DEIS Reasonable Alternatives
Archeological Resources Technical Report

SH 68 from IH-2/US 83 to IH-69C/US 281
CSJs: 3629-01-001, -002, -003
Hidalgo County, Texas

Texas Department of Transportation - Pharr District

February 2018

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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1.0 INTRODUCTION

The Pharr District of the Texas Department of Transportation (TxDOT) proposes to construct State Highway (SH) 68, a new highway facility from Interstate Highway (IH)-2/U.S. Highway (US) 83 to IH-69C/US 281, located in eastern Hidalgo County. The proposed project would begin at IH-2/US 83 and travel north then west to connect to IH-69C/US 281. The total length of the proposed project is approximately 22 miles.

The purpose of this technical report is to identify possible archeological historic properties (e.g., archeological sites, archeological districts that are eligible for or listed in the National Register of Historic Places [NRHP]) and assess potential impacts to archeological resources for the three reasonable alternatives and the No-Build Alternative identified for the proposed project. This document would serve as support for Section 4, the Affected Environment and Environmental Consequences of the SH 68 Draft Environmental Impact Statement (DEIS).

Project Description

SH 68, as currently described in the Metropolitan Transportation Plan (MTP) and the Statewide Transportation Improvement Program (STIP), is a proposed four-lane divided rural highway facility with future mainlanes and overpasses.

SH 68 would be constructed in several phases, as funding becomes available. Funding has been secured for Phase I of the proposed project. Funding for future phases has not yet been determined.

Phase I would construct a new four-lane divided rural highway facility from IH-2/US 83 to Farm-to-Market (FM) 1925/Monte Cristo Road. The four-lane divided facility would serve as frontage roads for the ultimate facility and consist of two lanes in each direction with shoulders, separated by an unpaved median. Future phases would extend the four-lane divided rural highway from FM 1925 to IH-69C/US 281, and eventually would complete the ultimate facility by constructing the mainlanes and overpasses. The proposed project is being developed as a non-tolled facility.

The ultimate, controlled-access facility would be contained within a 350-foot typical right-of-way (ROW) width, with up to 400 feet of ROW needed at proposed grade separations. The proposed frontage roads would consist of two 12-foot-wide lanes in each direction, with 4-foot-wide inside shoulders and 8-foot-wide outside shoulders. The frontage roads would include curb and gutter to accommodate drainage requirements. The proposed mainlanes would consist of two 12-foot-wide lanes in each direction, with 4-foot-wide inside shoulders and 10-foot-wide outside shoulders. Mainlanes would be separated by a grassy median. Mainlane overpasses would be provided at major roadway crossings. Proposed future

entrance and exit ramps would consist of 14-foot-wide lanes, with 2-foot-wide inside shoulders and 8-foot-wide outside shoulders. The termini at IH-2/US 83 and IH-69C/US 281 would include proposed connections to existing frontage roads and proposed direct connector ramps to and from existing mainlanes.

As part of the alternatives analysis and public involvement process for SH 68, study corridors and preliminary alternatives were developed within an approximately 179 square-mile study area for the proposed project. The preliminary alternatives were analyzed and evaluated to identify three reasonable alternatives. These reasonable alternatives, as well as the No-Build Alternative, are being advanced for more detailed analysis in order to identify a recommended preferred alternative. For more information about development of the reasonable alternatives and the alternatives analysis methodology, refer to the *DEIS Alternatives Analysis Technical Report* on file at TxDOT (TxDOT 2018).

The reasonable alternatives are shown in **Exhibits 1** and **2** and are described below, along with the No-Build Alternative. The alternatives are presented in order geographically, from west to east. All alternatives would have the same ultimate typical section, as described above.

The project's horizontal area of potential effects (APE) for archeological resources corresponds with the existing and proposed ROW of each alternative. Blanton & Associates, Inc. (B&A) assumes no easements are required. B&A assumes the vertical APE for the project would be the maximum depth of impacts or 3 feet in areas of widening/new pavement and 40 feet in areas of drill shafts for overpasses based on typical impacts for this class of project.

1.1 Description of Alternatives

1.1.1 2014 Modified 2 Alternative

The 2014 Modified 2 Alternative is approximately 21.7 miles in length and would require an estimated 1,057 acres of ROW (see **Exhibits 1** and **2**). The 2014 Modified 2 Alternative is almost entirely on new location. This alternative connects to IH-2/US 83 approximately 7 miles east of IH-69C/US 281, between the FM 1423/Val Verde Road overpass and the North Hutto Road overpass, near the existing intersection of the IH-2/US 83 westbound frontage road and Valley View Road. From IH-2/US 83, the 2014 Modified 2 Alternative would travel northwest on new location for approximately 3 miles to near Minnesota Road before turning generally northward for approximately 7 miles through the communities of Muniz and San Carlos to north of SH 107.

Approximately 1 mile north of SH 107, near Mile 17 ½ Road, the 2014 Modified 2 Alternative would curve to the west for approximately 2 miles, crossing FM 1925 and Davis Road. North of Davis Road, the 2014 Modified 2 route would run parallel to the west side of Brushline

Road for approximately 5 miles. The proposed roadway would then curve to the northwest for approximately 2 miles before running along the north side of the existing FM 490 for approximately 3 miles and connect to IH-69C/US 281 near the South Texas International Airport at Edinburg.

Future mainlane overpasses are assumed to be provided at Ferguson Road, Sioux Road, East Nolana Loop/Earling Road, Owassa Road, Alberta Road, Trenton Road, Wisconsin Road, Canton Road, SH 107, FM 1925, FM 2812, Brushline Road and Air Cargo Drive.

1.1.2 2014 PSM Alternative

The 2014 PSM Alternative (see **Exhibits 1** and **2**) is almost entirely on new location. The 2014 PSM Alternative is approximately 22.4 miles in length and would require an estimated 1,076 acres of ROW. The 2014 PSM Alternative follows the same new location route as the 2014 Modified 2 Alternative from its intersection with IH-2/US 83 to SH 107, a distance of approximately 8 miles, and continues generally northward for another 2 miles to cross FM 1925.

North of FM 1925, the 2014 PSM Alternative would curve to the east for approximately 1 mile, approaching Mile 19 N Road, where it would then run parallel to the west side of FM 1423 for approximately 4 miles. The corridor would then curve to the northwest for approximately 4 miles before running along the north side of the existing FM 490 for approximately 3 miles and connect to IH-69C/US 281 near the South Texas International Airport at Edinburg.

This alternative would also pass through the communities of Muniz and San Carlos. Future mainlane overpasses are assumed to be provided at Ferguson Road, Sioux Road, East Nolana Loop/Earling Road, Owassa Road, Alberta Road, Trenton Road, Wisconsin Road, Canton Road, SH 107, FM 1925, FM 2812, Brushline Road, and Air Cargo Drive.

1.1.3 FM 1423 PSM Alternative

The FM 1423 PSM Alternative (see **Exhibits 1** and **2**) is approximately 21.6 miles in length and would require an estimated 1,061 acres of ROW. This alternative would connect to IH-2/US 83 approximately six miles east of IH-69C/US 281.

This alternative would generally follow FM 1423 northward for approximately 7.5 miles from the intersection with IH-2/US 83 to SH 107 in the community of San Carlos. From SH 107, the alternative would continue northward along FM 1423 approximately 2 miles to FM 1925. Approximately 1.5 miles north of FM 1925, between Mile 19 Road and Mile 20 Road, the route would then follow the 2014 PSM Alternative route for approximately 11 miles north and west to IH-69C/US 281 near the South Texas International Airport at Edinburg.

This alternative would pass through the City of Donna and the community of San Carlos. Future mainlane overpasses are assumed to be provided at FM 495/Kansas Road, Sioux Road, East Nolana Loop/Earling Road, Roosevelt Road, Alberta Road, Trenton Road, Wisconsin Road, Canton Road, SH 107, FM 1925, FM 2812, Brushline Road, and Air Cargo Drive.

1.1.4 No-Build Alternative

The No-Build Alternative means that the proposed improvements associated with the SH 68 project would not occur. Under this alternative, the existing facilities would operate as they currently do and there would be no new roadway constructed. There would be no relocations or conversion of land to transportation uses, and no adverse environmental or economic impacts associated with this alternative would occur. However, the No-Build Alternative would not address the purpose and need for the proposed project because it would not improve north-south mobility, increase travel capacity for local and regional traffic, or provide an alternate north-south evacuation route during emergency events.

2.0 METHODOLOGY

A background review of data extracted from area topographic, soils, and geology maps was conducted by B&A. Also, previous archeological surveys and locations of recorded archeological sites within 1 km (0.6 mile) of the APE for each alternative were reviewed by consulting the Texas Historical Commission's restricted-access Online Archeological Sites Atlas (Atlas). In addition to identifying recorded archeological sites, the review included the following types of information on the Atlas: NRHP properties, State Antiquities Landmarks (SALs), Official Texas Historical Markers, Recorded Texas Historic Landmarks, and cemeteries. A combination of 1914, 1916, 1932, 1949, ands 1965 U.S. Geological Survey (USGS) 7.5-minute topographical quadrangle maps and 1953 and 1961 aerial photographs of the APE were consulted for the possible locations of historic sites (National Environmental Title Research [NETR] 2017). The results of the comprehensive review are presented below.

2.1 Topography

The APE for each alternative is located within the South Texas Plains physiographic region, a portion of the Interior Coastal Plains (Bureau of Economic Geology [BEG] 1996). This region located on the Hebbronville Plain, an area characterized by relatively flat topography that ranges in elevation from 70 to 300 feet above mean sea level rising from the Rio Grande Delta (BEG 1996; Trowbridge 1932). The area surrounding the APE is mostly rural containing a mix of residential, row-crop agriculture, orchard-based agriculture, undeveloped rangeland and pasture, and small amounts of industrial uses.

The northern half of the APE coincides with an area characterized by shallow deflation troughs, also referred to as playa lakes. Such features are identifiable by deposits of Rio Clay, which hold rainwater on a temporary basis in an otherwise arid landscape (Black 1989:40; Gonzalez et al. 2014). As the only source of surface water in this area (albeit seasonal), these deflation troughs, specifically the migrating aeolian dunes that coincide with them, have potential to contain buried archeological deposits (Mallouf et al. 1977).

2.2 Geology

The Interior Coastal Plains are part of the Gulf Coastal Plain geomorphic province. The geologic structure of deposits within the Interior Coastal Plains is characterized by beds tilted east comprised of unconsolidated clays and muds (BEG 1996). The APE for each alternative crosses four geologic units. From IH-2/US 83 north to just south of SH 107, the APE is within the Pleistocene-aged Beaumont Formation (Qb), interfingered with younger Holocene windblown deposits (Qds). At SH 107 and northward, the APE crosses the Pleistocene-aged Lissie Formation (Ql) and larger areas of Holocene windblown deposits (Qds). North of FM 2812, the APE crosses the Pliocene-aged Goliad Formation (Pg), the oldest bedrock formation in the area (12.5 to 4.5 million years old).

The windblown deposits are stabilized sand dunes and, since these date from the Holocene period, have potential to contain buried archeological deposits.

The Beaumont Formation is comprised mainly of clay, silt, sand and gravel characterized by interdistrubutary muds, abandoned channel-fill muds, and fluvial overbank muds, as well as floodplain deposits of mud veneer over meanderbelt sand (BEG 1976). Since this formation contains deposits from the Late Pleistocene, it is possible that Paleoindian deposits may occur in conjunction with this formation.

The Lissie Formation is comprised of clay, silt, sand, gravel, and caliche characterized by surface expressions of undrained circular to irregular depressions, relict clay dunes, and stabilized northwest-trending longitudinal dunes (BEG 1976). Since this formation contains deposits from the Late Pleistocene, it is possible that Paleoindian deposits may occur in conjunction with this formation.

The Goliad Formation is composed of clay, sand, sandstone, caliche, chert, limestone, and dark siliceous granules and pebbles in a caliche matrix (Brown et al. 1980). Although this formation appears too old to harbor preserved archeological deposits (Pliocene), it is a source for raw materials used in the manufacture of prehistoric lithic tools.

2.3 Soils

The APE for each alternative crosses several upland soils. Between IH-2/US 83 and FM 1925 these soils are dominated by Hidalgo sandy clay loam (0 to 1 percent slopes) punctuated by lower areas of Raymondville clay loam (0 to 1 percent slopes), and only a few small areas of Hidalgo fine sandy loam (0 to 1 percent slopes). Hidalgo sandy clay loam formed from calcareous loamy alluvium and may extend to a depth of 2 meters (m) (80 inches). As a whole, the general soil unit for this portion of the APE (Hidalgo Unit 1) is characterized by deep, well drained, moderately permeable soils, which are calcareous throughout (Soil Conservation Service [SCS] 1981).

North of FM 1925 the landscape surrounding the APE is slightly more undulating, marked by small depressions within an otherwise level upland plain to IH-69c/US 281. Soils here are more patchy with Hidalgo sandy clay loam giving way to Willacy fine sandy loam (0 to 3 percent slopes) in terms of dominance, and a higher occurrence of Hidalgo fine sandy loam, Racombes sandy clay loam, Delfina fine sandy loam (1 to 3 percent slopes), Hargill fine sandy loam (0 to 3 percent slopes), Brennan fine sandy loam (0 to 1 percent slopes), Hebbronville sandy loam (0 to 1 percent slopes), near US 281, and small amounts of Rio clay loam and Tiocano clay on top of small depressions within the landscape. Willacy fine sandy loam formed from loamy alluvium and may extend to a depth of 1.8 m (72 inches). As a whole, the general soil unit for this portion of the APE (Willacy-Delfina-Hargill Unit 4) is characterized by deep, well drained, moderately and moderately slowly permeable soils and non-calcareous to a depth of about 1 m (42 inches) (SCS 1981).

At IH-69C/US 281 the APE crosses slightly into a third and final general soil unit (Delfina-Hebbronville-Comitas Unit 8) where Hidalgo fine sandy loam, Hebbronville sandy loam, Brennan fine sandy loam, and Comitas loamy fine sand (0 to 3 percent slopes) are found. This soil unit is characterized by deep (extending down to 1.8 m [72 inches]), moderately slowly and moderately rapidly permeable soils and non-calcareous to a depth of about 1 m (39 inches) (SCS 1981).

These upland soils formed from calcareous loamy alluvium and loamy alluvium and given their depth may harbor archeological deposits in most areas of the APE, particularly areas marked by fine sandy loam which are well-drained. The integrity of these deposits, however, may be impacted by land use as agricultural cultivation is prevalent in this area, impacting at least the upper 30-50 centimeters (cm) of deposition. Also, portions of the project area associated with Holocene sand dunes may in addition be deflated landscapes, whereby archeological deposits, if identified, would lack stratigraphic integrity.

2.4 Review of Previously Identified Archeological Resources

2.4.1 2014 Modified 2

According to the Atlas (2017), one recorded archeological site is located within the APE of the 2014 Modified 2 Alternative (**Exhibit 3.4**). The site, 41HG41, is a possibly Late Archaic open campsite evident by a scatter of lithics, bone, and clay lumps at the edge of an in-filled deflation trough. The site was recorded during a survey in 1976 within a grapefruit orchard and was not recommended worthy of further study because of disturbance, although the degree of subsurface investigation at that time was unknown. The site is not listed on the NRHP or designated as an SAL and appears formally unevaluated for either (Atlas 2017).

Four additional archeological sites and one cemetery are located within a 1-km radius of the APE of the 2014 Modified 2 Alternative (see **Exhibits 3.4** through **3.6**). These sites are listed in **Table 1**. The cemetery is Cavasos Cemetery (see **Exhibit 3.5**), a non-perpetual care possible family cemetery that contains 23 known interments dating from 1909. It is not listed on the NRHP or designated as an SAL and appears unevaluated for either (Atlas 2017; findagrave.com 2016; Texas Department of Banking 2016).

The APE of the 2014 Modified 2 Alternative also crosses the Donna and Engleman Irrigation Districts, which have been recommended by TxDOT as eligible for listing in the NRHP, and the Louisiana-Rio Grande Canal Company Irrigation System (Hidalgo County Irrigation District 2) NRHP-listed District (see **Exhibits 3.1** through **3.5**).

Portions of the APE of the 2014 Modified 2 Alternative have been previously surveyed for archeological resources by seven investigators (see **Exhibits 3.1** through **3.7**) and three additional surveys have been conducted within a 1-km radius (**Table 2**). These investigations have been conducted in conjunction with water, electric, pipeline, and roadway development in the area. Previous surveys that cross the APE of the 2014 Modified 2 Alternative are almost entirely limited to narrow, linear corridors.

Table 1. Previously Recorded Sites within 1 km of the SH 68 (2014 Modified 2 Alternative) APE

Trinomial	Distance from APE	Site Type	Description	Date	Max Depth of deposit	Site Size	Site Integrity assessment	NRHP determination	SAL determination
41HG6	0.84 km	Prehistoric campsite	Artifact scatter in plowed field near intermittent lake on sink hole. Artifacts include bone, shell, and lithics. Lithic tools include scrapers, 2 Tortugas, 2 Abasolo, 21 Matamoros, 10 Catan, 4 Starr, 4 possible Folsom broken	Paleoindian to Middle Archaic to Late Archaic?	Unknown	12 to 15 acres	Unknown/Undetermined	Unknown	Unknown
41HG37	0.99 km	Prehistoric lithic scatter or camp	Lithic scatter (1 point, 1 flake) accompanied by clay nodules, burned rock, and faunal bone in plowed field on north side of rise just SE of water filled depression	Prehistoric-Undetermined period	Deflated (0 cmbs?)	Unknown	Severely disturbed by wind and rain erosion and plowing	Unknown but not recommended by recorder	Unknown but not recommended by recorder
41HG40	0.22 km	Prehistoric lithic scatter or camp	Light artifact scatter of lithics including tools-scrapers	Prehistoric-Undetermined period	Deflated (0 cmbs?)	Unknown	Disturbed by wind and rain erosion and landscaping/leveling/terracing of the ground surface	Unknown but not recommended by recorder	Unknown but not recommended by recorder
41HG41	Crossed by APE	Prehistoric lithic scatter or camp	Light artifact scatter of lithics including one tool-a scraper, bone, clay lumps in grapefruit orchard	Late Archaic?	Deflated (0 cmbs?)	ca. 100 m x 100 m	Severely disturbed by wind and rain erosion and plowing within the orchard	Unknown but not recommended by recorder	Unknown but not recommended by recorder
41HG196	0.55 km	Prehistoric artifact scatter, open campsite	Sparse, poorly defined artifact scatter of 1 lithic flake and a bone fragment	Prehistoric-Undetermined period	Limited to ground surface	130 m x 30 m	Severely disturbed by wind and rain erosion and plowing	Not eligible (2005)	Not eligible (2005)

Source: Atlas 2017.

Table 2. Previous Archeological Investigations within 1 km of SH 68 (2014 Modified 2 Alternative) APE

Project	Investigator	Crosses APE?	Site(s) Discovered or Revisited within 1 km of APE	Reference
1977 Hidalgo-Willacy Lower Rio Grande Basin Survey	THC	Yes	41HG37, 41HG40, 41HG41	Atlas 2017
1980 Canal Survey	Prewitt & Associates	Yes	None	Day et al. 1981
2001 Survey	TxDOT	Yes	Unknown	Atlas 2017
2004 Edinburg to Harlingen 40-Mile Pipeline Survey	Horizon	Yes	41HG196	Brownlow and Clark 2006
2004 North Pharr to Harlingen Substation Transmission Line Rebuild Survey	B&A	Yes	None	Young et al. 2004
2007 FM 1925 Expansion Survey	SWCA	Yes	None	Galindo et al. 2012
2009 Three Roads Survey	SWCA	Yes	None	Hartnett 2012
2010 IBTC Survey	PBS&J/Atkins	No	None	Burden et al. 2014
2012 Spectra Energy Transmission Survey	TRC	No	Unknown	Atlas 2017
2015 Texas Eastern Transmission Survey	RC Goodwin and Associates	No	None	Eberwine 2015

Source: Atlas 2017.

No Official Texas Historical Markers or Recorded Texas Historic Landmarks are located within 1 km of the APE of the 2014 Modified 2 Alternative. A 1965 USGS 7.5-minute topographical quadrangle map and 1961 and 1953 aerial photographs of the APE were consulted for the possible locations of historic sites (NETR 2017). These sources indicated 20 historical structures within the APE of the 2014 Modified 2 Alternative (see **Exhibits 3.1** through **3.4**, and **3.6** through **3.7**).

2.4.2 2014 PSM

According to the Atlas, no recorded archeological sites are located within the APE of the 2014 PSM Alternative; however, two archeological sites are located within a 1-km radius of the APE of the 2014 PSM Alternative (**Exhibit 4.6**, **Table 3**).

The APE of the 2014 PSM Alternative also crosses the Donna and Engleman Irrigation Districts, which have been recommended by TxDOT as eligible for listing in the NRHP, and the Louisiana-Rio Grande Canal Company Irrigation System NRHP-listed District (see **Exhibits 4.1** through **4.5**).

Portions of the APE of the 2014 PSM Alternative have been previously surveyed for archeological resources as part of seven investigations (see **Exhibits 4.1** through **4.5**) and four additional surveys have been conducted within a 1-km radius (**Table 4**). These investigations have been conducted in conjunction with water, electric, pipeline, and roadway development in the area. Previous surveys that cross the APE of the 2014 PSM Alternative are almost entirely limited to narrow, linear corridors.

No Official Texas Historical Markers or Recorded Texas Historic Landmarks are located within 1 km of the APE of the 2014 PSM Alternative. A 1965 USGS 7.5-minute topographical quadrangle map and 1953 and 1961 aerial photographs of the APE of the 2014 PSM Alternative were consulted for the possible locations of historic sites (NETR 2017). These sources indicated 22 historical structures within the APE of the 2014 PSM Alternative (see **Exhibits 4.1** through **4.7**).

Table 3. Previously Recorded Sites within 1 km of the SH 68 (2014 PSM Alternative) APE

Trinomial	Distance from APE	Site Type	Description	Date	Max Depth of Deposit	Site Size	Site Integrity Assessment	NRHP Determination	SAL Determination
41HG6	0.79 km	Prehistoric campsite	Artifact scatter in plowed field near intermittent lake on sink hole. Artifacts include bone, shell, and lithics. Lithic tools include scrapers, 2 Tortugas, 2 Abasolo, 21 Matamoros, 10 Catan, 4 Starr, 4 possible Folsom broken	Paleoindian to Middle Archaic to Late Archaic?	Unknown	12 to 15 acres	Unknown/Undetermined	Unknown	Unknown
41HG37	0.94 km	Prehistoric lithic scatter or camp	Lithic scatter (1 point, 1 flake) accompanied by clay nodules, burned rock, and faunal bone in plowed field on North side of rise just SE of water filled depression	Prehistoric-Undetermined period	Deflated (0 cmbs?)	Unknown	Severely disturbed by wind and rain erosion and plowing	Unknown but not recommended by recorder	Unknown but not recommended by recorder
Source: Atlas 2017.									

Table 4. Previous Archeological Investigations within 1 km of SH 68 (2014 PSM Alternative) APE

Project	Investigator	Crosses APE?	Site(s) Discovered or Revisited within 1 km of APE	Reference
1977 Hidalgo-Willacy Lower Rio Grande Basin Survey	THC	No	41HG37	Atlas 2017
1980 Canal Survey	Prewitt & Associates	Yes	None	Day et al. 1981
2001 Survey	TxDOT	Yes	Unknown	Atlas 2017
2004 Edinburg to Harlingen 40-Mile Pipeline Survey	Horizon	Yes	None	Brownlow and Clark 2006
2004 North Pharr to Harlingen Substation Transmission Line Rebuild Survey	B&A	Yes	None	Young et al. 2004
2007 FM 1925 Expansion Survey	SWCA	Yes	None	Galindo et al. 2012
2009 Three Roads Survey	SWCA	Yes	None	Hartnett 2012
2010 IBTC Survey	PBS&J/Atkins	No	None	Burden et al. 2014
2012 Spectra Energy Transmission Survey	TRC	No	Unknown	Atlas 2017
2014 Cross Valley Pipeline Survey	Atkins	Yes	None	Burden, Harris et al. 2014
2015 Texas Eastern Transmission Survey	RC Goodwin and Associates	No	None	Eberwine 2015

Source: Atlas 2017.

2.4.3 FM 1423 PSM

According to the Atlas (2017), no recorded archeological sites are located within the APE of the FM 1423 PSM Alternative; however, two archeological sites are located within a 1-km radius of the APE of the FM 1423 PSM Alternative (**Exhibit 5.6**, **Table 5**).

Portions of the APE of the FM 1423 PSM Alternative have been previously surveyed for archeological resources as part of seven investigations (see **Exhibits 5.1** through **5.7**) and two additional surveys have been conducted within a 1-km radius (**Table 6**). These investigations have been conducted in conjunction with water, electric, pipeline, and roadway development in the area. Previous surveys that cross the APE of the FM 1423 PSM Alternative are almost entirely limited to narrow, linear corridors.

The APE of the FM 1423 PSM Alternative also crosses the Donna and Engleman Irrigation Districts, which have been recommended by TxDOT as eligible for listing in the NRHP, and is within 1 km of the Louisiana-Rio Grande Canal Company Irrigation System NRHP-listed District (see **Exhibits 5.1** through **5.5**).

The 1914, 1916, 1932, 1949, and 1965 USGS 7.5-minute topographical quadrangle maps and 1953 and 1961 aerial photographs of the APE of the FM 1423 PSM Alternative were consulted for the possible locations of historic sites (NETR 2017). These sources indicated 32 historical structures within the APE of the FM 1423 PSM Alternative (see **Exhibits 5.1** through **5.4** and **5.6** through **5.7**).

1 **Table 5. Previously Recorded Sites within 1 km of the SH 68 (FM 1423 PSM Alternative) APE**
2

Trinomial	Distance from APE	Site Type	Description	Date	Max Depth of Deposit	Site Size	Site Integrity Assessment	NRHP Determination	SAL Determination
41HG6	0.83 km	Prehistoric campsite	Artifact scatter in plowed field near intermittent lake on sink hole. Artifacts include bone, shell, and lithics. Lithic tools include scrapers, 2 Tortugas, 2 Abasolo, 21 Matamoros, 10 Catan, 4 Starr, 4 possible Folsom broken	Paleoindian to Middle Archaic to Late Archaic?	Unknown	12 to 15 acres	Unknown/Undetermined	Unknown	Unknown
41HG37	0.94 km	Prehistoric lithic scatter or camp	Lithic scatter (1 point, 1 flake) accompanied by clay nodules, burned rock, and faunal bone in plowed field on North side of rise just SE of water filled depression	Prehistoric-Undetermined period	Deflated (0 cmbs?)	Unknown	Severely disturbed by wind and rain erosion and plowing	Unknown but not recommended by recorder	Unknown but not recommended by recorder

Source: Atlas 2017.

Table 6. Previous Archeological Investigations within 1 km of SH 68 (FM 1423 PSM Alternative) APE

Project	Investigator	Crosses APE?	Site(s) Discovered or Revisited within 1 km of APE	Reference
1977 Hidalgo-Willacy Lower Rio Grande Basin Survey	THC	No	41HG37	Atlas 2017
1980 Canal Survey	Prewitt & Associates	Yes	None	Day et al. 1981
2001 Survey	TxDOT	Yes	Unknown	Atlas 2017
2004 North Pharr to Harlingen Substation Transmission Line Rebuild Survey	B&A	Yes	None	Young et al. 2004
2004 Edinburg to Harlingen 40-Mile Pipeline Survey	Horizon	Yes	None	Brownlow and Clark 2006
2007 FM 1925 Expansion Survey	SWCA	Yes	None	Galindo et al. 2012
2009 Three Roads Survey	SWCA	Yes	None	Hartnett 2012
2010 IBTC Survey	PBS&J/Atkins	No	None	Burden et al. 2014
2014 Cross Valley Pipeline Survey	Atkins	Yes	None	Burden, Harris et al. 2014
Source: Atlas 2017.				

3.0 RESOURCES IN THE STUDY AREA

Cultural Context

Based on the cultural history of this portion of Hidalgo County, inferences can be made regarding expected archeological site types within the study area. From the Paleoindian era (ca. 11,200 to 8,000 Before Present [B.P.]) to the end of the Prehistoric Era (ca. 1,200 to 400 B.P.), the study area was home to nomadic bands of hunters and gatherers. Anticipated sites associated with these lifeways including open campsites, lithic resource processing, wild game processing, and plant processing sites, and Native American cemeteries including one or more human interments may be present within the study area.

Also during this period and through the late nineteenth century, the study area was crossed by a summer salt trade route extending from the salt deposits at *La Sal Vieja* and *La Sal del Rey* north of the study area to crossings of the Rio Grande near Rosarita and Reynosa (Fort 2016; General Land Office of Texas 1878; Hunt and Randel 1841). Prehistoric and historic sites associated with this trade route including short-term occupation sites may be present within the study area.

During the mid-to-late eighteenth century, Spanish settlement took root in the area and the southern half of the study area along the Rio Grande was partitioned for farms into *porciones*, or narrow strips of land extending from the Rio Grande, while the northern half of the study area was sectioned for large-scale ranching enterprises, many equaling tens of thousands of acres. Notable historic ranches in the study area include El Cibolo Ranch (ca. 1845) and La Piedra Ranch (ca.1879) (General Land Office of Texas 1879a, 1879b, 1879c; Isbell 2005). Surviving Native American people often congregated near certain ranches in the area into the nineteenth century for employment and/or protection from immigrant horse-mounted bands of Comanches, Kiowas, and Lipan Apaches or through enslavement (Salinas 1990:57; Valerio-Jimenez 2013:29-30). Sites associated with historic farming and ranching including Native American campsites and Catholic chapels may be present within the study area.

Lastly, railroad construction during the late nineteenth century near the center of the study area coupled with large-scale irrigation projects like the Louisiana-Rio Grande Canal Company Irrigation System in the early twentieth century lead to a boom in farming operations including commercial citrus orchards, which in turn created a demand for low wage and often migrant labor in the study area (Garza and Long 2015). Sites associated with the farming, particularly the extensive irrigation system, may be present within the study area.

4.0 ASSESSMENT OF ALTERNATIVES

4.1 2014 Modified 2 Alternative

According to background review, portions of the APE of the 2014 Modified 2 Alternative have been previously surveyed for archeological resources and there is one identified archeological resource within the APE. This prehistoric archeological site is not listed on the NRHP or designated as an SAL and appears formally unevaluated for either (Atlas 2017).

Based on the background review above, the APE of the 2014 Modified 2 Alternative has the potential to contain prehistoric archeological deposits, including surficial or near surficial lithic scatters, and historic archeological deposits associated with nineteenth- and twentieth-century habitations. Archeological deposits within this setting may retain some integrity below the plow zone or otherwise beyond modern disturbances unless associated with Holocene sand dunes, which may lack stratigraphic integrity because of the natural processes of deflation.

It is B&A's opinion that there is potential for the APE of the 2014 Modified 2 Alternative to contain archeological historic properties eligible for inclusion in the NRHP (36 CFR 60) or archeological sites warranting SAL designation (13 TAC 26) and cemeteries, particularly those that date to the prehistoric era. As such, B&A recommends an intensive pedestrian survey of the entire APE of the 2014 Modified 2 Alternative if this alternative is selected as the preferred, consisting of surface reconnaissance coupled with systematic shovel testing, be conducted in order to identify any potential archeological resources within the APE that may be affected by the undertaking. This intensive archeological survey should be conducted prior to the planned construction to ensure that the project would not affect any as yet unidentified SALs or archeological historic properties pursuant to 36 CFR 800.4(d)(1) or unknown cemeteries as defined in 13 TAC 22.

4.2 2014 PSM Alternative

According to background review, portions of the APE of the 2014 PSM Alternative have been previously surveyed for archeological resources and there are no previously identified archeological resources within the APE (Atlas 2017).

Based on the background review above, the APE of the 2014 PSM Alternative has the potential to contain prehistoric archeological deposits, including surficial or near surficial lithic scatters, and historic archeological deposits associated with nineteenth- and twentieth-century habitations. Archeological deposits within this setting may retain some integrity below the plow zone or otherwise beyond modern disturbances unless associated with Holocene sand dunes, which may lack stratigraphic integrity because of the natural processes of deflation.

It is B&A's opinion that there is potential for the APE of the 2014 PSM Alternative to contain archeological historic properties eligible for inclusion in the NRHP (36 CFR 60) or archeological sites

warranting SAL designation (13 TAC 26). As such, B&A recommends an intensive pedestrian survey of the entire APE of the 2014 PSM Alternative if this alternative is selected as the preferred, consisting of surface reconnaissance coupled with systematic shovel testing, be conducted in order to identify any potential archeological resources within the APE that may be affected by the undertaking. This intensive archeological survey should be conducted prior to the planned construction to ensure that the project would not affect any SALs or archeological historic properties pursuant to 36 CFR 800.4(d)(1) or unknown cemeteries as defined in 13 TAC 22.

4.3 FM 1423 PSM Alternative

According to background review, portions of the APE of the FM 1423 PSM Alternative have been previously surveyed for archeological resources and there are no previously identified archeological resources within the APE (Atlas 2017).

Based on the background review above, the APE of the FM 1423 PSM Alternative has the potential to contain prehistoric archeological deposits, including surficial or near surficial lithic scatters, and historical archeological deposits associated with nineteenth- and twentieth-century habitations. Archeological deposits within this setting may retain some integrity below the plow zone or otherwise beyond modern disturbances unless associated with Holocene sand dunes, which may lack stratigraphic integrity because of the natural processes of deflation.

It is B&A's opinion that there is potential for the APE of the FM 1423 PSM Alternative to contain archeological historic properties eligible for inclusion in the NRHP (36 CFR 60) or archeological sites warranting SAL designation (13 TAC 26). As such, B&A recommends an intensive pedestrian survey of the entire APE of the FM 1423 PSM Alternative if this alternative is selected as the preferred, consisting of surface reconnaissance coupled with systematic shovel testing, be conducted in order to identify any potential archeological resources within the APE that may be affected by the undertaking. This intensive archeological survey should be conducted prior to the planned construction to ensure that the project would not affect any SALs or archeological historic properties pursuant to 36 CFR 800.4(d)(1) or unknown cemeteries as defined in 13 TAC 22.

4.4 No-Build Alternative

Because this alternative would not include the construction, alteration, or improvement to transportation facilities in relation to the construction of the reasonable alternatives, it would have no potential impact on archeological historic properties.

5.0 CONCLUSION

Although the background review revealed one previously documented archeological site within the APE of the 2014 Modified 2 Alternative and no previously documented archeological sites or cemeteries within the APE of the 2014 PSM Alternative and FM 1423 PSM Alternative, all three of

the reasonable alternatives have the potential to impact as yet unidentified archeological historic properties eligible for inclusion in the NRHP (36 CFR 60) or archeological sites warranting SAL designation (13 TAC 26).

After the preferred alternative is selected, B&A recommends that an intensive archeological survey be conducted in order to identify any potential archeological resources within the APE that may be affected by the undertaking.

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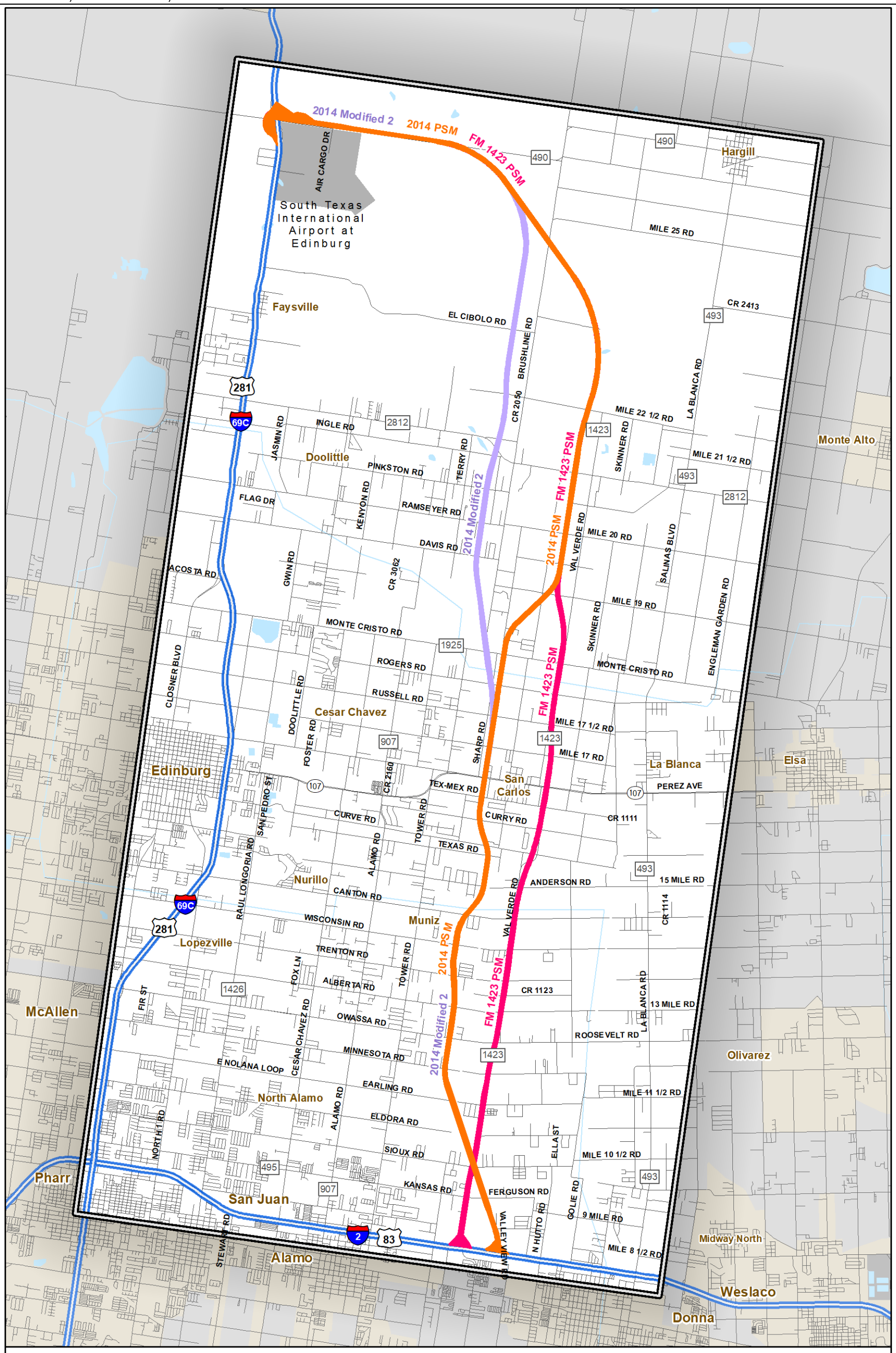
Attachment
Exhibits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South Texas International Airport at Edinburg
AIR CARGO DR
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Faysville
Doolittle
Cesar Chavez
Edinburg
Nurillo
Lopezville
Muniz
San Carlos
La Blanca
North Alamo
San Juan
Alamo
Pharr
McAllen
Monte Alto
Elsa
Olivarez
Midway North
Weslaco
Donna
MILE 25 RD
EL CIBOLO RD
CR 2413
BRUSHLINE RD
LA BLANCA RD
MILE 22 1/2 RD
INGLE RD
JASMIN RD
PINKSTON RD
TERRY RD
SKINNER RD
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FLAG DR
KENYON RD
RAMSEYER RD
DAVIS RD
MILE 20 RD
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ENGLEMAN GARDEN RD
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GWIN RD
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CLOSNER BLVD
ROGERS RD
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SHARP RD
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CURRY RD
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Base Map: ESRI-USA Base Map
2014 Modified 2 Alternative
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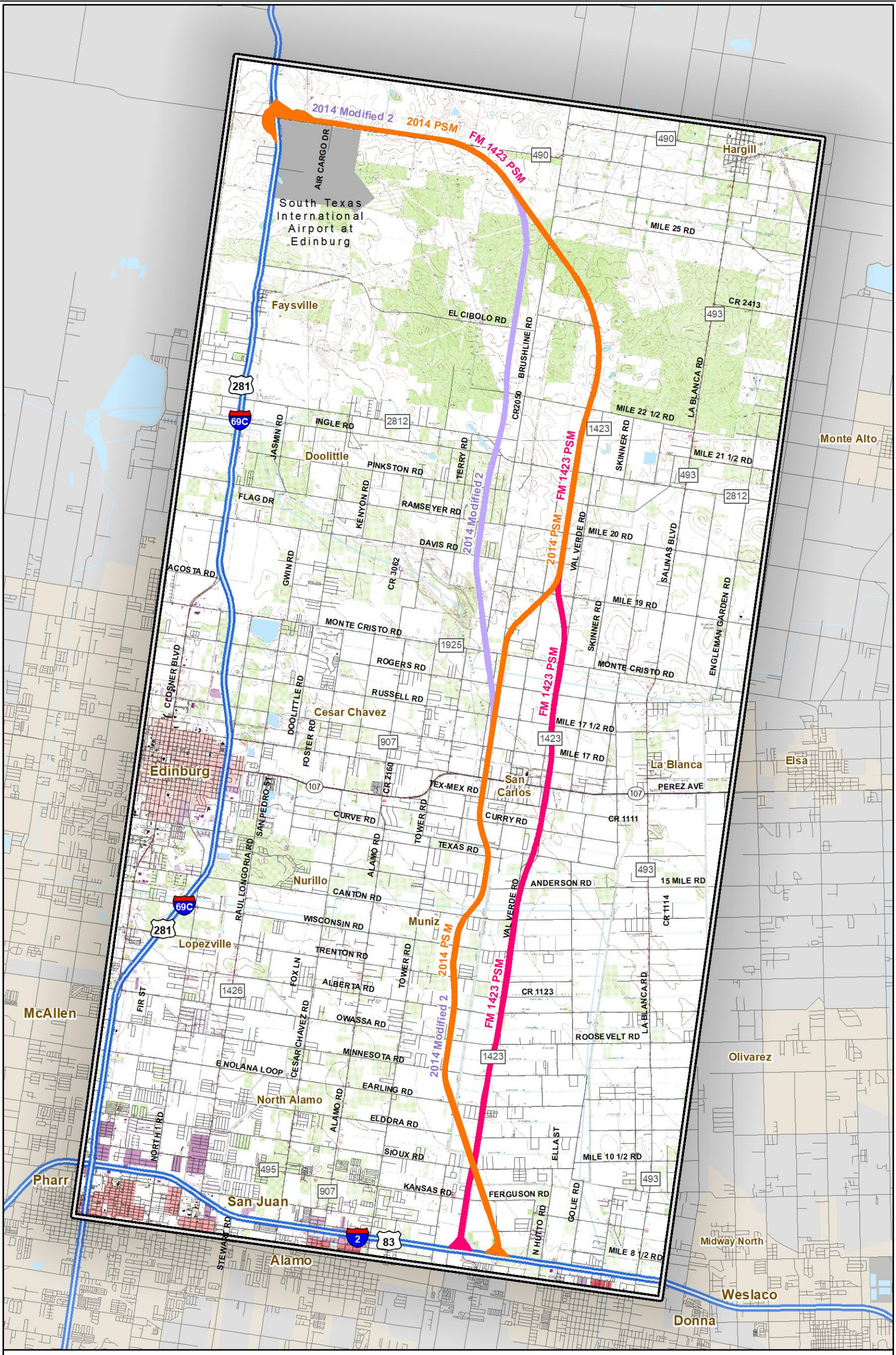
Exhibit 1
Project Location on County Base
SH 68 from
I-2/US 83 to I-69C/US 281
Hidalgo County, Texas
CSJs: 3629-01-001, 002, and 003

1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Doolittle
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TERRY RD
SKINNER RD
MILE 21 1/2 RD
Monte Alto
FLAG DR
KENYON RD
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Base Map: USGS 7.5' Topographic, ESRI-USA Base Map
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Exhibit 2
Project Location on
7.5' USGS Topographic
SH 68 from
I-2/US 83 to I-69C/US 281
Hidalgo County, Texas
CSJs: 3629-01-001, 002, and 003

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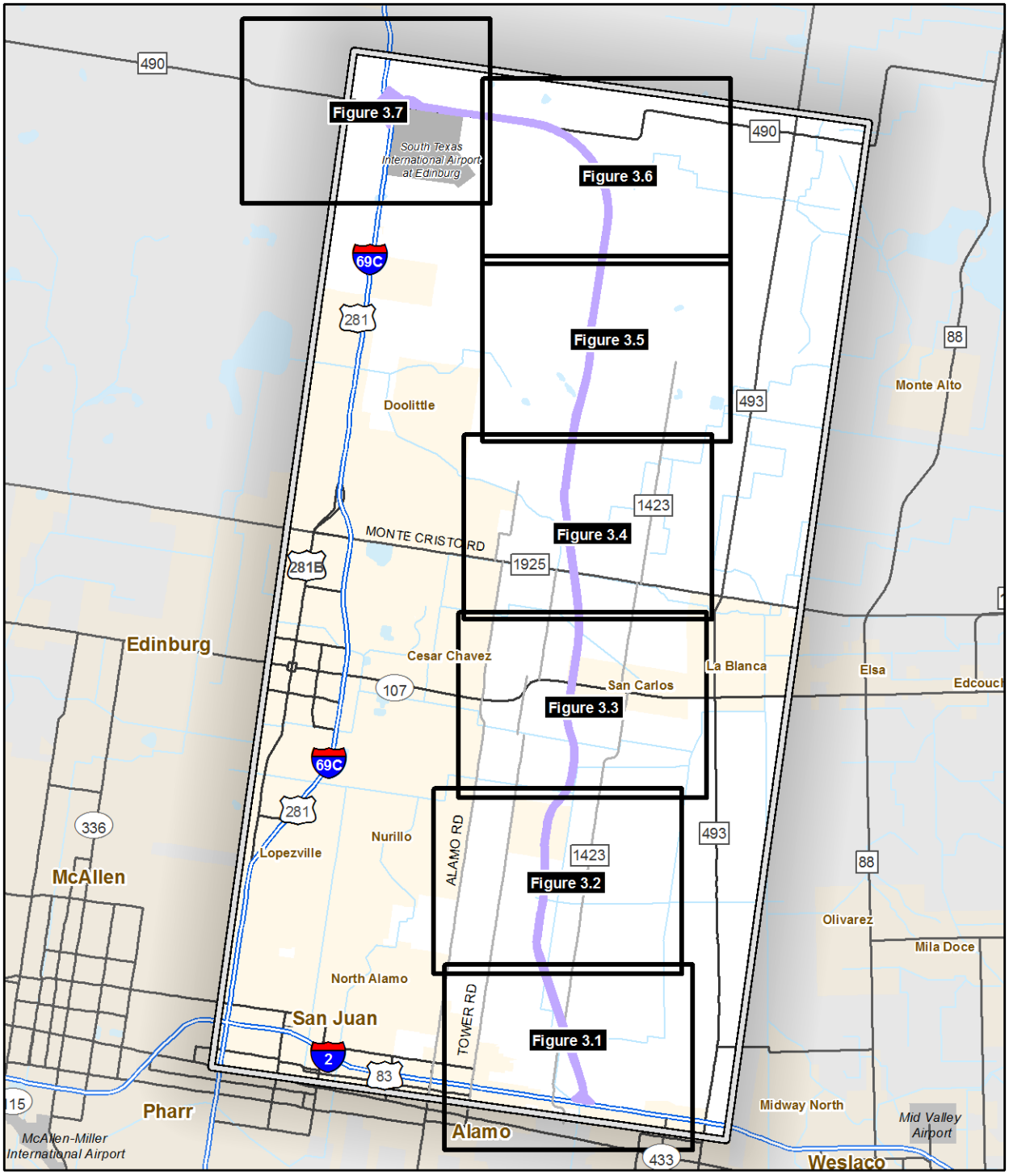
Figure 3.7
Figure 3.6
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Figure 3.1
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Exhibit 3.0 Index
2014 Modified 2 Alternative
SH 68 from
IH-2/US 83 to IH-69C/US 281
Hidalgo County, Texas
CSJs: 3629-01-001, 002, and 003

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EXHIBITS 3.1 THROUGH 3.7 WERE RECACTED BECAUSE THEY CONTAIN CONFIDENTIAL SITE LOCATIONS

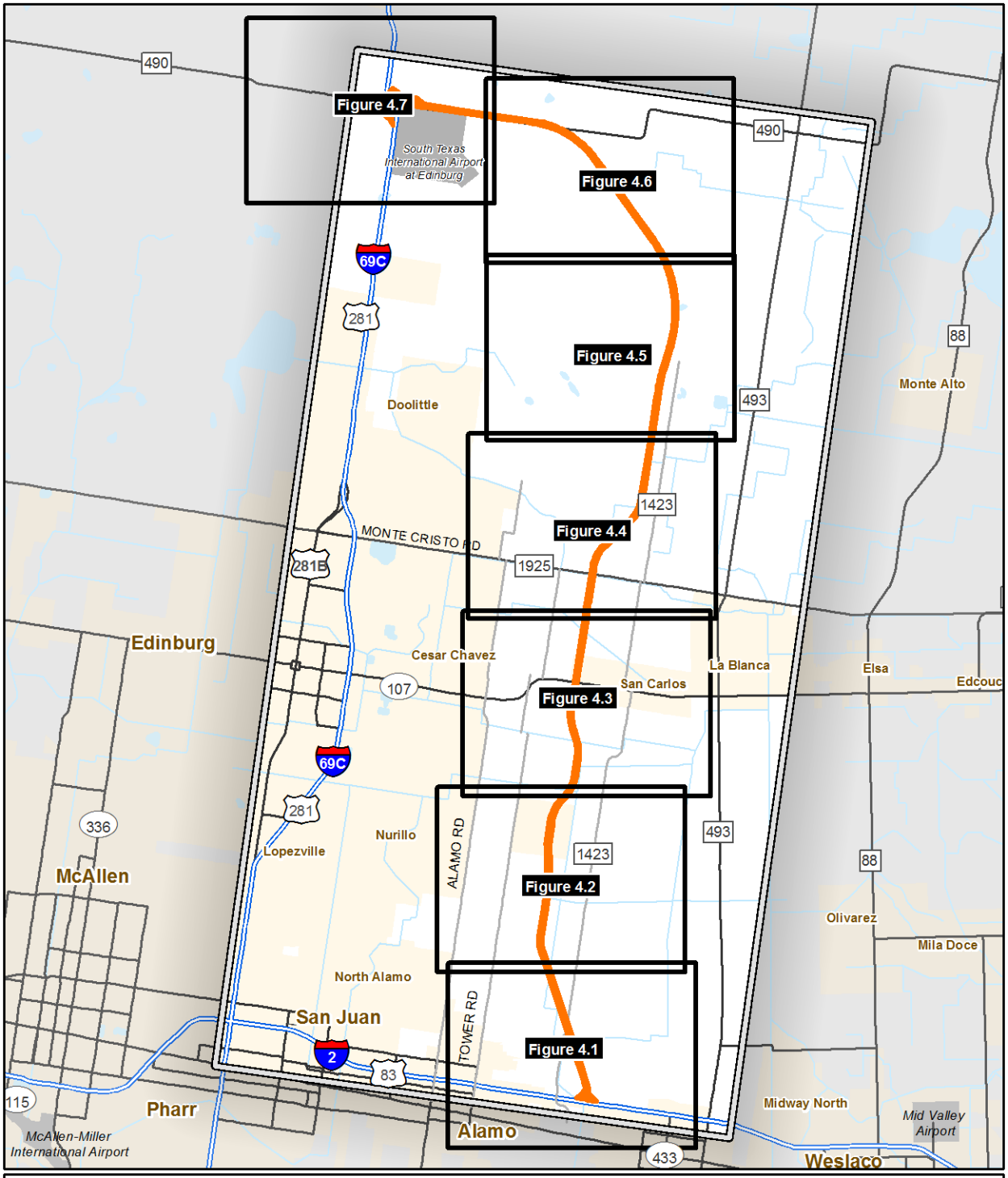
Figure 4.7
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Study Area
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Exhibit 4.0 Index
2014 PSM Alternative
SH 68 from
IH-2/US 83 to IH-69C/US 281
Hidalgo County, Texas
CSJs: 3629-01-001, 002, and 003

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EXHIBITS 4.1 THROUGH 4.7 WERE RECACTED BECAUSE THEY CONTAIN CONFIDENTIAL SITE LOCATIONS

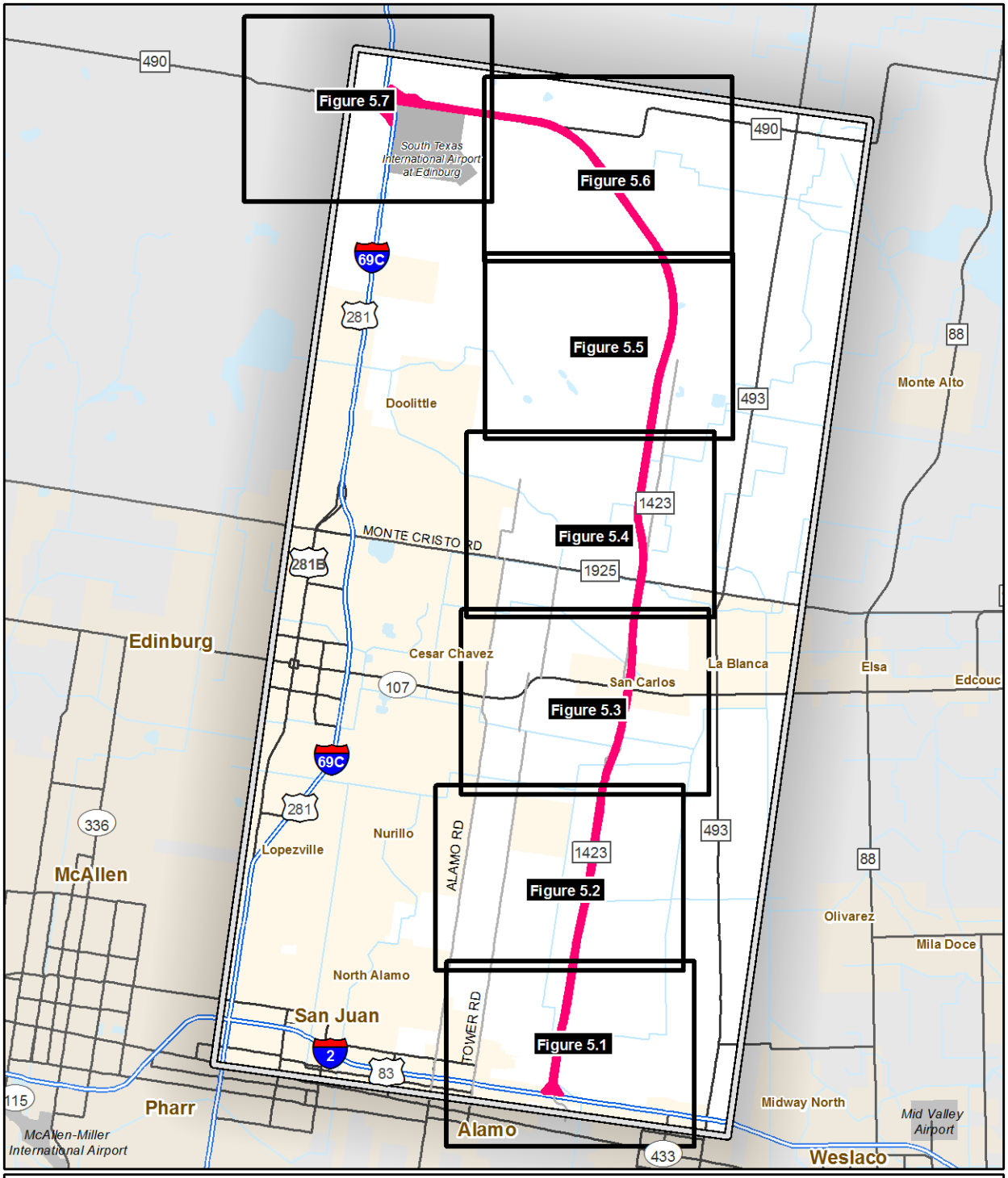
Figure 5.7
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FM 1423 PSM Alternative
SH 68 from
IH-2/US 83 to IH-69C/US 281
Hidalgo County, Texas
CSJs: 3629-01-001, 002, and 003

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EXHIBITS 5.1 THROUGH 5.7 WERE RECACTED BECAUSE THEY CONTAIN CONFIDENTIAL SITE LOCATIONS

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