservation Office
SLB&M	St. Louis, Brownsville, & Mexican Railroad
Study	Texas-Oklahoma Passenger Rail Study
TRE	Trinity Railway Express
TxDOT	Texas Department of Transportation
WWI	World War I
WWII	World War II

1.0 Introduction

The Texas Department of Transportation (TxDOT), along with the Federal Railroad Administration (FRA), is preparing a service-level environmental impact statement (EIS) to evaluate intercity passenger rail service alternatives for the Texas-Oklahoma Passenger Rail Program (Program). The purpose of the Program is to enhance intercity mobility by providing enhanced passenger rail service as a transportation alternative that is competitive with automobile, bus, and air travel. Preparation of the service-level EIS, in support of which this technical study has been prepared, is one of two primary objectives of the Texas-Oklahoma Passenger Rail Study (Study). In addition to the service-level EIS, TxDOT and FRA are preparing a service development plan for the corridor to guide further development and capital investment in passenger rail improvements identified in the EIS Record of Decision. The Oklahoma Department of Transportation is a partnering state agency for the Study and the EIS.

The 850-mile corridor analyzed for the Study runs north-south and roughly parallels Interstate Highway 35 (IH-35), with the northern point in Edmond, Oklahoma (i.e., northern end of the Oklahoma City portion of the corridor), and the southern end in south Texas, potentially in Corpus Christi, Brownsville, Laredo, or the Rio Grande Valley, as shown on Figure 1-1. For this service-level analysis, a preliminary alignment was developed to represent each EIS alternative, based on conceptual engineering that considered and avoided obvious physical or environmental constraints. These alignments were not refined to optimize performance, reduce cost, avoid specific properties or individual environmental resources, or for any other such considerations. If an alternative is selected at the service-level for further development, the above considerations would be assessed at the project level. A broad corridor of study with a width of 500 feet has been identified along each route. Unless described differently, for each environmental resource being analyzed, this 500-foot EIS Study Area[1] is the area in which potentially affected environmental resources are identified in proximity to each alternative. This EIS Study Area provides an envelope that could accommodate areas for associated effects, including necessary roadway shifts, grade separations, construction activities, and affiliated features such as stations and parking, traction-power substations, power lines, and maintenance-of-way facilities.

The area for which data were collected is identified as the Study Vicinity. Typically, county-wide data were collected for counties partially or completely within the Study Area.

The analysis provides quantitative information about historic, architectural, and non-archaeological cultural resources within the EIS Study Area for each alternative and compares it against the No Build Alternative and other build alternatives in the same geographic region. The discussion of effects also provides qualitative differences in permanent, temporary, and direct and indirect effects that are associated with the service type (conventional rail, higher-speed rail, or high-speed rail) relative to the environmental context. However, because the 500-foot EIS Study Area does not

[1] Some environmental resource issues, such as transportation, air quality, and noise and vibration, use broader study areas to determine impacts.

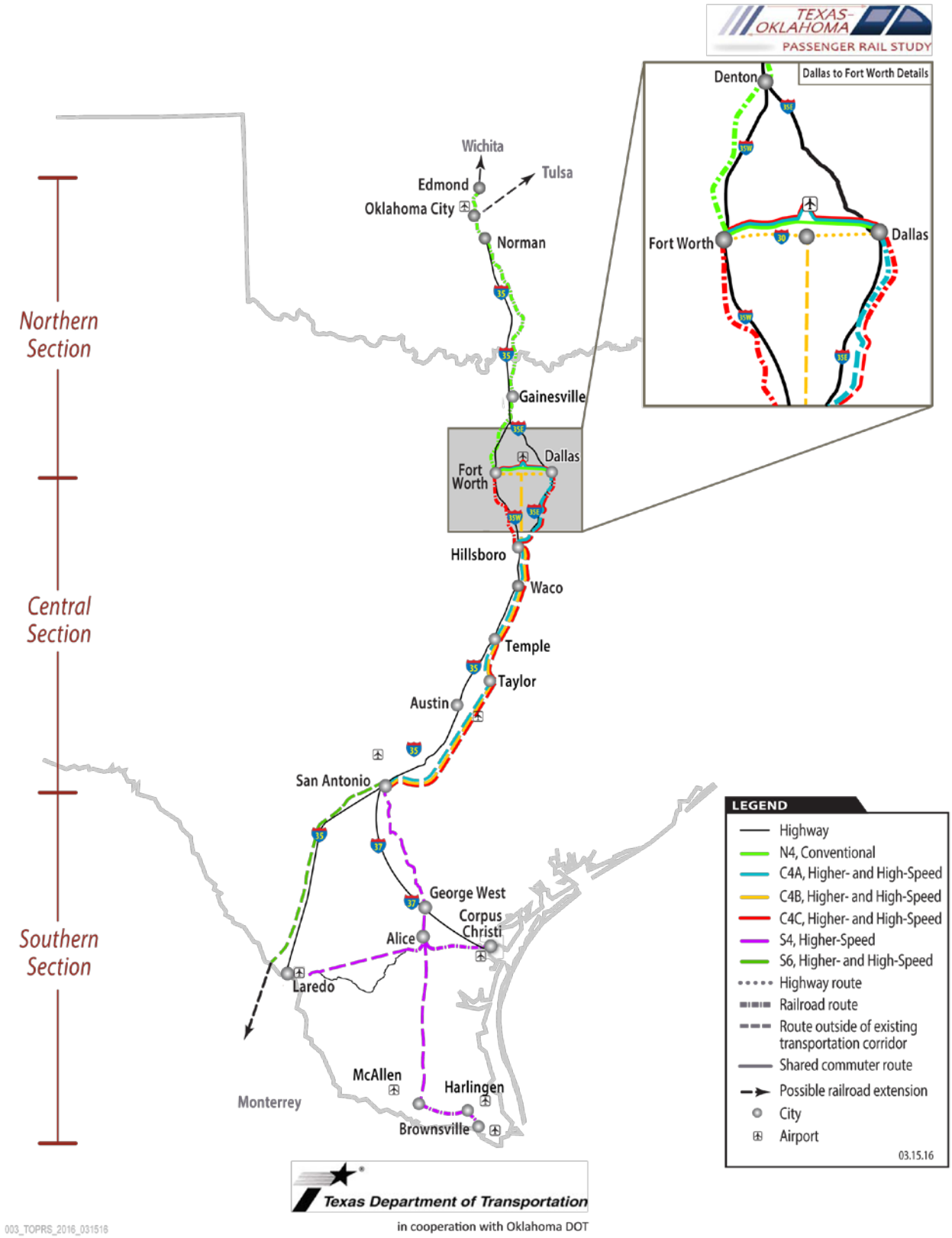


Figure 1-1: Build Alternatives

represent the actual footprint of operation or construction phases, the analysis is primarily comparative, based on the presence of the resource within the EIS Study Area and the likelihood of effects as appropriate for this service-level analysis.

The build alternatives are divided into the following three geographic sections based on the key regional markets that could be served by passenger rail improvements:

- Northern Section: Oklahoma City to Dallas and Fort Worth
- Central Section: Dallas and Fort Worth to San Antonio
- Southern Section: San Antonio to South Texas

In addition, the alternatives consist of both a route, which refers to the specific corridor that a potential alignment follows, and a service type, which refers to the speed or category of rail transportation (conventional rail, higher-speed rail, or high-speed rail). The alternatives that have been carried forward for analysis in the EIS, including their geographic sections, routes, and service types, are listed in Table 1-1.

Table 1-1: Alternatives Carried Forward for Further Evaluation

Route	Service Type [a]
Northern Section	
N4A	CONV
Central Section	
C4A	HrSR
	HSR
C4B	HrSR
	HSR
C4C	HrSR
	HSR
Southern Section	
S4	HrSR
S6	HrSR
	HSR

[a] CONV = conventional rail (up to 79 to 90 miles per hour [mph]); HrSR = higher-speed rail (up to 110 to 125 mph); HSR = high-speed rail (up to 220 to 250 mph)

The route alternatives were based on the alignments of existing transportation networks with corridors potentially suitable for passenger rail operations (i.e., the existing railroad network and the existing interstate highway network) (the term "operations" includes maintenance of the facilities as well), or they were located on new alignments outside existing transportation corridors. Potential alignments described as "following" railway corridors share existing tracks, are located within an existing right-of-way, or are generally adjacent to existing tracks, depending on the service type. Alternatives that are outside the existing transportation corridor could have greater indirect effects than those located in the existing transportation corridor; for example, alternatives outside existing corridors could divide neighborhoods or wildlife communities or create a potential new barrier.

1.1 Service Type Descriptions

The three service types (conventional rail, higher-speed rail, and high-speed rail) considered in this EIS are described below.

1.1.1 Conventional Rail

Conventional rail typically includes diesel-powered, steel-wheeled trains operating on steel tracks. Roadway crossings may be grade-separated depending on the type of roadway and amount of traffic, and rail rights-of-way may be fenced. Conventional rail would be operated at speeds up to 79 to 90 mph and would mostly use existing railroad rights-of-way. For conventional rail alternatives, existing railroad track may be used, or in some cases, modifications such as double-tracking could be constructed within the existing right-of-way to accommodate additional trains.

1.1.2 Higher-Speed Rail

Higher-speed rail is similar to conventional rail in several respects. In many cases, higher-speed rail trains can run on the same steel tracks that support conventional rail, but higher speeds can require improvements such as upgrading wooden ties with concrete ties, improving signaling, and upgrading roadway crossings. In this case, higher-speed rail trains are assumed to be diesel-powered. Higher-speed rail would be operated at speeds up to 110 to 125 mph. Where proposed within an existing railroad right-of-way, a shared right-of-way with separate tracks for freight and passenger services would be constructed. Because of its maximum speed and because train frequency would be similar to conventional rail, higher-speed rail could operate on a single track with passing locations and would not require double-tracking. Where higher-speed rail is proposed outside an existing transportation corridor, the new alignment would be designed with curves and other features that could accommodate high-speed rail service if warranted by ridership and economically feasible in the future. However, unlike high-speed rail, the design would not include electrification or a full double track, and some grade crossings would remain.

1.1.3 High-Speed Rail

High-speed rail includes electric trains powered by an overhead power supply system. Train sets are steel wheel on steel rail, but are designed to operate at high speeds with an aerodynamic shape, and suspension and braking systems are designed for high-speed travel. High-speed rail would be operated at speeds up to 220 to 250 mph. The entire right-of-way would be fenced and fully grade-separated. The alignment would be electrified and double-tracked. This service type could only reach its maximum speeds outside existing transportation corridors because existing railroad alignments are not compatible with the speeds required and they do not have the required space for separation of freight and high-speed rail. In areas where this service type is within existing transportation corridors, it would operate at lower speeds.

1.2 Alternative Descriptions

For this service-level analysis, a preliminary alignment was developed to represent each route alternative, based on conceptual engineering that considered obvious physical or environmental constraints. They are not detailed alignments that have been refined to optimize performance, reduce cost, avoid specific properties or individual environmental resources, or similar considerations, which would be assessed in the project-level phase for alternatives carried forward for further analysis.

The alternatives evaluated in the service-level EIS, shown on Figure 1-1, have been developed to a level of detail appropriate for a service-level analysis: the route alternatives represent a potential corridor where rail improvements could be implemented but do not specify the precise location of the track alignment. When a route alternative is refined to include a service type (conventional, higher-speed, or high-speed rail), it is then referred to as an alternative. Alternatives in the Northern, Central, and Southern sections could be built as individual, stand-alone projects or in combination with alternatives in another section. In addition, more than one alternative in the Central and Southern sections could be built in the future because the alternatives provide different service types for independent destinations. Details on connecting the alternatives would be determined during project-level studies.

Potential alignments are described below in terms of nearby transportation corridors and cities. For example, potential alignments are described as “following” railway corridors, which could mean that they are sharing existing tracks, within an existing right-of-way or generally adjacent to existing tracks depending on the service type.

The Southern Section alternatives include a potential extension to Monterrey, Mexico. The EIS evaluates alignment corridors only within the United States; however, the potential extension to Monterrey has been included for ridership analysis purposes, and FRA and TxDOT have initiated coordination with the Mexican government about the potential extension.

1.2.1 No Build Alternative

The No Build Alternative would not fulfil the Program's purpose and need but is carried forward as a baseline alternative against which the build alternatives are compared. The No Build Alternative would consist of the existing transportation network, including roadway, passenger rail, and air travel in the Study Vicinity and committed improvements to these systems. The No Build Alternative includes existing and planned roadway, passenger rail, and air travel in the Study Vicinity (including operation, maintenance, and expansion). Information was collected from current regional transportation plans within the Study Vicinity and websites describing services such as train schedules. These improvements and their evaluation at this service-level stage would require project-specific assessment. Conducting detailed project-specific assessments at this stage of the program development process is not feasible, except from a cumulative analysis perspective.

1.2.2 Northern Section: Oklahoma City to Dallas and Fort Worth

Due to feasibility based on initial ridership and cost information, only one route alternative with one service type was considered feasible in the Northern Section: Alternative N4A with conventional rail.

1.2.2.1 Alternative N4A Conventional Rail

Alternative N4A would begin in Edmond, Oklahoma, and follow the BNSF rail alignment south to Oklahoma City. The alternative would continue south along the BNSF rail alignment to Norman, Oklahoma; through Metro Junction, near Denton, Texas; and on to Fort Worth (as does the existing Heartland Flyer service). From Fort Worth, the alternative would continue east to Dallas following the Trinity Railway Express (TRE) tracks. From Edmond to Dallas, the route would be approximately 260 miles long. Because existing freight traffic would not preclude passenger service along this section of track, the route would provide passenger rail service on the existing BNSF track, with potential improvements within the existing BNSF right-of-way.

Alternative N4A would provide several improvements over the existing Heartland Flyer service. Alternative N4A would increase the number of daily round trips along this route (the Heartland Flyer currently offers one round trip per day), and the N4A route would extend from Fort Worth to Dallas without requiring a transfer (the Heartland Flyer service currently terminates in Fort Worth). In addition, Alternative N4A would provide improvements to existing station facilities and new train equipment with more onboard amenities, including business class available for a premium price.

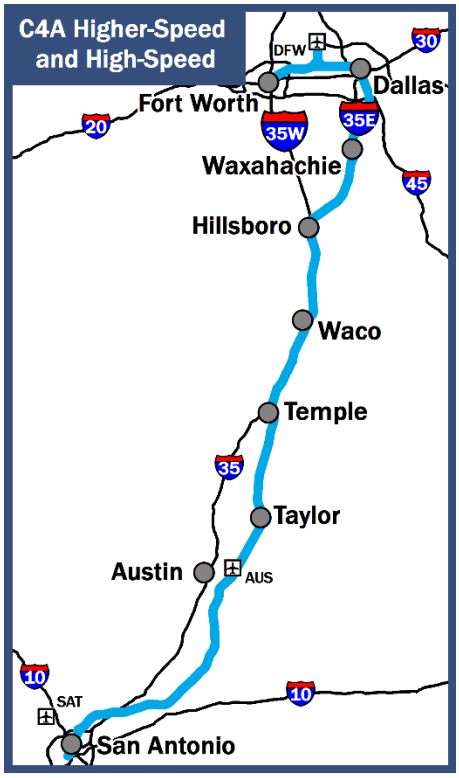
Alternative N4A assumes diesel-locomotive hauled equipment running three to six daily round trips. Two or three of the round trips would operate on an accelerated schedule, making roughly seven stops, with the remaining local trains making up to 12 stops.

1.2.3 Central Section: Dallas and Fort Worth to San Antonio

Three route alternatives, each with higher-speed and high-speed rail options, were evaluated in the Central Section Alternatives: C4A, C4B, and C4C.

The Central Section alternatives would provide several improvements over the existing Texas Eagle service in this corridor. All of the alternatives would increase the number of daily round trips along this route (the Texas Eagle currently offers one round trip per day). The high-speed rail options would provide faster service between Dallas and Fort Worth and Antonio – 2 hours versus 8 hours for the Texas Eagle Service. In addition, the Central Section alternatives would provide improvements to existing station facilities and new train equipment.

1.2.3.1 Alternative C4A Higher-Speed and High-Speed Rail



Alternative C4A would begin in Fort Worth and follow the TRE tracks east to Dallas. From Dallas, it would follow the BNSF alignment south toward Waxahachie where it would enter a new alignment outside existing highway and rail corridors to accommodate maximum operating speeds. Though outside existing transportation corridors, the southern portion of Alternative C4A would generally follow the BNSF alignment for about 250 miles, traveling south from Waxahachie through Hillsboro, Waco, Temple, Taylor, and Austin to San Antonio.

Alternative C4A Higher-Speed Rail assumes new high-performance diesel-locomotive hauled equipment running six to 12 daily round trips. Express trains would likely make seven stops, and local trains would make up to 12 stops.

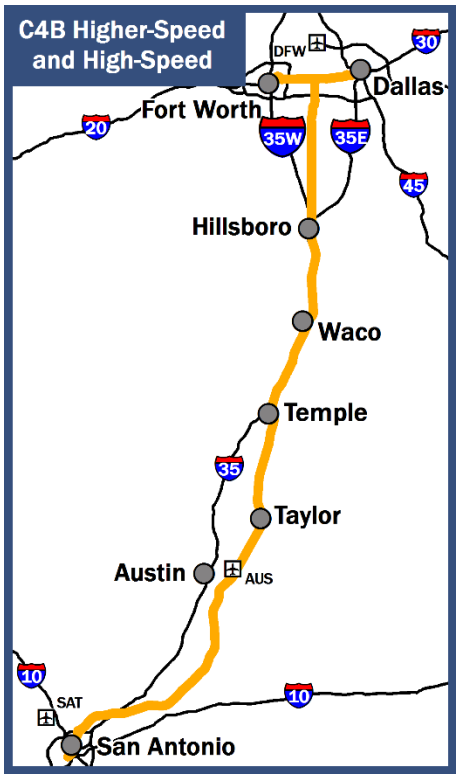
Alternative C4A High-Speed Rail assumes true electric-powered, high-speed service running 12 to 20 daily round trips. Express trains would likely make six stops, and local trains would make up to nine stops.

1.2.3.2 Alternative C4B Higher-Speed and High-Speed Rail

Alternative C4B would serve both Fort Worth and Dallas, with trains following a new elevated high-speed rail alignment over IH-30. In Arlington (between Dallas and Fort Worth), the alternative would turn south to Hillsboro on an alignment outside existing transportation corridors. The alternative would then follow the same high-speed rail alignment as Alternative C4A from Hillsboro to San Antonio.

Alternative C4B Higher-Speed Rail assumes new high-performance diesel-locomotive hauled equipment running six to 12 daily round trips. Express trains would likely make seven stops, and local trains would make up to 12 stops.

Alternative C4B High-Speed Rail assumes true electric-powered, high-speed service running 12 to 20 daily round trips. Express trains would likely make six stops, and local trains would make up to eight stops.

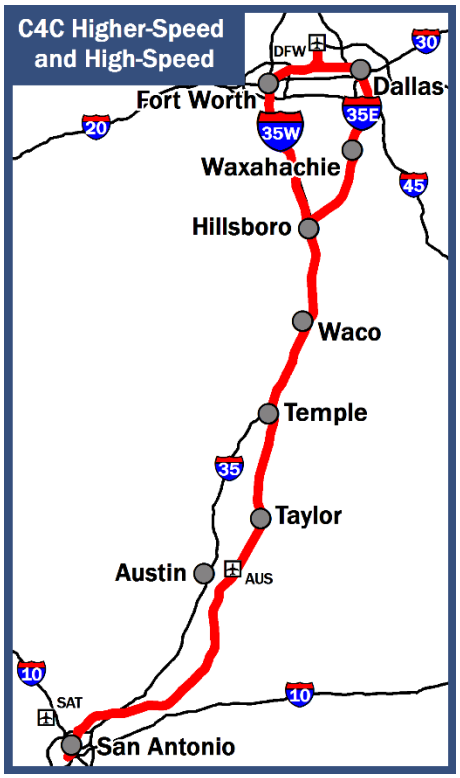


1.2.3.3 Alternative C4C Higher-Speed and High-Speed Rail

Alternative C4C would follow the same potential alignment as Alternative C4A from Fort Worth east to Dallas and south to San Antonio, but would include a link from Hillsboro directly to Fort Worth parallel to the UPRR alignment. Service on the Alternative C4C route would operate in a clockwise direction, running from Hillsboro to Fort Worth, to Dallas, back to Hillsboro, and south to San Antonio in order to serve Fort Worth directly (while also being compatible with the general service for Alternative C4A).

Alternative C4C Higher-Speed Rail assumes new high-performance diesel-locomotive hauled equipment running six to 12 daily round trips. Express trains would likely make seven stops, and local trains would make up to 12 stops.

Alternative C4C High-Speed Rail assumes true electric-powered high-speed service running 12 to 20 daily round trips. Express trains would likely make six stops, and local trains would make up to nine stops.



1.2.4 Southern Section: San Antonio to South Texas

Two route alternatives were evaluated in the Southern Section: Alternative S4, with higher-speed rail, and Alternative S6, with higher-speed and high-speed rail options.

1.2.4.1 Alternative S4 Higher-Speed Rail

Alternative S4 would begin in San Antonio and travel southeast along the UPRR alignment to George West, where it would continue outside existing transportation corridors to Alice. At Alice, the alternative would divide into three legs at a stop. The first leg would travel west along the Kansas City Southern (KCS) Railway to San Diego, Texas; it would then travel outside existing transportation corridors to east of Laredo in an alignment that would allow higher speeds and rejoin the KCS Railway to enter the highly developed Laredo area. The second leg would travel south along abandoned railroad tracks to McAllen and east to Harlingen and Brownsville. The third leg would travel east along the KCS Railway to Corpus Christi.

Alternative S4 assumes new high-performance diesel-locomotive hauled equipment running four to six daily round trips. Depending on corridor demand model forecasts, the primary service may be designated as Laredo-Alice-San Antonio and Corpus Christi-Alice-San Antonio, with a connecting feeder from Brownsville, Harlingen, and McAllen.

1.2.4.2 Alternative S6 Higher-Speed and High-Speed Rail

Alternative S6 would begin in San Antonio and travel south on a new alignment outside existing transportation corridors to a station near the Laredo-Columbia Solidarity Bridge, which crosses the Rio Grande north of Laredo. This study only examines the physical effects of the U.S. component of this new line, but it does consider the ridership effect of such a connection.

Alternative S6 Higher-Speed Rail assumes new high-performance diesel-locomotive hauled equipment running four to six daily round trips between San Antonio and Laredo, which would be the only U.S. stops for the alternative. If an extension from Laredo to Monterrey is added, the frequency of trips to Monterrey is assumed to be the same as those from San Antonio to Laredo.

Alternative S6 High-Speed Rail assumes true electric-powered, high-speed service running eight to 12 daily round trips between San Antonio and Laredo. If an extension from Laredo to Monterrey is added, the frequency of trips to Monterrey is assumed to be the same as those from San Antonio to Laredo.

1.2.5 Station Cities

The study does not evaluate specific station locations, and no conclusion about the exact location of stations will be made as part of the service-level EIS process. However, based on ridership data and transit connectivity information developed as part of the alternatives analysis (TxDOT 2014a), and based on stakeholder input, the cities in which stations would most likely be located have been assumed. The size and design of stations would be appropriate for the service type and the route of the alternative. Cities that could have stations are listed in Table 1-2.

Table 1-2: Cities with Potential Stations

Oklahoma	
Edmond	Pauls Valley
Oklahoma City	Ardmore
Norman	
Texas	
Gainesville	Austin
Fort Worth	San Antonio
Arlington	Alice
Dallas	Corpus Christi
Waxahachie	Harlingen
Waco	McAllen
Temple (also serving Killeen)	Brownsville
Taylor	Laredo

2.0 Regulatory Context and Purpose

This technical study outlines potential effects on historic, architectural, and non-archaeological cultural resources (henceforth referred to as historic resources) at the service level. Therefore, this technical study does not require a Section 106 analysis of the National Historic Preservation Act (NHPA) or the Antiquities Code of Texas because there is no proposed undertaking associated at the Program level. Documentation in accordance with Section 106 and Antiquities Code of Texas will be required at the project level.

The service-level EIS includes a corridor-level evaluation of reported historic resources in proximity to alternatives; it does not include the detailed evaluation of individual potential resources and properties.

This technical study identifies and describes the general areas of development and types of resource sites and areas within the EIS Study Area. This study does not discuss archaeological sites, tribal resources, or traditional cultural properties. Those property types are discussed in the Archaeological Sites Technical Study (TxDOT and FRA 2016; see Appendix K of the Draft EIS).

3.0 Evaluation Methods

This service-level analysis used a broad approach to determine the potential effects on historic resources along the alternatives. The EIS Study Area for historic resources was defined in consultation with FRA. The service-level analysis of potential historic resources was conducted at a corridor level as opposed to a specific alignment of the alternatives. As such, the EIS Study Area used to identify potential historic resources and areas of high sensitivity was defined as a 500-foot-wide corridor for each of the alternatives. Future studies conducted at the project level would likely define a specific Area of Potential Effects through the development of a Programmatic Agreement among FRA, TxDOT, the Oklahoma Department of Transportation, and the Texas and Oklahoma State Historic Preservation Offices (SHPOs).

3.1 Service-Level Analysis

The following activities were conducted during this service-level analysis:

- Delineated an EIS Study Area for each alternative to evaluate historic resources. The EIS Study Area is a 500-foot-wide buffer within which the rail alignment would be positioned.
- Prepared a general historic context using primary and secondary sources. Presented the history of the areas where alternatives lie to provide the general context to evaluate historic resources identified in the EIS Study Area.
- Identified known historic resources (that is, those that are listed or determined eligible for listing in the National Register of Historic Places [NRHP], including historic resources such as buildings, sites, structures, objects, and historic districts).
- Identified areas where there might be historic resources within the EIS Study Area that have not been evaluated but may meet NRHP eligibility (to be further assessed and formal determinations of NRHP eligibility to be completed at the project level). To allow for delays in Program planning, a survey cutoff date of 1970 was used for identification of potentially NRHP-eligible historic districts within the EIS Study Area. The cutoff date may need to be modified at the project level based on the actual date of Program construction. Additional historic resources may be identified at the project level that were constructed after 1970.
- Conducted a preliminary assessment of the potential effects on historic resources for each alternative. The assessment of potential effects was based on preliminary information and research conducted at the service level; potential effects may need to be reassessed based on changes to the proposed Program and the actual date of construction. Formal determination of effects pursuant to the National Environmental Policy Act (NEPA) and Section 106 of the NHPA would be made during the project-level NEPA process and would require field investigations to identify potential historic resources.

3.2 Data Sources

Primary and secondary information on potential historic resources was obtained from electronic databases and online resources including the following:

- *Texas Historic Sites Atlas* (Texas Historical Commission 2014)
- Oklahoma's National Register Handbook (Oklahoma Historical Society 2014)
- National Park Service's (NPS) Google Earth layer of NRHP-listed resources in Texas and Oklahoma
- TxDOT Environmental Affairs Division's (ENV) internal database of resources with previous determinations of NRHP eligibility
- Irrigation District Engineering and Assistance (Texas A&M University 2014)
- City planning and preservation department websites

In addition to these electronic resources from both Oklahoma and Texas, hard-copy files of previous surveys were reviewed at the Texas SHPO and TxDOT ENV offices. These files provided information about historic resources with previous determinations of NRHP eligibility within the EIS Study Area. Similar information was not available for Oklahoma. City preservation and planning departments with city preservation officers were contacted if information about locally designated historic resources was not available online.

3.3 Data Collection

Data were collected to identify NRHP-listed properties, previously determined NRHP-eligible properties or historic districts, or potentially NRHP-eligible historic districts within the EIS Study Area of the alternatives. For information regarding the NRHP criteria, see Section 3.4, NRHP Significance Criteria.

Investigations focused primarily on areas that had the potential for large concentrations of historic resources, such as NRHP-listed, locally designated, or potentially NRHP-eligible historic districts. Because of the broad nature of the service-level analysis, review and evaluation of NRHP-eligibility of all individual buildings and structures along the alternatives were not conducted. However, individual historic resources that were already NRHP-listed were included in this analysis. Additionally, individual historic resources were included if available information at the Texas SHPO or TxDOT offices revealed that they were previously determined NRHP-eligible.

The preparers of this technical study researched the websites listed in Section 3.2, Data Sources, and visited the TxDOT ENV office to review previous survey files. TxDOT ENV staff provided a KMZ file (geographically referenced electronic file) that showed the locations of resources for which TxDOT had made determinations of eligibility, including those that had been previously determined NRHP-eligible and those that had previously been determined not NRHP-eligible. This service-level

analysis only includes those resources that had been previously determined NRHP-eligible within the EIS Study Area.

The preparers also reviewed survey files at the Texas SHPO office. The *Historic Sites Atlas* only includes the locations of NRHP-listed individual resources and historic districts in Texas. As necessary, the preparers used current and historic aerial imagery and Google Earth Street View to confirm the location of the NRHP-listed individual resources and historic districts included in the *Historic Sites Atlas*. Because the *Historic Sites Atlas* does not include sites and districts that were previously determined NRHP-eligible for listing, the preparers reviewed Texas SHPO survey files in the EIS study area for each alternative to determine the presence of historic districts and individual historic properties that had previously been determined NRHP-eligible.

To identify additional potentially NRHP-eligible historic districts within or partially within the EIS Study Area of each alternative, the preparers reviewed current and historic aerial imagery and Google Earth Street View to identify concentrations of residential and commercial development. In particular, efforts focused on identifying residential neighborhoods from the post-World War II era and historic commercial downtown cores. For more information on the identification of potentially eligible historic districts, see Section 3.4, NRHP Significance Criteria.

In addition, cemeteries not listed on the NRHP or previously determined NRHP eligible were identified and noted as potentially NRHP-eligible resources. These and the other potentially NRHP-eligible resources and historic districts would be evaluated for their NRHP significance during the project-level analysis.

The NRHP-listed, NRHP-eligible, or potentially NRHP-eligible individual resources and historic districts identified during data collection are listed in Section 4, Baseline/Affected Environment.

3.4 NRHP Significance Criteria

Although this technical study is not intended for compliance with Section 106 of the NHPA, Section 106 standards were used to determine the presence of potentially NRHP-eligible historic districts. This service-level analysis does not evaluate individual buildings and structures for NRHP significance. However, large concentrations of commercial and residential development were identified as potentially NRHP-eligible historic districts. The NRHP significance criteria are summarized below.

Section 101 of the NHPA states districts, sites, buildings, structures, and objects may be eligible for the NRHP if they meet one of the following four criteria for significance:

- Criterion A: Event – Significant historical associations with events, trends, or patterns.
- Criterion B: Person – Significant associations with persons of transcendent importance.
- Criterion C: Design/Construction – Embody distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or

represent a significant and distinguishable entity whose components may lack individual distinction.

- Criterion D: Archaeology - Have yielded or may yield information important to prehistory or history.

For a concentration of historic resources to qualify as an NRHP-eligible historic district, the resources within the district must convey a sense of unity, continuity, and interrelation. For example, a residential historic district should represent a cohesive collection of resources and amenities that display an overarching design or development scheme. Features such as schools, parks, playgrounds, and community centers often indicate that residential resources were constructed as part of a planned community and, as a result, are more likely to convey cohesiveness and a distinct place in time. In reviewing the EIS Study Area for potentially NRHP-eligible residential historic districts, the preparers focused on residential neighborhoods that exhibited these features, as well as other indicators of planned communities such as curvilinear streets and themed street names. In addition, downtown commercial areas were analyzed to identify potentially NRHP-eligible historic commercial districts, because commercial historic districts are often in the downtown core of cities and towns and adjacent to transportation networks such as rail lines or major roadways. During data collection, current and historic aerial photography and Google Earth Street View were reviewed to identify potentially eligible historic districts.

Although historic districts are typically composed of resources within the same geographic area, the NPS states that a historic district may consist of multiple significant areas separated by non-significant areas. Non-contiguous historic districts are appropriate when contributing features are spatially divided, but the space between features does not negatively affect the significance of the district. For example, during this service-level analysis, potentially NRHP-eligible or NRHP-listed Santa Fe Railroad Depots were identified within the EIS Study Area, and additional potentially NRHP-eligible railroad depots within the EIS Study Area may be identified at the project level. Although further research would be required at the project level, these railroad depots may be eligible for the NRHP as a non-contiguous historic district. As a result, these individual resources have been included in this technical study.

3.5 Adverse Effects

Although this technical study is not intended for compliance with Section 106 of the NHPA, Section 106 standards were used as the basis for understanding potential effects on historic resources within the EIS Study Area. The criteria for eligibility for the NRHP are outlined in Section 3.4, NRHP Significance Criteria. The analysis of potential effects on historic resources is based on the Criteria of Adverse Effect described in regulations implementing Section 106 of the NHPA (36 Code of Federal Regulations [CFR] 800.5). Under these regulations, an undertaking has an effect on a historic property when the undertaking may alter, directly or indirectly, the characteristics of the property that may qualify the property for inclusion in the NRHP [36 CFR Part 800.5(a)]. An effect is considered adverse when the effect on an NRHP-eligible property may diminish the integrity of the

property's location, design, setting, materials, workmanship, feeling, or association. Consideration is given to qualifying characteristics of a historic property during effects analysis, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

Adverse effects on historic properties include, but are not limited to, the following:

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the *Interior Secretary's Standards for the Treatment of Historic Properties* (36 CFR 68; NPS 1995) and applicable guidelines.
- Removal of the property from its historic location.
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to a Native American tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The intensity of an effect as a result of the route alternatives is characterized as negligible, moderate, or substantial compared to the No Build Alternative. In relation to historic, architectural, and non-archaeological cultural resources (which include buildings, structures, and districts), these terms are defined as follows:

- Negligible intensity effects are those that would result in no permanent change in the setting or character-defining features that make the historic resource eligible for, or listed in, the NRHP.
- Moderate intensity effects are those that would result in a change or alteration to the historic resource but would not diminish the setting or character-defining features that make the resource eligible for, or listed in, the NRHP.

  Substantial intensity effects are those that would result in a permanent alteration, relocation, or removal of the resource that would result in a loss of character-defining features that make it eligible for, or listed in, the NRHP.

4.0 Baseline/Affected Environment

4.1 EIS Study Area

This service-level analysis did not identify the locations of potential easements and construction-related facilities such as equipment staging areas, access roads, and utilities. The locations of these facilities will be identified during the project-level analysis, and a specific Area of Potential Effect will be defined during development of a Programmatic Agreement.

4.2 Brief Cultural Background of Region

4.2.1 Northern Section: Oklahoma City to Dallas and Fort Worth

4.2.1.1 Edmond, Oklahoma, to the Oklahoma/Texas Border

Prior to Euro-American settlement, central Oklahoma was home to numerous nomadic Native American tribes. By the mid-19th century, passage of the Indian Removal Act allocated much of the land west of the Mississippi to specific Native American tribes who were removed from the southeastern United States. Five of the tribes—the Cherokee, Choctaw, Chickasaw, Creek, and Seminole Nations—are credited with bringing ranching to Oklahoma and Indian Territory during the mid-19th century. However, nearly 2 million acres of land at the crossroads of five rivers in central Oklahoma remained unassigned and became the focus of homesteading in the late 1800s.

Large-scale settlement in Oklahoma and the first sign of major Anglo-American expansion into the region began with the arrival of the Atchison, Topeka, and Santa Fe Railroad to Guthrie in 1887 (Crowder and Hoig 2008). That same year, several towns including Edmond (at the northern limit of the EIS Study Area), Oklahoma Station (present-day Oklahoma City), and Ardmore were established as stops along the railroad. The passage of the federal Homestead Act in 1889 furthered settlement to the region by opening the unassigned lands, and a flood of homesteaders arrived in Oklahoma to claim the nearly 11,000 agricultural homesteads (Hoig 2007). The Oklahoma Territory and its official boundaries were established and included all of the formerly unassigned lands and numerous Native American Tribe reservations in 1890. At the same time, seven large counties were initially established, including Cleveland and Oklahoma counties at the northern end of the EIS Study Area. That same year, Oklahoma City was officially incorporated. The town of Norman was also established in 1890, and 2 years later, the University of Oklahoma opened in the town (Levy 2007). Norman grew to 2,225 residents in 1900, up from 787 in 1890 (O'Dell 2007). Ardmore was officially incorporated in 1899, and by 1900, its population was 5,681, up from 2,500 residents in 1890 (Bamburg 2007).

The first few decades of the 20th century were shaped by Oklahoma's statehood, its agricultural industry, and oil discoveries. In 1906, Garvin County was officially established. One year later, Oklahoma was officially declared a state, and Ardmore became the county seat of the newly formed Carter County. Love, Murray, and McClain counties were founded at the same time as Oklahoma's statehood. In 1910, Oklahoma City was designated as the state capitol, and the population of the city reached 64,205, up from 10,037 in 1900 (Wilson 2007). Although Oklahoma City became a

major urban center in the early 20th century and an interurban railway stretched from Edmond through Oklahoma City to Norman, the economy of the surrounding area and the state still relied on agriculture. Cattle ranching and corn, cotton, and wheat cultivation were the leading agricultural pursuits (Hager 2008). By 1910, the number of farms in the state had risen to nearly 190,192 (Fite 2007). A shift in Oklahoma's economic focus began in the 1910s with the discovery of oil in the state. Healdton Field, one of the largest oil fields in Oklahoma, was discovered in the first decade of the 20th century near Ardmore, and operation of the oil field began in 1913 (DeJarnett 2007). In the 1920s, oil was discovered in large quantities throughout the state, beginning a decade-long oil boom that lasted until the Great Depression, when oil prices plummeted.

The supremacy of agriculture in Oklahoma weakened in the mid-1920s as market prices for corn, cotton, wheat, and livestock declined and the cost to maintain farms rose. The severe drought and Dust Bowl of the 1930s and 1940s further devastated the agricultural industry, forcing many farmers and ranchers to move to cities to find work. They found work in the recovering oil industry and in aviation production, both of which provided economic relief to Oklahoma during the 1930s and 1940s. The oil industry bounced back after its plummet during the Great Depression. In 1935, oil fields in Oklahoma City alone produced approximately 409 million barrels of crude oil, and approximately 95 oil-related companies employed nearly 12,000 people in the area (Wilson 2007). In 1943, the West Edmond Field was first tapped, and by 1944, it had produced 7,752,000 barrels of oil (Weaver 2007). Additionally, the aviation industry in Oklahoma began in the 1940s with the construction of several airfields used by the U.S. armed forces, including an airbase in Ardmore, the Max Westheimer Field in Norman, and the Oklahoma City Air Depot and the Midwest City Douglas Aircraft Company Plant in Oklahoma City (O'Dell 2007; Fugate 2007).

Although the price of agricultural goods and livestock rose during World War II (WWII), Oklahoma's agricultural sector never fully recovered from the events of the first half of the 20th century. Technological advances in farming equipment and the consolidation of small farms across the state led to the creation of large-scale farms and ranches. By 1950, Oklahoma only had 142,246 farms, down from 213,325 in 1935 (Fite 2007). Oklahoma City began experiencing urban sprawl, and significant advances in transportation networks, combined with increased automobile use, essentially transformed towns like Edmond and Norman into bedroom communities during the second half of the 20th century. The passage of the Federal Aid Highway Act in 1956 resulted in the construction of interstate highways throughout the country. The improvement to transportation networks assisted the urbanization shift. In 1959, IH-35 was completed through the western part of Norman. By the early 1960s, more than half the population of the state lived in or adjacent to Oklahoma City or Tulsa (Baird and Goble 2008). The population of Oklahoma City rose from 243,504 in 1950 to 368,164 in 1970 (Wilson 2007). By 1980, only 72,000 farms remained in the state, and the average size of farms had grown to approximately 480 acres (Fite 2007).

4.2.1.2 Oklahoma Border to Dallas and Fort Worth

Before the early 19th century, much of the land in north Texas was occupied by Native American tribes, with scattered ranchers, Indian traders, and Texas Rangers. Settlement of north Texas began

slowly after the Mexican War, when the Republic of Texas was established in 1836. The new Texas government began parceling out land following the Spanish colonial system of *empresarios*, which granted large pieces of land to individuals who would be responsible for enticing settlers and further dividing the land (Wade 2010). The 1840s and 1850s in north Texas were characterized by continual settlement and establishment of counties and towns. The majority of residents in these newly established towns were farmers and ranchers.

In 1841, Dallas was founded on land within one of the large *empresarios*. Five years later, Dallas and Denton counties were established, followed by Cooke County in 1848 and Tarrant County in 1849. In 1850, Dallas was named the county seat of Dallas County. Birdville was named the first county seat of Tarrant County, and Gainesville was established as the county seat of Cooke County. In the 1850s, to protect against Indian raids and conflicts with Mexican forces, the U.S. military established several posts in north Texas including Fort Worth, Fort Chadbourne, and Fort Griffin. Denton was founded in 1857 as the new county seat of Denton County. By the end of the 1850s, Fort Worth was elected as the new county seat of Tarrant County.

The latter half of the 19th century in north Texas was characterized by the establishment of cattle trails and the arrival of the railroads. The economy of north Texas was based largely in agriculture, predominantly livestock ranching. When Texas fever infected cattle in Texas in the late 1860s and early 1870s, neighboring states enforced embargos and quarantines on Texas cattle, affecting the cattle industry for several years (Haygood 2010). However, a Texas rancher and entrepreneur circumvented these embargos by constructing cattle pens, stockyards, and loading facilities outside the quarantine area in Abilene, Kan. (Worcester 2010). In 1868, the Chisholm Trail opened, and Fort Worth was one of the last northern outposts for cattlemen before reaching the stockyards in Abilene (Sanders and Tyler 1973). The cattle drives solidified Fort Worth as one of the main livestock trade and market hubs in the south. The city itself was officially incorporated in 1872.

The arrival of the railroads in the mid-1870s further opened north Texas to larger and far-reaching markets. Railroads, including the Houston and Texas Central Railroad and the Texas and Pacific Railway, had profound impacts on population, commercial, and agricultural growth in the region. While Fort Worth had a slower growth rate with 6,663 residents in 1880, the population of Dallas increased tremendously, from just 678 residents in 1860 to more than 10,000 in 1880 (Sanders and Tyler 1973; McElhaney and Hazel 2010). Banking and insurance had become major commercial enterprises in Dallas. In addition, the first Dallas State Fair was held in 1886, and by 1890, the population of Dallas exploded to 38,067 residents (McElhaney and Hazel 2010). Denton's population also grew during this time due to the arrival of the Texas and Pacific Railway and the Missouri-Kansas-Texas Railway in the early 1880s. By 1890, the North Texas Normal College (present-day University of North Texas) was established, and Denton's population was 2,558 residents, more than double its population in 1880 (Odom 2010). As the railroads opened the region to larger markets, farming also increased with corn, wheat, and cotton production leading cultivation in the region during the 1880s and 1890s.

The north Texas economy flourished in the first two decades of the 20th century. Denton continued its foray into higher education with the establishment of the Girls' Industrial College (present-day Texas Woman's College) in 1903 (Odom 2010). The meat processing and packing industry in Fort Worth contributed to the city's population boom of the early 20th century, which increased from 26,688 in 1900 to 73,312 in 1910 (Sanders and Tyler 1973). Around the same time, the city began annexing neighboring communities, and eventually the Fort Worth city limits expanded to cover 16.83 square miles (Schmelzer 2010).

Oil discoveries in west and north Texas in the first few decades of the 20th century resulted in jobs in oil companies and oil-related services in Fort Worth and Dallas. By 1918, oil companies and refineries in the Fort Worth area were processing nearly 80 percent of Texas's crude oil (Selcer 2004). At the same time, during the 1920s, the agricultural sector and the price of cotton fell drastically. The onset of the Great Depression further affected farming and ranching in north Texas. The Dust Bowl also destroyed crops, and many farmers and ranchers moved to cities, beginning the urbanization trend that affected other parts of the region. As the urban areas grew, new infrastructure facilities were established in the cities. Meacham Field in Fort Worth opened in 1927 as the first municipal airport in north Texas. That same year, Love Field in Dallas was converted to a municipal airport, and by 1928, Dallas Love Field Airport operated flights to Houston and San Antonio (Selcer 2004).

The mid-1930s and 1940s in north Texas were marked by recovery from the Great Depression and by WWII. Dallas outbid Houston and San Antonio to host the Texas Centennial Exposition, and in 1936, more than 6.4 million visitors came to the state fairgrounds (now called Fair Park). To improve the region's economy, cities courted industrial product companies to the area. WWII contributed to the expansion of manufacturing in Dallas, and by 1947, approximately 1,068 manufacturing facilities supported nearly 38,936 employees in Dallas County (Maxwell 2010). In 1949, 13 new plants opened in Dallas every month (McElhaney and Hazel 2010).

The post-WWII era in north Texas was a period of immense growth as the region shifted away from the agricultural sector with the escalation of the aviation industry, construction of manufacturing facilities, and improved transportation networks. Dallas, Tarrant, and Denton counties all experienced population booms, largely concentrated in the Cities of Dallas, Fort Worth, and Denton. In 1950, nearly 90 percent of Dallas County residents were considered urban, and the population of Dallas totaled 434,462 (Hill 1996). That same year, the population of Fort Worth was recorded at 385,164, and by 1955, the city limits covered 127 square miles, up from 62 in 1940 (Schmelzer 2010; Selcer 2004). The proliferation of automobile culture during the post-war years led to the upgrade and construction of several interstate highways throughout Texas and the region. Construction of the Dallas–Fort Worth Turnpike began in 1955 and was completed by 1957 (TxDOT 2014b). The improved facility led to the formation of bedroom communities, including Arlington and Grand Prairie. The 1960s also marked the designation, construction, and upgrade of existing facilities to form the IH-35 corridor and the IH-35 West (IH-35W) and IH-35 East (IH-35E) split in Fort Worth and Dallas, respectively.

In 1963, one of the pinnacle events in the history of both Dallas and the nation occurred when President John F. Kennedy was assassinated in a motorcade traveling through Dealey Plaza. Already widely considered a den of right-wing conservatism, Dallas received enormous backlash from the event. However, in 1964, Erik Jonsson was elected mayor of Dallas and began to reinvent the city, creating the Dallas/Fort Worth International Airport, completed in 1974. The largest airport in the world at the time of its construction, it linked Fort Worth to Dallas, creating the Metroplex.

IH-35 was completed from Dallas to the Oklahoma border in 1965. By 1967, the interstate had been upgraded to Austin, and the IH-35W segment from Fort Worth to Denton was complete (TxDOT 2014c). The Dallas–Fort Worth Turnpike was also transferred to the Interstate Highway System and designated as IH-30 in 1970 (TxDOT 2014b). By 1980, the population of Dallas had reached 904,078, and the city was approximately 378 square miles (Hazel 1997). That same year, the population of Fort Worth was 447,619 (Schmelzer 2010).

4.2.2 Central Section: Dallas and Fort Worth to San Antonio

The early history of central Texas centers on San Antonio. Established as a mission in the early 18th century and later the first civil settlement in what is now the state of Texas, San Antonio played a crucial role in the development of central Texas and the surrounding area (Richardson et al. 2005). The Catholic Church initially established several missions in the area, including the Mission San Antonio de Valero (the chapel is now the Alamo) and San José y San Miguel de Aguayo. The communities in and around San Antonio constructed a complex system of irrigation canals, known as *acequias*, which were used to water farmland. At the same time, the Catholic Church operated large ranches on big parcels of land outside the missions (Moore et al. 2013).

The 1820s and early 1830s in central Texas were marked by settlements of large land grants and land disputes. San Antonio was named the county seat of Bexar County in 1836, and Austin was founded along the Colorado River in 1839, serving as the capitol of the Republic of Texas.

Similar to settlement in north Texas, the 1840s and 1850s in central Texas were marked by the establishment of towns and the delineation of counties. Travis County was founded in 1840, followed by Guadalupe and Comal counties in 1846. The marked difference between the development of central Texas and the rest of the state was the influx of German immigrants that began in the 1830s and continued into the 1840s. The towns of Fredericksburg and New Braunfels were founded in 1845 and 1846, respectively, with largely German immigrant populations. By the late 1840s, German settlers outnumbered all other foreign-born immigrants in the region (Richardson et al. 2005).

In 1848, Williamson, Caldwell, Hays, and Medina counties were established. One year later, Waco Village (present-day Waco) was founded, and Ellis County was carved out of Navarro County. The year 1850 marked a banner year for the establishment of counties and communities within central Texas. Austin was voted the official state capitol of Texas with a population of 1,001 residents (Humphrey 2010). Bell County was established, and Nolan Springs (later renamed Belton) was named county seat (Long 2010a). That same year, McLennan and Falls counties were founded. By

1850, Bexar County's population was recorded at 5,633, and San Antonio had grown to 3,488 (Long 2010b). The year 1852 marked the establishment of Hill County, followed by Johnson County in 1854. In 1856, Waco Village was incorporated as Waco, with 759 residents by 1859 (Conger 2010).

The first few decades following the U.S. Civil War were difficult in central Texas. During the reconstruction era, agricultural production slowed, particularly for cotton. Many farmers turned to livestock raising, realizing that the tall native grasses of the Blackland Prairies were ideal for grazing. Many of the cattle trails, including the Chisholm Trail, Shawnee Trail, and Western Trail, traveled through San Antonio, Austin, and Waco before heading north through Oklahoma Territory toward the large railroad shipping points in the Midwest. Eventually, the invention of barbed wire in the 1870s reigned in the massive herds roaming central Texas, preventing livestock from grazing on farmland and reviving farming in central Texas.

In the latter half of the 19th century, railroads and improved infrastructure and transportation networks proliferated, connecting central Texas to larger state and national markets, causing a significant boon to the region's economy. In 1870, the Waco Bridge Company completed a 475-foot-long tolled suspension bridge over the Brazos River, the largest in the world at the time. In 1871, the Waco Railroad Company finished a tap line that connected to the Central Railway in Millican (Conger 1964). That same year, the Houston and Texas Central Railway arrived in Austin. In 1877, the Galveston, Harrisburg, and San Antonio Railway reached San Antonio. The expansion of the railroads through central Texas, including the International & Great Northern and the Gulf, Colorado, and Santa Fe Railway (GC&SF), created numerous new towns along their routes. In 1881, Temple was established along the GC&SF, quickly becoming a rival for its neighbor Belton approximately 8 miles southwest (Long 2010a). Institutions of higher learning, including Baylor University and the University of Texas, were established in the early and mid-1880s. Municipal improvements, such as street paving, sewage and water systems, telephone lines, and hospitals, were installed in San Antonio, and by 1900, the city had become the biggest in Texas with 53,321 residents (Fehrenbach 2010).

The turn of the century marked a shift in the agricultural economy of central Texas. Advances in milk processing introduced dairying to the region. Additionally, although ranching was still prevalent in central Texas, crop cultivation, particularly cotton, increased significantly at this time (Moore et al. 2013). Other industries also came to the forefront. During World War I (WWI), the federal government chose an approximately 10,000-acre plot in northwest Waco for the construction of Camp MacArthur, a military facility for nearly 35,000 troops throughout the war, which created a substantial demand for housing within the city. In San Antonio, Government Hill (originally established in the mid-1870s and renamed Fort Sam Houston in 1890) had become one of the largest army posts in the U.S. South (Conger 2010; Manguso 2010).

During the post-WWI years, the following factors increased urbanization in central Texas: the rising automobile culture, improved transportation networks, the discovery of oil in south and north Texas, rampant industrialization, and the return of servicemen looking for employment. By 1920, Austin's

population was 34,876, and San Antonio's population was 161,379 (Humphrey 2010; Humphrey and Crawford 2001; Fehrenbach 2010). Following portions of the Meridian Highway, which traveled from Canada to Mexico through Texas, the highway department designated U.S. Highway 81 in 1927. The road traveled through Texas from the Oklahoma border through Fort Worth, Waco, Austin, San Antonio, and Laredo, forming the major north-west corridor through the state and central Texas (TxDOT 2014d).

Central Texas fared slightly better in the 1930s and 1940s than the Texas panhandle and U.S. Plains States. With the center of the state government in Austin, the establishment of several military facilities and the higher education institutions diversified the economic base of the region. Military facilities were constructed throughout central Texas including the Del Valle Army Air Base (later Bergstrom Air Force Base) in Austin and Camp Hood (later Fort Hood) in Killeen. The Waco area also added more bases, including the Waco Army Flying School and the Blackland Army Air Field.

Austin's economic mainstays were government and education based. As a result, the dropping prices in crops, livestock, oil and gas, and manufactured products had little impact on the city. In fact, Austin's population grew significantly during the 1930s, increasing from 53,000 to 88,000 (Humphrey and Crawford 2001). San Antonio also had military facilities and, like Austin, had become a center of higher education. In 1942, Trinity University decided to relocate from Waxahachie to San Antonio, joining several institutions already in the city including St. Mary's University (founded in the 19th century), University of the Incarnate Word (1881), and Our Lady of the Lake University (ca. 1911). Construction of the Trinity University campus, designed by renowned architect O'Neil Ford, was completed in 1952 (Everett 2010).

The mid-20th century was characterized by dramatic changes in the agricultural system both nationally and in central Texas. Mechanization of farming equipment required less manpower to run agricultural properties. This consolidated many small farms and ranches and led to the corporatization of the agricultural industry. Continued advances in transportation networks, as well as the introduction of large trucking and hauling vehicles, improved the movement of large quantities of goods (Moore et al. 2013). In 1952 Waco's population reached 84,300, and the economic future of the city looked bright (Conger 2010). In 1959, IH-35 was completed and was one of the most significant developments in transportation infrastructure in central Texas and throughout the state (TxDOT 2014e). Urban renewal programs began in the late 1950s to revitalize urban centers, and in 1967, Waco was chosen to be one of the federal government's "Model Cities." As with most urban renewal programs across the country, low income housing was demolished to provide for middle-class housing and shopping centers, displacing minority and low income communities (Conger 2010).

San Antonio and Austin were also changing during this time. In 1959, the Brooks Air Force Base in San Antonio transitioned from a military facility to a medical research and education center, becoming headquarters to the Aerospace Medical Center. The following year, aviation ceased at the facility, and in 1961, it was renamed the U.S. Air Force School of Aerospace Medicine, playing a

major role in the national space program that gained national attention during the Cold War years (Alcott 2010). By 1960, the population of San Antonio was 587,718 (Fehrenbach 2010). In Austin, the University of Texas expanded its scientific research facilities, which fostered a burgeoning new industry in technology, engineering, and manufacturing. As a result, in the late 1960s and 1970s, technology companies, including IBM, Texas Instruments, and Motorola, located their offices in the city, a trend that has continued to the present day (Humphrey 2010).

4.2.3 Southern Section: San Antonio to South Texas

The south Texas region was first occupied by numerous Native American tribes, followed by Spanish settlement in the region beginning in the mid-18th century (Garza 2010a). Referred to as "the father of the lower Rio Grande Valley," José de Escandón was tasked by the Spanish crown with colonizing the area between the Pánuco River in Mexico and the Guadalupe River in Texas and with establishing permanent settlements, which created the town of Laredo. The land bordering the Rio Grande was divided into long, narrow lots that extended north and south of the river called porciones (Knight 2009). Areas further removed from the river were parceled out into much larger land grants. A majority of the development during the late 18th through mid-19th centuries was concentrated along the Rio Grande. Much of the vast expanse of land between San Antonio and south Texas remained largely unpopulated, primarily due to lack of sufficient permanent water sources and adequate means of transportation.

The Texas Revolution in the 1830s, followed by the Mexican War in the 1840s, led to political upheaval and disputed territory. Laredo residents sided with Mexico during the Texas Revolution, and skirmishes between Mexican and Texan forces were commonplace. Although Texas officially declared land north of the Rio Grande part of Texas in 1836, the area remained disputed for the next decade, and the area between the Rio Grande and Nueces Rivers became a "no man's land" (City of Laredo 2014). In 1836, San Patricio County was established, and in 1839, businessmen established Kinney's Trading Post (present-day Corpus Christi) along the bay. Its proximity to Mexico made the area ideal for trading. Present-day Brownsville was also established in the mid-19th century, when General Zachary Taylor arrived in the area to secure the Rio Grande as the southern border of the U.S., and immediately began construction on a temporary fort later named Fort Brown. In 1846, Corpus Christi became the Nueces County seat (Long 2010c).

After the end of the border fighting between Mexico and the U.S., both countries signed the Treaty of Guadalupe Hidalgo in 1848. This treaty firmly established the Rio Grande as the southern border of Texas (Richardson et al. 2005). That same year, Nueces County was divided to form three new counties: Cameron, Starr, and Webb counties. Brownsville was officially founded in 1848 and 1 year later was named the county seat of Cameron County (Garza and Long 2010). At that time, Laredo was designated the county seat of Webb County. The U.S. military also set up a makeshift military camp in 1849 approximately 1 mile west of Laredo; it was named Camp Crawford, then renamed Fort McIntosh 1 year later. It was essential in protecting the border town and operated almost continuously until 1947 (Cuéllar 2010). In 1852, Hidalgo County was officially established, and La Habitación was renamed Edinburg and selected as the county seat (Garza 2010a).

The second half of the 19th century marked a significant establishment of Anglo-American settlement in the region. In 1850, Richard King and Mifflin Kenedy formed the Mifflin Kenedy and Company steamship business. The company operated steamships up the Rio Grande, which was navigable as far inland as Mier and connected to Camargo (Mexico), Edinburg, and Brownsville (Kearney 1989). Two years later, Richard King established the King Ranch in 1852, encompassing parts of Nueces, Kenedy, Kleberg, and Willacy counties (Ashton and Sneed 2010). Ranching remained the area's economic mainstay in the region. For example, in 1860, Nueces County had approximately 56,454 cattle and 8,554 horses, and farms other than subsistence farms were virtually non-existent (Long 2010d).

During the U.S. Civil War, Corpus Christi served as a crossroads for the Confederate army; however, the town was eventually occupied by Union forces, which remained until the 1870s. Despite the occupation, the economy of the town grew, largely due to the livestock ranching operations of the surrounding area. This led to Corpus Christi becoming a leading market for wool. In 1876, a city charter was formally adopted, establishing a city government. With its location on the Gulf Coast and its protective bay, Corpus Christi became one of the leading economic and commercial centers of the region during the late 19th century.

The towns along the Texas border did not significantly grow until the arrival of the railroads. The first border town in Texas to receive rail service was Laredo in 1881. The Corpus Christi, San Diego, and Rio Grande Railway (CCSD&RG) connected Laredo to Corpus Christi, opening up extensive trade opportunities for both cities and the surrounding regions. In 1887, the Mexican National Railway arrived in Nuevo Laredo in Mexico. This railroad traveled to Mexico City and combined with the CCSD&RG, constituting the Tex-Mex Railway (DaCamara 1949). This connection exposed Laredo to national and international markets and established the city as a gateway to Mexico. With improved streets, municipal facilities, and schools, the population of Laredo nearly quadrupled from 3,521 to 13,429 between 1880 and 1900 (Cuéllar 2010). In 1889, the city established an electric street railway and the first international bridge, known as the Foot and Wagon Bridge, between Laredo and Nuevo Laredo (City of Laredo 2014).

In 1904, Brownsville received rail service when the St. Louis, Brownsville, & Mexican Railroad (SLB&M) connected the area to Corpus Christi. In doing so, the region was opened to larger state and national markets; the construction of the SLB&M served as a watershed event for the area from Corpus Christi to Brownsville and throughout the Lower Rio Grande Valley. Developers flocked to the areas where the railroad line traversed, platting and establishing new towns throughout the region. For example, in 1904, John McAllen and James Ballí McAllen, along with their business partners, formed McAllen Townsite Company for the creation of a town at the train depot, which later became McAllen (Garza 2010b). In 1904, Lon C. Hill Harlingen founded Harlingen, approximately 30 miles east of McAllen along the Arroyo Colorado, a former outlet of the Rio Grande. Harlingen intended to create a commercial waterway that would make the town a hub of commerce and trade. In 1910, the town was officially incorporated and its population reached 1,126 (Gilbert 2010).

Although attempts at installing irrigation systems in the Lower Rio Grande Valley had begun as early as 1870, the arrival of the SLB&M led to a major boom in the creation of private irrigation companies and increased settlement to the area. By 1910, at least 20 major irrigation companies were in operation along the Rio Grande, resulting in a significant impact on the region's agricultural production (Knight 2009). Soon, the economy of the area primarily consisted of agriculture, particularly cotton and vegetables (Gilbert 2010). Simultaneously, newly settled residents wanted to be closer to county seats and government centers, leading to the division and formation of additional counties from existing larger counties: Brooks and Willacy counties in 1911, Jim Wells County in 1912, Kleburg County in 1913, and Kenedy County in 1921.

Access to water was essential to successful farming operations and, therefore, proximity to the Rio Grande was essential for profitable cultivation. In the areas north of Edinburg and Harlingen that were farther from the river, the availability of shallow surface water allowed construction of wells to service livestock, and ranching continued to be the primary agricultural pursuit. Large ranches were scattered throughout the majority of the EIS Study Area in south Texas. The population was largely dispersed with a few small communities established at large ranch headquarters that typically had a school, supply store, and cemetery.

The onset of the Mexican Revolution led to unstable conditions along the U.S./Mexico border in the second decade of the 20th century. WWI created more chaos in the region because Germany supplied weapons and ammunition to varying factions within Mexico (Richardson et al. 2005). In 1916, nearly 20,000 troops arrived in McAllen from New York and the population increased from 1,200 in 1916 to 6,000 in 1920 (Garza 2010b). The population of Brownsville increased from 6,000 in 1900 to 22,021 in 1930 (Garza and Long 2010).

The inter-war years in south Texas were characterized by the arrival of new industries and shifts in previous industrial trends. By 1920, Corpus Christi had several railroad lines serving the city and had become a tourist destination for beachgoers (Long 2010c). Oil was discovered in south Texas, leading to a booming oil industry and the growth of refineries in the area (Richardson et al. 2005). In addition, the first hard-surfaced highways in south Texas were constructed (including present-day U.S. Highway 77), which led to the growth of the truck farming industry (Ficker and Barron 2010). A new and deeper ship channel opened in Corpus Christi in 1926, allowing for larger vessels to enter the bay. The discovery of oil in the 1920s, combined with growing transportation networks, shifted the economies of Laredo, Brownsville, and Corpus Christi from primarily agricultural to industrial- and manufacturing-based. The Brownsville ship channel opened in 1936, providing deep-water access to Brownsville, which was instrumental to the city's growth and establishment as a center for trade, industry, and commerce ("Port of Brownsville, Serving Two Nations" 1955).

Like other areas of Texas and Oklahoma during WWII, in south Texas, construction of military facilities increased. The Harlingen Army Air Field was installed 3 miles northwest of the town, and it was shut down in 1946 at the end of the war ("Harlingen Air Force Base" 2010). Located on an international border, south Texas was considered of strategic significance during the war, and numerous other military facilities were constructed or expanded in the area during the 1940s,

including Corpus Christi's University of the Air, the Laredo Army Air Field, and the continued use of Fort Brown in Brownsville.

Following WWII, the economy and industries of south Texas shifted. In 1949, the Gulf Intracoastal Waterway was extended to Brownsville, and the ship channel was widened to allow the entry of much larger ships, which facilitated transporting produce to larger markets. Although citrus production became one of south Texas' most significant crops by 1950, the 1940s and 1950s were a difficult time for agricultural production in the valley. The construction of Falcon Dam, combined with increased regulation of the Rio Grande, restricted much needed access to water required for citrus growth. Furthermore, a series of bad weather events also destroyed many of the citrus crops during the mid-20th century, and many of the smaller farms could not survive. This, combined with improved agricultural technology, replaced many farm laborers with machines, and smaller farms were consolidated into larger landholdings (Knight 2009). To diversify the economy, the Lower Rio Grande Valley became a destination for tourists attracted by the warm, sunny climate.

The latter half of the 20th century in south Texas was defined by changes to military and aviation operations, improved transportation networks, and booming manufacturing and oil and gas industries. The Harlingen Army Air Field reopened as the Harlingen Air Force Base during the Korean War, increasing the population of Harlingen from 23,000 in 1950 to 41,000 in 1960 (Gilbert 2010). Military functions at the base ended in 1962, and the facilities were repurposed, partially for use as the Rio Grande Valley International Airport ("Harlingen Air Force Base" 2010). Construction of IH-37, approximately following the existing U.S. Highway 181 route, began in the 1960s and was completed in the 1980s (TxDOT 2014f; Beaumont, et al. no date [n.d.]). Also during this time, the old U.S. Highway 81 roadway that extended from Laredo to the Minnesota/Canada border was upgraded and incorporated into the interstate system as IH-35 (TxDOT 2014d, 2014e). These upgrades to existing transportation facilities and the construction of new facilities were major contributors to the economic growth in south Texas.

Cities and counties during this period grew and expanded. Corpus Christi experienced a rising manufacturing industry, which ranged from petrochemical production to food processing, storage, and freezing facilities. In 1966, the city had nearly 167 manufacturing companies that employed more than 10,000 residents (Munz 1966). By the 1970s, Laredo had established itself as the largest inland port in the U.S. and had cultivated thriving industries in commerce, trade, tourism, and manufacturing (Elliott n.d.). In the late 20th century, the production of natural gas in the area increased significantly, and in 1989, Webb County was the leading producer of natural gas in Texas (Parish 1989). During the latter half of the 20th century, numerous new industries, including petrochemicals, frozen and canned foods, and metal products, arrived in Brownsville. By 1990, the population reached more than 107,000, approximately 80 percent of which were of Mexican descent (Garza and Long 2010).

4.3 Structures from the Historic Period

Historic resources within the EIS Study Area consist of buildings, structures, sites, objects, and districts that serve residential, commercial, industrial, agricultural, and transportation functions. These resources include residential buildings, stores, municipal buildings, railroad depots, bridges, educational complexes, and agricultural facilities that are at least 50 years old. Cemeteries are also within the EIS Study Area; however, the exact age of the cemeteries was not verified for this service-level analysis.

As mentioned in Section 4.2, Brief Cultural Background of Region, prior to 1900 a majority of the EIS Study Area was rural and was characterized by sporadic agricultural settlements, ranches, and small towns. Transportation networks were not adequate for large-scale settlement and urban growth. Resources from this period consist largely of agricultural buildings and structures such as main farm and ranch houses, barns, sheds, corrals, pens, and fences.

The arrival of the railroads to the region at the turn of the century opened Texas and Oklahoma to much larger regional and national markets and contributed to significant growth. As a result, historically significant railroad-related resources, including depots and stations, were identified within the EIS Study Area. Although the agricultural industry continued to be a mainstay of the economy, the discovery of oil in Texas and Oklahoma also contributed to a boon to industrial development during this time period. Some residential, commercial, and industrial resources were likely constructed as a result of the economic growth brought by the booming oil industry.

The arrival of the automobile had a major impact on the growth of the state and the nation in the early 20th century. In addition to increased access to transportation networks and advanced mobility, the proliferation of the automobile led to new commercial resources associated with transportation, including gas stations, motels, hotels, auto repair shops, and drive-through restaurants.

During WWI, numerous military and aviation facilities were constructed and manufacturing industries serving the war effort increased in the region. This trend continued throughout the mid-20th century and, combined with the economic devastation by the Dust Bowl and the Great Depression, led to urbanization and suburban growth. Residential construction was prolific in the post-WWII era, and neighborhoods were designed as cohesive communities with amenities such as parks, community centers, and schools.

NRHP-listed, NRHP-eligible, or potentially NRHP-eligible historic resources, divided by the Northern, Central, and Southern sections of the EIS Study Area, are listed in Tables 4-1, 4-2, and 4-3, respectively. Locations of historic resources are shown on Figures 4-1 through 4-13. Cemeteries were also identified as part of the EIS Study Area. However, because this is a service-level analysis, the cemeteries are listed as potentially NRHP-eligible, pending further investigations. Because of the late addition of Alternative C4C Higher-Speed Rail and Alternative C4C High-Speed Rail, and to maintain the project schedule for the service-level analysis, additional structures and historic

districts identified along these alternatives are listed in non-sequential order in Table 4-1 and on Figures 4-1 through 4-13.

Table 4-1: Historic Resources – Northern Section

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
1 Figure 4-2	Edgemere Park Historic District	35.50639/ -97.514683	NRHP-Listed	N4A CONV
2 Figure 4-2	Mesta Park and Heritage Hills Historic Districts	35.491974/ -97.513299	NRHP-Listed	N4A CONV
3 Figure 4-2	Cain's Coffee Building	35.48141681/ -97.5122159	NRHP-Listed	N4A CONV
4 Figure 4-2	Automobile Alley Historic District	35.47801715/ -97.51249716	NRHP-Listed	N4A CONV
5 Figure 4-2	Sherman Machine and Iron Works Building	35.4678438/ -97.51156819	NRHP-Listed	N4A CONV
6 Figure 4-2	Stanford Furniture Company Building	35.46663246/ -97.51186181	NRHP-Listed	N4A CONV
7 Figure 4-2	J.I. Case Plow Works Building	35.4650558/ -97.5118831	NRHP-Listed	N4A CONV
8 Figure 4-2	Sooner Theater Building	35.22114837/ -97.4432098	NRHP-Listed	N4A CONV
9 Figure 4-2	Santa Fe Depot	35.21993512/ -97.4429154	NRHP-Listed	N4A CONV
10 Figure 4-2	Norman Historic District	35.219368/ -97.442376	NRHP-Listed	N4A CONV
11 Figure 4-2	Miller Historic District	35.217936/ -97.441167	Potentially NRHP-Eligible	N4A CONV
12 Figure 4-2	DeBarr Historic District	35.21183909/ -97.43882983	NRHP-Listed	N4A CONV
13 Figure 4-2	U.S. Highway 77 Bridge at Canadian River	35.01374298/ -97.35678374	NRHP-Listed	N4A CONV
14 Figure 4-2	Purcell Train Station	35.01191388/ -97.35728219	NRHP-Listed	N4A CONV
15 Figure 4-2	Santa Fe Depot	34.74137837/ -97.21791761	Potentially NRHP-Eligible	N4A CONV
16 Figure 4-2	Pauls Valley Historic District	34.74067683/ -97.21744851	NRHP-Listed	N4A CONV
17 Figure 4-3	Arbuckle Historical Museum/ Davis Santa Fe Depot	34.50361524/ -97.1217722	NRHP-Listed	N4A CONV
18 Figure 4-3	Ardmore Commercial Historic District	34.1716344/ -97.12609074	NRHP-Listed	N4A CONV

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
19 Figure 4-3	Marietta Main Street Historic District	33.93723476/ -97.11732243	Potentially NRHP-Eligible	N4A CONV
20 Figure 4-3	Santa Fe Depot	33.93670828/ -97.11677581	NRHP-Listed	N4A CONV
21 Figure 4-3	Saint Paul's Church	33.62597124/ -97.14132663	NRHP-Eligible	N4A CONV
22 Figure 4-3	Santa Fe Passenger Depot	33.62501115/ -97.140706	NRHP-Listed	N4A CONV
23 Figure 4-3	Gainesville Commercial Historical District	33.624124/ -97.140743	Potentially NRHP-Eligible	N4A CONV
24 Figure 4-4	Krum Cemetery	33.244875/ -97.243899	Potentially NRHP-Eligible Cemetery	N4A CONV
25 Figure 4-4	Fort Worth Stockyards Historic District	32.793943/ -97.343368	NRHP-Listed	N4A CONV
26 Figure 4-4	Samuels Avenue Historical District	32.768609/ -97.328688	Potentially NRHP-Eligible	N4A CONV
27 Figure 4-4	Pioneers Rest Cemetery	32.765624/ -97.327955	Potentially NRHP-Eligible Cemetery	N4A CONV
28 Figure 4-4	Hampton-Peach Streets Historical District	32.763048/ -97.32699	Potentially NRHP-Eligible	N4A CONV
29 Figure 4-4	Allen Chapel AME Church	32.75897211/ -97.32752389	NRHP-Eligible	N4A CONV
30[a] Figure 4-4	Montgomery Ward and Company Building	32.75401418/ -97.32647395	NRHP-Listed	N4A CONV
31[a] Figure 4-4	Gulf, Colorado and Santa Fe Railroad Passenger Station	32.74916071/ -97.32410681	NRHP-Eligible	N4A CONV
32[a] Figure 4-4	Calloway Cemetery	32.810561/ -97.089142	Potentially NRHP-Eligible Cemetery	N4A CONV
33[a] Figure 4-4	Rock Island Railroad Bridge	32.81315531/ -96.86163747	NRHP-Eligible	N4A CONV
34[a] Figure 4-4	Turtle Creek Pump Station	32.80004162/ -96.81644069	NRHP-Listed	N4A CONV
35[a] Figure 4-4	West End Historic District	32.779764/ -96.809595	NRHP-Listed	N4A CONV

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative

[a] Indicates a resource that is also located in the Central Section.

Sources: Baird and Goble (2008); Bamburg (2007); Beaumont et al. (n.d); Crowder and Hoig (2008); Fite (2007); Fugate (2007); Google Maps (2014); GoogleEarth (1950 – 2014); Hager (2008); Hazel (1997); Hill (1996); Hoig (2007); Levy (2007); Long (2010a); Maxwell (2010); McElhaney and Hazel (2010); Moore et al. (2013); NPS (2014); NPS (1995); NETROnline (2014); O'Dell (2007); Odom (2010); Oklahoma Historical Society (2014); Richardson (2005); Sanders and Tyler (1973); Schmelzer (2010); Selcer (2004); TxDOT (2014b); TxDOT (2014c); TxDOT (2014d); TxDOT (2014e); TxDOT (2014g); TxDOT and FRA (2014); Texas Historical Commission (2014); Wade (2010); Weaver (2007); Wilson (2007); Worcester (2010).

Table 4-2: Historic Resources – Central Section

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
30 [a] Figure 4-4	Montgomery Ward and Company Building	32.75401418/ -97.32647395	NRHP-Listed	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
31 [a] Figure 4-4	Gulf, Colorado and Santa Fe Railroad Passenger Station	32.74916071/ -97.32410681	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
32 [a] Figure 4-4	Calloway Cemetery	32.810561/ -97.089142	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4C HrSR C4C HSR
33 [a] Figure 4-4	Rock Island Railroad Bridge	32.81315531/ -96.86163747	NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
34 [a] Figure 4-4	Turtle Creek Pump Station	32.80004162/ -96.81644069	NRHP-Listed	C4A HrSR C4A HSR C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
35 [a] Figure 4-4	West End Historic District	32.779764/ -96.809595	NRHP-Listed	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
36 Figure 4-4	White Lake Hills Historic District	32.759264/ -97.256597	Potentially NRHP-Eligible	C4B HrSR C4B HSR
37 Figure 4-4	Hollandale Historic District	32.729643/ -97.061774	NRHP-Eligible	C4B HrSR C4B HSR
38 Figure 4-4	Vought Manor Historic District	32.728696/ -97.063174	NRHP-Eligible	C4B HrSR C4B HSR
39 Figure 4-4	Grand Prairie Historic District	32.758908/ -96.976517	Potentially NRHP-Eligible	C4B HrSR C4B HSR
40 Figure 4-4	Scott Cemetery	32.776438/ -96.830282	Potentially NRHP-Eligible Cemetery	C4B HrSR C4B HSR
41 Figure 4-4	Dealey Plaza Historic District	32.777795/ -96.808461	NRHP-Listed	C4A HrSR C4A HSR C4C HrSR C4C HSR
42 Figure 4-4	Dallas Union Terminal	32.775551/ -96.807861	NRHP-Listed	C4A HrSR C4A HSR C4C HrSR C4C HSR
43 Figure 4-4	Houston Street Viaduct	32.772899/ -96.806363	NRHP-Listed	C4A HrSR C4A HSR C4C HrSR C4C HSR
44 Figure 4-4	Cadiz Street Overpasses and Underpasses	32.76992438/ -96.80142353	NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
45 Figure 4-4	Proctor & Gamble Manufacturing Complex	32.753842/ -96.776522	NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
46 Figure 4-4	Red Oak Cemetery	32.502635/ -96.812177	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
47 Figure 4-4	Ellis County Centennial Marker	32.48502864/ -96.82699143	NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
48 Figure 4-4	Waxahachie City Cemetery	32.3879/ -96.85707	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4C HrSR C4C HSR
49 Figure 4-4	Rogers Street Bridge	32.38304891/ -96.85079886	NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
50 Figure 4-4	Ellis County Courthouse Historic District	32.382978/ -96.85001	NRHP-Listed	C4A HrSR C4A HSR C4C HrSR C4C HSR
51 Figure 4-4	Waxahachie Train Depot	32.38288238/ -96.84953313	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4C HrSR C4C HSR
52 Figure 4-5	Joe E. Turner House	32.17286616/ -97.09188122	NRHP-Listed	C4B HrSR C4B HSR
53 Figure 4-5	John Stubblefield Cemetery	32.17234802/ -97.09126114	Potentially NRHP-Eligible Cemetery	C4B HrSR C4B HSR
54 Figure 4-5	Abbott Cemetery	31.89251/ -97.072992	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR, C4B HrSR C4B HSR C4C HrSR C4C HSR
55 Figure 4-5	First Street Cemetery	31.55413275/ -97.1196492	NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
56 Figure 4-5	Baylor University Historic District	31.548335/ -97.123263	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
57 Figure 4-5	10th Street Bridge at Waco Creek	31.54413021/ -97.12581695	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
58 Figure 4-5	Elite Café	31.52468786/ -97.13297609	NRHP-Eligible	C4A HrSR, C4A HSR, C4B HrSR, C4B HSR C4C HrSR C4C HSR
59 Figure 4-5	Waco Memorial Park Cemetery	31.474495/ -97.161357	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
60 Figure 4-5	Chapel Hill Memorial Park Cemetery	31.461623/ -97.169368	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
61 Figure 4-5	Cox Cemetery	31.336606/ -97.227864	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR
62 Figure 4-5	Eddy 3rd Street Historic District	31.29517312/ -97.2531277	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
63 Figure 4-5	1st National Bank	31.29511263/ -97.25298717	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR
64 Figure 4-6	Jefferson Historic District	31.120135/ -97.343249	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
65 Figure 4-6	Santa Fe Depot	31.09562772/ -97.34519641	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
66 Figure 4-6	St. Mary's Catholic Cemetery	30.579728/ -97.403508	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
67 Figure 4-6	Taylor Black Cemetery	30.577043/ -97.402118	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
68 Figure 4-6	Taylor City Cemetery	30.575672/ -97.402164	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
69 Figure 4-6	Rosehill Cemetery	30.372299/ -97.524404	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
70 Figure 4-7	Withers House	29.87087726/ -97.72733176	NRHP-Listed	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
71 Figure 4-7	Guadalupe Valley Memorial Park Cemetery	29.647161/ -98.039395	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
72 Figure 4-7	Holy Cross Cemetery	29.599446/ -98.338229	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
73 Figure 4-7	Schulmeier Cemetery	29.55242338/ -98.42829685	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
74 Figure 4-7	Olmos Park Historic District	29.482189/ -98.490498	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
75 Figure 4-7	Beacon Hill Historic District	29.451135/ -98.50622	Potentially NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
76 Figure 4-7	International & Great Northern Railroad Passenger Station	29.42704679/ -98.50563435	NRHP-Listed	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
77 Figure 4-7	San Fernando #1 Cemetery	29.414107/ -98.510484	Potentially NRHP-Eligible Cemetery	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
78 Figure 4-7	Capt. Jose Antonio Menchaca Centennial Marker	29.41392268/ -98.51049747	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
79 Figure 4-7	Jose Antonio Navarro Centennial Marker	29.41390188/ -98.51057822	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
80 Figure 4-7	Col. Jose Francisco Ruiz Centennial Marker	29.41387101/ -98.51054135	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
81 Figure 4-7	Don Juan Ximenes Centennial Marker	29.41385003/ -98.51063199	NRHP-Eligible	C4A HrSR C4A HSR C4B HrSR C4B HSR C4C HrSR C4C HSR
118 Figure 4-4	South Main Street Overpass	32.723962/ -97.32639	NRHP-Eligible	C4C HrSR C4C HSR
119 Figure 4-4	Kimbell Milling Company Historic District	32.723317/ -97.325975	Potentially NRHP-Eligible	C4C HrSR C4C HSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
120 Figure 4-4	J.W. Hall House	32.705324/ -97.32921	NRHP-Eligible	C4C HrSR C4C HSR
121 Figure 4-4	Ullman/Bungee Elevators	32.694673/ -97.329103	NRHP-Eligible	C4C HrSR C4C HSR
122 Figure 4-4	Burleson Main Street Historic District	32.542028/ -97.321191	Potentially NRHP-Eligible	C4C HrSR C4C HSR
123 Figure 4-5	Antioch Rest Cemetery	32.3090451/ -97.1933298	Potentially NRHP-Eligible Cemetery	C4C HrSR C4C HSR
124 Figure 4-5	Railroad Truss Bridge	32.291411/ -97.179735	Potentially NRHP-Eligible	C4C HrSR C4C HSR
125 Figure 4-5	Itasca City Cemetery	32.1490201/ -97.1481092	Potentially NRHP-Eligible Cemetery	C4C HrSR C4C HSR
126 Figure 4-5	Luke Tipton Cemetery	32.1475415/ -97.1473631	Potentially NRHP-Eligible Cemetery	C4C HrSR C4C HSR
127 Figure 4-5	609 Hawkins Street Residence	32.002807/ -97.132713	NRHP-Eligible	C4C HrSR C4C HSR

[a] Indicates a resource that is also located in the Northern Section.

Sources: Beaumont et al. (n.d); Everett (2010); Google Maps (2014); GoogleEarth (1950 – 2014); Humphrey (2010); Humphrey and Crawford (2001); Long (2010b); Manguso (2010); Moore et al. (2013); NPS (2014); NPS (2015); NETROnline (2014); Richardson (2005); TxDOT (2014d); TxDOT (2014e); TxDOT (2014g); TxDOT and FRA (2014); Texas Historical Commission (2014); Worcester (2010).

Table 4-3: Historic Resources – Southern Section

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
82 Figure 4-12	Alice Cemetery	27.738462/ -98.077518	Potentially NRHP-Eligible Cemetery	S4 HrSR
83 Figure 4-12	Hotel Brendel	27.7878792/ -97.66149443	NRHP-Eligible	S4 HrSR
84 Figure 4-12	King Ranch Historic District	27.527646/ -98.10017	NRHP-Listed	S4 HrSR
85 Figure 4-12	One-story Wood House	27.22840748/ -98.13982955	NRHP-Eligible	S4 HrSR
86 Figure 4-13	Southern Pacific Depot	26.30145346/ -98.16842767	NRHP-Eligible	S4 HrSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
87 Figure 4-13	Casa de Palmas	26.20511172/ -98.23488877	NRHP-Eligible	S4 HrSR
88 Figure 4-13	Restaurant	26.20341706/ -98.23139302	NRHP-Eligible	S4 HrSR
89 Figure 4-13	Louisiana--Rio Grande Canal Company Irrigation System Historic District	26.196429/ -98.191846	NRHP-Listed	S4 HrSR
90 Figure 4-13	San Juan Hotel	26.18945199/ -98.15687578	NRHP-Eligible	S4 HrSR
91 Figure 4-13	Early 20th Century Tile Decorated Storefront	26.18939291/ -98.15619621	NRHP-Eligible	S4 HrSR
92 Figure 4-13	Moderne Style Service Station/Muffler Shop	26.18201284/ -98.11508722	NRHP-Eligible	S4 HrSR
93 Figure 4-13	Crest Fruit Company Warehouse	26.18237037/ -98.11337202	NRHP-Eligible	S4 HrSR
94 Figure 4-13	Concrete Commercial Building	26.17662498/ -98.08187689	NRHP-Eligible	S4 HrSR
95 Figure 4-13	Hanson House	26.17562512/ -98.08117409	NRHP-Eligible	S4 HrSR
96 Figure 4-13	Donna Irrigation Historic District	26.172009/ -98.058142	NRHP-Eligible	S4 HrSR
97 Figure 4-13	Art Moderne Southern Mosaic Tile Factory	26.16488336/ -98.02111419	NRHP-Eligible	S4 HrSR
98 Figure 4-13	Cortez Hotel	26.15938574/ -97.99100852	NRHP-Listed	S4 HrSR
99 Figure 4-13	Commercial Building	26.15053982/ -97.91245295	NRHP-Eligible	S4 HrSR
100 Figure 4-13	Former Hidalgo County Irrigation District #5 Offices	26.15031853/ -97.91249016	NRHP-Eligible	S4 HrSR
101 Figure 4-13	Quonset Hut	26.15042375/ -97.90431001	NRHP-Eligible	S4 HrSR
102 Figure 4-13	Moderne Stucco Gas Station	26.15750842/ -97.82839521	NRHP-Eligible	S4 HrSR
103 Figure 4-13	Moderne Gas Station	26.15846407/ -97.8253208	NRHP-Eligible	S4 HrSR
104 Figure 4-13	La Feria Canning Co.	26.15886264/ -97.82343175	NRHP-Eligible	S4 HrSR

Map ID# Figure #	Site Name	Location (Lat/Long)	NRHP Status	Alternative
105 Figure 4-13	Texas Citrus Fruit Growers	26.15897524/ -97.82300438	NRHP-Eligible	S4 HrSR
106 Figure 4-13	La Feria Irrigation Historic District	26.160936/ -97.818269	NRHP-Eligible	S4 HrSR
107 Figure 4-13	International Style Cinder Block Fence	26.16414182/ -97.80606571	NRHP-Eligible	S4 HrSR
108 Figure 4-13	Restlawn Cemetery	26.166681/ -97.797061	Potentially NRHP-Eligible Cemetery	S4 HrSR
109 Figure 4-13	Adams Gardens Irrigation Historic District	26.169652/ -97.787909	NRHP-Eligible	S4 HrSR
110 Figure 4-13	Spanish Revival Petrified Stone Gates	26.17159694/ -97.7828932	NRHP-Eligible	S4 HrSR
111 Figure 4-13	Santos Lozano Building	26.1926212/ -97.69721701	NRHP-Eligible	S4 HrSR
112 Figure 4-13	Travis Historic District	26.185728/ -97.691487	Potentially NRHP-Eligible	S4 HrSR
113 Figure 4-13	RR Parker Through Truss Bridge	26.1773826/ -97.68292121	Potentially NRHP-Eligible	S4 HrSR
114 Figure 4-13	Cameron County Irrigation District #2 Historic District	26.14208/ -97.643964	NRHP-Eligible	S4 HrSR
115 Figure 4-13	CCWC Irrigation District #6 Historic District	25.974444/ -97.523804	NRHP-Eligible	S4 HrSR
116 Figure 4-13	West Brownsville Historic District	25.91883/ -97.519924	Potentially NRHP-Eligible	S4 HrSR
117 Figure 4-13	Brownsville Downtown Overlay Historic District	25.907635/ -97.511476	Potentially NRHP-Eligible	S4 HrSR

Sources: Alcott (2010); Ashton and Sneed (2010); Beaumont et al. (n.d); Conger (1964); Conger (2010); City of Laredo (2014); Cuéllar (2010); DaCamara (1949); Elliott (n.d); Fehrenbach (2010); Ficker and Barron (2010); Garza (2010a); Garza (2010b); Garza and Long (2010); Gilbert (2010); Google Maps (2014); GoogleEarth (1950 – 2014); Harlingen Air Force Base (2010); Kearney (1989); Knight (2009); Long (2010c); Long (2010d); Manguso (2010); Munz (1966); NPS (2014); NPS (2015); NETROnline (2014); Parish (1989); "Port of Brownsville, Serving Two Nations." (1955); Richardson (2005); Texas A&M University (2014); TxDOT (2014d); TxDOT (2014e); TxDOT (2014f); TxDOT (2014g); TxDOT and FRA (2014); Texas Historical Commission (2014); Worcester (2010).

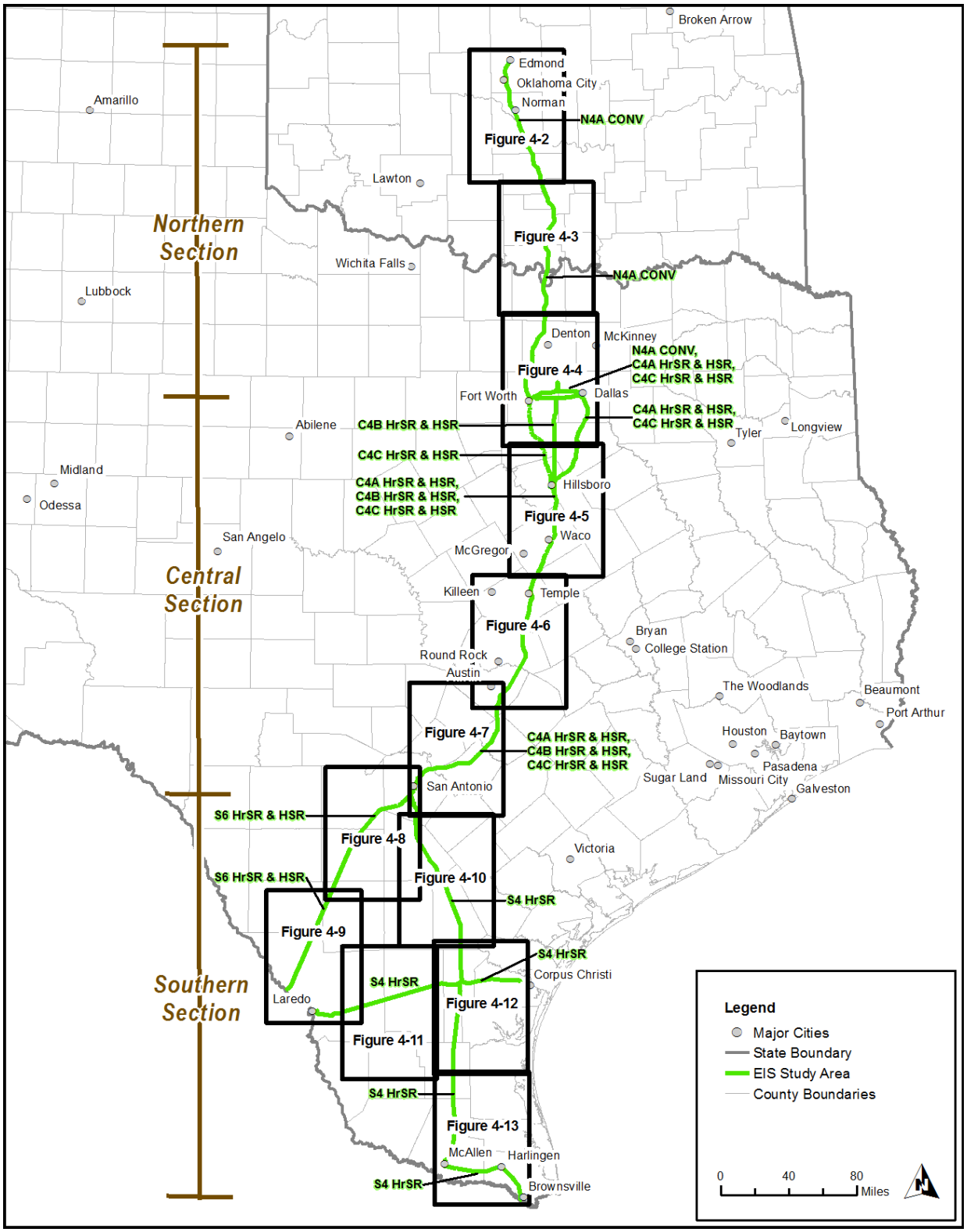


Figure 4-1: Index Map of Historic Resources within the EIS Study Area

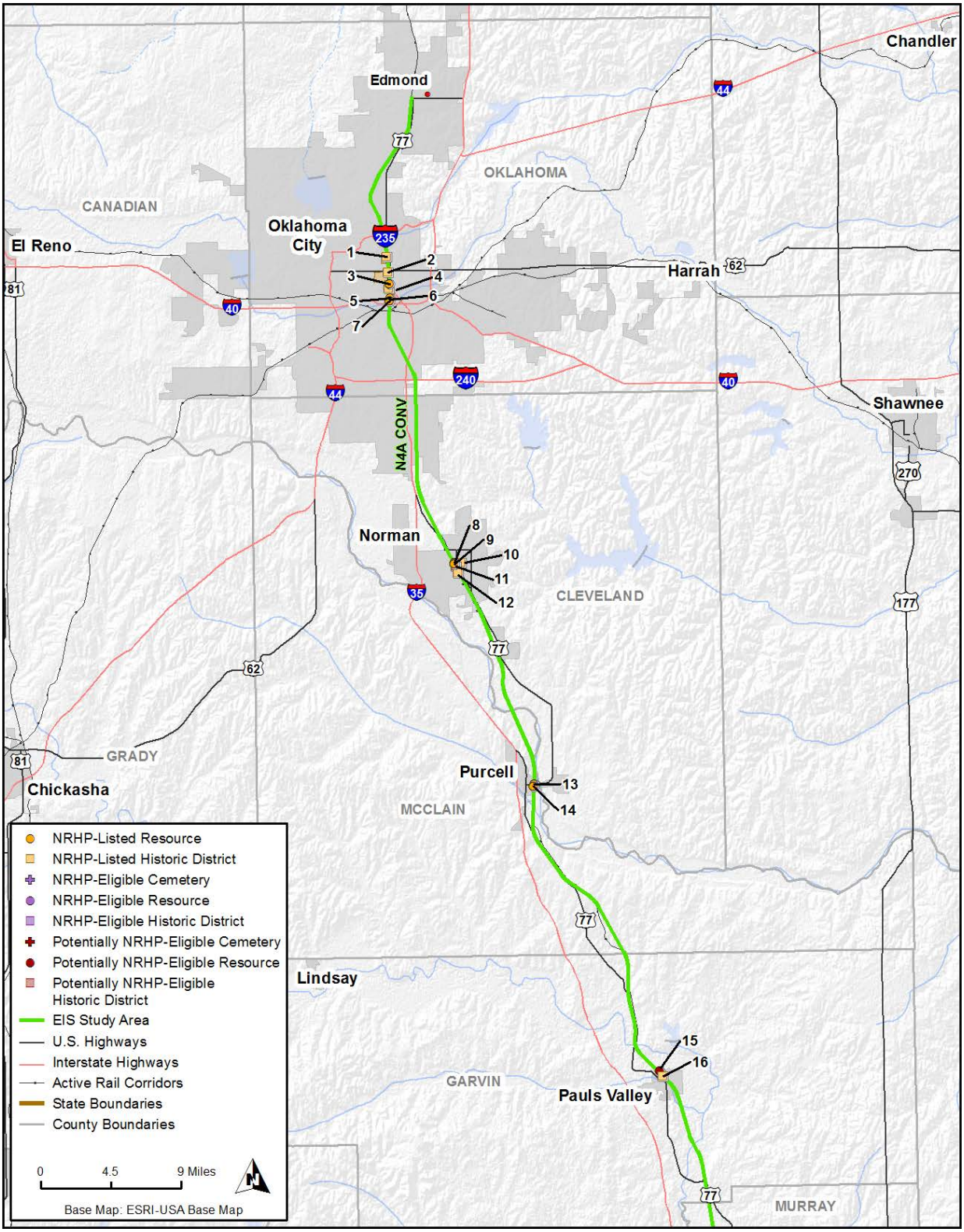


Figure 4-2: Historic Resources within the EIS Study Area

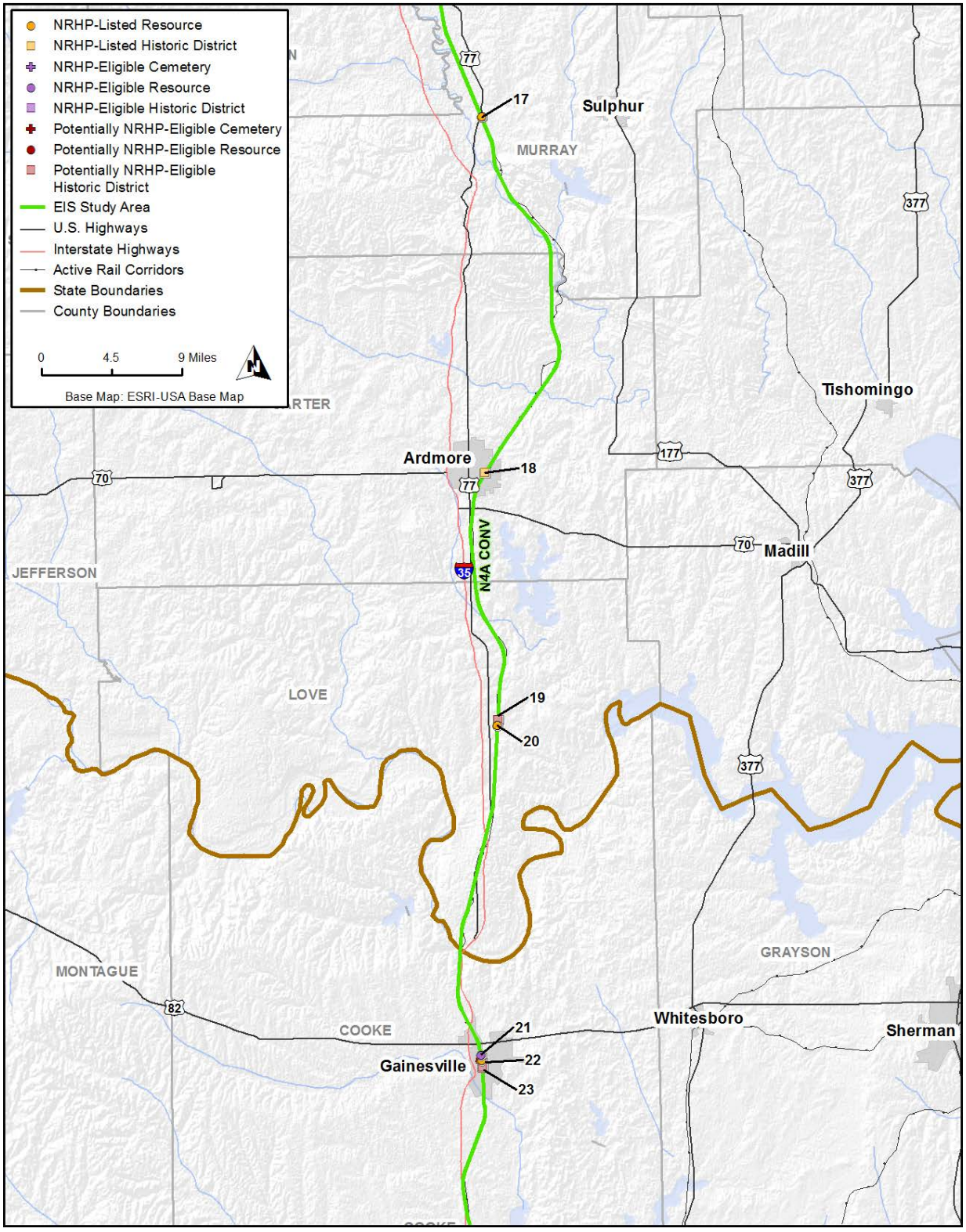


Figure 4-3: Historic Resources within the EIS Study Area

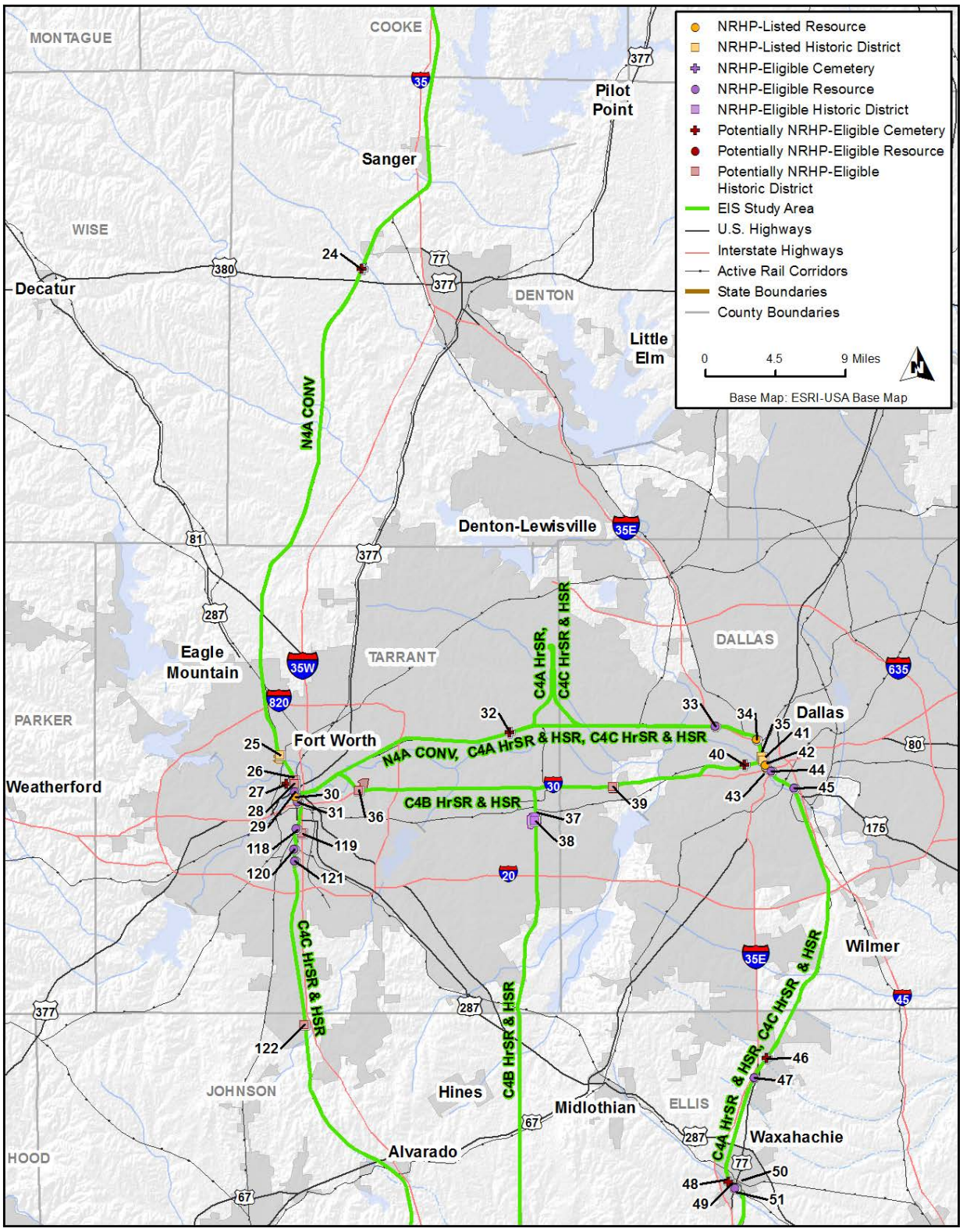


Figure 4-4: Historic Resources within the EIS Study Area

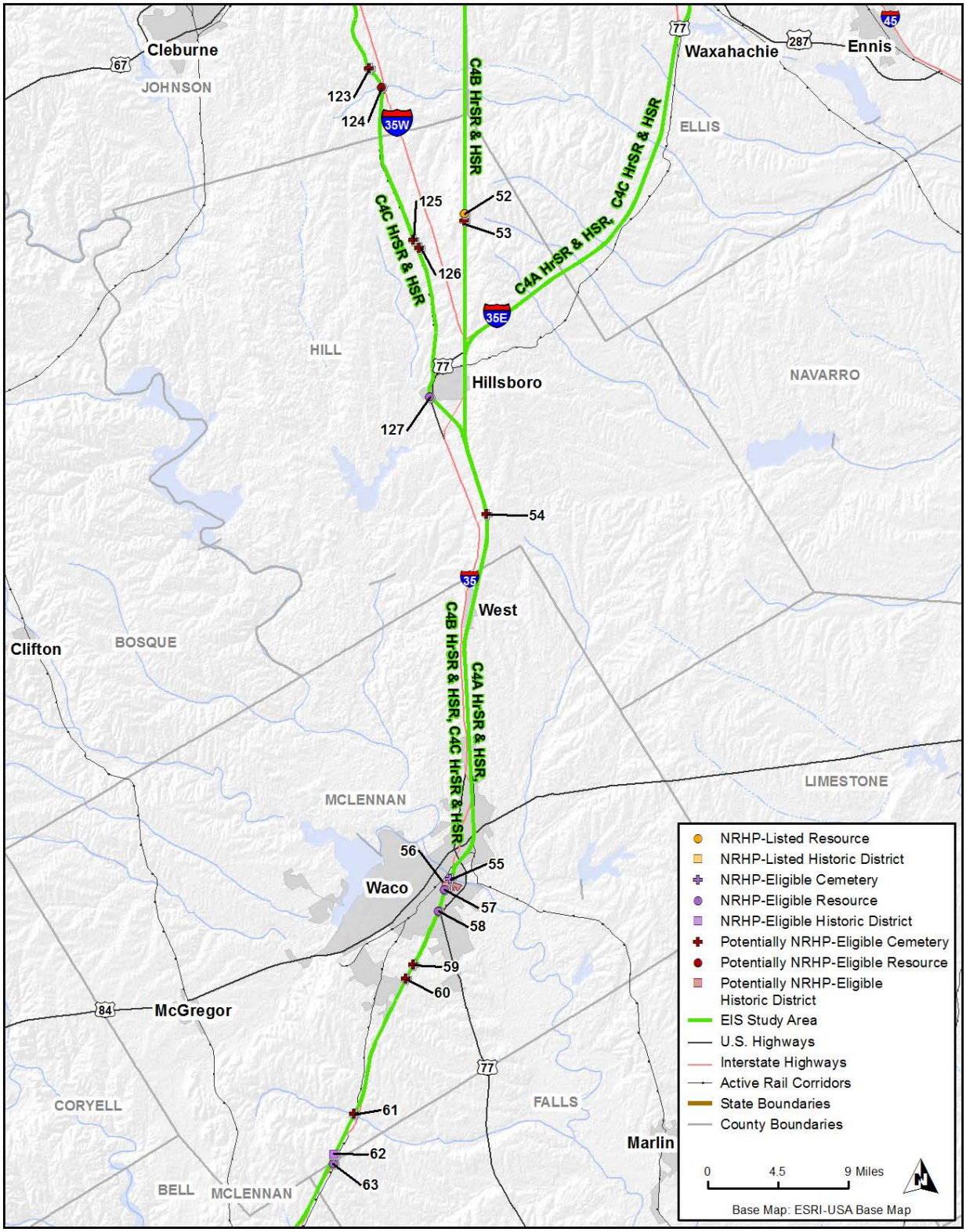


Figure 4-5: Historic Resources within the EIS Study Area

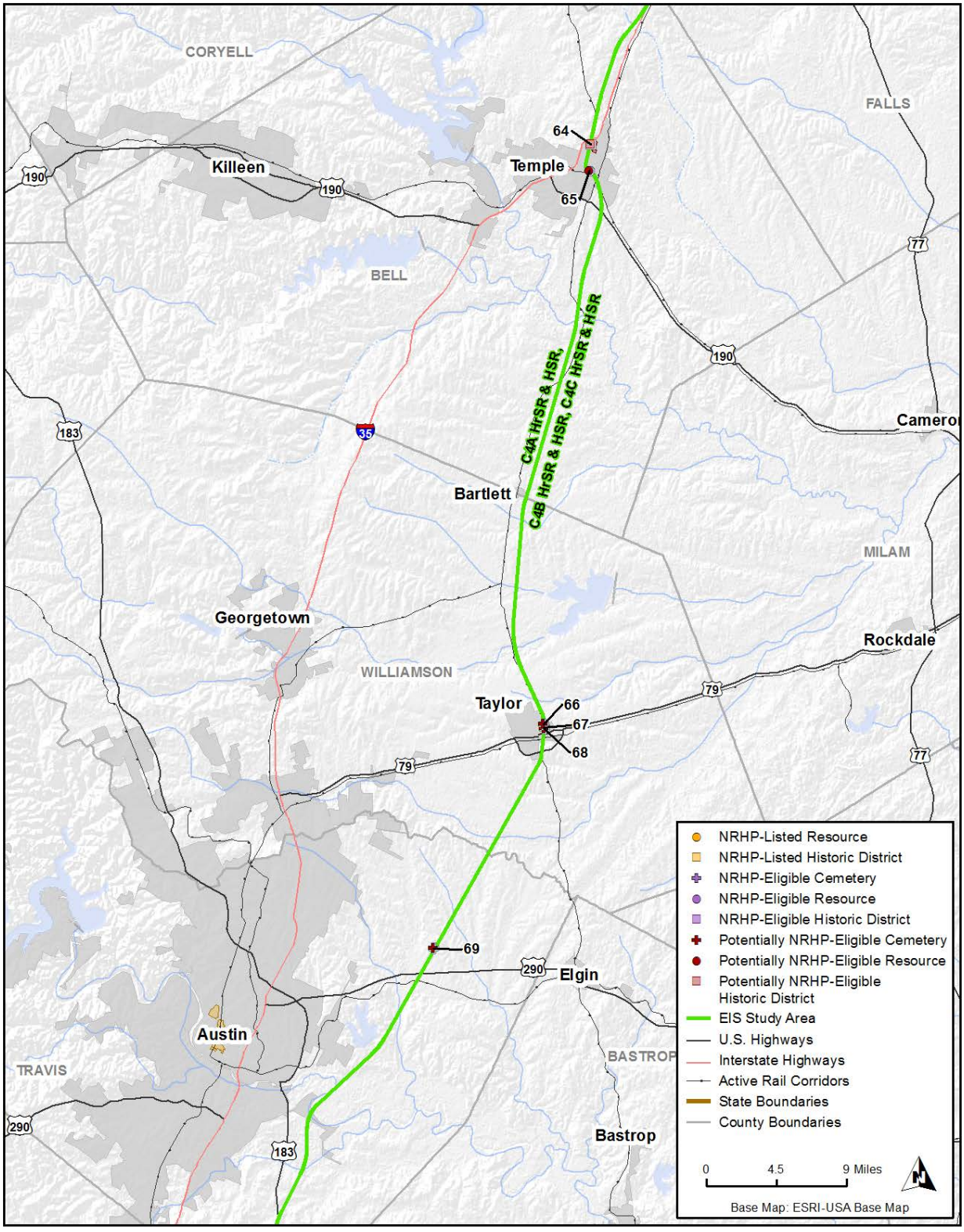


Figure 4-6: Historic Resources within the EIS Study Area

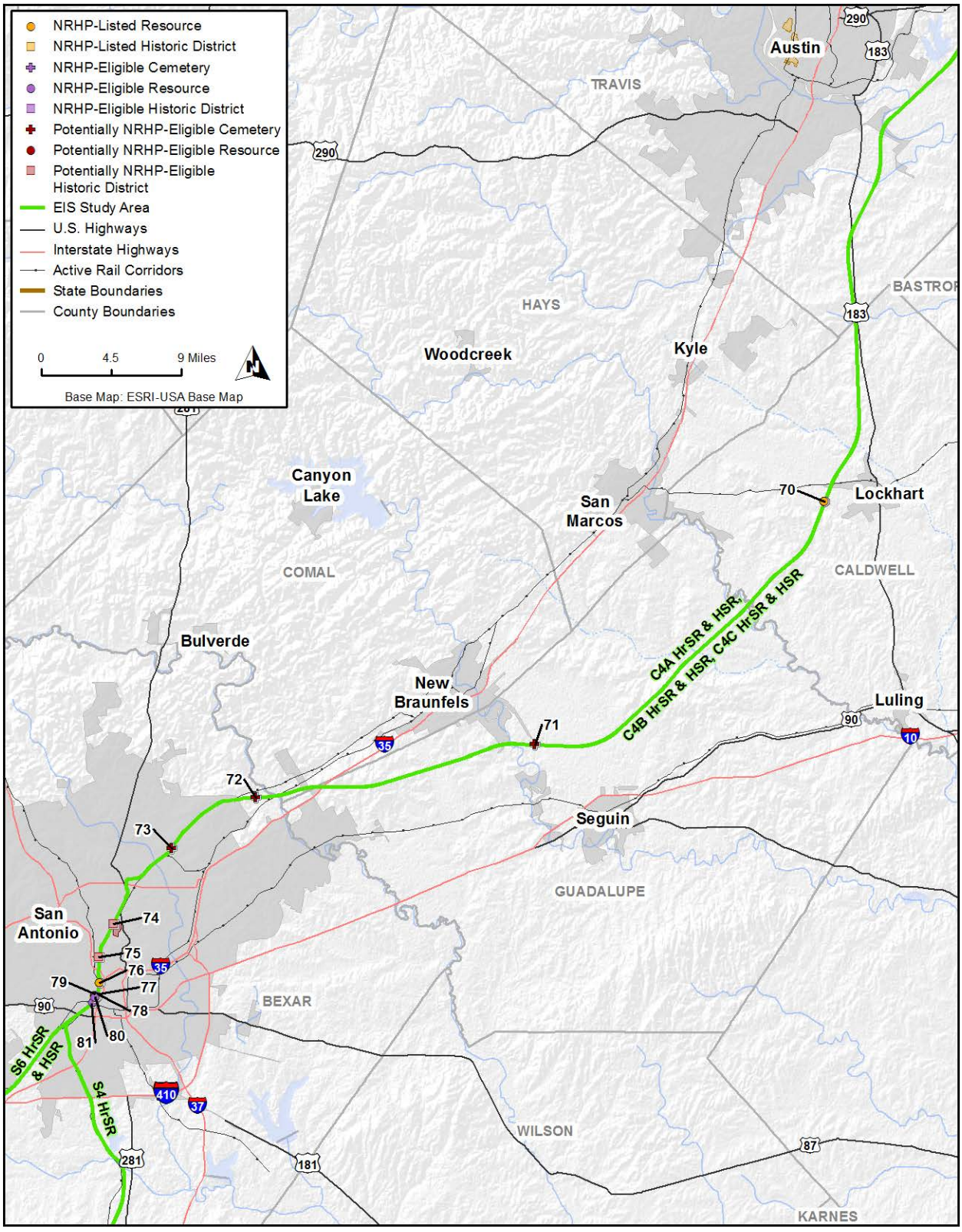


Figure 4-7: Historic Resources within the EIS Study Area

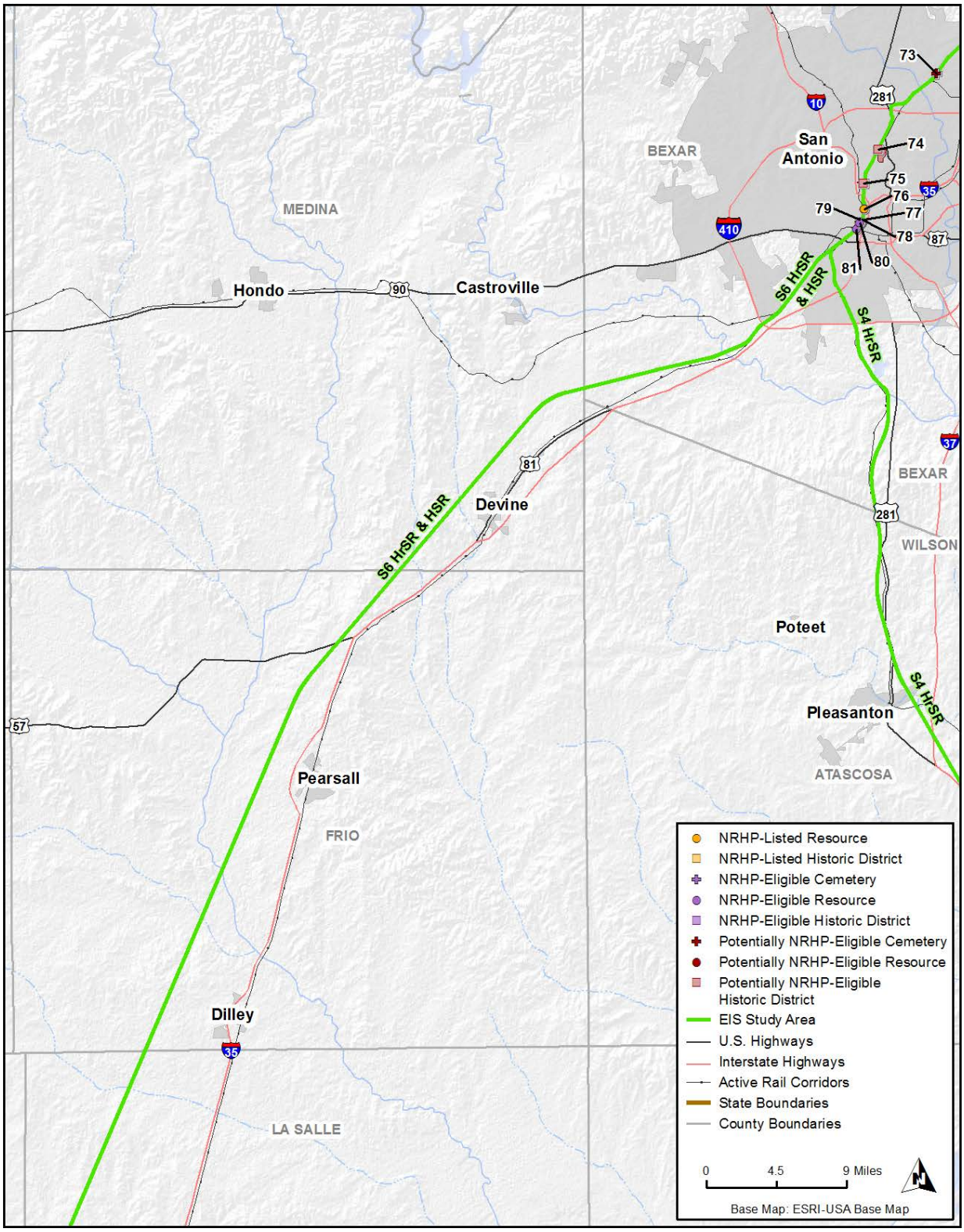


Figure 4-8: Historic Resources within the EIS Study Area

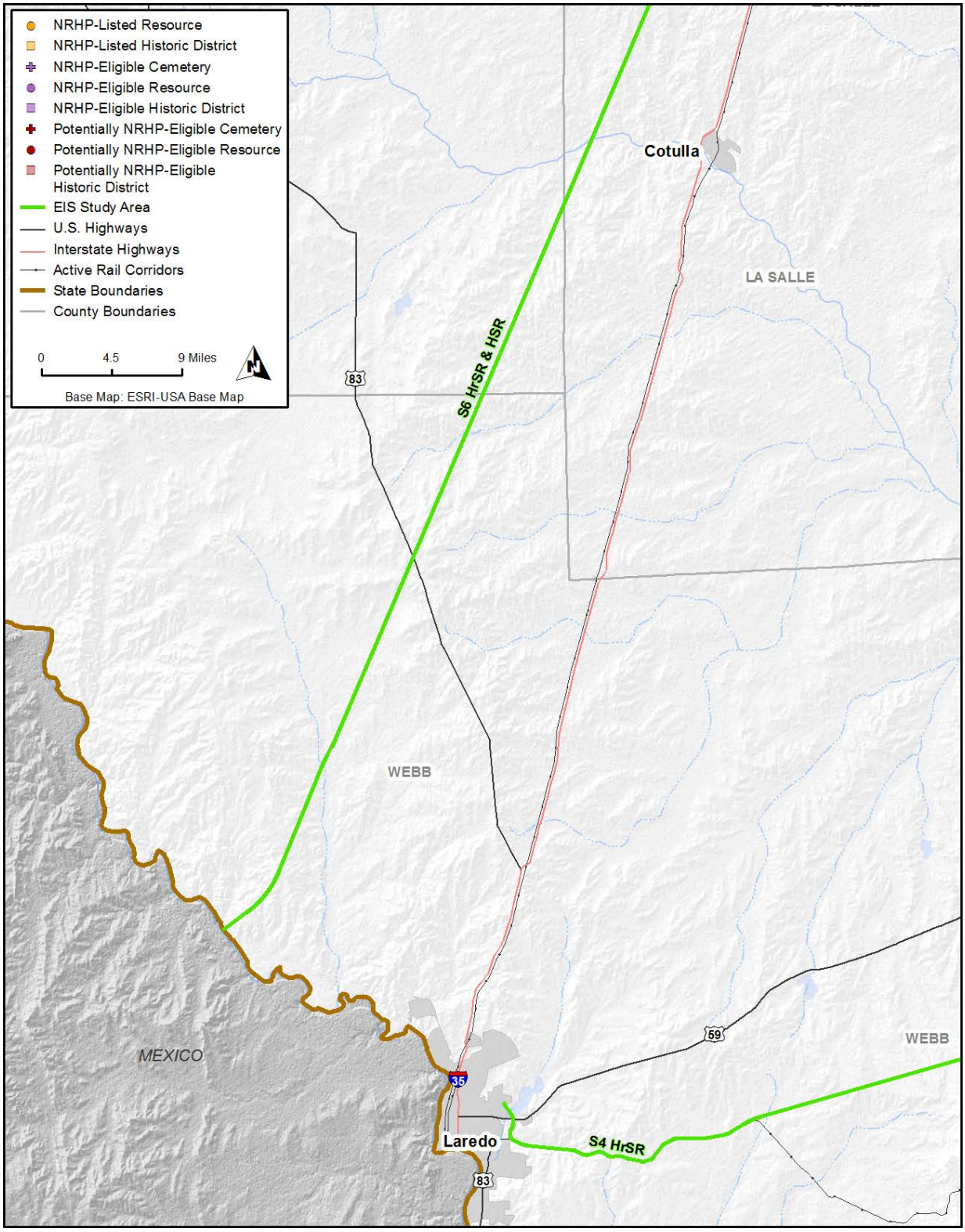


Figure 4-9: Historic Resources within the EIS Study Area

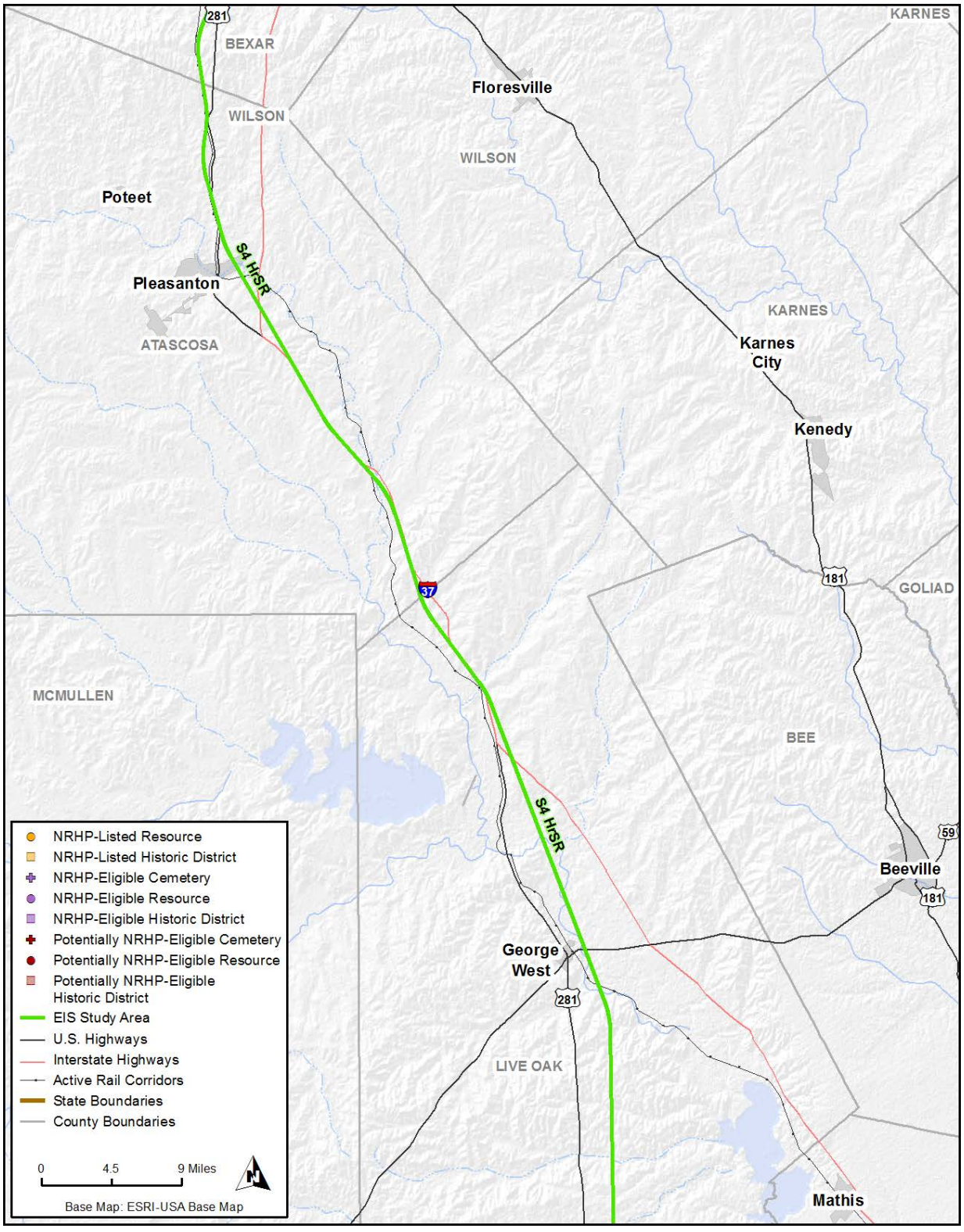


Figure 4-10: Historic Resources within the EIS Study Area

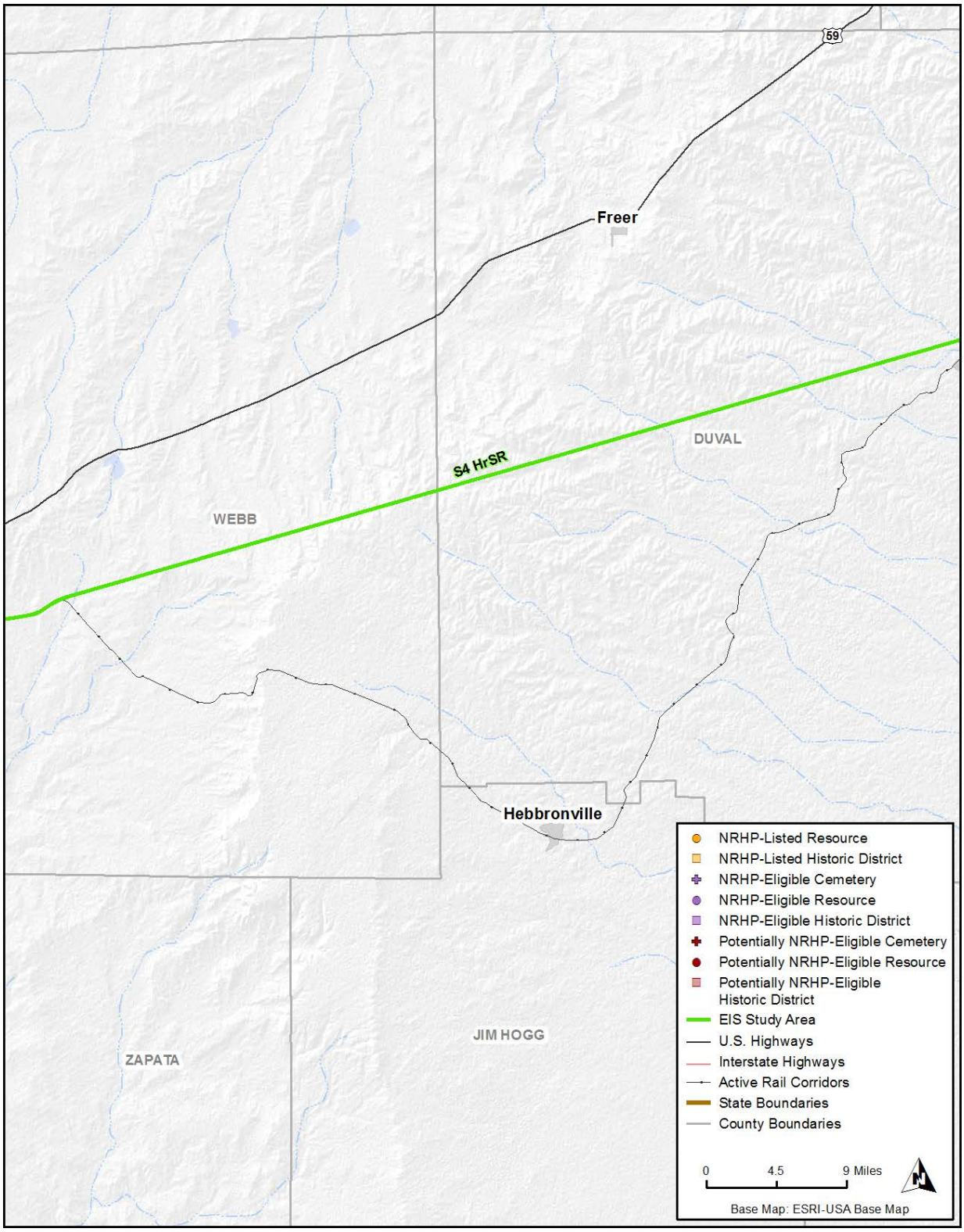


Figure 4-11: Historic Resources within the EIS Study Area

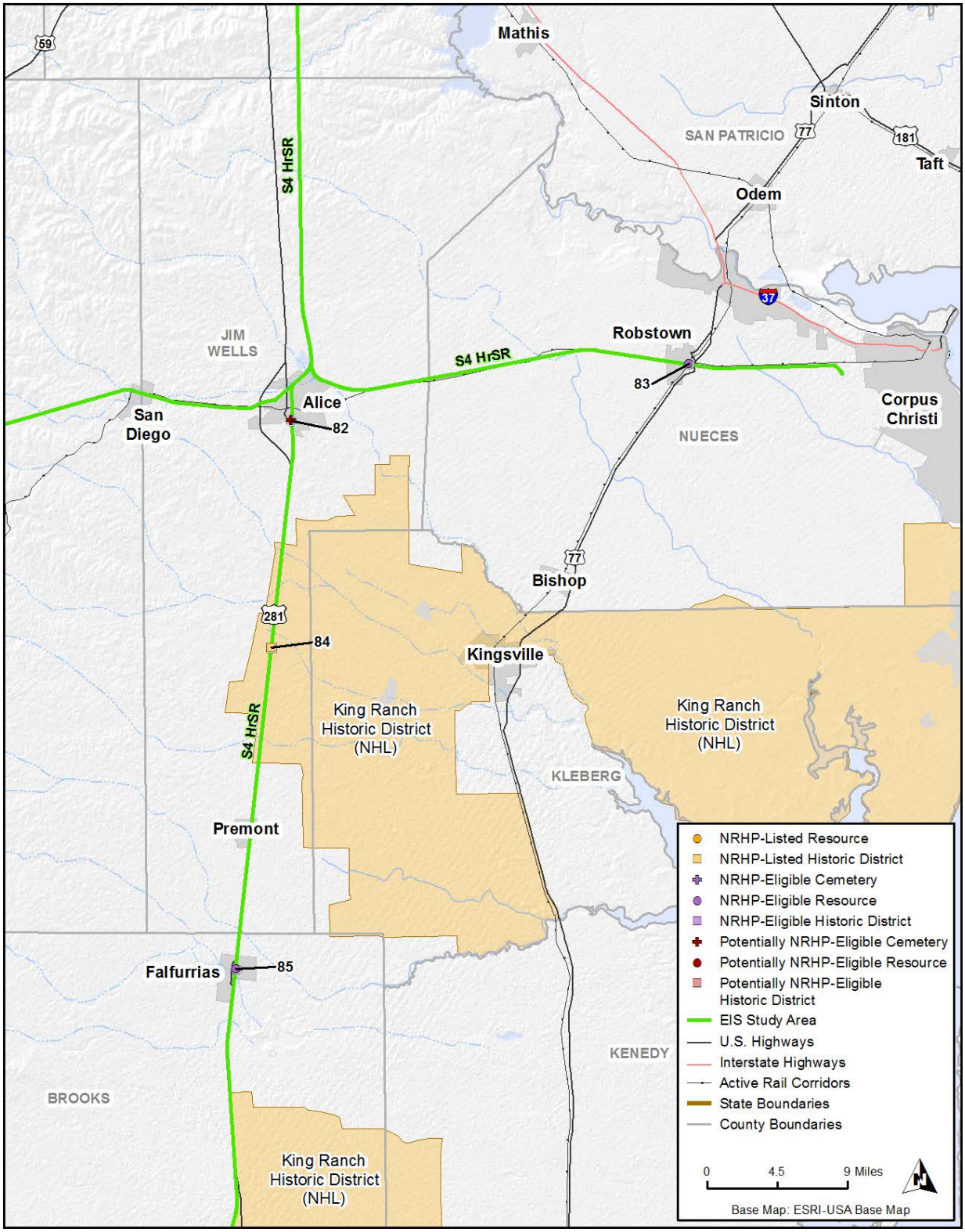


Figure 4-12: Historic Resources within the EIS Study Area

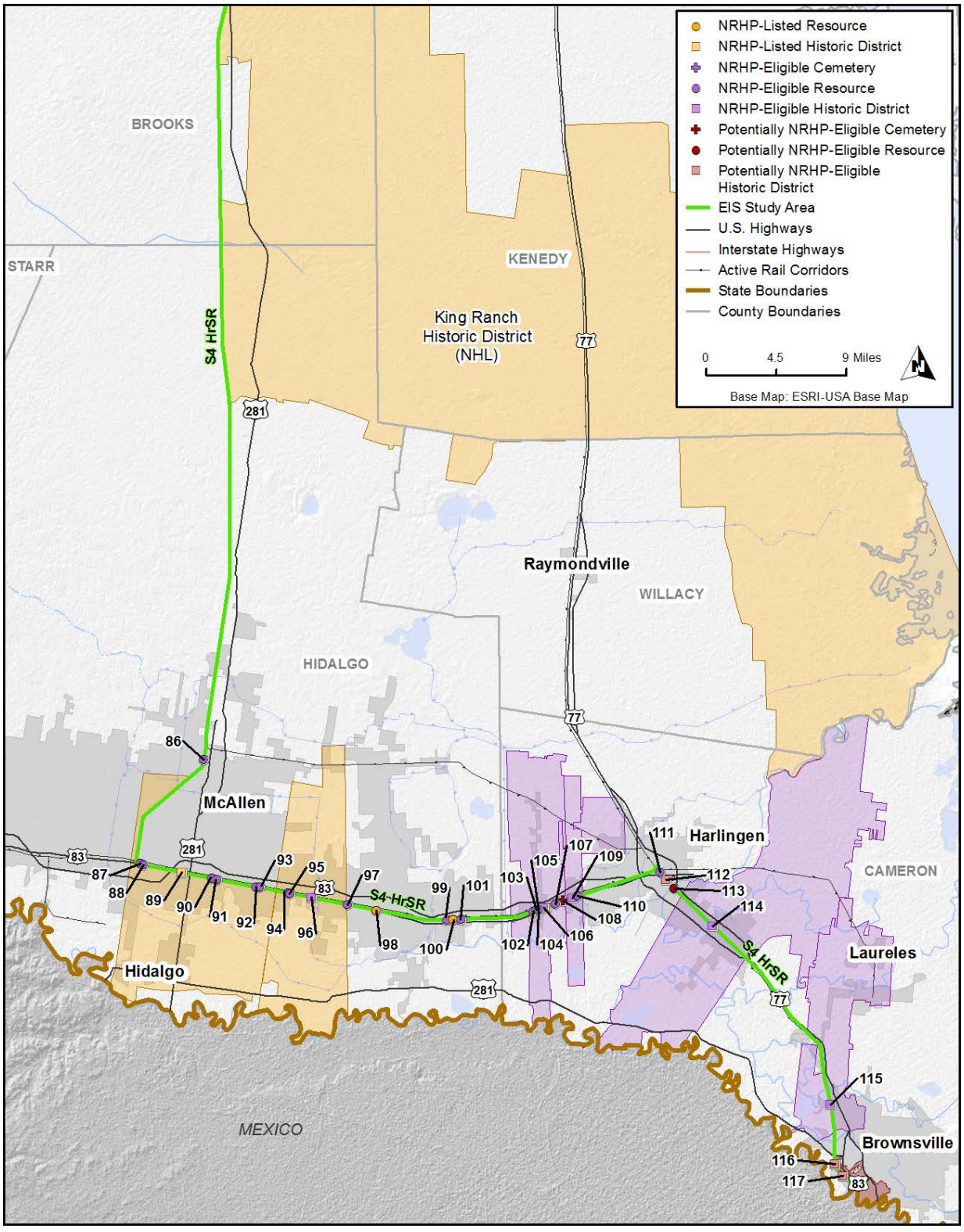


Figure 4-13: Historic Resources within the EIS Study Area

5.0 Effects on Historic, Architectural, and Non-Archaeological Cultural Resources

This section analyzes the potential effects on historic resources identified within the EIS Study Area (see Table 5-1). Individual property surveys were not conducted. Additional historic resources would likely be identified at the project level when a detailed field survey and evaluation would be conducted, and they should be considered when evaluating the alternatives during the project-level analysis. The effects analysis is presented by geographic location (Northern, Central, and Southern sections) and by build alternative. The analysis presents anticipated permanent direct and indirect effects within urban, suburban, and rural areas for each alternative and associated stations.

Table 5-1: Number of Historic Sites by Route Alternative

	N4A CONV	C4A HrSR and HSR [a]	C4B HrSR and HSR [a]	C4C-HrSR and HSR [a]	S4 HrSR	S6 HrSR and HSR
NRHP-Listed or NRHP-Eligible Historic Districts	9	4	4	3	7	0
Potentially NRHP-Eligible Historic Districts	5	4	6	6	3	0
NRHP-Listed or NRHP-Eligible Individual Resources	17	19	12	22	23	0
Potentially NRHP-Eligible Individual Resources	1	2	1	3	1	0
NRHP-Listed or NRHP-Eligible Cemeteries	0	1	1	1	0	0
Potentially NRHP-Eligible Cemeteries	3	15	14	17	2	0
Total Historic Resources	**35**	**45**	**38**	**52**	**36**	**0**

[a] These alternatives are listed together because the total number of historic resources within the EIS Study Area is the same for both.

The discussion of effects below reflects a level of assessment for the historic resources appropriate for a service-level analysis. For this service-level analysis, the details of the alignment, construction footprint, profile of the railway or the specific station locations were not available. Therefore, the analysis is based on information gathered regarding the route and service type to determine the likelihood the historic resources may be permanently acquired and removed. Other effects that can occur during construction include vibratory effects on nearby historic structures; however, best management practices can be implemented to avoid these effects. For this service-level analysis then, construction effects are limited to the potential for removal of historic properties.

Noise and vibration effects could also cause an indirect adverse effect on non-archaeological historic resources under Section 106 if the resource's setting and landscape are integral to its historic significance or are considered character-defining features. However, based on 36 CFR 800.5 and the project team's experiential insight, direct or indirect impacts from noise are only considered if a historic resource's quiet environment is considered a character-defining feature of its historic significance or if a historic resource's specific use or function is integral to its historic significance. For this service-level analysis, no known historic resources meet these criteria. Increased noise levels would not likely affect the continued use of historic properties within the EIS Study Area and, therefore, would not likely diminish the integrity of significant historic features.

Different rail service could cause indirect vibration effects on historic resources. However, vibration effects that might damage the building and diminish the historic significance are rare and dependent on building material types. Typically, vibration effects only occur during construction if avoidance measures are not incorporated into the construction planning.

A more detailed noise and vibration impact assessment would be completed on individual historic resources during the project-level analysis because detailed alignment, station locations, and grade separations have not yet been identified. Nevertheless, it is assumed that noise and vibration effects, which would be otherwise mitigated for sensitive receptors' (e.g., residential, libraries, and schools) uses, would not directly result in damage or indirectly result in diminishing the character-defining feature of its historic significance or altering the historic resource's specific use or function integral to its historic significance. Noise and vibration effects are not discussed further.

Based on 36 CFR 800.5 and the Program team's experiential insight, visual impacts on historic resources occur when new features are introduced to a landscape that may physically or visually affect the historic setting or the elements of the resource that make it eligible for the NRHP. These impacts may constitute an indirect effect under Section 106. The introduction of new visual features to the surrounding setting does not necessarily constitute an adverse effect on historic resources under Section 106, unless the resource's setting and landscape are integral to its historic significance or are considered character-defining features.

Visual impacts would most likely occur during the operational phase for higher-speed and high-speed rail service because of the potential for new railroad-related facilities and stations. High-speed rail service may require stations and grade crossings to be elevated, which would impose new large-scale features on the surrounding landscape and would result in substantial visual

effects, potentially affecting the historic setting. In rural areas, these visual impacts would be mitigated using vegetative screening, as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies. A more detailed assessment of visual impacts on individual historic resources would occur during the project-level analysis because station locations and grade separations have not yet been identified. Nevertheless, it is assumed that conventional rail and higher-speed rail would result in negligible visual effects and high-speed rail would result in substantial visual effects on historic resources, specifically in urban and suburban areas near historic districts where grade separations are required. As these locations are not defined in this phase of engineering, visual impacts are not discussed further in this section.

5.1 No Build Alternative

The No Build Alternative would not result in property acquisition or changes to transit operations. The No Build Alternative is used as a basis for comparison with the alternatives. Because this alternative would not include the construction, alteration, or improvement of transportation facilities in relation to the construction of the route alternatives, it would not affect non-archaeological historic resources. The No Build Alternative would not implement the Program of rail improvements associated with this service-level evaluation and would not meet the purpose and need of the Program; therefore, the No Build Alternative would not affect historic resources.

5.2 Northern Section: Oklahoma City to Dallas and Fort Worth

In the Northern Section, only one alternative was carried forward for further evaluation. Alternative N4A Conventional would follow the same general alignment within Dallas and Fort Worth as several alternatives in the Central Section. As a result, historic resources identified within the EIS Study Area are in both the Northern and Central sections. These overlapping historic resources are identified in Table 5-1. The service-level analysis for the Northern Section outlines the potential construction and operational effects and associated station locations along Alternative N4A Conventional. In addition, the analysis includes an assessment of the effects within context of urban, suburban, and rural areas.

5.2.1 Alternative N4A Conventional

Data collection revealed nine NRHP-listed or NRHP-eligible historic districts and five potentially NRHP-eligible historic districts within the N4A EIS Study Area. The historic districts are largely concentrated in developed areas such as Oklahoma City, Dallas, and Fort Worth, although several are in smaller towns and cities along the EIS study area of Alternative N4A Conventional. The service-level analysis also revealed 17 individual NRHP-listed or previously determined NRHP-eligible resources within the N4A EIS Study Area. In addition, three potentially NRHP-eligible cemeteries are within the EIS Study Area (see Table 5-1). Although detailed survey to identify potentially NRHP-eligible individual historic resources was not part of this analysis, the prevalence of historic Santa Fe Railroad Depots along the Alternative N4A route led to the identification of one previously unevaluated Santa Fe Railroad Depot (Map ID #15) in Pauls Valley, Oklahoma. This depot has been included as a potentially NRHP-eligible resource. Because of the prevalence of

historically significant Santa Fe Railroad Depots along the alternative, there is also potential for a discontinuous Santa Fe Railroad historic district (see Section 3.4, NRHP Significance Criteria). This discontinuous rail-related historic district would be evaluated at the project level.

Alternative N4A Conventional would likely have negligible acquisition effects on urban, suburban, and rural historic resources compared to the No Build Alternative. Because Alternative N4A Conventional would primarily use existing railroad infrastructure or would be directly adjacent to existing railroad facilities and tracks, minimal new right-of-way and easements would be required. In urban and suburban areas, railroad-related historic resources within existing railroad rights-of-way, including the historic railroad depots (Map ID #9, 15, 17, 20, 22, and 31) and the Rock Island Railroad Bridge (Map ID #33), would have the greatest potential for effects. However, effects on these resources could be avoided in most situations at the project level, and therefore, this alternative would have a negligible effect on historic resources. As long as Alternative N4A Conventional remains within the existing rail right-of-way, it would not affect other historic resource types and historic districts in urban and suburban areas because they are located outside the existing railroad right-of-way.

The expansion of existing stations and new stations within urban and suburban areas could result in moderate effects on historic resources within the EIS Study Area. Because several stations are NRHP-listed or NRHP-eligible, expansion and reconstruction of historically significant buildings and structures may be required to accommodate increased ridership. Such work would be completed using the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995) when possible to avoid effects on the depots. If effects on existing historically significant depots cannot be avoided, effects would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies. Although increased or additional parking facilities may be required, siting parking facilities would attempt to avoid significant historic resources. In addition, the construction of new stations in urban and suburban areas could result in effects on historic resources; such effects would be assessed during the project-level analysis.

As in urban and suburban areas, Alternative N4A Conventional would use existing railroad facilities or closely parallel existing facilities in rural locations. Therefore, Alternative N4A Conventional and associated stations would likely have a negligible effect on historic resources at the construction phase. Few rural historic resources and districts were identified, and avoidance of these resources would be considered during the project-level analysis. Even though additional individual historic resources and rural historic districts may be identified during project-level analysis, these resources would historically have railroad facilities adjacent to or on their property. The introduction of passenger rail service on existing railroad facilities or a new railroad line alongside existing facilities would not change the setting or character of the landscape. Furthermore, if additional historically significant resources or historic districts are identified, potential impacts on these resources from a new station would be evaluated during the project-level analysis.

During operation of the proposed rail lines, Alternative N4A Conventional and associated stations would likely result in negligible effects on urban, suburban, and rural historic resources. The historic

resources within the EIS Study Area have historically been close to a railroad facility. Therefore, vibration effects from additional passing trains would likely be minimal on historic resources within the EIS Study Area. For conventional rail service that operates at less than 100 mph, vibration would be felt approximately 60 feet on either side of the alignment centerline for residential resources and 20 feet on either side for institutional resources. Potential vibration and associated adverse effects, as outlined in Section 106, would be assessed during the project-level analysis.

5.3 Central Section: Dallas and Fort Worth to San Antonio

In the Central Section, the six alternatives under evaluation follow the same alignment from Hillsboro south to San Antonio, with the exception of several small variations along Alternative C4C Higher-Speed Rail and Alternative C4C High-Speed Rail (see Figures 1-1, 4-5, 4-6, and 4-7). The following sections outline the potential construction and operational effects and associated station locations along these alternatives within urban, suburban, and rural areas for each alternative.

5.3.1 Alternative C4A Higher-Speed Rail

A total of 45 NRHP, NRHP-eligible, or potentially NRHP-eligible unique resources were identified within the C4A Higher-Speed rail EIS Study Area. The service-level data collection revealed 19 individual NRHP-listed or previously determined NRHP-eligible structures within the EIS Study Area. Also, 15 potentially NRHP-eligible cemeteries and one NRHP-eligible cemetery are within the EIS Study Area (see Table 5-1). The data collected revealed four documented NRHP-listed or NRHP-eligible historic districts and four potentially NRHP-eligible historic districts within the C4A Higher-Speed Rail EIS Study Area. The historic districts are largely concentrated in developed areas such as Dallas, Fort Worth, and San Antonio, although several are in smaller towns and cities along the build alternative.

Although potentially NRHP-eligible individual historic resources were not surveyed in this service-level analysis, during data collection, two potentially NRHP-eligible railroad depots were identified, one in Waxahachie (Map ID #51) and one in Temple (Map ID #65). Because of their proximity to the alternative, there is a high potential for property acquisitions to affect historic resources and the potentially discontinuous rail-related historic district (see Section 3.4, NRHP Significance Criteria). Where existing railroad rights-of-way are present, Alternative C4A Higher-Speed Rail would likely use or improve existing railroad stations and depots. However, new stations may be required along corridors planned outside existing rail rights-of-way.

Compared to the No Build Alternative, the C4A Higher-Speed Rail would likely result in substantial effects on historic resources in urban areas. The densest concentration of urban development and thus potential for concentrations of historic resources is near the northern and southern termini of Alternative C4A Higher-Speed Rail, largely within Dallas, Fort Worth, and San Antonio. In these areas, the alternative would be within existing railroad rights-of-way, and construction would likely be directly adjacent to existing railroad facilities and tracks, thus requiring new right-of-way or easements. In urban areas where existing railroad rights-of-way would be used, railroad-related historic resources, including historic railroad depots (Map ID #31, 42, 65, and 76) and the Rock

Island Railroad Bridge (Map ID #33), would have the greatest potential for effects. Where new alignments may be necessary, such as through downtown Waco, Alternative C4A Higher-Speed Rail would likely have substantial property acquisition on historic resources. For example, the alternative may pass through portions of Baylor University (Map ID #56), which has been identified as a potentially NRHP-eligible historic district. Further evaluation would be required at the project level to determine if the property is eligible for the NRHP, and, if so, if contributing features to the historic district would be affected.

Stations associated with Alternative C4A Higher-Speed Rail within urban areas would also result in substantial effects on historic resources. Several existing railroad terminals are NRHP-listed or NRHP-eligible, including the GC&SF Passenger Station (Map ID #31), the Dallas Union Terminal (Map ID #42), and International & Great Northern Passenger Station (Map ID #76). If these facilities are considered for expansion and reconstruction, such work would be completed incompliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995) when possible to avoid effects on the depots, or effects would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies. Although increased or additional parking facilities may be required, construction of parking facilities would attempt to avoid significant historic resources.

Unless the right-of-way can remain within the existing rights-of-way, the greatest potential for permanent effects on historic resources within suburban areas would be in areas with previously designated or potentially eligible NRHP-eligible historic districts (such as Map ID #56, 62, and 64). But, where the alternative would be constructed within existing railroad rights-of-way, the alternative may still affect railroad-related historic resources, such as the train depot in Waxahachie (Map ID #51) or the Santa Fe Depot in Temple (Map ID #65). Therefore, Alternative C4A Higher-Speed Rail may result in substantial effects in the suburban areas.

Alternative C4A Higher-Speed Rail in rural areas would likely have negligible effects on historic resources along both existing and new alignments. Only one historically significant agricultural property, the Withers House near Lockhart (Map ID #70), was identified within the EIS Study Area. However, additional agricultural resources or rural historic landscapes may be identified within the EIS Study Area during the project-level analysis. In suburban and rural areas, locations that require new stations would likely have a negligible effect on historic resources. Suburban and rural areas have more available space than dense urban areas; therefore, historic resources could be avoided during site selection.

In areas where a new corridor is proposed, operational and long-term effects on historic resources would likely be limited to visual effects; however, these effects would be moderate and mitigated (see Section 6.0, Avoidance, Minimization, and Mitigation Strategies).

5.3.2 Alternative C4A High-Speed Rail

The Alternative C4A High-Speed Rail EIS Study Area is the same as the Alternative C4A Higher-Speed Rail study area; therefore, the same historic resources are potentially affected. The

difference is the service type: high-speed rail would require more property acquisition than higher-speed rail because high-speed rail must be completely grade separated. Grade separation would require elevated guideways (providing physical support structure to guide the train along the tracks) or roadways to cross over or under the guideway. In both cases, more property is necessary to build the grade separations. Similarly, high-speed rail stations may be larger and require larger parking areas than conventional or higher-speed stations.

Alternative C4A High-Speed Rail would likely result in substantial permanent effects in the urban areas for the guideway and station areas. This is a higher potential effect compared to Alternative C4A Higher-Speed Rail, which may be able to avoid and minimize property impacts in urban areas by remaining at-grade rather than utilizing grade separations and thus result in moderate effects on historic resources. Both C4A alternatives may result in moderate effects in suburban areas and negligible effects in rural areas. This is because there are fewer potential historical resources and lower density development in these areas and thus a greater possibility of avoiding these resources.

Stations associated with Alternative C4A High-Speed Rail within urban areas have the potential for substantial effects on historic resources. Several existing stations along the alternative are NRHP-listed or NRHP-eligible, including the GC&SF Passenger Station (Map ID #31), the Dallas Union Terminal (Map ID #42), Santa Fe Depot (Map #65), and International & Great Northern Passenger Station (Map ID #76). Because high-speed rail service typically requires the construction of new station facilities or extensive alterations to existing facilities, construction of this alternative could result in the alteration, relocation, or demolition of historic resources. Because these stations would be in dense urban areas that typically have limited flexibility in terms of land availability, it is unlikely that effects on these resources could be avoided. These impacts would be assessed during the project-level analysis and mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies.

Although increased or additional parking facilities may be required, efforts to locate parking facilities would attempt to avoid significant historic resources. In suburban areas, locations that require new stations would likely have a negligible effect on historic resources. As previously mentioned, several potentially eligible historic districts were identified within the EIS Study Area in suburban areas. However, if these districts are determined NRHP-eligible, effects would be assessed during the project-level analysis. Effects on historic resources in rural areas through construction of new stations would be negligible, because there is more available space than in dense urban areas, and effects on historic resources may be avoided during site selection. Such work would be completed in compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995).

Because high-speed rail can result in the potential for relatively more elevated profile and grade separations, the Alternative C4A High-Speed Rail may result in substantial visual effects, thereby indirectly affecting the historic setting. However, these effects may be minimized through mitigation (see Section 6.0, Avoidance, Minimization, and Mitigation Strategies).

5.3.3 Alternative C4B Higher-Speed Rail

The data collected revealed 38 NRHP-listed or NRHP-eligible or potentially NRHP-eligible unique resources within the C4B EIS Study Area. This is the lowest number of historic resources among the central section alternatives. Although Alternative C4B Higher-Speed Rail does not affect 14 of the resources potentially affected by the C4A alternatives, it does potentially affect 7 additional resources not originally affected by the C4A alternatives. Alternative C4B Higher-Speed Rail potential effects are the same as for Alternative C4A Higher-Speed Rail, resulting in substantial effects on historic resources in urban areas, moderate effects in suburban areas, and negligible effects in rural areas.

The 38 resources identified within the Alternative C4B Higher-Speed Rail EIS Study Area include four NRHP-listed or NRHP-eligible historic districts and six potentially NRHP-eligible historic districts. The historic districts are largely concentrated in dense urban areas, including Dallas, Fort Worth, and San Antonio. The service-level analysis also revealed 12 individual NRHP-listed or previously determined NRHP-eligible resources within the EIS Study Area. In addition, 14 potentially NRHP-eligible cemeteries and 1 NRHP-eligible cemetery were identified (see Table 5-1). Although this technical study does not evaluate individual resources along the route and alternatives were not evaluated for potential NRHP eligibility during the data collection phase of the analysis, there is one potentially NRHP-eligible railroad depot (Map ID #65) within the C4B Higher-Speed Rail EIS Study Area.

Within urban areas, most of the alternative alignment would likely follow existing railroad rights-of-way or existing roadway rights-of-way (such as IH-30 and State Highway 360), thus requiring minimal new rights-of-way or easements. One exception would be one short new alignment east of downtown Fort Worth. The greatest potential for effects within the urban areas, specifically in Dallas and Fort Worth, would be if new right-of-way or easements are required from NRHP-listed resources, such as the West End Historic District in downtown Dallas (Map ID #35). Furthermore, where existing railroad rights-of-way would be used, railroad-related historic resources including historic railroad depots (Map ID #31, 65, and 76) would have great potential for effects.

In urban areas where new alignments outside of existing right-of-way may be necessary, such as through downtown Waco, Alternative C4B Higher-Speed Rail would likely have substantial permanent effects on historic resources. For example, the alternative may pass through portions of Baylor University (Map ID #56), which has been identified as a potentially NRHP-eligible historic district. Further evaluation would be required at the project level to determine if the property is eligible for the NRHP, and, if so, whether contributing features to the historic district would be affected. If new rights-of-way are required from historic resources along the new alignment portion of Alternative C4B Higher-Speed Rail, impacts would be assessed during the project-level analysis and would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies.

The greatest potential for effects during construction within suburban areas would be if new rights-of-way or easements are required from NRHP-eligible suburban neighborhoods in Dallas and Fort Worth (such as Map ID #36, 37, and 38), or where the alternative would be constructed within existing railroad rights-of-way and railroad-related historic resources are present, such as the train depot in Waxahachie (Map ID #51) or the Santa Fe Depot in Temple (Map ID #65). Effects in the suburban areas may be moderate in intensity, but they have the potential to be substantial, depending on the final alignment.

Only two historically significant agricultural properties, the Joe E. Turner House (Map ID #52) and the Withers House (Map ID #70), were identified within the rural areas of the EIS Study Area. As previously stated, higher-speed rail design refinements could avoid these resources.

The stations associated with Alternative C4B Higher-Speed Rail within urban areas may result in moderate effects on historic resources. Because several stations are NRHP-listed or NRHP-eligible, including the GC&SF Passenger Station (Map ID# 31), Santa Fe Depot (Map ID #65), and International & Great Northern Passenger Station (Map ID #76), expansion and rehabilitation of historically significant buildings and structures may be required to accommodate increased ridership. Such work would be completed in compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995) when possible to avoid effects on the depots. If effects on existing historically significant depots cannot be avoided, the effects would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies. Although increased or additional parking facilities may be required, construction of parking facilities would attempt to avoid significant historic resources. In suburban and rural areas, locations that require the construction of new stations would likely have a negligible effect on historic resources because suburban and rural areas have more available space than do dense urban areas and therefore would allow more flexibility during site selection.

During the operational phase, Alternative C4B Higher-Speed Rail would have the same potential for moderate visual effects on resources as Alternative C4A Higher-Speed Rail. These impacts would be assessed for specific resources in the project-level analysis.

5.3.4 Alternative C4B High-Speed Rail

The C4B High-Speed Rail EIS Study Area is the same as the study area for C4B Higher-Speed Rail; therefore, the same historic resources are potentially affected. However, high-speed rail would require more property acquisitions than higher-speed rail because high-speed rail must be completely grade separated. Grade separation would require elevated guideways or roadways to cross over or under the guideway. In either case, more property would be necessary to build grade separations. In addition, high-speed rail stations may be larger and would require large parking areas.

Alternative C4B High-Speed Rail would result in substantial permanent effects in urban areas for the guideway and station areas. This is a higher potential effect compared to Alternative C4B Higher-Speed Rail, which may be able to avoid and minimize property effects in urban areas by

remaining at-grade. Alternative C4B High-Speed Rail may result in substantial effects in suburban areas compared to Alternative C4B Higher-Speed Rail, which could have moderate intensity effects. Both C4B alternatives are likely to result in negligible effects on historic resources in rural areas. This is because there are fewer potential resources and lower density development, so there is a higher possibility of avoiding these resources.

Some differences are that Alternative C4B High-Speed Rail may not be able to avoid some resources that the higher-speed rail could avoid. Within the EIS Study Area, the White Lake Hills Historic District (Map ID #36), the Hollandale Historic District (Map ID #37), the Vought Manor Historic District (Map ID #38), and the Grand Prairie Historic District (Map ID #39) are more likely to be affected by Alternative C4B High-Speed Rail. A new railroad right-of-way would be anticipated, and large resources such as historic districts may be affected by substantial property acquisitions. Most of this alternative between Fort Worth and Dallas would be within the existing IH-30 corridor, but a small portion of the alternative would require a new transportation corridor adjacent to potentially NRHP-eligible White Lake Hills Historic District (Map ID #36). If this alternative is selected, a formal determination of NRHP eligibility would be conducted during the project-level analysis, and if minimization of effects or avoidance are not feasible, mitigation would be conducted.

Stations associated with Alternative C4B High-Speed Rail within urban and suburban areas have the potential for substantial effects on historic resources. Several existing stations along the alternative are NRHP-listed or NRHP-eligible, including the GC&SF Passenger Station (Map ID #31) and the Dallas Union Terminal (Map ID #42). Because high-speed rail service typically requires new station facilities or extensive alterations to existing facilities, this alternative could result in the alteration, relocation, or demolition of historic resources. Because the stations would be in dense urban areas that typically have limited flexibility in terms of land availability, it is unlikely that effects on these resources could be avoided, and the effects would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies. In suburban areas, locations that require a new high-speed train stations would have a negligible effect on historic resources. As previously mentioned, several potentially eligible historic districts were identified within the EIS Study Area in suburban areas. However, if these districts are determined NRHP-eligible, impacts would be assessed during the project-level analysis, depending on where contributing features are located in relation to the alternative. Although increased or additional parking facilities may be required, parking facilities would be sited to avoid significant historic resources. Effects on historic resources in rural areas for a new station would be negligible, because there is more available space than in dense urban areas, which would allow more flexibility during site selection.

The potential substantial visual effects of operations on nearby historic resources of the Alternative C4B High-Speed Rail would be the same as those described for Alternative C4A High-Speed Rail. These impacts would be assessed on a project-specific basis, and mitigated accordingly.

5.3.5 Alternative C4C Higher-Speed Rail

The C4C EIS Study Area represents the highest potential for effects on historic resources, with 52 identified NRHP-listed, NRHP-eligible, or potentially NRHP-eligible resources. The C4C Higher-Speed Rail EIS study area travels much of the same route as the C4A Higher-Speed Rail EIS Study Area. Although Alternative C4C Higher-Speed Rail would not affect three of the resources potentially affected by the C4A alternatives, it does potentially affect 10 additional resources not originally affected by the C4A alternatives. Alternative C4C Higher-Speed Rail would result in substantial effects in urban areas, moderate effects in suburban areas, and negligible effects in rural areas.

The 52 resources identified within the Alternative C4C Higher-Speed Rail EIS Study Area include four NRHP-listed or NRHP-eligible historic districts and six potentially NRHP-eligible historic districts. The historic districts are largely concentrated in dense urban areas, including Dallas, Fort Worth, and San Antonio. The service-level analysis also revealed 22 individual NRHP-listed or previously determined NRHP-eligible resources within that study area. In addition, 17 potentially NRHP-eligible cemeteries and 1 NRHP-eligible cemetery were identified (see Table 5-1). This technical study did not evaluate individual resources along the route, and alternatives were not evaluated for potential NRHP eligibility during the data collection phase of the analysis. However, there are three potentially NRHP-eligible resources within the EIS Study Area for the Alternative C4C Higher-Speed Rail.

In urban areas where new alignments outside existing rights-of-way may be necessary, such as through downtown Waco, Alternative C4C Higher-Speed Rail would have substantial effects on historic resources. For example, the alternative may pass through portions of Baylor University (Map ID #56), which has been identified as a potentially NRHP-eligible historic district. Further evaluation would be required at the project level to determine if the property is eligible for the NRHP, and, if so, whether contributing features to the historic district would be affected. If new rights-of-way are required from historic resources along the new alignment portion of Alternative C4C Higher-Speed Rail, effects would be mitigated as discussed in Section 6.0, Avoidance, Minimization, and Mitigation Strategies.

Like C4A Higher-Speed Rail, Alternative C4C Higher-Speed Rail would likely have a moderate permanent effect on suburban resources in areas where the alternative would be constructed within the existing railroad right-of-way. In these areas, railroad-related historic resources such as the train depot in Waxahachie (Map ID #51) and the Santa Fe Depot in Temple (Map ID #65) would have the greatest potential to be affected. On the portions of the alternative that would require new alignments outside the existing right-of-way, effects on historic resources in suburban areas would be negligible, unless the presence of more resources are found during the project-level analysis. Likewise, Alternative C4C Higher-Speed Rail would have the same potential for negligible effects in rural areas as Alternative C4A Higher-Speed Rail.

The potential moderate visual effects of operations of Alternative C4C Higher-Speed Rail would be the same as those described for Alternative C4A Higher-Speed Rail. These impacts would be assessed during the project-level analysis, and mitigated accordingly.

5.3.6 Alternative C4C High-Speed Rail

Alternative C4C High-Speed Rail EIS Study Area is the same as the Alternative C4C Higher-Speed Rail study area; therefore, the same historic resources are potentially affected. The difference is that high-speed rail would require more property acquisitions than higher-speed rail because high-speed rail must be completely grade separated. Grade separation would require elevated guideways or roadways to cross over or under the guideway. In both cases, more property would be necessary to build grade separations. Similarly, high-speed rail stations may be large and require large parking areas.

Alternative C4C High-Speed Rail would result in substantial permanent effects in urban areas for the guideway and station areas. This is a greater potential effect compared to Alternative C4C Higher-Speed Rail, which may be able to avoid and minimize property effects in urban areas by remaining at-grade. Alternative C4C High-Speed Rail may result in substantial effects in the suburban areas compared to Alternative C4C Higher-Speed Rail, which could have moderate intensity effects. Both C4C alternatives are likely to result in negligible effects on historic resources in rural areas. This is because there are fewer potential resources and lower density development in rural areas and therefore a greater likelihood of avoiding these resources.

Of particular note, under Alternative C4C High-Speed Rail, areas either within or adjacent to historic districts may have the most potential for permanent removal of historic resources, such as the potentially NRHP-eligible Kimbell Milling Company in Fort Worth (Map ID #119), the West End Historic District in Dallas (Map ID #35), the Ellis County Courthouse Historic District in Waxahachie (Map ID #50), or potentially NRHP-eligible Baylor University in Waco (Map ID #56).

Stations associated with Alternative C4C High-Speed Rail within urban areas have the potential for substantial effects on historic resources. Several existing stations along the alternative are NRHP-listed or NRHP-eligible, including the GC&SF Passenger Station (Map ID #31), the Dallas Union Terminal (Map ID #42), Santa Fe Depot (Map #65), and International & Great Northern Passenger Station (Map ID #76). Because high-speed rail typically requires new station facilities or extensive alterations to existing facilities, this alternative could result in the alteration, relocation, or demolition of historic resources. Because these stations would be located in dense urban areas that typically have limited flexibility in terms of land availability, it is unlikely that effects on these resources could be avoided. In suburban and rural areas, the differences between the C4C alternatives is minimal regarding permanent effects.

The potential substantial visual effects of operations on nearby historic resources from the Alternative C4C High-Speed Rail would be the same as those described for Alternative C4A High-Speed Rail. These impacts would be assessed during a project-level analysis, and mitigated accordingly.

5.4 Southern Section: San Antonio to South Texas

The service-level analysis for the Southern Section outlines the potential construction and operational effects and associated station locations along these alternatives.

5.4.1 Alternative S4 Higher-Speed Rail

The data collected revealed 36 NRHP-listed or NRHP-eligible or potentially NRHP-eligible unique resources within the Alternative S4 Higher-Speed Rail EIS Study Area. Among these resources are seven NRHP-listed or NRHP-eligible historic districts and three potentially NRHP-eligible historic districts. The historic districts include rural and urban historic districts composed of agricultural properties, residential neighborhoods, and irrigation districts. In addition, there are 23 individual NRHP-listed or previously determined NRHP-eligible resources within the Alternative S4 Higher-Speed Rail EIS Study Area. Although potentially NRHP-eligible individual resources were not identified at a property level, one potentially NRHP-eligible individual resource and two potentially NRHP-eligible cemeteries were identified within the EIS Study Area (see Table 5-1).

Alternative S4 Higher-Speed Rail would be located adjacent to existing rights-of-way in the urban areas of San Antonio and Lower Rio Grande Valley area (from Edinburg to McAllen and from McAllen to Brownsville). In this case, Alternative S4 Higher-Speed Rail would have moderate effects on urban historic resources compared to the No Build Alternative. Alternative S4 Higher-Speed Rail would be designed within existing railroad rights-of-way for a majority of the alignment, and at-grade railroad crossings and grade-separated crossings are already in place in the densely populated areas. Therefore, effects on historic resources would be avoided. It appears that only one historic railroad depot (Map ID #86) is within the existing railroad right-of-way along the alternative.

In suburban and rural areas, the majority of Alternative S4 Higher-Speed Rail would be developed within the right-of-way of the abandoned railroad. Because of the limited number of suburban and urban resources, Alternative S4 Higher-Speed Rail could be designed to avoid effects on historic resources. Although Alternative S4 Higher-Speed Rail would extend through portions of and also be adjacent to the 1-million-acre NRHP-listed (and National Historic Landmark) King Ranch, the alternative would be within the abandoned Texas and New Orleans Railroad (later Southern Pacific Railroad) right-of-way. During construction, King Ranch operations would not be hindered, and access to gates would be maintained with the use of phased construction. Because numerous complexes on the King Ranch are near U.S. Highway 77 and are several miles from the EIS Study Area of Alternative S4 Higher-Speed Rail, it would likely have a negligible effect on the King Ranch or other rural historic resources.

The expansion of existing stations or new stations would result in moderate effects on the historic resources identified in this service-level analysis. Because at least one existing rail station (Map ID #86) near Edinburg is NRHP-eligible, expansion and reconstruction of this historically significant building could be completed in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties* (NPS 1995). Although increased or additional parking facilities

would be required, siting of the parking facilities during the project-level analysis would avoid historic resources.

The potential moderate visual effects of operation of Alternative S4 Higher-Speed Rail would be the same as those described for Alternative C4A Higher-Speed Rail. During operation of the proposed rail lines, Alternative S4 Higher-Speed Rail and associated stations would have negligible effects on urban, suburban, and rural historic resources. Because Alternative S4 Higher-Speed Rail would be within existing railroad rights-of-way within the urban areas, the historic resources within the EIS Study Area have historically been close to a railroad facility. Additionally, with few historic resources in rural locations, effects would be negligible during the operational phase. Because the complexes associated with the King Ranch are several miles from Alternative S4 Higher-Speed Rail, there would be no long-term effects from the operation of a higher-speed railroad facility adjacent to this large cattle ranch. The details of operational impacts would be assessed during the project-level analysis, and mitigated accordingly.

5.4.2 Alternative S6 Higher-Speed Rail

Alternative S6 Higher-Speed Rail would primarily pass through rural and undeveloped areas. No known historic resources were identified within the EIS Study Area for this alternative. Therefore, Alternative S6 Higher-Speed Rail would have negligible acquisition effects on historic resources.

Alternative S6 Higher-Speed Rail would have no construction or operational effects on known historic resources identified in this service-level analysis (see Table 5-1). Historic resources would be identified during the project-level analysis; based on the existing topography and landscape, such historic resources would likely be agricultural.

5.4.3 Alternative S6 High-Speed Rail

Alternative S6 High-Speed Rail would follow the same route as Alternative S6 Higher-Speed Rail; therefore, it would have negligible acquisition effects on historic resources. A property survey would be conducted during the project-level evaluation to confirm this conclusion.

6.0 Avoidance, Minimization, and Mitigation Strategies

Avoidance, minimization, and mitigation strategies for specific historic resources should be evaluated at the project level. The project-level review would include a more detailed analysis of potentially moderate or substantial effects and avoidance, minimization, and mitigation measures to reduce such effects. For actions that would result in moderate or substantial effects on historic resources that could not be avoided or minimized, Section 106 of the NHPA would require a more detailed evaluation and determination of specific impacts and proposed mitigation strategies. Similarly, for uses of historic resources, Section 4(f) of the U.S. Department of Transportation Act requires a more detailed evaluation and determination of specific impacts and proposed mitigation strategies. Often these evaluations will result in mitigation agreements among agencies that may be executed through a Memorandum of Agreement or Programmatic Agreement.

For this service-level analysis, a wide range of mitigation strategies could be used in cases where moderate or substantial effects could not be avoided or minimized. These mitigation strategies could include sound barriers, vegetative screening, and landscaping. Documentation of the historic property prior to construction could also be a mitigation strategy and may include Historic American Building Survey (HABS) or Historic American Engineering Record (HAER) documentation, NRHP nominations, historic property management and treatment plans, and educational materials for public outreach including brochures, displays, and websites. Sound barriers, vegetative screening, and landscaping would be appropriate mitigation strategies during the construction phase. HABS or HAER documentation, NRHP nominations, and management and treatment plans would be appropriate mitigation strategies before the construction phase. Information gathering would occur before construction (including necessary documentation of the historic property), and development and distribution of education materials would occur throughout the Program.

In urban and suburban areas where there is a higher density of historic resources, mitigation strategies would include sound barriers, vegetative screening, landscaping, or any combination of these. HABS or HAER documentation, NRHP nominations, management and treatment plans, and public educational materials would also be appropriate in cases where a historic property is directly adjacent to the proposed railroad track and the proposed Program would have substantial effects.

In rural areas, historic resources generally have larger acreages than urban and suburban historic resources (with the exception of depots or other structures and buildings that may be directly adjacent to the railroad tracks). As such, sound barriers would likely not be applicable. Instead, vegetative screening and landscaping may be suitable for these rural historic resources. Additionally, HABS or HAER documentation, NRHP nominations, management and treatment plans, and public education materials would be appropriate for rural historic resources, particularly in cases where effects would be substantial and avoidance or minimization of these effects is not possible.

7.0 Summary

The potential intensity of effects on historic resources is shown in Table 7-1. Effects of the alternatives cannot be added across the three geographic sections. Each alternative would have termini within large cities and independent utility, which may overlap with the alternative from the adjacent geographic section. Each alternative could be constructed alone or in combination with other alternatives. Multiple alternatives could be constructed within each region as well because each alternative provides separate service-type options for different locations.

Table 7-1: Potential Intensity of Effects on Historic Resources

Section	Alternatives	Number of NRHP-Listed, NRHP-Eligible, or Potentially NRHP-Eligible Historic Resources	Potential Intensity of Effects[a]
Northern	N4A CONV	35	Moderate
Central	C4A HrSR	45	Substantial
	C4A HSR	45	Substantial
	C4B HrSR	38	Substantial
	C4B HSR	38	Substantial
	C4C HrSR	52	Substantial
	C4C HSR	52	Substantial
Southern	S4 HrSR	36	Moderate
	S6 HrSR	0	Negligible
	S6 HSR	0	Negligible

[a] The most intense effect for each alternative is presented in the table. However, alternatives may include additional, less intense effects depending on urban, suburban or rural locations.

All alternatives, except for the No Build Alternative, Alternative S6 Higher-Speed Rail, and Alternative S6 High-Speed Rail, would potentially affect known historic resources. No survey efforts other than a literature and aerial mapping review has been completed to provide a complete list of historic resources present. Alternative N4A Conventional may best avoid historic resources because it may remain within existing rail rights-of-way. Therefore, there would be a negligible effect on historic resources in the Northern Section within existing rail rights-of-way. The Central Section alternatives would affect historic resources because of the potential for acquisitions, which would likely result in the alteration, removal, or demolition of some historic resources. Noise and vibration effects are not likely to result in adverse effects, but the project-level analysis would review these impacts. High-speed rail alternatives may result in a greater number of effects than the higher-speed rail alternatives, because of the potential for a larger footprint at stations (existing railway stations are historic resources) and potential roadway overpasses or underpasses, which would result in more property acquisitions. Neither of the S6 alternatives have known historic resources present. Alternative S4 Higher-Speed Rail may have moderate effects in urbanized parts of the EIS

Study Area that would be difficult to avoid; however, avoidance efforts may result in negligible effects in suburban and rural areas.

Based on the service-level analysis of potential effects on historic resources, the highest intensity of effects would occur within the Central Section because of the potential for acquisitions and demolition of historic properties. The alternatives in the Central Section would travel through major urban areas that have the densest concentration of historic resources, including historic districts. In addition, because high-speed rail service would require grade-separated structures and new alignments outside existing rights-of-way, high-speed rail service would have the greatest potential for permanent effects.

No historic resources were identified in the EIS Study Area for Alternative S6 Higher-Speed Rail or Alternative S6 High-Speed Rail; therefore, effects on historic resources would be negligible. Although historic resources are present in the EIS Study Area for Alternative N4A Conventional and Alternative S4 Higher-Speed Rail, these alternatives would require minimal new rights-of-way and would have the potential to use existing facilities; therefore, effects on historic resources along these alternatives would be minor, and effects may be easily avoided or mitigated.

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