



SH 34 Feasibility Report

FM 2578 To SH 243

CSJ: 0173-04-056

Kaufman County, Texas

May 2021

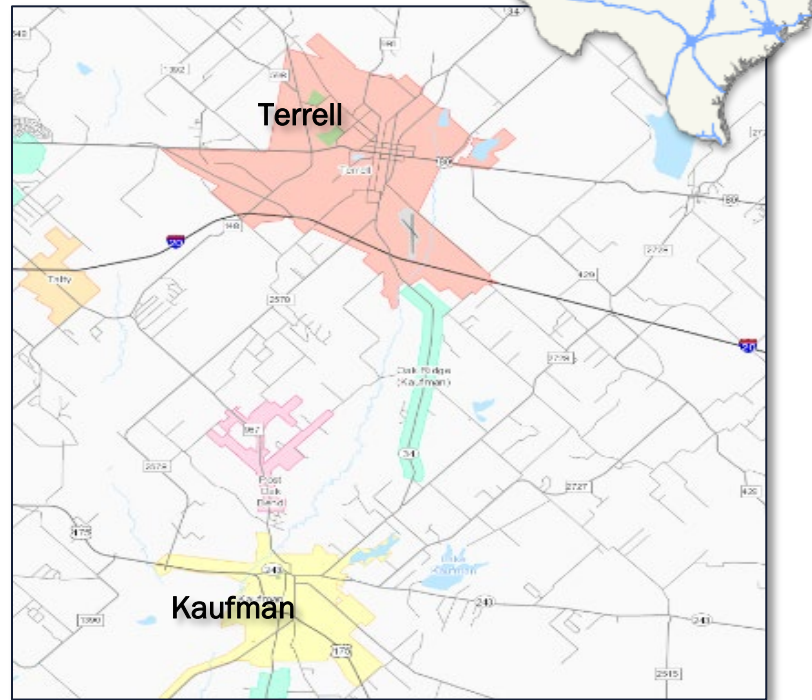
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Introduction

State Highway 34 (SH 34) is a generally north-south regional arterial in north central Texas from Honey Grove in Hunt County (northeast of the Dallas) to Italy in Ellis County (south of Dallas) constructed in the 1920s and 1930s. It serves as a regional connector serving rural communities and provides a connection for local and regional traffic traveling around the more urbanized Metroplex.

Within Kaufman County, feasibility studies for the SH 34 corridor have been developed over the years to identify needed mobility improvements to the corridor including the construction of new location reliever routes around the east side of Terrell and the south side of Kaufman. Between Terrell and Kaufman, where roadways are generally aligned in the northeast to southwest or northwest to southeast direction to match original land grants, SH 34 provides a primary linkage. The generally north-south SH 34



alignment, however, creates skewed intersections with most of the local roadways creating sight distance/safety issues. Additionally, westbound truck traffic along Interstate 20 (I-20) headed for Interstate 35E (I-35E) and I-45 utilize SH 34 to avoid travelling into Dallas.

The skewed intersections and additional regional traffic avoiding congestion in Dallas have created transportation problems on the SH 34 corridor. In 2017, the Texas Department of Transportation (TxDOT) began a new feasibility study for improvements for SH 34 within Kaufman County, connecting the city of Terrell to the north with the city of Kaufman to the south. The purpose of this feasibility study is to investigate potential alternatives and evaluate environmental issues early in the planning process.

Project History

In 1996, the Texas Department of Transportation (TxDOT) conducted a SH 34 Feasibility Study for improvements between Terrell and Kaufman (see **Figure 1** or **Appendix 1**). The original study area covered approximately 120 square miles and was generally bounded by SH 243 to the south, Farm to Market Road 2578 (FM 2578) to the west, one mile north of I-20 to the north, and FM 2728 to the east. The locally-preferred alternative recommended (shown in Teal) for implementation by that study had its northern terminus at the intersection of existing SH 34 and FM 2578 in Terrell. It followed FM 2578 for approximately 1.1 miles before curving slightly to the southeast to continue southward along Bachelors Creek. Then, it crossed County Road (CR) 279 between CR 301 and Brooks Lane. It then curved to the southwest to parallel Kings Creek and CR 279. After crossing Angelina Road, it curved south, joining the old Southern Pacific Railroad alignment, and terminated at the intersection of Railroad Street and Mulberry Street (SH 243) in the city of Kaufman. No funding was identified so the recommended alignment was not carried forward to Schematic Development or Design phases.

In 2006, TDOT again performed a Feasibility Study which investigated 11 alternative alignments (A-K), which included the preferred alternative from the 1996 study as Alternative D and a No Build option (see **Figure 2** or **Appendix 2**). This study concluded that Alignment K (shown in orange), essentially a hybrid of new alignment and alternatives D, E, F and G. The proposed included two basic typical sections; a rural section and an urban section. The rural section consisted of a four-lane divided rural highway with a

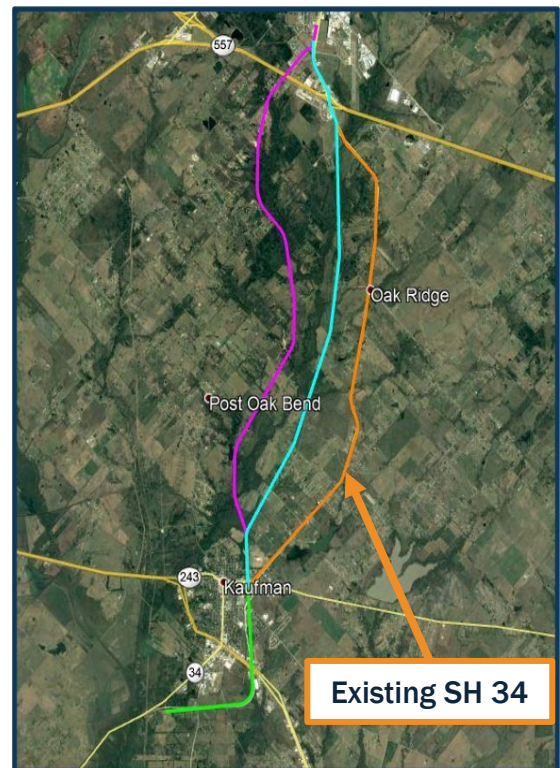


Figure 1 1996 Feasibility Study Alternatives

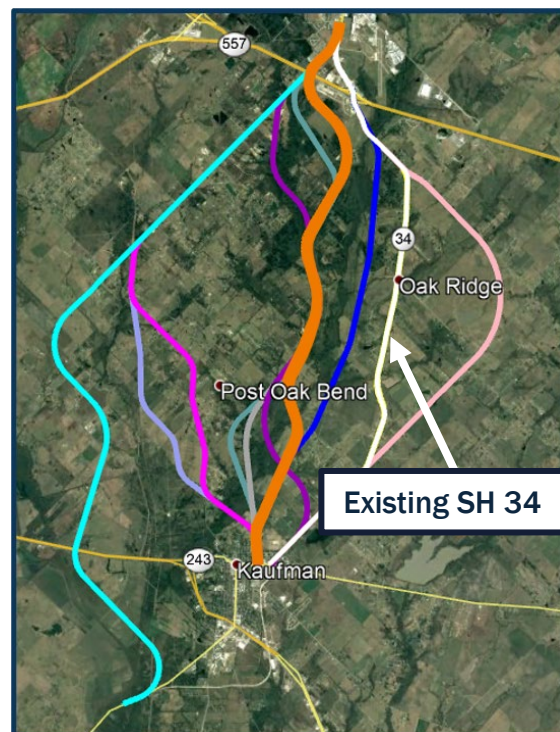


Figure 2 2006 Feasibility Study Alternatives

depressed median and open drainage. The planned lanes were 12 feet wide with a four-foot inside shoulder and a ten-foot outside shoulder, and there was 76-foot median between northbound and southbound lanes. The urban section consisted of a four-lane divided suburban arterial with curb and gutter and enclosed drainage system. The lanes were 12 feet wide with two-foot curb offsets to the base of the curb with a 28 to 52 foot raised median. The proposed urban and rural sections were centered within the usual rights-of-way (ROW) that would be between 140 and 220 feet. The median widths for both urban and rural sections provided allowances for expansion to six lanes should traffic volumes warrant an expansion after the project design year of 2035. Funding was identified for schematic development, but no funding was identified for Design or Construction.

Project Study Area

The SH 34 Feasibility Study project is located in Kaufman County, approximately 32 miles east of Dallas, Texas. The study area (See **Figure 3**) begins just south of downtown Terrell, Texas and extends south roughly nine miles toward Kaufman, Texas, and it covers an area from three miles west of Post Oak Bend to two miles east of Oak Ridge. The combined study area boundary includes about 115 square miles.

Although there are several, much smaller, north-south route options between the two connecting cities, there are essentially two existing corridors to make the trip between Terrell and Kaufman: (1) SH 34 (11.9 miles), and (2) FM 987 and FM 2578 (12.7 miles).

There are four area municipalities located within the project study area:

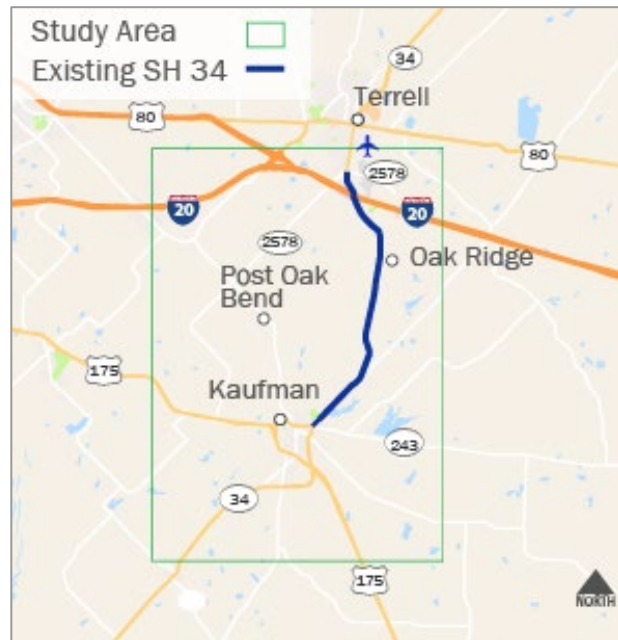


Figure 3 SH 34 Feasibility Study Area

Municipality	2020 Population *
Kaufman County	128,520
Kaufman	6,840
Terrell	16,860
Post Oak Bend	595**
Oak Ridge	141**

* 2020 NCTCOG Population Estimates Publication | North Central Texas Council of Governments (arcgis.com)

** Population Information and Statistics From Every City, State and County in the US (suburbanstats.org)

According to the October 2016 Kaufman County Transportation Plan – 2035 Functional Classification map, the proposed SH 34 corridor projects as a Principal Arterial. The principal arterial has been defined within the 2016 Kaufman County Transportation Plan as the following:

Right Of Way	120 ft – 140 ft
Lanes	4 – 6
Lane Width	12 ft
Median Width	16 ft (min)
Outside Shoulder Width	8 ft – 10 ft
Inside Shoulder Width	4 ft (min)

Study Approach

The SH 34 Feasibility Study approach to identifying improvements can be divided into the following steps:

- Identify Improvement Need
- Data Collection/Constraints Identification
- Identify Design Criteria
- Develop Alternatives
- Evaluate Alternatives
- Select Recommended Alignment

Study Purpose and Need

For people living in Kaufman County, travelling between Terrell and Kaufman, Texas is an everyday occurrence. TxDOT proposes to increase the capacity of SH 34 connecting the two cities, either along the existing SH 34 alignment or an alternative alignment on new location.

Improvements are needed to address current and projected transportation demands and facility deficiencies. The transportation problems on the SH 34 corridor are due to both geometry and capacity issues. The existing two-lane roadway geometry was designed in the 1920s and 1930s for low-speed traffic at a time when fewer passenger cars were on the road and the Kaufman County population was approximately 40,000 residents. Kaufman County's population has tripled to over 136,000 residents and SH 34's traffic has also grown by 50% since the year 2000. Existing SH 34 lacks sufficient capacity to accommodate the existing and projected north-south traffic demand.

Population

Kaufman County is located east of the Dallas-Fort Worth (DFW) Metroplex. The population of this largely rural county has grown in recent decades, and this growth trend is expected to continue. Census data for the City of Kaufman, the City of Terrell, and Kaufman County in **Table 1** show the population growth and the current population estimate. The projected growth of many communities within the DFW Metroplex and continued economic development in the region is expected to affect Kaufman County. Both the City of Terrell Master Plan and the City of Kaufman Comprehensive Plan indicate an anticipated residential and commercial increase in the area. Furthermore, the mission of the City of Kaufman Economic Development Corporation is to make Kaufman one of the most economically prosperous suburbs of Dallas and one of the best places to work in North Texas. The economic development and construction activities in coming years are expected to place a much greater demand on the transportation grid in the area and particularly on the ability to move people and goods north and south between the county seat of Kaufman and the county's largest city, Terrell.

Table 1: Population Trends and Current Estimate

Location	1970 Census	1980 Census	1990 Census	2000 Census	2010 Census	2020 Estimate*
City of Kaufman	4,012	1,658	5,238	6,490	6,703	6,840
City of Terrell	14,182	13,169	12,490	13,606	15,816	16,860
Kaufman County	32,392	39,015	52,220	71,313	103,350	128,520

Source: U.S. Decennial Census 1850-2010, *2020 NCTCOG Population Estimates Publication

Level of Service

Additionally, existing SH 34 is an aging roadway in need of expansion and repair to safely maintain its current level of service. Based on a 2019 TxDOT Traffic Counts, the existing SH 34 south of I-20 registers average daily traffic (ADT) of approximately 9,200 vehicles per day (VPD); by the design year 2045, the projected ADT is estimated to increase to 25,000 VPD.

A Level of Service (LOS) analysis was performed during the previous environmental study. The LOS is a qualitative measure of describing operational conditions within a traffic stream or at an intersection that is generally described in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and conveniences, and safety. LOS measures range from LOS A (free flow operation with minimum delays) to LOS F (extremely low speeds, high delays, high volumes, and extensive queuing). When traffic volumes approach a roadway's capacity, significant delays are expected. Any incident, from a disabled vehicle on the roadway to inclement weather, is likely to reduce the roadway's capacity enough to produce congestion and delay. **Table 2** summarizes the LOS for various locations on SH 34.

Table 2: 2019 LOS and Forecasted LOS under the No-Build Alternative

Roadway Section	2019 LOS	2045 LOS
Southern Section(2-lanes), SH 243 to I-20	D	E
Northern Section(4-lanes), I-20 to FM 2578	A	B
Intersection	2019 LOS	2045 LOS
SH 34 and SH 243 (Mulberry)	F	F
SH 34 and I-20 Eastbound Frontage Road	B	B
SH 34 and I-20 Westbound Frontage Road	B	B

Crashes

High traffic volumes can be a contributing factor to crashes on SH 34. Crash rates ranged from 140 to 217 crashes per 100 million vehicle miles for 2017 through 2020 which is significantly above the 99 to 102 rural two-lane, two-way roadway crash rates. Additionally, the presence of numerous driveways and cross streets increases the potential for incidents and collisions. The lack of turn lanes and the absence of shoulders wide enough to allow a disabled vehicle to clear through-traffic lanes also contribute to reduced safety on existing SH 34.

Table 3: Crash Rate Analysis for SH 34

Year	Crashes	Crash rate (per 100M miles)	Statewide Crash Rate (per 100M miles)
2017	73	217	102.48
2018	62	184	102.09
2019	49	140	99.12
2020	61	182	Not yet available

<https://cris.dot.state.tx.us/>

Affected Environment (i.e. Constraints Mapping)

Data Collection and Review

The purpose of the initial data collection was to identify possible constraints and their approximate locations that would influence the location of alternative corridors and alignments. The data collection phase of the project consisted of identifying constraints in the study area and meeting with affected cities and agencies. Constraints are features that ideally should be avoided due to their relatively high cost or consequences if impacted. Information was obtained regarding the following constraints:

- Presence of hazardous material sites
- Existing landfills and possible abandoned landfills
- Potential for presence of threatened and endangered species and/or habitat
- Presence and location of sites listed on the National Register of Historic Places
- Presence and location of state historical markers

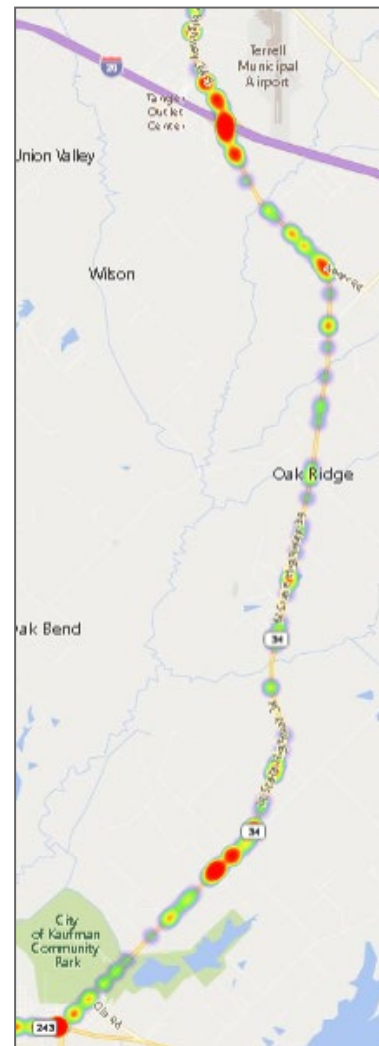


Figure 4 Crash Heat Map - 2017-2020

- Presence of jurisdictional waters of the United States, including wetlands
- Extent and quality of existing woodlands and riparian areas
- Presence and location of cemeteries
- Presence and location of parks
- Presence and extent of areas within the 100-year floodplain
- Soil types in the study area, primarily the presence of hydric and prime farmland soils
- Potential for presence of protected Native Prairie species
- Existing and proposed development plans
- Presence and location of significant archaeological sites
- Existing and proposed utilities

Affected Environment

Land Use

Kaufman County is located east of the Dallas-Fort Worth (DFW) Metroplex. While the county is largely rural, population has grown in recent decades and is expected to continue to grow, which would convert existing agricultural land to residential.

The study area is located within the Texas Blackland Prairie ecoregion as described on the *Ecoregions of Texas* map published by the United States Geological Survey (USGS) in 2004. The Blackland Prairie region is named for its fertile black soils that once supported a tallgrass prairie. Because of these fertile soils, much of the original prairie has been plowed for agriculture. According to the USDA web-soil survey, approximately 65% of the study area soils are Prime Farmland or Farmland of Statewide Importance soils. The Soil Survey of Kaufman and Rockwall Counties (1977) indicates that soils in the study area are dominated by the Wilson-Burleson Association. These soils are somewhat poorly drained, very slowly permeable, non-calcareous loamy or clayey soils that have a clayey subsoil and lower layers. This association was historically used for farming purposes. While some areas are still used for crops this association is now predominately used as pasture or range. These soils are well suited to cultivate locally grown crops and habitat for open-land wildlife.

The study area consists of predominately undeveloped grazing land as well as mixed urban land use including residential, commercial, industrial, parks, and infrastructure. The majority of the study area lies outside of city limits and consists of undeveloped land that is primarily used for grazing. Although aerial photographs do show evidence of cultivated land within the study area.

The proposed project would run between the larger cities of Kaufman and Terrell. Post Oak Bend City is located in between Kaufman and Terrell. The City of Oak Ridge is positioned along existing SH 34 and FM 2728 between the cities of Terrell and Kaufman. The town of

Oak Grove is located south of Kaufman. The town of Scurry is southeast of Kaufman on existing SH 34. While Scurry is outside of the project study area, it is approximately one mile southeast of a proposed intersection with a proposed alignment and existing SH 34 and could therefore benefit from the connectivity of the proposed alignment. Both Kaufman and Terrell consist of mixed urban land use including residential, commercial, industrial, parks, and infrastructure. The smaller towns contain primarily undeveloped or agricultural land with single-family low-density residences.

The City of Terrell approved its Master Plan in 2002 which outlines the city's development goals. The 2017 Future Transportation Plan (see **Appendix 3**) includes a proposed SH 34 alignment and includes low density residential, industrial, and commercial land use adjacent to the proposed project. This project would be consistent with Master Plan and would improve infrastructure in the region but would not change the planned land use.

The City of Kaufman Comprehensive Land Use and Thoroughfare Plan Map (see **Appendix 4**) includes a partially completed SH 34 Bypass through the city, north to Terrell. The Map indicates future residential and commercial development along the proposed bypass. The 1999 Comprehensive Plan includes a thoroughfare plan that encourages providing high capacity routes for moving regional traffic and local traffic through the community while keeping traffic through neighborhoods to a minimum. The proposed project would be consistent with these goals and policies as it would provide a high capacity route to move regional traffic and would not require changes to the future land use plan.

Community Resources

Community Facilities

The City of Post Oak Bend has a community center on FM 278, north of FM 987.

Schools

The Cities of Kaufman, Oak Grove, Oak Ridge, and Post Oak Bend are serviced by Kaufman Independent School District (ISD) with six campuses serving pre-kindergarten through 12th grade. At this time, no schools should be impacted by any of the proposed alternatives. Legacy Academy charter school for grades 6-12, Kaufman Christian School for grades kindergarten through 12th grade, as well as the Trinity Valley Community College Health Science Center are also located in Kaufman.

The City of Terrell is serviced by Terrell ISD with six campuses serving pre-kindergarten through 12th grade. No schools should be impacted by any of the proposed alternatives. Terrell is also home to Trinity Valley Community College and Southwestern Christian College.

Churches

There are approximately twenty-four churches in the proposed project area. Five churches are adjacent to proposed alternatives and property would potentially need to be acquired from

up to three churches depending on which proposed alternative is selected as the recommended alternative.

Fire and Police Departments

Kaufman Fire Rescue is a combination fire department that provides coverage to much of the southern portion of the study area including the City of Kaufman. The Terrell Fire department services the City of Terrell. In addition to Kaufman County Sheriff's Department, Kaufman Police Department (PD), Terrell PD, and Oak Ridge PD provide police service to much of the project study area.

Hospitals

Texas Health Presbyterian Hospital Kaufman and Terrell State Hospital provide medical services to the study area along with five health centers and one urgent care facility. While Terrell State Hospital provides medical services to the project study area, it is located outside the project study area limits.

Airports

Terrell Municipal Airport is located northeast of the intersection of existing SH 34 and I-20 adjacent to the northern terminus of the proposed alternatives. There are two additional small, private airports within the study area. At this time, they are not anticipated to be impacted by the proposed alternatives.

Historic and Archaeological Resources

A review of the Texas Archeological Sites Atlas maintained by the Texas Historical Commission (THC) and the Texas Archeological Research Laboratory was conducted to identify archeological sites, Recorded Texas Historic Landmarks (RTHLs), properties or districts listed on the National Register of Historic Places (NRHP), State Antiquities Landmarks, cemeteries, or other cultural resources in the project study area. There are sixteen historical sites or markers in the study area.

In addition to historic sites, bridges that were at least 50 years or older and therefore potentially eligible for listing as a historic bridge were identified. There were 25 bridges that were identified as being 50 years or older. Further work would be needed to identify eligibility for Historic Bridge listing.

The previous environmental study identified eleven archeological sites including a survey for the Seaway Loop Pipeline which runs north-south, west of existing SH 34, and would be within the ROW for three proposed alternatives.

DOT Act Section 4(f), LWCF Act Section 6(f) and PWC Chapter 26

Department of Transportation (DOT) Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 states that the Federal Highway Administration (FHWA) may not approve the use of land from a significant publicly owned park, recreation area, wildlife and waterfowl refuge, or historic site. However, if a determination is made that there is no feasible and prudent alternative to the use of land from the property and the action includes all possible planning to minimize harm to the property resulting from such use, then the taking may be approved. A Section 4(f) can be processed as a de minimis, programmatic, or individual evaluation.

There are three parks in Kaufman and one park in Terrell, within the study area, that would be considered Section 4(f) properties. Two parks in Kaufman, Kaufman City Lakes Park and Kaufman Sports Complex, are adjacent to existing SH 34. Public Involvement would be required if Section 4(f) impacts are found to occur.

Land and Water Conservation Fund (LWCF) Section 6(f)

LWCF Section 6(f) protects parks and recreation areas developed or improved with LWCF funds. Once land has been purchased or developed, partially or entirely, or improved with LWCF assistance, it is considered a Section 6(f) property, and no Section 6(f) property shall be wholly or partly converted to a use other than public outdoor recreation uses without the approval of the National Park Service (NPS). In other words Section 6(f) properties must be used for public recreation, unless the NPS approves the substitution of a replacement property, which must be substituted at a 1:1 ratio in terms of fair market value (36 CFR 59.3(b)(1)) and usefulness in comparison to the converted/used land (36 CFR 59.3 (b)(3)).

There are two parks in Kaufman County that are sponsored by the City of Terrell that have received LWCF funds, Central Park, or Ben Gill Park and Terrell Town North Park or Arlie White Park. Both parks are outside the project study area.

Parks and Wildlife Code (PWC) Chapter 26

Under PWC Chapter 26, state law prohibits the approval of any project that requires the use or taking of any public land designated and used prior to the arrangement of the project as a park, recreation area, scientific area, wildlife refuge, or historic site, unless it has been determined that: (1) there is no feasible and prudent alternative to the use or taking of such land; and (2) the project includes all reasonable planning to minimize harm to the land resulting from the use or taking.

The four parks that would be considered Section 4(f) properties would also be considered PWC Chapter 26 properties. Public Involvement criteria for Section 4(f) would satisfy PWC Chapter 26 public involvement criteria.

Visual Quality and Aesthetics

Visual and aesthetic resources within the project study area were identified by field and desktop surveys. The study area is predominately rural with large properties used for agriculture. However, construction of the proposed roadway could result in some homes and businesses being located closer to the roadway.

The construction of a new roadway or an expanded existing roadway would permanently change views and the visual quality of the corridor due to expanded roadway width and an adjusted alignment. Removal of vegetation in the form of trees and hedges along the new ROW would result in a reduction of vegetative screening. Additional light impacts may result from new illumination.

Temporary impacts on the visual character of the surrounding environment related to construction activities include those related to vehicle and equipment activity, construction staging, stockpiling of excavated material, temporary signage, and traffic congestion. Developed and naturally vegetated areas within the existing and proposed ROW may be cleared for the construction of the roadway lanes, and topography would be modified to fill slopes. Construction activities would result in increased levels of dust, indirect transfer of dirt between locations, and localized glare from lighting sources assembled to ensure the safety of construction crews and vehicle drivers. Staging areas would be located away from visually sensitive areas where practicable and where land is available. Construction activities would be primarily limited to daylight hours to eliminate the need to use high-wattage lighting sources to operate during nighttime hours. Revegetation would take place in areas disturbed during construction.

As the alternatives proposed in this study are conceptual and do not include a detailed design, actual impacts cannot be fully assessed.

Air Quality

This project is located within Kaufman County which has been designated by the Environmental Protection Agency (EPA) as a moderate non-attainment for the 2008 8-hour Ozone National Ambient Air Quality Standards (NAAQS); therefore, transportation conformity rules apply.

Wetlands and Other Waters of the U.S.

National Wetland Inventory (NWI) wetland signatures were identified and mapped on the Environmental Constraints Map (shown in **Figure 5** and **Appendix 5**). These signatures have been mapped and recorded in a national database but have not been confirmed with wetland delineations.

Big Brushy Creek, Little Brushy Creek, Bachelor Creek, and King's Creek drain into Cedar Creek Reservoir south of the project study area. These creeks and their associated branches and tributaries could be considered jurisdictional waters of the U.S. All current proposed

alternatives would cross over one or more of these creeks or associated branches or tributaries. The project would most likely require a Nationwide Permit (NWP). Nationwide Permit #14 is a permit for linear transportation crossings and is the most applicable for this project.

For linear transportation projects in non-tidal waters, the discharge cannot cause the loss of greater than 1/2-acre of waters of the United States at any individual crossing.

The permittee must submit a pre-construction notification to the U.S. Army Corps of Engineers prior to commencing the activity if: (1) the loss of waters of the United States exceeds 1/10-acre; or (2) there is a discharge in a special aquatic site, including wetlands.

If the project were to result in the loss of more than 1/2-acre of waters of the United States at any individual crossing, the entire project would likely require an Individual Permit.

Section 303(d) Impaired Waters

Based on the 2014 Texas 303(d) list, there are no impaired waters within the project study area. The nearest impaired water is the East Fork of the Trinity River located west of the study area. At this time, the proposed alternative alignments are not within five miles of the impaired river or within its watershed.

Texas Pollutant Discharge Elimination System (TPDES)

Since TPDES Construction General Permit (CGP) authorization and compliance (and the associated documentation) occur outside of the environmental clearance process, compliance is ensured by the policies and procedures that govern the design and construction phases of the project. The Project Development Process Manual and the Plans, Specifications, and Estimates (PS&E) Preparation Manual require a storm water pollution prevention plan (SWP3) be included in the plans of all projects that disturb one or more acres of earth. The Construction Contract Administration Manual requires that the appropriate CGP authorization documents (notice of intent or site notice) be completed, posted, and submitted, when required by the CGP, to Texas Commission on Environmental Quality (TCEQ) and the municipal separate storm sewer system (MS4) operator. It also requires that projects be inspected to ensure compliance with the CGP.

The PS&E Preparation Manual requires that all projects include Standard Specification Item 506 (Temporary Erosion, Sedimentation, and Environmental Controls), and the “Required Specification Checklists” require Special Provision 506-003 on all projects that need authorization under the CGP. These documents require the project contractor to comply with the CGP and SWP3, and to complete the appropriate authorization documents.

Kaufman County Municipal Utility District operates MS4s in the project study area and the proposed project would include five or more acres of earth disturbance. TxDOT would comply with all applicable MS4 requirements and the TCEQ Texas Pollutant Discharge Elimination

System (TPDES) Construction General Permit (CGP). A SW3P would be prepared and implemented, and a construction site notice would be posted on the construction site. A Notice of Intent (NOI) would therefore be required.

Vegetation

The study area is located within the Texas Blackland Prairie ecoregion as described on the *Ecoregions of Texas* map published by the United States Geological Survey (USGS) in 2004. The study area was overlaid on the Ecological Mapping Systems of Texas (EMST) vegetation type maps. The largest individual vegetation type within the project study area is the Blackland Prairie: Disturbance or Tame Grassland which accounts for approximately one quarter of the vegetation cover in the study area. Most of the study area seems consistent with rangeland and agricultural vegetation with woodlands following riparian corridors. Common trees present in the area may include different combinations and age classes of pine (*Pinus* sp.) regrowth, southern red oak (*Quercus falcata*), sweetgum (*Liquidambar styraciflua*), post oak (*Quercus stellata*), white oak (*Quercus alba*), water oak (*Quercus nigra*), mesquite (*Prosopis* sp), black hickory (*Carya texana*), blackgum (*Nyssa sylvatica*), elm (*Ulmus* sp.), hackberry (*Celtis* sp.), live oak (*Quercus virginiana*), eastern red cedar (*Juniperus virginiana*), ashe juniper (*Juniperus ashei*), cedar elm (*Ulmus crassifolia*), Texas persimmon (*Diospyros texana*), elbowbush (*Forestiera pubescens*), and deciduous holly (*Ilex decidua*). Shrubs include hawthorn (*Crataegus* sp.), poison oak (*Toxicodendron radicans*), sumac (*Rhus* sp.), holly (*ilex* sp.), wax myrtle (*Morella cerifera*), blueberry (*Vaccinium* sp.), blackberry (*Rubus villosus*), and red bay (*Persea borbonia*).

Special Habitat Features – Special habitat features can include bottomland hardwoods, caves, cliffs and bluffs, native prairies, seeps or springs, snags or groups of snags, existing bridges with known observed bird or bat colonies, rookeries, and prairie dog towns. The Texas Natural Diversity Database (NDD) returned three occurrences of rare communities which include two occurrences of Little Bluestem-indiangrass and one occurrence of Vertisol Blackland Prairie. One occurrence of the Little Bluestem-indiangrass occurs north of the town of Scurry along SH 34 and one of the proposed alternatives would require ROW from the occurrence area. This community was last recorded in 1986 and it was noted that a site visit during the growing season would be needed. The second occurrence of Little Bluestem is located west of the proposed alternatives in the southeast area of the US 175 and FM 1390 interchange. This community was last recorded in 1986 and is noted to be in excellent quality. At this time, this community would not be impacted by the proposed alternatives. The occurrence of the Vertisol Blackland Prairie occurs within the city limits of Post Oak Bend and at this time, the occurrence area would not be impacted by the proposed alternatives. This community was last recorded in 2009.

The NDD also returned one occurrence of the Southern Crawfish Frog. The occurrence of the Southern Crawfish frog is located within the City of Kaufman, north of existing SH 34, south

of US 175, east of FM 1388. At this time, the occurrence area would not be impacted by the proposed alternatives, however, further investigation would be necessary during the EA phase.

Unusual Vegetation Features – Unusual vegetation features can include unmaintained vegetation, fencerow vegetation, riparian vegetation, trees that are considered historically significant, ecologically significant, or locally important, and unusual stands or islands of vegetation.

Special Habitat Features and Unusual Vegetation Features would need to be further assessed during a more detailed environmental analysis.

If the proposed project were to exceed the impact thresholds listed in the Threshold Table Programmatic Agreement between TxDOT and Texas Parks and Wildlife Department (TPWD) shown in **Table 4**, early coordination with TPWD would be required.

Table 4: TPWD Vegetation Impact Thresholds

Texas Blackland Prairies (TBPR)	
MOU Type	Threshold (AC)
Agriculture	10
Coastal Grassland	1
Crosstimbers Woodland and Forest	1
Disturbed Prairie	3
Edwards Plateau Savannah, Woodland, and Shrubland	1
Riparian	0.1
Mixed Woodlands and Forest	1
Post Oak Savanna	2
Scrub, Thornscrub, Shrubland	2
Tallgrass Prairie, Grassland	2
Wet Savanna, Swamp, Baygall	0.1
Xeric Sandyland	0.1

Floodplains

The project study area is not located within the Regulatory Zone for the Trinity River Corridor; therefore a permit under the Trinity River Corridor Development Certification process is not required.

FEMA floodplain maps were gathered in order to identify the 100-year floodplain within the study area. The 100-year floodplains were identified and mapped in the Environmental Constraints Map. The 100-year floodplains are around Big Brushy Creek, Little Brushy Creek, Bachelor's Creek, King's Creek, and their associated branches and tributaries. The proposed alternatives therefore, would likely go through the 100-year floodplain. The hydraulic design for this project would be in accordance with current FHWA and TxDOT design policies. The

facility would permit the conveyance of the 100-year flood, inundation of the roadway being acceptable, without causing significant damage to the facility, stream, or other property. The proposed project would not increase the base flood elevation to a level that would violate applicable floodplain regulations and ordinances. Coordination with the local Floodplain Administrator would be required.

Threatened and Endangered Species

The Endangered Species Act affords protection for federally listed threatened and endangered species and their habitats. State law prohibits direct harm to state-listed species. Species of Greatest Conservation Need (SGCNs) are designated by TPWD, and may be either federally listed or state-listed species, or have no regulatory status. The Texas Parks and Wildlife County List of Rare Species for Kaufman County, the Information for Planning and Conservation, and a search of the NDD in conjunction with Geographic Information Systems, was conducted to determine the potential occurrence of State or Federally listed threatened or endangered species and their habitat

There are four Federally listed Threatened and Endangered species that may occur in the project study area; the endangered Least Tern (*Sterna antillarum*), threatened Piping Plover (*Charadrius melodus*), threatened Red Knot (*Calidris canutus rufa*), and the endangered Whooping Crane (*Grus americana*) could potentially be affected by activities in this area. While Piping Plover could potentially be impacted, the species only needs to be considered for wind energy projects and the study area is outside the final critical habitat designated for this species. Additionally, the study area is outside the final critical habitat designated for the Whooping Crane. The Piping Plover, Red Knot, and the Whooping Crane are all migratory species that winter along the Texas coast and could potentially be found in the study area during migration. The Least Tern nests along sand and gravel bars within braided streams and rivers. There are three main creeks with their associated branches and tributaries that could provide habitat for the Least Tern. Measures to avoid harm to any threatened and endangered species would be taken should they be observed. Consultation with USFWS may be required.

Additionally, the project study area has potential habitat for nine state listed threatened species; three birds; Bald Eagle (*Haliaeetus leucocephalus*), White-faced Ibis (*Plegadis chihi*), and Wood Stork (*Mycteria americana*), four mollusks; Louisiana pigtoe (*Pleurobema riddellii*), Sandbank pocketbook (*Lampsilis satura*), Texas heelsplitter (*Potamilus amphichaenus*), and Texas pigtoe (*Fusconaia askewi*), and two reptiles; Alligator snapping turtle (*Macrochelys temminckii*), and the Timber rattlesnake (*Crotalus horridus*). There are no state listed endangered species in the project study area.

The Bald Eagle is found primarily near rivers and large lakes; nesting in tall trees near water. Big Brushy Creek, Little Brush Creek, Bachelor's Creek, and King's Creek could provide suitable habitat for the species. While no longer federally listed as threatened or endangered,

the species is protected under the Bald and Golden Eagle Protection Act of 2007. Site investigations would be needed to assess waterways within the study area for potential bald eagle nests, mollusk species, and the Alligator snapping turtle. The White-faced Ibis prefers freshwater marshes, sloughs, and irrigated rice fields. The Wood-stork forages in prairie ponds, flooded pastures or fields, ditches, and other shallow standing water. Woodlands within the study area provide habitat for the timber rattlesnake.

There is also potential habitat for seven SGCNs in the project area: Southern Crawfish Frog (*Lithobates areolatus areolatus*), Plains Spotted Skunk (*Spilogale putorius interrupta*), Henslow's Sparrow (*Ammodramus henslowii*), Sprague's Pipit (*Anthus spragueii*), Western Burrowing Owl (*Athene cunicularia hypugaea*), Texas garter snake (*Thamnophis sirtalis annectens*), and the Topeka purple-coneflower (*Echinaceae atrorubens*).

The TXNDD indicates that there has been one occurrence of the Southern Crawfish Frog, and an additional three occurrences of rare communities within the proposed project study area which include two occurrences of Little Bluestem-indiangrass (*Schizachyrium scoparium-sorghastrum nutans series*) and one occurrence of a Vertisol Blackland Prairie (*Schizachyrium scoparium - Sorghastrum nutans - Andropogon gerardii - Bifora americana Vertisol Grassland*). These communities were discussed above in Vegetation.

Contractors would be advised of potential occurrence of the timber rattlesnake and the plains spotted skunk in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts.

Proposed Best Management Practices (BMPs) Include:

Species Specific BMPs

- Bald Eagle – Bird BMPs and Bald and Golden Eagle Protection Act;
- Plains Spotted Skunk – Contractors would be advised of potential occurrence in the project area, and to avoid harming the species if encountered, and to avoid unnecessary impacts to dens;
- White faced Ibis – Bird BMPs, and if a known or mapped TXNDD colonial water bird rookery is within 300 meters of the project, coordinate with TPWD;
- Timber Rattlesnake – Contractors would be advised of potential occurrence in the project area, and to avoid harming the species if encountered.

Hazardous Materials

A radius search was conducted by GeoSearch which located hazardous material sites within a specified radius of the proposed alternative alignments. These sites can be found in the Environmental Constraints Map and are labeled for easier reference. There are 398 hazardous material sites within one mile of the proposed alternative alignments, including one Final National Priorities List (NPL) superfund site.

Superfund Site

A Superfund site is any land in the United States that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment. These sites are placed on the final NPL. One NPL registered Superfund site is located within one mile of the proposed alternatives. The former Van der Horst site is located approximately 300 yards from downtown Terrell, Texas. The main building is located at 419 East Grove Street and the Wastewater treatment building is located at 410 East Grove Street. As part of the plating operations, the facility generated spent kerosene, wastewater treatment sludge, and chromium contaminated wastewater and soil. When the site was abandoned in April 2007, these wastes remained on-site in two underground sumps, 27 variously-sized plating vats, and 450 55-gallon drums. Two closed surface lagoons which treated chromium wastewater were also present to the east of the wastewater treatment building. This site is also listed as a Resource Conservation & Recovery Act (RCRA) Non-generator, a RCRA – Subject to Corrective Action Facility, and an Industrial and Hazardous Waste Corrective Action Site.

Another four sites are “Removal Only Sites” and an additional six sites do not qualify for listing on the NPL. These ten sites are not listed on the NPL but are within a half mile search radius of the proposed alternatives.

Federal Resource Conservation & Recovery Act Facilities

Two sites were identified as RCRA facilities subject to corrective actions (RCRASUBC), two were identified as RCRA Non-Corrupts Treatment, storage and disposal facilities (RCRAT), five were identified as RCRA generator (RCRAGRO6) sites, and six were identified as non-generator (RCRANGRO6) sites.

The Van der Horst Superfund site discussed above is listed as a RCRASUBC site as well as a RCRANGRO6 and RCRAT site. The second RCRASUBC and RCRAT site is Falcon Steel Kaufman located at 1200 Rand Rd, Kaufman, Texas which is approximately 0.43 mile south of the southern terminus of some of the alternatives at the SH 34/SH 243 intersection.

Texas Health Presbyterian Hospital in Kaufman is located at SH 243 and US 175, approximately one-quarter mile from a proposed alternative and is listed as a RCRAGRO6. The CVS located at 102 E. Mulberry St, Kaufman, Texas is listed as a RCRAGRO6 facility. The Home Depot located at 151 Windsor Avenue, Terrell, Texas, is also a listed generator. This facility is located between FM 2578 and SH 34 on the north side of I-20. While it is approximately 0.15 mile from the nearest proposed alternative, it is in between all of the proposed alternatives at their northern terminus. The Family Dollar located at 702 E. Mulberry St, Kaufman, Texas is located approximately 0.05 mile from the southern terminus of six proposed alternatives that begin around the intersection of E. Mulberry and S. Old Rail Rd. The fifth RCRAGRO6 site is Powerlab, located at 1145 SH 34 S. in Terrell and is approximately a quarter-mile from the northern terminus of the proposed alternatives.

Industrial and Hazardous Waste Corrective Action Sites

There are ten sites that are listed as Industrial and Hazardous Waste Corrective Action (IHWCA) Sites, however only nine were locatable; The Van der Horst Superfund site discussed above, Fujicolor Photo Processing Center located at 1149 S Virginia St in Terrell, Perfection Industries Terrell is located at 102 E Grove Street in Terrell, Innocor Terrell Facility located at 501 Industrial Blvd in Terrell, Stericycle Waste Incinerator located at 410 Industrial Blvd in Terrell, Falcon Steel Kaufman located at 1200 Rand Rd in Kaufman, Oldcastle Building Envelope Facility located at 803 Airport Rd in Terrell, Bulldog Battery DBA Powerflow Systems located at 1000 Airport Rd in Terrell, and Madix Skyline Facility located at 201 Skyline Dr in Terrell. While all sites are within one mile of proposed alternatives, they would not be adjacent to or within proposed right-of-way (ROW).

Municipal Solid Waste Landfill Sites

There are four sites that are listed as Municipal Solid Waste Landfill Sites (MSWLF). The City of Terrell Landfill is located south of I-20 and west of SH 34 in Terrell and is adjacent to four proposed alternatives. The City of Kaufman Landfill is located at 999 E 1st North Street in Kaufman. Four proposed alternatives would require ROW from the landfill and would be adjacent to an additional two proposed alternatives. Stericycle Waste Incinerator and Terrell Service Center located at 410 Industrial Blvd and 400 Industrial Blvd respectively in Terrell are also listed as MSWLF Sites and are within 0.30 mile of proposed alternatives, however ROW would not be required from either site.

Closed and Abandoned Landfill Inventory

There are three sites that are listed on the Closed and Abandoned Landfill Inventory (CALF). The Old Kaufman Dump is located northeast of Elmo Street in Kaufman. This would be adjacent to or within the proposed ROW of four proposed alternatives. The Kemp and Crandall CALF sites are located north of the existing City of Kaufman Landfill and would be within the proposed ROW of three proposed alternatives and adjacent to another proposed alternative.

Leaking Petroleum Storage Tanks

There are 34 sites that are identified as having leaking petroleum storage tanks (LPSTs) in the study area, however they are, for the most part, clustered inside the city limits of Kaufman and Terrell.

Voluntary Cleanup Program Sites

There is one voluntary cleanup site located in the project study area. The Union Pacific Railroad – Terrell located in the southeast corner of SH 34 and Temple Street in Terrell is approximately 0.70 mile from the northern terminus of the proposed alternatives.

Innocent Owner/Operator Database

There are two locatable instances of Innocent Owner Operators, the Old Terrell Plant Site and General Chemical. Both are located in Terrell, more than half a mile from the northern terminus of the proposed alternatives.

Additional Noteworthy Hazardous Material Sites

Paul Murrey Ford Mercury is listed as a RCRANGR06. This dealership is located at 1105 E Mulberry just west of SH 34. A portion of this facility's lot is within the proposed ROW of a proposed alternative.

Two Federal Emergency Response Notification System (ERNSTX) sites were locatable, however, neither site would be acquired for proposed ROW or adjacent to the proposed alternatives.

There were no TCEQ Dry Cleaner remediation only sites or Texas Railroad Commission VCP sites within one mile of the searched alternative alignments.

Sites not included in the radius report include Moore Airport in Oak Grove, Numo Manufacturing Inc and the City of Kaufman Water Treatment facility. These sites were not included because of the distance from the target property searched. However, they are within 1-mile of the alternatives as the alternative alignments have changed. They would most likely be included on a more up to date Hazardous Materials Search.

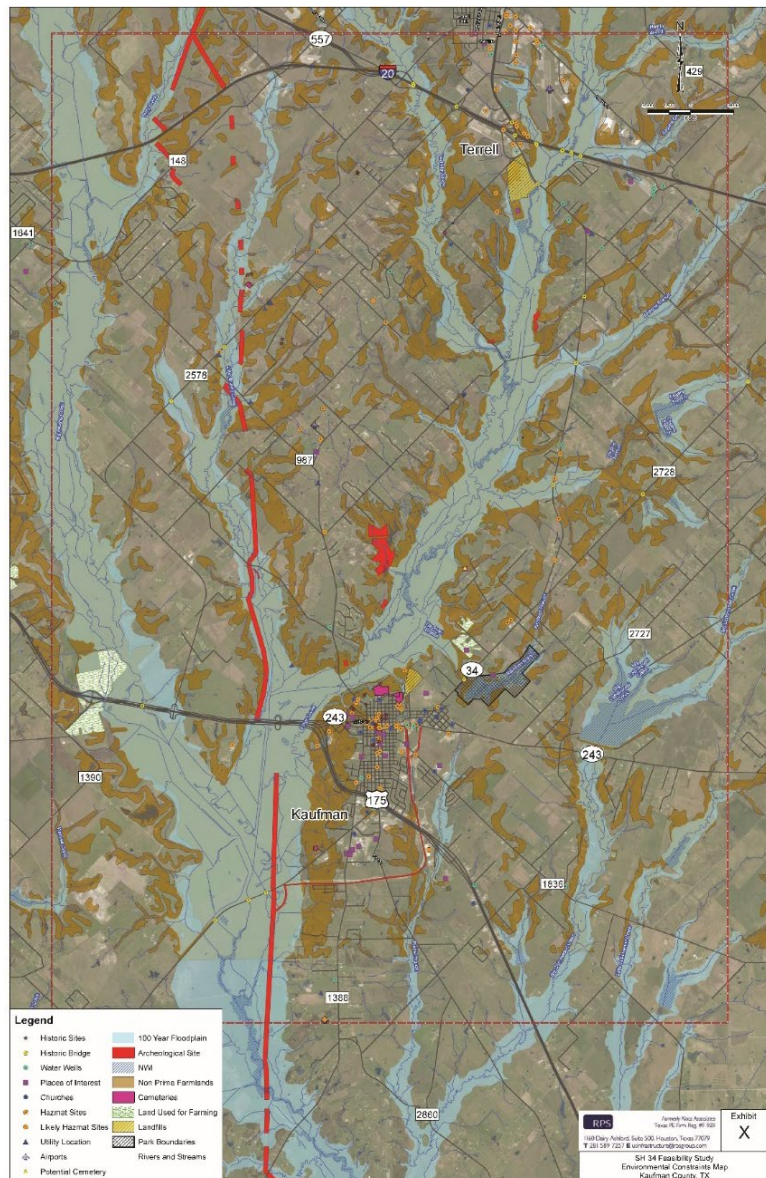


Figure 5 Constraints Map

Public Involvement

Public involvement and stakeholder outreach were conducted and used to inform the public, local officials and major stakeholders of the ongoing SH 34 project activities throughout this feasibility study. Input is one of many factors that TxDOT considers when making decisions about the future of SH 34.

TxDOT was able to engage, inform, and obtain feedback from the public by employing several avenues of public outreach including the following:

- Kickoff Stakeholder Meeting
- Two rounds of public meetings during which TxDOT collected input
- City of Oak Ridge coordination after Public Meeting #2

Stakeholder Meeting

A Stakeholder Kickoff meeting was held on April 12, 2018 to meet with key stakeholders to introduce the feasibility study and answer questions prior to the public meeting as well as help to announce and promoting engagement at the public meeting. A presentation was displayed including a brief history of the SH 34 project, followed by a description of the issues with the existing facility and the process by which these issues would be addressed. Stakeholder comments/questions included:

- Are improvements to SH 34 within the current regional (NCTCOG) plan?
- How would a new alignment for SH 34 would affect property values?
- Can current drainage issues along the existing SH 34 be addressed as part of ongoing maintenance?
- If a new location alternative is selected, who would have maintenance responsibilities for the existing SH 34?

Invitees included:

- Cities of Terrell, Kaufman, Post Oak Bend, and Oak Ridge – all council members, Mayor, and City Manager
- Kaufman County – County Judge, Commissioners
- Kaufman Independent School District (ISD) – Superintendent and Director of Transportation
- Terrell ISD – Superintendent and Director of Transportation
- Emergency Service Providers – Terrell and Kaufman Fire and Police, Kaufman County Sheriff
- NCTCOG – Liaison for Regional Transportation Council
- TxDOT project team

A list of invitees for the stakeholder meeting is included in **Appendix 7**. The Stakeholder Presentation is included in **Appendix 8**.

Public Meetings

The first Public Meeting was held June 28, 2018 at the Kaufman High School cafeteria. A presentation was played on a continuous loop for public review including an overview of the study, brief history of the SH 34 project, followed by a description of the issues with the existing facility and the process by which these issues would be addressed. TxDOT also presented eight alternative alignment corridors and solicited feedback on the alternatives. The corridors were four lane divided corridors with a wide median for safety, except as it approached existing tie-ins near Terrell and Kaufman to match the existing facilities. Public comments/questions included:

- Concerns regarding safety of existing SH 34 including:
 - Significant Heavy Truck Traffic utilizing SH 34 (20%)
 - Significant number of driveways and cross streets along SH 34 leads to crashes
 - Limited sight distance in some areas
- Concerns regarding significant number of displacements along existing routes – including SH 34 and FM 2578
- Concerns regarding noise and safety impacts to adjacent residences for any SH 34 alternative
- Desire to utilize the recently completed SH 34 southern reliever route south of Kaufman
- Desire to serve Terrell to Kaufman linkage-not bypass Kaufman.

Public Meeting materials can be viewed on the public meeting webpage: <https://www.txdot.gov/inside-txdot/projects/studies/dallas/sh34-feasibility-study.html>. The Public Meeting #1 Presentation is included in **Appendix 9**.

For the second round of engagement, a Virtual Public Meeting was available from Sept. 24 – Oct. 9. A presentation was developed to provide background information on the purpose of the study, share analysis of different alignment corridors considered, present the recommended alternative (upgrade the existing SH 34), and share next steps and collect public comments. Public comments/questions included:

- Concerns that one on one meetings with City of Oak Ridge did not occur prior to the Public Meeting #2
- Concerns regarding impacts to property along SH 34
- Concerns regarding the proposed roadway width
- Support for the improvements to the existing SH 34

Public meeting materials and the Virtua Public Meeting can be viewed online at : <http://www.KeepItMovingDallas.com/SH34>. Public Meeting #2 Presentation is included in Appendix 10.

City of Oak Ridge Coordination after Public Meeting #2

From September 2020 to May 2021, coordination meetings were held between City of Oak Ridge representatives and TxDOT staff to discuss alternatives to reduce impacts of widening SH 34 through the City of Oak Ridge on the adjacent development. Alternatives were considered to develop a new location four lane SH 34 to the east or west of the existing highway as well as revisions to the typical roadway section including:

- Various right-of-way widths from 140' desirable to 110' minimum.
- Various median types and widths including no median, flush median and raised median.
- Adding shoulders to accommodate farm and postal delivery vehicles.
- Adding curbs and enclosing the storm water in an enclosed system to reduce the right of way footprint and add safety or utilizing ditches to accommodate runoff.

The City and TxDOT agreed that a new alignment alternative would not be feasible as the City is unable to maintain the existing SH 34 if it were brought off system. During the schematic and environmental evaluation phase, the right of way requirements will be determined based upon the geometric requirements of the median, shoulder and storm drainage alternative selected.

Corridor Development and Evaluation

Before any corridor alternatives were developed, a technical methodology plan was developed to ensure an unbiased evaluation process. Each of the alternative corridors and alignments were evaluated using the technical methodology.

The purpose of the SH 34 Feasibility Study is to improve mobility, while achieving compatibility with the community, and providing cost effective/feasible solutions. Therefore, the effectiveness of each alternative corridor/alignment was evaluated using a wide range of criteria which support the four primary project goals: Enhanced Mobility and Safety, Cost Effectiveness, Engineering Feasibility, and Minimal Environmental Impacts.

Proposed Roadway Configuration

Based upon the project needs to maximize safety and mobility, two typical sections were developed to accommodate current and future mobility needs for the corridor. The two sections include a rural 4-lane typical section with a 76' median and an urban 4-lane typical section with a narrow median for segments with extensive constraints. The Design Criteria is shown in **Appendix 6**.

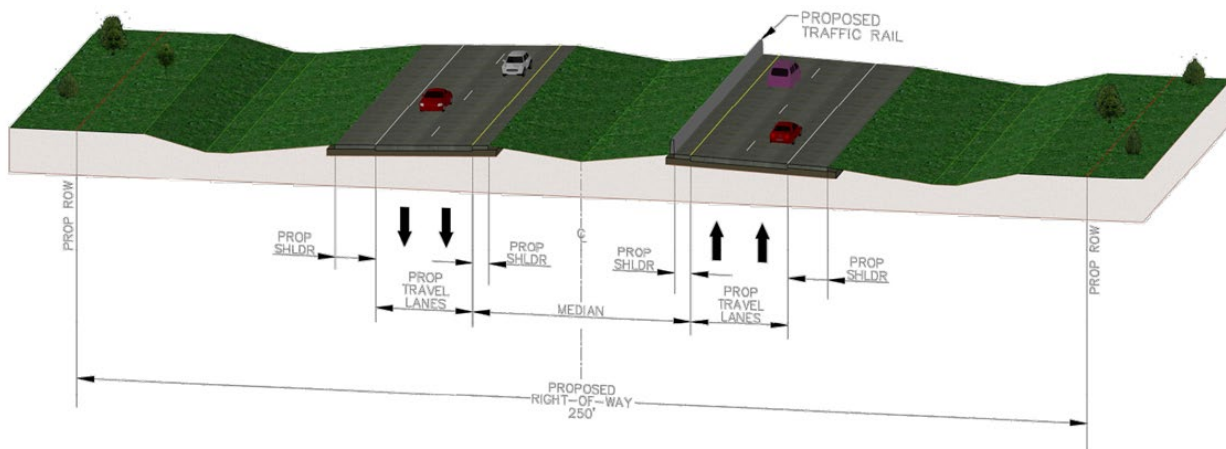


Figure 7 Proposed Rural Typical Section

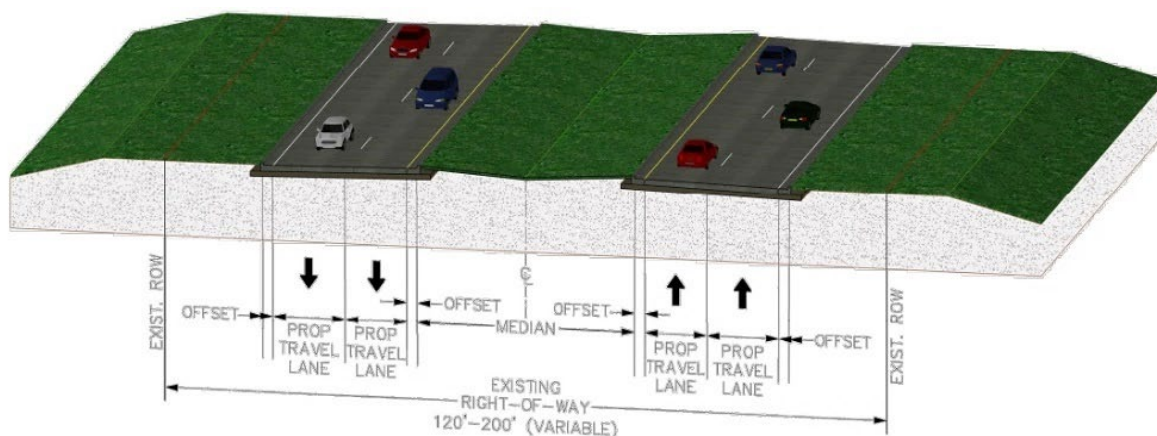


Figure 8 Proposed Urban Typical Section

Alternatives Development

The next step was to identify alternative corridors, 250 feet in width, in the study area based on minimizing impacts to identified constraints. The alternative corridors represent general areas for further detailed study. Once potential corridors were identified, a more detailed environmental evaluation was conducted within that specific area including field visits to confirm impacts. Over 32 alternative corridors were identified and evaluated under a three-step evaluation of progressively more detailed evaluations. The three-step evaluation included:

- Level 1: Fatal Flaw and Order of Magnitude Analysis
- Level 2: Reasonable Alternative Alignment Analysis Matrix
- Level 3: Preferred Alternative Evaluation

The SH 34 Feasibility Study utilized a decision-making framework to determine how well each of the developed alternatives meets the purpose and need of the study goals. A multi-level screening process was used to identify which of the alignment options best solve the transportation problems within the corridor.

Once a universe of alternatives had been developed, the screening process was applied. The first level in the corridor evaluation involved a qualitative screening based on the purpose and need and alternative corridors were grouped with similar alternative corridors to identify the best of these groupings. This eliminated some options and reduced the original alternatives down to eight Preliminary Alternatives.

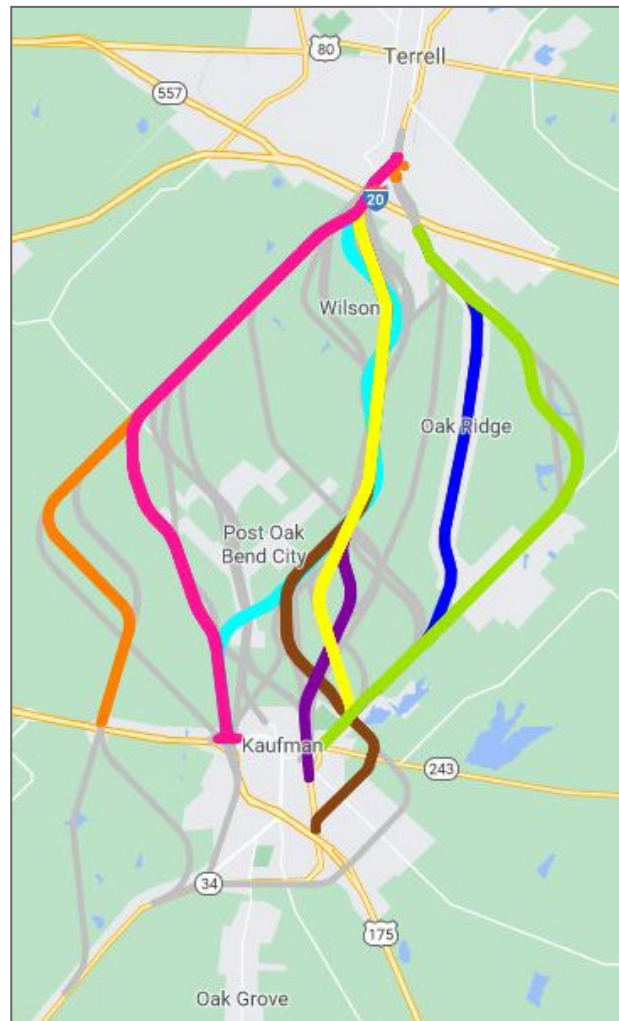


Figure 6 Feasibility Study Initial Alternative Corridors

Fatal Flaw and Order of Magnitude Analysis

The identified 32 alternative corridors were consolidated to eight alternative corridors by grouping similar corridors and selecting the best alternative for each group. The rationale for consolidation is presented below.

Table 5

Alignment Alternative	Corridor Grouping	Reason Alignment Alternative Eliminated	Superseded by
1	West	7 more displacements than alignment 2	2
2	West	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
3	West	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
4	West	<ul style="list-style-type: none"> 6 more displacements than alignment 3 encroaches on cemetery property 	3
5	West	9 more displacements than alignment 3	3
6	West	<ul style="list-style-type: none"> 16 more displacements than alignment 3 encroaches on cemetery property encroaches on Hazmat sites Runs through Water Tower 	3
7	West	<ul style="list-style-type: none"> 20 more displacements than alignment 3 encroaches on Power Substation 	3
8	West	<ul style="list-style-type: none"> 20 more displacements than alignment 3 encroaches on 4F Property encroaches on landfill 	3,17
9	Central	<ul style="list-style-type: none"> 5 more displacements than alignment 10 Must construct interchange at US 175 Approx. 3 miles longer than alignment 10 	10
10	Central	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
11	Central	<ul style="list-style-type: none"> 3 more displacements than alignment 10 Must construct interchange at US 175 Approx. 1 miles longer than alignment 10 	10
12	Central	<ul style="list-style-type: none"> 3 more displacements than alignment 14 encroaches on cemetery property 	14
13	Central	2 more displacements than alignment 17	17
14	Central	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
15	Central	more ROW area required than alignment 14	14
16	Central	<ul style="list-style-type: none"> 1 mile longer than alignment 17 Number of Parcels impacted greater than alignment 17 	17
17	Central	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
18	Central	17 more displacements than alignment 32	32
19	Central	encroaches on electrical substation ROW	17
20	Central	<ul style="list-style-type: none"> encroaches on Electrical Substation ROW broke back horizontal curve in alignment, splits large property 	14
21	Central	<ul style="list-style-type: none"> encroaches on Electrical Substation ROW encroaches on landfill 	17
22	Central	<ul style="list-style-type: none"> encroaches on Electrical Substation ROW more flood plain encroachment than alignment 17 	17

Alignment Alternative	Corridor Grouping	Reason Alignment Alternative Eliminated	Superseded by
23	Central	<ul style="list-style-type: none"> encroaches on Electrical Substation ROW encroaches on Water treatment Plant ROW comes in close vicinity of rural neighborhood 	14
24	Central	Tie-in to Terrell at existing SH 34 instead of FM 2578, requires extra creek crossing and occupies more flood plain than alignment 14	14
25	Central	majority of alignment located within floodplain, increasing construction costs and decreasing development possibilities for adjacent land.	17
26	Central	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
27	Central	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
28	West	Tie-in to SH 34 is at undesirable location and requires steep horizontal curves	2
29	East	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward
30	East	alignment runs through Soil Conservation Service Site 57 Reservoir	29
31	East	7 more displacements than alignment 29	29
32	East	Not Applicable-Alternative Corridor Carried Forward	Not Applicable-Alternative Corridor Carried Forward

Once the corridors were consolidated, the second level of evaluation used a more quantitative approach based on the study goals. Alternatives were renamed by color to limit evaluation bias. The eight Reasonable Alternative corridors were labelled Orange, Pink, Light Blue, Brown, Purple, Yellow, Blue and Green.

Reasonable Alternatives Analysis

The Reasonable Alternatives were evaluated using all the data collected, however, since most of the impacts were similar across the Reasonable Alternatives, the criteria which made the most significant differences were combined into the alternative matrix that follows.

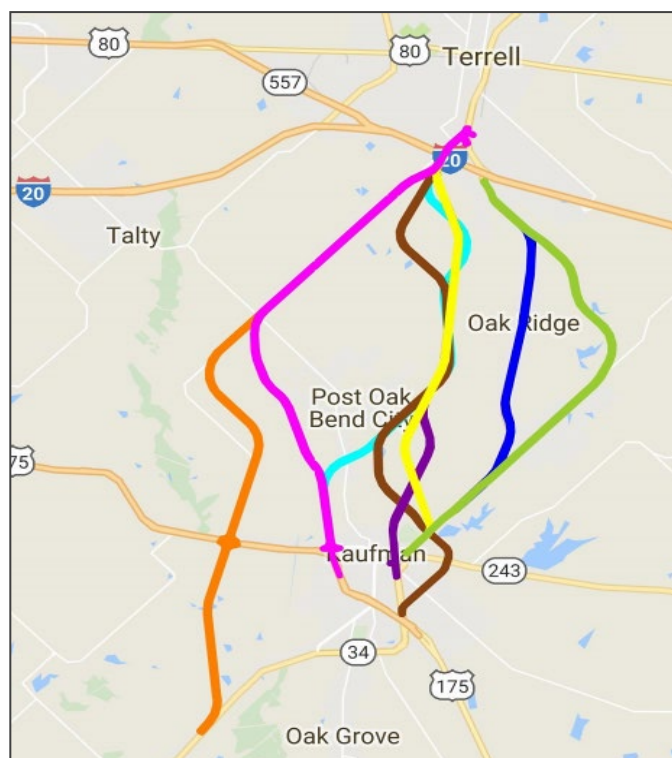


Figure 9 Reasonable Alternative Corridors

Quantitative Alternative Matrix

Criteria	Orange	Pink	Light Blue	Brown	Purple	Yellow	Blue	Green
Alignment Length (miles)	14.86	11.11	10.75	11.89	9.66	9.34	8.68	9.99
Estimated ROW Acquisition (ac)	365.27	266.33	292.48	308.98	263.77	233.26	173.13	217.50
Total # of Parcels	109	74	38	63	74	68	142	119
Displaced Residential	20	16	0	0	9	15	63	46
Displaced Commercial	1	1	0	0	10	2	11	8
Impacted Commercial (not displaced)	1	2	1	4	0	5	8	6
# of Homes within 500'	62	52	13	145	69	112	217	193
Archeological Sites	0	0	1	1	0	0	0	0
Stream Crossings	4	4	3	4	3	3	3	3
Hazmat Sites	0	0	0	0	1	1	3	1
Cemeteries (ac)	0	0	0	0	0.76	0	0	0
Construction Cost (\$M)	\$ 133.8	\$ 108	\$103.5	\$ 99	\$ 74.8	\$ 74.6	\$ 80	\$ 88.1
Estimated ROW Costs (\$M)	\$ 9.8	\$ 8	\$ 3.2	\$ 3	\$ 6.7	\$ 5.3	\$ 18.4	\$ 15.1
Total Project Cost (\$M)	\$ 143.6	\$116.1	\$106.7	\$102.1	\$ 81.5	\$ 79.9	\$ 98.4	\$ 103.2

Based upon feedback from the first Public Meeting concerning which aspects the attendees and commenters identified as critical elements, two criteria were identified as critical discriminators for the new location corridors:

- Reduced displacements
- Connection to recently constructed eastern reliever route

Based upon these two criteria, the three alternative corridors were identified with the least relative displacements while maintain the benefits of enhancing safety and mobility were the Light Blue, Brown and Yellow Alternatives.

Criteria			Light Blue	Brown		Yellow		
Alignment Length (miles)			10.75	11.89		9.34		
Estimated ROW Acquisition (ac)			292.48	308.98		233.26		
Total # of Parcels			38	63		68		
Displaced Residential			0	0		15		
Displaced Commercial			0	0		2		
Impacted Commercial (not displaced)			1	4		5		
# of Homes within 500'			13	145		112		
Archeological Sites			1	1		0		
Stream Crossings			3	4		3		
Hazmat Sites			0	0		1		
Cemeteries (ac)			0	0		0		
Construction Cost (\$M)			\$103.5	\$ 99		\$ 74.6		
Estimated ROW Costs (\$M)			\$ 3.2	\$ 3		\$ 5.3		
Total Project Cost (\$M)			\$106.7	\$102.1		\$ 79.9		

The three preferred alignment alternatives, shown all connect to the existing SH 34 north of Interstate 20 and tie into SH 34 in Kaufman either using SH 175 or connecting to SH 34 east of Kaufman.

The three new location alternatives were compared against an upgraded SH 34 alternative with a reduced right of way footprint, using urban roadway design criteria, to limit impacts and the results presented in the matrix below. The table below highlights the differences between the alternatives. Generally, the new location corridors required significantly more new right of way (three to four times the amount of new right of way required to improve the existing SH 34) and more floodplain impacts while utilizing the existing 34 alignment required reduced right of way and impacted the properties already impacted by SH 34 traffic.

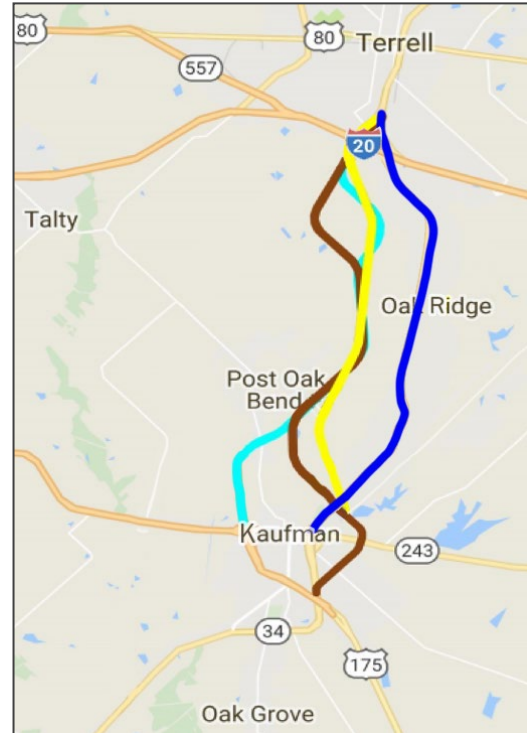


Figure 10 Preferred Alternative Corridors

Property Impacts Evaluation

Evaluation Criteria	No Build	Light Blue	Brown	Yellow	Existing SH 34 Blue
		Rural 250' ROW	Rural 250' ROW	Rural 250' ROW	Urban 140' ROW, 45 MPH
Estimated ROW Acquisition (ac)	0	314	298	242	76
Total Number of Parcels	0	48	58	72	176
Impacted Residential (Not Displaced)	0	3	5	3	58
Displaced Residential	0	2	2	14	21
Impacted Commercial (Not Displaced)	0	1	2	4	8
Direct Displaced Commercial	0	0	0	2	3
Induced Displaced Commercial	0	0	0	0	0
Future Development Impacts	0	0	1	0	0

Environmental Impacts Evaluation

Evaluation Criteria	No Build	Light Blue	Brown	Yellow	Existing SH 34 Blue
		Rural 250' ROW	Rural 250' ROW	Rural 250' ROW	Urban 140' ROW, 45 MPH
Area Inside 100-year Floodplain (ac)	0	54	45	75	18
Park Properties Impacted (4f)	0	0	0	1	1
Hazmat Sites	0	0	0	1	4

Socio-Economic Impacts Evaluation

Enhance Regional Mobility	–	++	++	++	+
Satisfies Travel Demand for Year 2045	–	++	++	++	++
Reduces Crash Risk	–	+	+	+	+
Supports Future Regional Economic Growth	–	++	++	++	+

Cost Evaluations

Evaluation Criteria	No Build	Light Blue	Brown	Yellow	Existing SH 34 Blue
		Rural 250' ROW	Rural 250' ROW	Rural 250' ROW	Urban 140' ROW, 45 MPH
Construction Cost	\$ -	\$ 101,300,000	\$ 90,413,000	\$ 74,808,000	\$ 90,536,000
Maintenance Cost (20-year design life)	\$ 5,930,000	\$ 10,150,000	\$ 10,506,000	\$ 9,734,000	\$ 3,536,000
Utility Relocation Cost	\$ -	\$ 668,000	\$ 682,000	\$ 686,000	\$ 1,580,000
Estimated ROW Costs	\$ -	\$ 3,738,000	\$ 3,790,000	\$ 8,488,000	\$ 9,267,000
Engineering Costs	\$ -	\$ 6,078,000	\$ 5,425,000	\$ 4,489,000	\$ 5,433,000
Total Project Cost	\$ 5,930,000	\$ 121,934,000	\$ 110,816,000	\$ 98,205,000	\$ 110,352,000

Recommendation

The public-reviewed alternatives analysis for SH 34 resulted in the selection of a “Recommended Alternative “. This Recommended Alternative is to utilize the existing SH 34 corridor, since it would maintain TxDOT maintenance of the existing SH 34 corridor, accommodate access to existing development along SH 34, and reduce encroachment on floodplains and undeveloped land. Based upon this selection, it is recommended that the alternative be carried forward to further development of the alternative and funding.

The next step in the development of SH 34 is to:

- Add improvements to the SH 34 corridor to the NCTCOG regional plan, and
- Add engineering level of authority to the corridor to perform the post-study Roadway Design Schematic and Environmental Studies phase to further refine the alternative and minimize adverse impact to the corridor.

Funding

No funding sources have been currently identified to construct the Recommended Alternative; however, funding could be identified from national, state, and local funding sources. Future pursuits to identify specific funding sources may include discussions with, or funding

allocations involving, TxDOT, the NCTCOG, Kaufman County, SH 34 corridor municipalities, the Unified Transportation Plan (UTP), and the Transportation Improvement program (TIP).

The Recommended Build Alternative is not currently included in the region's MTP or TxDOT's UTP but would need to be included in those documents as well as the TIP. The UTP is TxDOT's statewide 10-year plan that guides the development of transportation work across the state. Organized into 12 funding categories, with each one addressing a specific type of work, the UTP authorizes the distribution of construction dollars expected to be available over the next 10 years. The outcome of the UTP process is a list of projects TxDOT intends to develop or begin constructing over the next 10 years, as well as information on the available funding associated with those projects.

The funding categories SH 34 would be eligible for would likely include categories 2, 4, and 12. The funding allocation for the 2020 UTP for these categories for projects in the TxDOT Dallas District, which includes Kaufman County, totals \$38,442,260,000 and are as follows:

- Category 2 (Metropolitan and Urban Corridors) – \$11,481,710,000 for the DFW region which includes the Dallas, Fort Worth and Paris TxDOT Districts, an average of approximately \$1.15 billion per year for three districts.
- Category 4 (Connectivity Corridors) – \$11,220,550,000 for the Dallas District, an average of approximately \$1.12 billion per year for the District.
- Category 12 (Strategic Priority) – \$15,740,000,000 for the Dallas District, an average of approximately \$1.60 billion per year for the District.

However, it is important to note there are many transportation needs in the DFW region which would need to also utilize these categories. In fact, according to NCTCOG, the region's most current 10-year plan contains \$7 billion in transportation projects that need funding in the DFW region from FY 2021-2029. The funding in UTP is allocated already to other projects, but those funds could be moved to new projects. The UTP is updated every year.

The current estimated cost for the Recommended Alternative (\$110.4 million in 2020 dollars) is within the amount the Dallas District receives in Category 12 funding for each of the UTP's 10 years. TxDOT, Kaufman County, and NCTCOG plan to continue to work together to identify funding as this project (Recommended Alternative) moves forward.

Timeline

No definite or planned timeline has been established for the post-Study phase of developing the SH 34 Recommended Build Alternative. However, successive timeline phases currently envisioned by TxDOT are listed below and remain subject to change, particularly since no funding has been assigned to construct the Recommended Build Alternative.

- 2 to 4 years – SH 34 Roadway Schematic Design, Environmental Studies and Public Involvement (Public Meeting & Public Hearing)

- 5 to 8 years – SH 34 Final Design, Construction Plans and Utilities Coordination
- 9 to 11 years – Phased SH 34 Construction

After the future Roadway Schematic Design and Environmental Studies are finalized, and the Public Hearing is conducted, ROW preservation required to construct the Recommended Alternative should occur via land use planning and ROW acquisition.

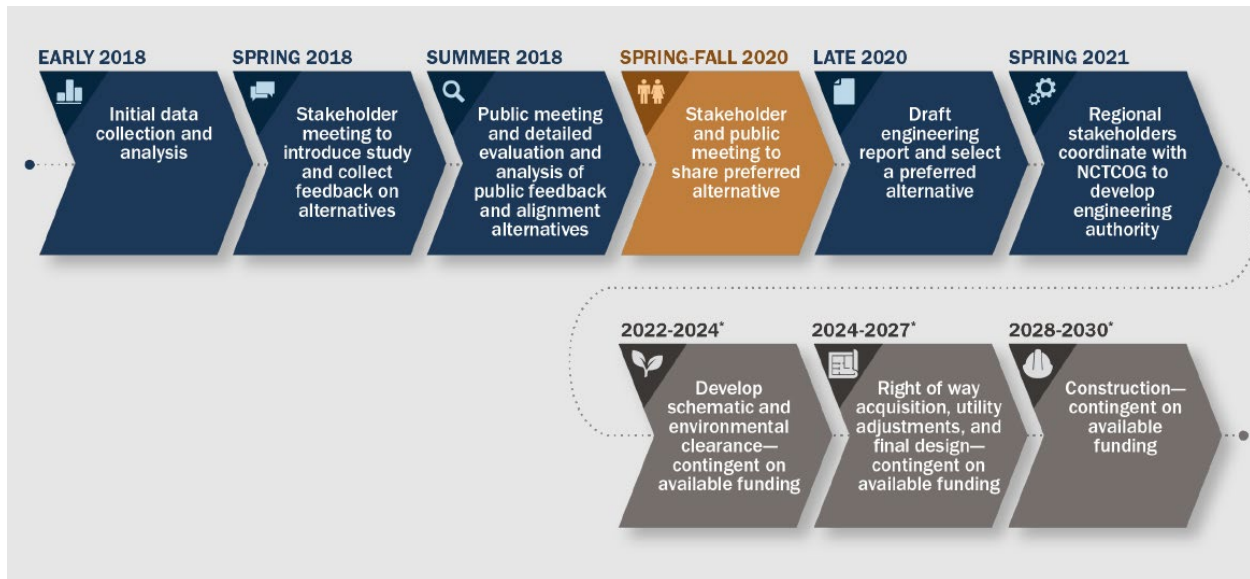


Figure 11 Project Schedule (Presented at PM #2)

Roadway Design Schematic and Environmental Study Analysis

Further evaluation within a future SH 34 Roadway Design Schematic and Environmental Studies phase would assess and evaluate in more detail the following environmental constraint topics:

- Land Use
- Hazardous Materials
- Threatened and Endangered Species/Habitat
- Vegetation
- Cultural Resources
- Waters of the U.S. (including Wetlands)
- Floodplains
- Soils
- Socio-Economic
- Traffic Noise
- Air Quality

The future Environmental Studies would also include documented constraint recommendations or determinations and related exhibits which would include:

- Project Location Map
- USGS Topographic Map
- 2020 Census Tracts
- Land Use
- Environmental Constraints Map
- FEMA Floodplain
- Historic Resources
- Hazardous Material Sites
- Photographs

Safety upgrades provided by the Recommended Alternative are a curbed median separating the bi-directional SH 34 traffic and providing a slow speed dedicated left turn lane, removal of the awkward roadway alignment curvature. Relatedly, the Alternative Refinements would include upgrades to the various existing SH 34 and cross-street intersections via traffic flow, mobility operations and travel lane capacity upgrades. To achieve a multi-modal solution, the Alternative Refinements would provide pedestrian and bicyclist accommodation and access in the form of continuous Shared Use Path/ sidewalk installations along the entire corridor and at the cross-street intersections.

Also, the SH 34 Roadway Design Schematic will include more in-depths SH 34 drainage analysis which would include:

- Survey coordination and review;
- Roadside Ditch and storm sewer analysis;
- Roadway Drainage, channel design, scour analyses, or erosion control;
- Bridge and culvert design layout sheets;
- Hydraulic data sheets for all crossings;
- Floodplain / floodway mapping;
- Storage / Detention analysis; and
- FEMA submittals (CLOMR / LOMR).