

**TIERED ENVIRONMENTAL ASSESSMENT
TO THE LEWISVILLE LAKE PROGRAMMATIC
ENVIRONMENTAL ASSESSMENT**

**Proposed Lewisville Lake Toll Bridge Project
With Addition of Approach Roads and Toll Plaza**

Lewisville Lake, Denton County, Texas



Prepared for

Lewisville Lake Project Office

By

**U.S. Army Corps of Engineers
Fort Worth District**

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DRAFT FINDING OF NO SIGNIFICANT IMPACT

PROPOSED IMPLEMENTATION OF THE LEWISVILLE LAKE TOLL BRIDGE PROJECT WITH ADDITION OF APPROACH ROADS AND TOLL PLAZA AT LEWISVILLE LAKE, DENTON COUNTY, TEXAS

Description of Action. The United States Army Corps of Engineers (USACE) assessed potential impacts to the environment that may result from the out granting of USACE property at Lewisville Lake, Texas. Because the proposed action involves Federal interests in property, it is considered a Federal action and as such requires compliance with the National Environmental Policy Act (NEPA) of 1969, as amended. This Tiered Environmental Assessment (TEA) and Finding of No Significant Impact (FONSI) address Denton County's need to obtain easements for construction of a new toll plaza and approach roads for the proposed Lewisville Lake Toll Bridge Project. The TEA addresses the changes to the proposed Lewisville Lake Toll Bridge Project that have come to pass since the FONSI was signed for the Lewisville Lake Programmatic Environmental Assessment (PEA). The bridge is now proposed to be a toll bridge instead of a toll-free bridge. This change would necessitate the addition of a toll plaza, which would require a small increase in the amount of Federal land to be disturbed. The most significant change would be primarily socioeconomic in that the toll bridge users would be required to pay a fee.

Anticipated Environmental Effects. The TEA evaluated three tollway bridge alternatives to address changes to the PEA that would result from conversion of the freeway bridge to a tollway bridge. Evaluation of project costs and environmental impacts indicated that Alternative 2, a tollway facility with retaining walls, was the preferred alternative. The proposed toll bridge facility would consist of four 12-foot wide travel lanes. The PEA recommended 80-foot wide ROW would be increased to 175-foot wide within the toll plaza facility requiring the use of an additional 0.43-acre of USACE property. To elevate the toll bridge facility above the flood pool elevation and minimize impacts to USACE property, retaining walls with approximately 2,050 linear feet of fill would be required resulting in the loss of an additional 14,000 cubic yards of flood storage. The TEA preferred alternative would result in an additional 0.53-acre of impacts to woodland habitat and a reduction of 0.10-acre of impacts to grassland habitat. The bridge structure would be consistent with the height, span, column configuration, and alignment as described in the PEA.

The TEA preferred alternative would have minor impacts to Waters of the U.S. within Lewisville Lake and along an unnamed tributary of Lewisville Lake. Short-term construction-related discharge of dredged or fill material, potential for increased erosion, and inputs of small amounts of oil and grease from construction-related equipment would be minimized during and following construction by utilizing erosion, total suspended solids, and sediment control devices as required for water quality by the Texas Pollutant Discharge Elimination System (TPDES) general permit for construction activity. The proposed project would use Nationwide Permit (NWP) #14 (Linear Transportation Crossings) for discharges to Waters of the U. S. The TEA preferred alternative would not have any significant negative impacts to the existing geology, soils, ground water, wetlands, socioeconomic amenities, or parklands. The TEA preferred alternative is not likely to adversely affect plant or animal species that are proposed or listed as threatened or endangered. No existing historical, archeological, or hazardous waste concerns were identified on USACE property. Impacts to existing wildlife habitat would be mitigated through 9.75 acres of woodland and 1.48 acres of grassland plantings within the Lewisville Lake Environmental Learning Area. Long-term water quality impacts to Lewisville Lake due to bridge stormwater runoff would be minimized through installation of bridge deck drains, a piping system, and oil/water/debris separators. Impacts to Lewisville Lake flood storage would be mitigated through removal of appropriate amounts of fill material from the Garza-Little Elm (Lake Dallas) Dam.

Conclusions. Based on review of information contained in this TEA, it is concluded that the out granting of Government lands for the construction of Lewisville Lake toll bridge facilities is not a major Federal action, which would significantly affect the quality of the human environment within the meaning of Section 102(2)(c) of the National Environmental Policy Act of 1969, as amended. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

John R. Minahan
Colonel, Corps of Engineers
District Engineer

Date

EXECUTIVE SUMMARY

This is a Tiered Environmental Assessment (TEA) to the Lewisville Lake Programmatic Environmental Assessment (PEA), as prepared by the U.S. Army Corps of Engineers, Fort Worth District (USACE), in August 1999. The bridge across Lewisville Lake and the connecting approach roads are a part of the original PEA. This TEA is necessary due to the changes to the proposed Lewisville Lake Bridge crossing in Lewisville Lake, Texas. The proposed bridge design was changed from a freeway to a tollway facility due to a shortage of project funds. Without this change, the proposed bridge would not be constructed. The proposed changes include:

1. Status changed from freeway to tollway; and
2. The addition of a toll plaza and the necessary expanded Right of Way (ROW) required for the toll plaza.

The PEA was conducted in accordance with the National Environmental Policy Act (NEPA) of 1969 and implementing regulations. The PEA discusses the environmental impacts of more than 300 foreseeable individual development activities being proposed by eighteen public and private entities on Federal lands around Lewisville Lake. These activities were assessed to properly evaluate the cumulative impacts of all of these developments.

Over 300 PEA activities were grouped into categories by either similar actions, connected actions, or actions that would have cumulative affects. The resulting nine categories were:

1. Bridges and Roadways;
2. Water Related Recreation Use Facilities;
3. Existing Park Enhancements;
4. Utilities;
5. Golf Courses;
6. Habitable Structures;
7. Hike, Bike and Equestrian Trails;
8. Land Use Classification Changes; and
9. Miscellaneous Activities.

Thirty of the over 300 activities were assessed and removed from further environmental evaluation and consideration. These activities would require additional information, redesign, and/or require additional environmental analysis. However approximately 270 activities were assessed and resulted in no significant adverse impacts, either individually or cumulatively, as long as the projects are designed to adhere to applicable regulations, policies, mitigation requirements, and standards and guidelines. These activities were recommended for Finding of No Significant Impact (FONSI).

The TEA to the Lewisville Lake PEA did not identify any natural or cultural resources that would be impacted by the proposed project. A comprehensive archaeological survey of the proposed road alignment and toll plaza area did not identify any resources. The Federal Aviation Administration (FAA) has determined that the proposed bridge with pole mounted lighting is presumed to be of no hazard to air navigation. The three water wells near Garza Lane, upon further review of design schematics, do not appear to be adversely impacted by the proposed project actions. The environmental screen questionnaire did not identify any significant issues that would affect the proposed project. Oil/water separators would be designed for the project so that surface water run-off from the proposed bridge would not adversely affect Lewisville Lake. Mitigation plans would be prepared when and where needed once final design is complete and construction begins. The result of this TEA for the proposed Lewisville Lake Toll Bridge

Project suggests that no additional environmental investigation is warranted. Lewisville Lake statistical data is listed below in **Table ES-1**.

TABLE ES-1 - LEWISVILLE LAKE STATISTICAL DATA

<u>Dam</u>	
Length (including spillway)	32,888 feet
Height (above streambed)	125 feet
Width of crown (maximum)	20 feet
Top elevation (above msl)	560 feet
<u>Flood-Control Outlets</u>	
Three gate-controlled intakes	Each 6.5 feet wide and 13 feet high
One circular flood control conduit	16-foot diameter
<u>Water-Supply Outlets</u>	
Two gate-controlled discharge conduits	60-inch diameter
<u>Emergency Spillway</u>	
Length	560 feet
Crest elevation (above msl)	532 feet
<u>Reservoir</u>	
Capacity (flood-control pool)	325,700 acre-feet
Capacity (conservation pool)	555,000 acre-feet
Area (flood-control pool)	39,080 acres
Area (conservation pool)	28,980 acres
Shoreline (conservation pool)	187 miles
Conservation pool elevation (above msl)	522 feet
Flood pool elevation (above msl) - 100-year flood	537 feet

Source: Lewisville Lake Programmatic Environmental Assessment, USACE, 1999, p. 2

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I. INTRODUCTION

According to the May 31, 2000 *Lewisville Lake Corridor Study*, Lake Dallas was constructed in the 1920's. After completion of the Garza Dam in 1928, water storage on the Elm Fork of the Trinity River began in 1928. In 1948, the United States Army Corps of Engineers (USACE) initiated construction on the Lewisville Dam and the Garza-Little Elm Reservoir because silt accumulation had significantly reduced the water storage capacity of Lake Dallas. In, 1957, the Garza Dam was breached to consolidate the waters of Lake Dallas and Garza-Little Elm Reservoir. This flooded and closed SH-24.

The closure of SH-24 eliminated the only direct route to the eastern side of Lewisville Lake. The 1980 Denton County Transportation Plan assessed the long-term needs of the county. The study also identified the need for a new-location four-lane undivided roadway running from FM-720 through the southern area of Oak Point, west across the lake to Shayan's Point to I-35E on a new alignment between Shady Shores Road and Dobbs Road.

The 1993 *Lewisville Lake Bridge Crossing Feasibility Study* (LLBCF) determined need, identified feasible alternatives, conducted public meetings, selected a technically preferred alternative, conducted environmental studies, and held a public hearing to establish a locally preferred alternative. In 1995, Denton County completed an Environmental Overview Study (EOS) that expanded on the LLBCF. The EOS did not identify any substantial impacts; therefore, Denton County began purchasing eighty feet of ROW for the preferred alternative after completion of the EOS.

In accordance with the National Environmental Policy Act of 1969 (NEPA), a Programmatic Environmental Assessment (PEA) was conducted for Lewisville Lake. The PEA addressed the environmental impacts for over 300 foreseeable individual activities proposed by eighteen public and private entities on Federal Lands within 10 years of the PEA. This included the cumulative impacts of these proposed projects and the environmental impacts resulting from the construction of a proposed new roadway facility connecting FM-720 to IH-35E bridged over Lewisville Lake and running through Lake Dallas.

The proposed project discussed in the PEA consisted of a new-location roadway with two 12-foot travel lanes (one in each direction) and 6-foot wide outside shoulders within an 80-foot wide ROW providing for future expansion to a four-lane facility. The proposed Lewisville Lake Bridge would be required to have a minimum of 52 feet of clearance above the uncontrolled spillway elevation for a total span of 360 feet with support columns spaced on 120-foot centers. This requirement would allow clearance of sailboat masts during periods of high water.

A Finding of No Significant Impact (FONSI) was obtained for the PEA in September 1999. Denton County voters approved The Safer Roads Bond Program with 63.56% voters in favor of this program in January 1999. The bond election approved \$2,750,000 for the construction of a bridge facility across Lewisville Lake.

II. PROPOSED ACTION AND ALTERNATIVES

Project Description

There has already been an extensive amount of design and environmental survey work performed on the proposed Lewisville Lake bridge crossing. In November 1993, Denton County completed the LLBCF Study on the proposal, including determinations of the need and type of facility, and identification and evaluation of various alternatives. Subsequently, in January 1995, Denton County completed the EOS, which included public involvement and evaluation of the potential environmental impacts of the feasible

alternatives recommended in the November 1993 Feasibility Study. The August 1999 PEA evaluated the environmental impacts of the Lewisville Lake bridge crossing. The PEA's recommended plan involves construction of a new roadway from IH-35E to FM-720 including a new bridge over Lewisville Lake (see **Figures 1, 2, and 3**). The route would utilize existing roadways in some locations and would require construction of a new roadway in other areas. For a detailed analysis of these alternatives, including the true no action alternative, please refer to the August 1999 PEA and Denton County's 1995 EOS. Because any changes to the alignment of the preferred alternative are within the scope anticipated and analyzed by the 1999 PEA, the alignment will not be discussed in detail for this Tiered Environmental Assessment (TEA).

This TEA to the PEA is necessary due to recent changes in the proposed Lewisville Lake bridge crossing. All proposed alternatives in the TEA would be compared to the recommended plan identified in the 1999 PEA. Therefore, the PEA recommended plan would serve as the baseline or no action alternative for comparison of proposed alternatives in the TEA. The TEA addresses the impacts to the human environment due to: 1) changing the design from freeway to tollway; and 2) the addition of a toll plaza and necessary ROW associated with the toll plaza. The proposed bridge design was changed from a freeway to a tollway facility due to a shortage of project funds. Without this change, the proposed bridge would not be constructed. The TEA provides a more detailed investigation of ROW requirements and preliminary designs that have been obtained and platted. The following are the results of the environmental review and investigations based on the preliminary design/alignment and locations (HNTB - Schematic - April 2002).

PEA Alternative

There were six different alignment alternatives studied and evaluated in the previous studies including the no action alternative. The applicant selected alternative 5 as the preferred alternative. This alternative consists of two 12-foot wide travel lanes (one in each direction) and 6-foot wide outside shoulders. This would be constructed within the 80-foot wide ROW, providing for the potential future expansion of two additional travel lanes to make a four-lane roadway without having to acquire any additional property. The 1995 EOS did not identify any significant adverse impacts with this alternative.

Tollway Alternatives

The proposed road has been increased from a facility with two 12-foot wide travel lanes to a proposed facility with four 12-foot wide travel lanes that would be located within the 80-foot wide easement for most of the alignment. Modification of the proposed freeway project to a proposed tollway project would require the addition of a toll both facility. This proposed toll bridge facility would result in some minor changes from the PEA; however, the bridge structure for each tollway alternative is consistent with the height, span, column configuration, and alignment as the bridge described in the PEA (see **Figures 3 and 4**). The addition of a toll plaza would require a wider ROW and additional fill on USACE property. The proposed toll plaza would require the bridge to be widened from the proposed configuration to two 11-foot wide and one 12-foot wide lanes separated by two 8.5-foot wide tollbooths in each direction and then taper down to the proposed bridge typical section (see **Figure 5**). The following three build alternatives were analyzed.

Alternative 1 - Toll facility with Side Slopes

This alternative uses approximately 2,050 linear feet of fill with 3:1 to 4:1 side slopes to elevate the proposed toll bridge facility above the flood pool elevation. Side slopes would require the ROW to range from the typical 80-foot wide to a maximum of 325 feet.

Alternative 2 - Toll facility with retaining walls (preferred alternative)

This alternative is the preferred alternative and uses approximately 2,050 linear feet of fill with retaining walls at the edge of the proposed pavement to elevate the proposed toll bridge facility above the flood pool elevation and minimize impacts to USACE property. The toll bridge facility would require the ROW to range from the typical 80-foot wide to a maximum of 175 feet.

Alternative 3 - Bridged toll facility

This alternative uses a bridge structure to elevate the proposed toll bridge facility above the flood pool elevation and minimize impacts to USACE property. The proposed toll bridge facility would require the ROW to range from the typical 80-foot wide to a maximum of 175 feet.

III. EXISTING ENVIRONMENT

A. General Location

The proposed project is located in the cities of Lake Dallas and Little Elm in southern Denton County, Texas. The project would extend from IH-35E to FM-720. The TEA addresses the modification of the PEA facility to include the construction of a toll plaza on USACE property.

B. Property History

Lake Dallas was originally constructed in the 1920's. The Garza Dam constructed on the Elm Fork of the Trinity River and was completed in 1927 and water storage began in 1928. Siltation of Lake Dallas caused the USACE to begin construction of the Lewisville Dam in 1948. Lewisville Lake and the adjacent property between 522 to 537 feet above mean sea level (msl) have been owned, operated, and maintained by the USACE for wildlife management, water storage, and flood storage since the completion of Lewisville Dam in 1955.

C. Current Land Use

The primary land use at Lewisville Lake is flood storage and water conservation. Secondary land use is fish and wildlife management, recreation and hydroelectric power generation. The USACE property between 522 to 537 feet above msl is maintained for wildlife management and flood storage.

D. Geology and Soils

According to the United States Department of Agriculture (USDA) *Soil Survey of Denton County, Texas*, soils along the proposed project belong to two soil map units. The project area on the west bank of Lewisville Lake and on USACE property is located on Altoga silty clay, 3 to 5 percent slopes. The project area on the east bank of Lewisville Lake is located on Ferris-Heiden clays, 5 to 15 percent slopes. Altoga silty clay is a deep, clayey gently sloping soils found on high terraces of major streams. This soil is well-drained, medium runoff and moderate permeability with a high available water capacity. Ferris-Heiden clay is a slopping to moderately steep soil that is found on convex ridges and on the sides of drains. This complex is well drained and has rapid runoff and very slow permeability with a high available water capacity.

The proposed project is located on fluvial terrace deposits, according to the University of Texas *Bureau of Economic Geology, Sherman Sheet*. The fluvial terrace deposits are Holocene-aged deposits consisting of gravel, sand, and silt. The gravel is found in sandy, lenticular, and stratified calcite cemented beds, often cross-bedded. The clasts are generally granule to cobble sized and range in roundness from well rounded

to subangular. The gravel is composed of metamorphic rocks, quartzite, milky quarts, chert, and fine-grained igneous rock from distant western sources. The deposits also contain minor clasts of local bedrock and contiguous terraces of different ages separated by a distinct horizon line.

E. Surface Water

Segment 0823 is listed in the Texas Commission on Environmental Quality (TCEQ) *Water Quality Inventory* and is designated for aquatic life use, contact recreation, general use, fish consumption use, and public water supply use. The proposed project is adjacent to Lewisville Lake, Segment 0823 of the Trinity River Basin. In addition, this segment is not designated as threatened or impaired in the 2002 Clean Water Act (CWA) Section 303(d) List and the proposed project is not within five miles upstream of a threatened or impaired segment. The water quality of waters in the state shall be maintained in accordance with all applicable provisions of the Texas Surface Water Quality Standards including the General, Narrative, and Numerical Criteria.

F. Ground Water

Aquifers in the project area include the Trinity and the Woodbine. The Trinity aquifer is a major aquifer or an aquifer capable of yielding large quantities of usable quality water in a large region. The Woodbine aquifer is a minor aquifer, an aquifer capable of yielding large amounts of water in small areas or an aquifer capable of yielding small amounts of water in large areas of the state.

G. Wetlands

A field inspection of the project area was conducted for wetlands and waters of the U.S. in accordance with the methodology described in the 1987 USACE *Corps of Engineers Wetlands Delineation Manual* (Wetlands Research Program Technical Report Y-87-1). There were no jurisdictional wetlands identified on USACE property where fill or columns would be placed. However, the project alignment crosses several waters of the U.S including Lewisville Lake.

H. Floodplains

The proposed project is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for the Denton County, Texas and Incorporated Areas, Community Panel Nos. 48121C-0394-E (December 6, 2002) and 48121C-0415-E (April 2, 1997) and is located within flood zone "AE." Zone AE designates areas of 100-year shallow flooding where base flood elevations are determined.

I. Air Quality

The proposed project is located in Denton County, a non-attainment area for ozone (O₃). The proposed project does not utilize state or federal funds; therefore, the transportation conformity rule does not apply.

J. Noise

Land use activity areas adjacent to the proposed project currently consist of undeveloped land, Lewisville Lake, and one commercial facility. Human activities at Lewisville Lake near the proposed project primarily consist of the occasional recreational boater and angler. The commercial facility, a dog kennel, is located approximately 176 feet away from the proposed project.

K. Biologic Resources

Wildlife Habitat

The study area terrain is characterized as gently rolling and is located within the Eastern Cross Timbers vegetative community. Post Oak (*Quercus stellata*) and Blackjack Oak (*Q. marilandica*) generally form an open savannah to closed woodland overstory depending upon soil characteristics and past land use. The understory is dominated by varying densities of shrubs and herbaceous species. Eastern Red Cedar (*Juniperus virginiana*), Cedar Elm (*Ulmus crassifolia*), Gum Elastic (*Bumelia lanuginosa*), Hackberry (*Celtis laevigata*), Texas Hickory (*Carya texana*), and Osage Orange (*Maclura pomifera*) occur scattered throughout, while locally high densities occur in some soils. In a relatively undisturbed state the upland savannahs and woodlands would have an understory dominated by mid-size and tall grasses consisting of Little Blue Stem (*Schizachyrium scoparium*), Indiangrass (*Sorghastrum nutans*), and others along with a high diversity of other grasses and forbs. Bottomland areas have open to closed canopies of Pecan (*Carya illinoensis*), Green Ash (*Fraxinus pennsylvanica*), Cedar Elm, and Sycamore (*Platanus occidentalis*).

Due to the development and urbanization of the privately held land along the proposed alignment, most of the wildlife is concentrated in the lands adjacent to Lewisville Lake. The lake area contains a typical assortment of endemic wildlife species such as owls (families *Tytonidae* and *Strigidae*), raccoons (*Procyon lotor*), bobcats (*Lynx rufus*), mink (*Mustela vison*), opossums (*Didelphis virginiana*), squirrels (*Sciurus niger*), rabbits (*Sylvilagus floridanus*), and deer (*Odocoileus virginianus*), as well as species of moles, shrews, bats, skunks, armadillos, and mice.

Lewisville Lake and associated wetlands offer important feeding, staging, and roosting areas for migratory birds. Species such as ducks, coots, grebes, pelicans, herons, egrets, gulls, terns, and hawks migrate through the area and utilize open water, shallow wetlands, and the associated riparian vegetation for feeding, perching, and roosting. The typical resident bird population includes: great blue heron (*Ardea herodias*), turkey vulture (*Carthartes aura*), mourning dove (*Zenaida asiatica*), red-tailed hawk (*Buteo jamaicensis*), northern bob-white (*Colinus virginianus*), blue jay (*Cyanocitta cristata*), American crow (*Corvus brachyrhynchos*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), Carolina wren (*Thryothorus ludovicianus*), northern cardinal (*Richmondena cardinalis*), field sparrow (*Spizella pusilla*), red-winged blackbird (*Agelaius phoeniceus*), northern mockingbird (*Mimus polyglottos*), and red-bellied woodpecker (*Melanerpes carolinus*).

The fish of Lewisville Lake represent a typical assemblage of reservoir fish that include recreationally important species, such as channel catfish (*Ictalurus punctatus*), largemouth bass (*Micropterus salmoides*), white crappie (*Pomoxis annularis*), black crappie (*P. nigromaculatus*), bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), warmouth (*L. gulosus*), striped bass (*Morone saxatilis*), white bass (*M. chrysops*), and hybrid bass (a cross between two species of *Morone*). Rough fish such as gar (*Lepisosteus spp.*), bowfish (*Amia calva*), and buffalo fish (*Ictiobus spp.*) are present in the lake. Baitfish species include minnow (Family *Cyprinidae*), shiner (*Notropis spp.*), gizzard shad (*Dorosoma cepedianum*), and inland silverside (*Menidia beryllina*).

Threatened and Endangered Species

The project limits are within the mapped areas of the USGS Quadrangle Maps “Denton East, Texas,” and “Little Elm, Texas” in Denton County, Texas. The U.S. Fish and Wildlife Service (USFWS) indicate the federally listed threatened and/or endangered species known to occur or that may migrate through Denton County as:

- Whooping cranes (*Grus americana*), listed as endangered, and may be encountered in any county in North Central Texas during migration. Autumn migration normally begins in mid September, with most birds arriving on the wintering grounds at Aransas National Wildlife Refuge between late October and mid-November. Spring migration occurs during March and April. Denton County is situated within the migration route of the whooping crane. Whooping cranes prefer isolated areas away from human activity for feeding and roosting.
- Black-capped vireos (*Vireo atricapillus*) listed as endangered, nest in Texas from April through July and spend the winter on the western coast of Mexico. Preferred nesting sites are usually two to four feet above ground in shrubs.
- Mountain plovers (*Charadrius montanus*), listed as a proposed threatened species, migrate in small numbers throughout northwestern and north-central Texas from early March to mid-May and from early August to late October. Preferred habitat consists of expansive flats of short-grass prairie. In areas of tall grass, the plover is closely associated with prairie dog towns. Nesting plovers appear to prefer areas that have been intensively grazed by livestock. In addition, the piping plovers (*Charadrius melodus*) have been reported in the Lewisville Lake area.
- Bald Eagle (*Haliaeetus leucocephalus*), listed as a threatened species (proposed for delisting), live in quiet coastal areas, rivers or lakeshores with large, tall trees. Man-made reservoirs have provided excellent habitat. Nests are used for several years by the same pair of eagles, with the birds adding materials each year. Northern breeders migrate north out of Texas in early spring and return by September or October.

The Texas Parks and Wildlife Department (TPWD) indicates both the timber/canebrake rattlesnake (*Crotalus horridus*) and the Texas horned lizard (*Phrynosoma cornutum*) as state-listed threatened species. These species may be impacted if suitable habitat is present with the project study area.

According to the USACE PEA for Lewisville Lake, there is no federally listed threatened or endangered flora or fauna species in the Lewisville Lake area. Species that migrate through Denton County and might be seen in the Lewisville Lake area are the whooping crane, piping plover, and the interior least tern (*Sterna antillarum athalassos*). The bald eagle (*Haliaeetus leucocephalus*) is listed as indigenous to Denton County. According to the PEA, none of the species identified above are known to occur in the Lewisville Lake area.

L. Cultural Resources

On September 10, 2002, archeological consultants performed a historic/cultural and archaeological evaluation/survey of the proposed Lewisville Lake Toll Bridge alignment (see **Appendix H** for the full report). The report looked at both the eastern alignment access road (Little Elm), as well as the western alignment access road (Lake Dallas). The eastern access road, it was deemed, crosses areas of low archaeological probability and no further research is necessary. The western access road, however, from IH-35E to Shady Shores Road has been impacted by development. The proposed alignment east of Shady Shores Road, however, may have a higher archaeological potential.

After reviewing the archeological consultant's initial report, an additional site visit was conducted for a possible historical residence located along Swisher Road. On July 29, 2002, Jesse Todd, research archaeologist with AR Consultants, visited the site, talked to the renters, and inspected the home. Mr. Todd's letter report can be found in **Appendix D**. While a portion of the home pre-dates a 1960 USGS map, it has been so modified over the years that the home is of little historic significance. The letter states "Although some part of the house may have been an original homestead, it has been modified sufficiently

through time so that the original structure has been lost; therefore, its historical significance is greatly reduced.”¹

As a result of AR Consultants’ recommendations and in concurrence with the Texas Historical Commission (THC) letter of August 8, 2002 (see **Appendix D**), AR Consultants conducted a comprehensive archaeological survey and shovel testing of the proposed Lewisville Lake toll bridge access road (Segment 1) and toll plaza locations in August and September of 2002. The purpose of the survey was to determine the likelihood of encountering prehistoric or historic archaeological sites within the road alignment.

The comprehensive survey located no archaeological resources. The conclusion is that this area in the Eastern Cross Timbers in North Texas has a low potential for containing significant cultural resources. Based on the field investigation, it was archeological consultant's recommendation that no further cultural resource investigations are necessary on the property.

M. Socioeconomic Resources

Lewisville Lake is located in Denton County, Texas, one of the sixteen counties included in the North Central Texas Council of Governments (NCTCOG) region. The NCTCOG region had a combined population of approximately 5,067,400 people in 2000. Denton County is one of the four counties that account for 81 percent of all growth within the NCTCOG area and Lewisville is one of the top ten cities that account for 50 percent of all growth within the NCTCOG area². **Table 1** displays regional growth around the proposed project.

Table 1: Regional Population Growth

Location	1980	1990	2000	Percentage Growth 1980 - 2000
Copper Canyon	465	978	1,216	162%
Corinth	1,264	3,944	11,325	796%
Hickory Creek	1,422	1,893	2,078	46%
Highland Village	3,246	7,027	12,713	292%
Lake Dallas	3,177	3,656	6,166	94%
Lewisville	24,273	46,521	77,737	220%
Little Elm	926	1,255	3,646	294%
Shady Shores	813	1,045	1,461	80%
The Colony	11,586	22,113	26,531	129%
Denton County	143,126	273,525	432,976	203%

Source: NCTCOG, 2004.

According to NCTCOG demographic projections, population growth in and along the proposed project is expected to continue. The NCTCOG projections are shown below in **Table 2**.

¹ AR Consultants Letter. July 29, 2002.

² NCTCOG, *2004 Current Population Estimates*, April 2004

Table 2: Area Population Estimates

Location	2000	2030	Projected Change	Projected Percentage Growth 2000 - 2030
Corinth	11,325	27,070	15,745	139%
Highland Village	12,713	18,624	5,911	46%
Lake Dallas	6,166	9,209	3,043	49%
Lewisville	77,737	111,168	33,431	43%
Little Elm	3,646	18,882	15,236	418%
The Colony	16,141	64,216	48,075	298%
Denton County	432,976	1,085,300	652,324	151%

Source: NCTCOG, *North Central Texas 2030 Demographic Forecast*, April 2003.

Environmental Justice

Executive Order 12898 on Environmental Justice directs that federal programs, policies, and activities not have a disproportionately high and adverse human health and environmental effect on minority and low-income populations.

As shown in **Table 3**, neither of the census tracts was identified as having racial and/or ethnic minority populations, a poverty level above 50% or double the city reference area, or a median household income level below the 2005 U.S. Department of Health and Human Services threshold of \$19,350 for a family of four.

Table 3: Minority and Low-Income Characteristics

Location ¹	Total Population	Racial Distribution							Ethnicity	Income	
		White	Black	American Indian/ Alaskan Native	Asian American	Other Race	Two or More Races	Racial Minority ²	Hispanic or Latino ³	Population Below Poverty Level ⁴	Median Household Income ⁵
Denton County	432,976	81.73%	5.86%	0.59%	4.03%	5.61%	2.19%	18.27%	12.15%	6.48%	\$58,216
Project Area	15,536	87.72%	1.91%	0.89%	0.64%	6.85%	2.00%	12.28%	12.98%	8.39%	\$50,996
Census Tract											
201.02	8,601	84.46%	1.87%	0.91%	0.40%	10.21%	2.16%	15.54%	17.20%	9.89%	\$52,233
214.03	6,935	90.99%	1.95%	0.87%	0.88%	3.49%	1.83%	9.01%	8.77%	6.89%	\$49,759

Source: U.S. Census Bureau, 2000 Census.

Notes:

- ¹ The project area is located entirely within Census Tracts 201.02 and 214.03.
- ² Total of persons reporting in non-white racial categories, including Black or African American, American Indian and Alaskan Native, Asian American, some other race, and two or more races.
- ³ Total of persons reporting as Hispanic or Latino ethnic origin. The U.S. Census Bureau considers race to be separate from ethnicity. Hispanic or Latino is an ethnic population and may be of any race.
- ⁴ Households below poverty level, as reported in the 2000 Census.
- ⁵ The U.S. Department of Health and Human Services 2005 Poverty Guidelines for a family of four is \$19,350.

N. Potential Hazardous, Toxic and Radioactive Waste Concerns

An environmental screening questionnaire was completed for the area of the proposed main-lane toll plaza (i.e., east of Sandy Lake Road on the ridge before descending to the western edge of the lake). The environmental screening was accomplished by conducting an on-site visit and completing the environmental screening questionnaire. The screening questionnaire was based on the Standard Practice, Environmental Site Assessment, and Transaction Screen according to ASTM E-1528-93. The completed Transaction Screen Questionnaire can be found in **Appendix E**. Answers to the questions were prepared during on-site observations on July 29, 2002. Except for a very small amount of fill, dirt (less than a pick-up truckload) placed for erosion control and the proximity of the Lakeview Regional Water Reclamation Plant, the environmental screening did not identify any condition that would jeopardize the project or cause impacts to the surrounding area.

A regulatory review was conducted of the preferred alignment of the access roads and bridge locations for the Lewisville Lake project. Environmental Data Resources, Inc., (EDR) was requested to search the environmental databases for all Federal, State, and Local agencies for the proposed project. As indicated on the map in **Appendix F, Figure 6**, EDR's report indicated the following:

- One leaking underground storage tank facility at Payless Cashways, Inc. on Swisher Road near IH-35E; and
- Four underground storage tank facilities located at the Lake Cities Municipal Airport, Phillips 66, Video Plus, Inc., and Payless Cashways, Inc.

In addition, EDR was also requested to conduct a water well search within one mile of the proposed alignment. Seventeen wells were located. These are identified in the report summary in **Appendix G** and the well locations are plotted on a map (**Figure 7**).

O. Aesthetic Concerns

Aesthetics is the way an individual perceives the environment around them. There are no Federal policies regarding aesthetics; however, the USACE does have a policy to establish architectural themes for structures on projects so that they blend with the existing area to the extent that is practical.

The western shoreline near where the toll plaza would be located can be characterized by a shoreline that has woody gentle slopes reaching toward suburban residential subdivisions. The eastern shoreline can be characterized as a shoreline with step banks and dense vegetation that hinders the view towards the lake from the surrounding areas. There are no industrial or heavy commercial developments within the proposed project area.

IV. IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

A. Land Use

The use of fill by the proposed project would displace flood storage and wildlife habitat. Recreation and hydroelectric power generation would not be impacted by the proposed project. The USACE property between 522 to 537 feet above msl would require mitigation for all impacted flood storage and wildlife habitat. These impacts are discussed below.

PEA Alternative

The PEA alternative would require the use of 18.72 acres of USACE property and would place approximately 73,000 cubic yards of fill on USACE property. This would change the land use from flood storage and wildlife habitat to transportation. Approximately 33,000 cubic yards of the fill would be placed within flood storage.

Alternative 1

Alternative 1 would require the use of 26.11 acres of USACE property and would place approximately 137,000 cubic yards fill on USACE property. This would change the land use from flood storage and wildlife habitat to transportation. Approximately 84,000 cubic yards of the fill would be placed within flood storage.

Alternative 2 (Preferred)

Alternative 2 would require the use of 19.15 acres of USACE property and would place 95,000 cubic yards of fill on USACE property. This would change the land use from flood storage and wildlife habitat to transportation. Approximately 47,000 cubic yards of this fill would be placed within flood storage.

Alternative 3

Alternative 3 would require the use of 19.15 acres of USACE property. This would change the land use from flood storage and wildlife habitat to transportation. The bridge would utilize columns; therefore, it would not require the use of fill on USACE property; however, the proposed bridge columns would displace approximately 2,500 cubic yards of flood storage.

B. Geology and Soils

The proposed project would result in minor impacts to soils and surface geology within the project area. These impacts to the proposed project area and surrounding land would be minimized through the implementation of Best Management Practices (BMP).

PEA Alternative

The PEA alternative would impact approximately 4.06 acres of land.

Alternative 1

Alternative 1 would impact approximately 11.45 acres of land.

Alternative 2 (Preferred)

Alternative 2 would impact approximately 4.49 acres of land.

Alternative 3

Alternative 3 would impact approximately 4.49 acres of land.

C. Surface Water

Because the proposed project would disturb more than one acre during construction, the Texas Pollutant Discharge Elimination system (TPDES) general permit for construction activity would be required. The project would also disturb more than five acres; therefore a Notice of Intent (NOI) would be filed with TCEQ stating that there would be a Storm Water Pollution Prevention Plan (SW3P) in place during the construction period. In addition, because of impacts to jurisdictional waters associated with the construction of the proposed project, Erosion Control, Post-Construction Total Suspended Solids (TSS) Control, and Sedimentation Control devices would be required under TCEQ's 401 Water Quality Certification. At least one erosion control device would be implemented and maintained during the construction period. Erosion control devices to be used include temporary vegetation, blankets/matting, mulch, sod, interceptor swales, and diversion dikes. In addition, at least one post-construction TSS control device would be implemented upon completion of the project. Post-construction TSS devices to be used include retention/irrigation, extended detention basins, vegetative filter strips, constructed wetlands, wet basins, vegetation-lined drainage ditches, grassy swales, and sand filter systems. In addition, at least one sedimentation control device would be maintained and remain in place during the construction period. Sedimentation control devices to be used include sand bag berms, silt fences, triangular filter dikes, rock berms and hay bale dikes, brush berms, stone outlet sediment traps, or sediment basins.

Waters of the U.S. would be temporarily impacted during the construction phase. These water quality impacts, resulting from soil disturbance and removal of existing vegetation, are anticipated to be short-term in nature. After the construction phase, these disturbed areas would be re-established.

Construction of the proposed toll bridge facility would result in temporary adverse impacts during the construction phase. These impacts are anticipated to be short-term in nature. Any displaced aquatic resources would return and reestablish after project construction is completed.

All of the alternatives utilize the same number of bridge structural members in the same configuration; therefore, there are no additional impacts to surface water caused by the toll bridge facility when compared to the freeway facility.

D. Ground Water

No long-term water quality impacts are expected as a result of the proposed project. No adverse effects to ground water are expected to occur. The proposed project is not expected to contaminate or otherwise adversely affect the public water supply, water treatment facilities, or water distribution systems.

E. Wetlands

Through the use of bridge structures, none of the alternatives of the proposed project would impact jurisdictional wetlands within the scope of this TEA. However, waters of the U.S such as Lewisville Lake would be impacted and the project would require a Section 404 permit. A Nationwide Permit (NWP) 14 for linear transportation projects has been issued for the Lewisville Lake Toll Bridge. The project will have until March 18, 2010 to complete all activities under the present terms and conditions of this NWP.

F. Floodplains

The use of fill by the proposed project would displace flood storage. The USACE property between 522 to 537 feet above msl would require mitigation for all impacted flood storage. These impacts are discussed below.

PEA Alternative

The PEA alternative would require the use of 18.72 acres of USACE property and would place approximately 73,000 cubic yards of fill on USACE property. Approximately 33,000 cubic yards of the fill would be placed within flood storage of Lewisville Lake. The use of fill in this area will not interfere with surface drainage. Local drainage patterns will be accommodated by the flowage easement bridge and cross drainage culverts.

Alternative 1

Alternative 1 would require the use of 26.11 acres of USACE property and would place approximately 137,000 cubic yards fill on USACE property. Approximately 84,000 cubic yards of the fill would be placed within flood storage of Lewisville Lake. The use of fill in this area will not interfere with surface drainage. Local drainage patterns will be accommodated by the flowage easement bridge and cross drainage culverts.

Alternative 2 (Preferred)

Alternative 2 would require the use of 19.15 acres of USACE property and would place 95,000 cubic yards of fill on USACE property. Approximately 47,000 cubic yards of this fill would be placed within flood storage of Lewisville Lake. The use of fill in this area will not interfere with surface drainage. Local drainage patterns will be accommodated by the flowage easement bridge and cross drainage culverts.

Alternative 3

Alternative 3 would require the use of 19.15 acres of USACE property. The bridge would utilize columns; therefore, it would not require the use of fill on USACE property. However, the proposed bridge columns would displace approximately 2,500 cubic yards of Lewisville Lake flood storage.

G. Air Quality

None of the proposed toll bridge alternatives would increase traffic volumes versus the PEA Alternative; therefore, air quality impacts would not be increased by the toll bridge alternatives. Air quality within the area may actually improve due to shorter drive times and subsequent reductions in vehicle emissions.

H. Noise

None of the proposed toll bridge alternatives would increase traffic volumes or substantially alter the horizontal or vertical alignment as compared to the PEA alternative. As a result, noise levels adjacent to the toll bridge are anticipated to be similar to the PEA alternative. The toll plaza, located at the western end of the bridge, is designed with both pass-through (toll tag) and change-made lanes. Noise levels

adjacent to the toll plaza are anticipated to be slightly higher as compared to the PEA alternative because of decelerating and accelerating traffic.

As discussed in the existing conditions section, land-uses in the project vicinity are undeveloped land, one commercial facility, and Lewisville Lake. Therefore, there are no land use activity areas adjacent to the proposed toll bridge that would be impacted by traffic noise and benefit from any feasible and reasonable noise abatement measures. Lewisville Lake users (boating and fishing) would experience similar noise levels with the toll bridge alternatives or the PEA alternative. These noise levels are anticipated to have minimal effect considering the duration of time an individual boater or fisherman would be in the vicinity of the toll bridge.

Short-term localized noise increases associated with the construction of the toll bridge alternatives or the PEA alternatives would be similar. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are tolerable. No extended disruption of normal activities is expected. Provisions will be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

None of the proposed toll bridge alternatives would increase traffic volumes, vertical or horizontal alignment from the PEA alternative and there is no immediate noise receivers that would benefit from any feasible and reasonable noise abatement measures, therefore, the noise impacts would not be increased by the toll bridge alternatives.

I. Biologic Resources

Vegetation

The proposed alignment would impact three wooded areas. One area is located east of the Swisher Road/Shady Shores Road intersection and is characterized as a Post Oak Savannah. The second area is located southeast of the Kingwood Estates Mobile Home Park, adjacent to the west of Lakeview Drive and is characterized as Post Oak Forest. In general, the typical trees within the woodland areas are Post Oak, Blackjack Oak, and Cedar Elm. The trees are typically six inches to ten inches diameter at breast height (dbh). Tree density is approximately 140 trees per acre. There are a few large trees greater than twenty inches diameter at breast height (dbh) scattered throughout these areas, averaging about eight to ten trees per acre. The third impacted area is located north of Lakeview Drive and is located on USACE property. The woody vegetation along this area predominantly consists of cedar elm, winged elm (*U. alata*), mesquite (*Prosopis glandulosa*), and honey locus (*Gleditsia triacanthos f. inermis*). The trees are typically four to twelve inches dbh. Tree density is approximately 110 trees per acre.

PEA Alternative

The PEA alternative would impact approximately 3.22 acres of woody vegetation and 0.84 acre of grassland.

Alternative 1

Alternative 1 would impact approximately 9.11 acres of woody vegetation and 2.34 acres of grassland.

Alternative 2 (Preferred)

Alternative 2 would impact approximately 3.75 acres of woody vegetation and 0.74 acre of grassland.

Alternative 3

Alternative 3 would impact approximately 3.75 acres of woody vegetation and 0.74 acre of grassland.

Wildlife

Minor fragmentation of wildlife habitat would occur with the proposed project. The proposed project would also reduce some habitat available to bird species; however, the proposed bridge crossing is not expected to displace waterfowl and/or shorebird species that frequent the area at various times during the year. In addition, displaced woodland and grassland habitat would be mitigated in compliance with USACE requirements. The availability of medium to high quality emergent wetland areas near Lewisville Lake would likely continue to serve as the primary influence on aquatic wildlife use. The proposed project would continue to allow unrestricted wildlife movement along the shoreline and below the bridge structures.

Threatened and Endangered Species

- Because whooping cranes prefer isolated areas away from human activity for feeding and roosting, they would not likely select project construction areas or traveled roadways for feeding, resting, or nesting during the annual autumn and spring migrations. Consequently, the proposed project is not likely to adversely affect the whooping crane.
- Field reconnaissance performed during June and July 2002 found no evidence of bald eagles, nesting sites, or critical habitat in or within 1,500 feet of the project corridor. Therefore, the proposed project is not likely to adversely affect bald eagles, their nesting sites, or critical habitat.
- Field reconnaissance performed during June and July 2002 found no evidence of critical habitat for mountain plover, piping plover, black-capped vireo, Texas horned lizard, or timber/canebrake rattlesnake. Therefore, the proposed project is not likely to adversely affect these species.

PEA Alternative

The PEA alternative would impact approximately 4.06 acres of woodland and grassland habitat. In addition to the reduction in habitat, the retaining walls and fill from this alternative would act as an approximate 2,050 linear foot barrier that wildlife would have to cross over or circumvent.

Alternative 1

Alternative 1 would remove approximately 11.45 acres of woodland and grassland habitat and the fill used by this alternative would act as an approximate 2,050 linear foot barrier that wildlife would have to cross over or circumvent.

Alternative 2 (Preferred)

Alternative 2 would remove approximately 4.49 acres of woodland and grassland habitat and the retaining walls and fill used by this alternative would act as an approximate 2,050 linear foot barrier that wildlife would have to cross over or circumvent.

Alternative 3

Alternative 3 would remove approximately 4.49 acres of woodland and grassland habitat, but the bridge structure would not act as a barrier that wildlife would have to cross over or circumvent.

J. Cultural Resources

A letter dated October 1, 2002, from the THC, indicated that the draft report from archeological consultants regarding the archeological survey of the Lewisville Lake Toll Bridge access road had been reviewed and they concluded that the proposed project would have no affect on historic properties. The project may proceed if the Texas Department of Transportation (TxDOT) has no further concerns or comments on the draft report (see **Appendix D**).

Because of the additional site inspections and a comprehensive archaeological survey, no further investigations are warranted. If any cultural resources are uncovered during construction, construction activities would cease immediately and the THC would be contacted.

K. Socioeconomic Resources

None of the alternatives would disproportionately affect, separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups. There are no known areas where there are measurable differences in the potential impacts on minority or low-income populations compared to the total population. There does not appear to be disproportionate impacts on any minority or low-income populations associated with the proposed project. Therefore, the requirements of Executive Order 12898 on Environmental Justice appear to be satisfied.

Due to a shortage of funds, without the toll bridge alternatives, the proposed bridge would not be constructed. The installation of any of the toll bridge alternatives would require a toll to use the bridge; however, the distance savings would offset the toll costs. Currently motorists must drive around the lake to arrive at a destination across the lake. For example, the quickest route from Lake Dallas to Camp Dallas is approximately 25 miles. The installation of the proposed bridge structure would reduce the mileage required by approximately 20 miles. A trip from Lake Dallas to Camp Dallas would cost approximately \$7.50 (using the 2004 IRS allowed value of 0.375 cents per mile x 20 miles = \$7.50) plus the time spent traveling around the lake (approximately 37 minutes). This would be more expensive than the toll of the proposed toll bridge alternatives. Currently, 2004 North Texas Tollway Authority (NTTA) tolls range from 30 to 75 cents per tollbooth for a two-axle vehicle. The estimated toll to utilize toll bridge is \$1.00, which is subject to NTTA review and adjustment as needed.

L. Potential Hazardous, Toxic and Radioactive Waste Concerns

After the initial review of the EDR water well search, two of the seventeen wells appeared to be in close proximity (i.e. within 500 feet) to the ROW of the proposed alignment along FM-720 - Garza Lane. During a field inspection, pictures were taken of Garza Well and storage tank and Sunrise Bay Well and

storage tank. Both of these municipal wells appear to be close to the proposed alignment/ROW of the new road (Segment 3). Final highway designs should avoid these municipal water wells.

In addition to the water wells, none of the five hazardous materials facilities sites is within close proximity of the toll bridge facility. All of the alternatives follow the same horizontal and vertical alignment; therefore, these facilities would not be impacted by any of the proposed alternatives.

M. Aesthetic Concerns

The construction of the proposed bridge facility would provide a new point of view for the lake and surrounding areas. All of the proposed alternatives would be partially visible to boaters, motorist, and people along adjacent lands; however, the whole project would not be visible from any one location. Aesthetically it is not anticipated that any of the toll bridge alternatives would be substantially different from the PEA preferred alternative.

As roadway design plans are developed, design enhancements would be considered to better define the proposed project to conform to the existing project corridor. Design enhancements would be consistent with the North Texas Tollway Authority's (NTTA) *System-Wide Design Guidelines*. Design enhancements would consist of proper landscaping, foreground elements (i.e., toll plazas, toll plaza landscaping, and foreground colors unique to the corridor), and background elements (i.e., background color, roadway and pedestrian lighting, sign structures, wall texture, logo wall panels, bridge railing, and ROW fencing).

V. CUMULATIVE IMPACTS

The cumulative impacts assessment in the 1999 USACE PEA addressed over 300 activities. Of the proposed activities, thirty of the activities were reviewed and then removed from further environmental evaluation and consideration due to their requirements for additional information, redesign, and/or requirements for further environmental impact analysis. Two hundred and seventy activities were assessed and anticipated to result in no significant adverse impact as long as the proposed projects were designed to adhere to applicable local, state, and federal regulations, policies, mitigation requirements, standards, and guidelines. The proposed project was reviewed and approved as a freeway project within the PEA. A copy of this document is available on-line for review at: <http://www.swf.usace.army.mil/pubdata/ops/lewisville/toc/toc.htm>.

The proposed project includes mitigation to offset direct impacts and reduce cumulative impacts of the proposed project. The proposed project's mitigation requirements would be necessary to comply with state and federal regulations, agreements, and/or policies; therefore, analysis of the proposed project without mitigation was not analyzed, as the proposed project would not be built without appropriate mitigation. The cumulative impacts of the proposed project are discussed as follows.

A. Land Use

The Lewisville Lake area is expected to see continued urbanization as growth is projected to continue, guided by local land use plans and policies. The cumulative effects of continuing development within the study area and beyond are speculative due to market forces and individual decisions. Study area transportation projects have been designed to accommodate growth that is projected in the region by NCTCOG, consistent with the general plans of affected jurisdictions. The proposed project would not cause a significant adverse cumulative impact to land use in the Lewisville Lake area.

B. Geology and Soils

Urbanization in the area would include minor short-term impacts and long-term disturbances of soils and surface geology. Minor short-term impacts would include the disturbance of soils during construction activities, increased dust emissions, and the potential for increased erosion and subsequent sedimentation of adjacent water resources during heavy rainfall events. Additional impacts may include the replacement of bare soils and native vegetation with hardpan surfaces and the potential for increased erosion due to increased storm water runoff from residential, commercial, and industrial areas. Impacts to these resources would be minimized by federal, state, and local policies. The proposed project would result in minor impacts to soils and surface geology; however, it would not cause a significant adverse cumulative impact to geology and soils in the Lewisville Lake area.

C. Surface Water

Impacts from urbanization have included physical modifications and heavy management of stream and river channels for flood control; construction of reservoirs; storm water runoff from residential, commercial, and industrial areas; and discharges from municipal wastewater treatment plants. Urban runoff has resulted in other types of use impairments as evidenced by the multiple 303(d) listings for legacy pollutants (pesticides and PCBs) in fish tissue in the DFW area. Numerous studies examining storm water runoff have documented that this is the predominant source for these water quality constituents.

In the future, additional urbanization will likely occur in and around the Lewisville Lake area, as well as in other areas of the DFW region. This would result in additional storm water and treated wastewater discharges to the Trinity River watershed. However, it is expected that future storm water and treated wastewater discharges would be regulated by TPDES permits with specific restrictions on the loading of water quality constituents of concern. The loading of such constituents may also be governed by future Total Maximum Daily Loads (TMDL) limitations prescribed by the TCEQ.

Individually, any of the Lewisville Lake Toll Bridge build alternatives would have minimal short-term impacts on water quality. The proposed action may have a slight contribution to the historic and on-going trends of increased surface water runoff. These would be due to more impervious surfaces and decreased surface water quality due to increased development. The proposed action's contribution to cumulative construction impacts on water quality would be mitigated to insignificance with implementation of a SW3P; therefore, the actions of the proposed project would not be a significant adverse cumulative impact to the water quality of the Lewisville Lake area.

D. Ground Water

Urbanization in the area would lead to a more rapid and higher discharge runoff pattern, hydrologic disturbance, impaired ground water recharge rates, over draught of ground water, and pollution loading. The proposed project would not directly impact ground water and would implement actions to minimize impacts to surface water, which contributes to improving water conditions of surface water that recharges ground water. The proposed project would not cause a significant adverse cumulative impact to ground water.

E. Wetlands

Wetlands cover about 7.6 million acres of Texas or 4.4 percent of the State's area. The most extensive wetlands are the bottomland hardwood forests and swamps of East Texas; the marshes, swamps, and tidal flats of the coast; and the playa lakes of the High Plains. Although wetlands in Texas comprise less than

5 percent of the state's total land area, Texas is one of nineteen states that have exhibited the most significant losses of wetland ecosystems. A variety of human induced actions, natural events, and secondary non-point problems have contributed to the decline of about one-half of Texas's original wetlands. Within the Lewisville Lake study area, the most notable sources of wetland decline include conversion of land to agricultural uses, sedimentation from storm water erosion, infilling for urban development, and chemical contamination from excessive nutrients, fertilizers, and pesticides. The destruction and loss of wetlands has created secondary impacts such as increased flood damages, increased drought damages, and the decline of bird populations. The toll bridge alternatives avoid wetlands and waters of the U.S. to the greatest extent practicable; however, mitigation is included to compensate unavoidable impacts caused by other portions of the project. Section IV.C and Section VII describe the mitigation activities that would be applied during and following construction activities to minimize impacts to waters of the U.S. A NWP 14 (Project Number 200200210) has been issued for this project.

F. Floodplains

The protection of floodplains and floodways is required by EO 11988 Floodplain Management and is implemented through 23 CFR 650, Subpart A Location and Hydraulic Design of Encroachments on Floodplains. Urban development, flood damage reduction projects, placement of fill material, and transportation projects could have cumulative impacts to floodplains within the Lewisville Lake area. Secondary impacts associated with floodplain encroachment include increases in base flood elevations, changes in natural stream flow dynamics, and alternations to life process requirements of aquatic species. Practical measures to minimize harm to floodplains are incorporated into the preliminary designs of the Lewisville Lake toll bridge alternatives, which directly affect the Lewisville Lake flood storage. Little or no change to historic drainage patterns are expected within or down gradient from the study area. Impacts are minimized with the use of retaining wall and bridge structures. Bridge and roadway designs seek to minimize impacts to floodplains in compliance with state and federal requirements – including efforts to span 100-year (base) and standard project floodplains. Final designs will adhere to drainage criteria for both minor and major hydraulic structures, as well as following all FEMA and USACE requirements. As a result, the proposed project would not cause a significant adverse cumulative impact to floodplains.

G. Air Quality

Planned transportation improvements in the Lewisville Lake area are intended to cumulatively reduce congestion on a regional scale, with a resultant decrease in air pollution. When combined, these proposed actions are anticipated to have a cumulatively beneficial impact on air quality.

H. Biologic Resources

Vegetation

Development in the DFW region, whether it is transportation improvements or commercial/residential development, would have cumulative effects upon the region's remaining natural resources (i.e., wetlands, water resources, and biological resources). These effects would be minimized by applicable federal, state, and local regulations, requiring mitigation for other planned transportation system improvements, flood control projects, and development project impacts. As a result, the proposed project would not cause a significant adverse cumulative impact to vegetation.

Wildlife

Impacts to wildlife resources would be avoided or minimized in compliance with existing federal statutes, which apply to private as well as public developments. The USACE (under the Clean Water Act) and the USFWS (under the Endangered Species Act) have legislative mandates to reduce or avoid substantial,

adverse impacts to protected resources on an individual as well as cumulative project basis. As a result, the proposed project would not cause a significant adverse cumulative impact to protected wildlife.

I. Cultural Resources

Under the requirements of the Antiquities Code of Texas in 1969, the THC works to preserve and protect the state's archeological and historical resources. However, not all historic buildings and archeological sites affected by a project require protection. State and federal guidelines exist to determine which are important, and consequently, which need protection. In this regard, the THC partners with project sponsors to ensure the tangible remains of our state's heritage are not needlessly destroyed during development.

Continued growth and development in the DFW area is projected to continue in the future at a rate similar to that experienced in recent years. The proposed action would not contribute to the localized disturbance of known archeological resources. However, urban development at other locations in DFW could represent a contribution to the disturbance of archeological resources as a result of associated construction. The degree of disturbance would depend on the type and nature of preservation or mitigation efforts and location of these resources.

J. Socioeconomic Resources

Population in the DFW area grew approximately 70 percent from 1995 to 2000. Growth is more dominant in the counties surrounding Dallas County, such as Collin and Denton. The development of surrounding land would provide homes and employment in the immediate vicinity and added transportation facilities would provide means that are more efficient for residents to commute. Most of the development in the area would be on undeveloped land; therefore, it is not anticipated that local development, in accordance with local planning efforts, would have a significant adverse cumulative impact to socioeconomic resources.

K. Aesthetic Concerns

The visual landscape near the project area is characterized by Lewisville Lake, undeveloped land, and a commercial facility. The proposed project would be in compliance with and facilitate local development plans. In addition, the proposed project would be in compliance with NTTA's *System-wide Design Guidelines*, which would minimize aesthetic impacts by adding aesthetic features to the toll bridge. As a result, the proposed project would not cause a significant adverse cumulative impact to aesthetics.

VI. PERMITS AND REGULATORY REQUIREMENTS

A. FAA / Air Space

The FAA-Southwest Region, Air Traffic Division was contacted with regard to the height of the proposed bridge and pole-mounted lighting above ground level (AGL) and obstructions for landing at Lakeview Airport (see letter in **Appendix D**). The bridge height is calculated to be 68 feet AGL and the acceptable height is not to exceed 38 feet AGL. The FAA therefore determined, "that the structure is presumed to be a hazard to air navigators." (FAA letter, July 5, 2002 - **Appendix D**). Further study was recommended and the circulation of the FAA letter to the public for comment for 90 - 120 days. This public notice period started on July 5, 2002 and concluded on November 5, 2002 (120 days).

The FAA completed their aeronautical study on October 10, 2002 under the provisions of 49 U.S.C. Section 44718 and Title 14 of the Code of Federal Regulations Part 77 concerning the proposed Lewisville Lake toll bridge. They concluded, “This aeronautical study revealed that the structures would have no substantial adverse effect on the safety and utilization of the navigable airspace by aircraft or on the operation of air navigation facilities.” They further stated that, “...the structure would not be a hazard to air navigation....”

B. Waters of the U.S.

The project crosses waters of the U.S. that are regulated by the USACE under authority of Section 404 of the CWA. All discharges of fill material into Lewisville Lake would be in tightly sealed forms and used as structural members for bridges. These members would be used to support roadway construction only - not for buildings, homes, or other structures. Nationwide Permit 14 - *Linear Transportation Crossings* (Project Number 200200210) was used to authorize the crossing of waters of the U.S with a permit being issued on April 25, 2003. A re-verification of this permit was issued on March 4, 2005, which extends the authorization under this permit until March 18, 2010.

VII. MITIGATION AND BEST MANAGEMENT PRACTICES

The proposed project would be in compliance with NTTA’s *System-wide Design Guidelines* and would utilize avoidance and minimization techniques to the maximum extent practicable. Trees within the proposed ROW, but not in the construction zone, would not be removed if possible. These areas would be preserved to minimize the impact to wildlife habitat in the area. Every effort would be made to preserve trees within the ROW and other areas where they neither compromise safety nor substantially interfere with the project's construction.

During project development, NTTA would design, use, and promote construction practices that minimize adverse affects on both regulated and unregulated wildlife habitat. Existing vegetation, especially native trees, would be avoided and preserved.

Vegetation/habitat impacts would be mitigated using compensatory mitigation ratios assessed according to vegetation elevation and habitat quality, as outlined in the PEA. Flooding events inundate and impact the vegetation at lower elevations more frequently than at the higher elevations; therefore, the vegetation at higher elevations is considered higher quality habitat. Vegetation mitigation would be conducted in the Lewisville Lake Environmental Learning Area (LLELA) wildlife management area in the form of in-lieu fees. These fees would be used by LLELA on LLELA leased property with oversight by the Lewisville Lake USACE Lake Manager. All tree mitigation would require monitoring to ensure at least 80 percent survivability over a two to five year monitoring period. **Table 4** summarizes the vegetative impacts, mitigation ratios, and mitigation requirements. A summary of the proposed mitigation plan is presented in **Appendix D**.

Table 4: Vegetation Effects of the Change of the Freeway to a Tollway

Elevation (feet above mean sea level)	Habitat Condition	Tollway Facility Habitat Impacts (acres) to USACE Property/ Mitigation Acreage Required							
		PEA Alternative		Alternative 1 Side Slopes		Alternative 2 Retaining Wall		Alternative 3 Bridge	
		Woody Habitat	Grassland ¹ Habitat	Woody Habitat	Grassland ¹ Habitat	Woody Habitat	Grassland ¹ Habitat	Woody Habitat	Grassland ¹ Habitat
522 -	Good	0.78	0.22	2.74	0.53	0.92	0.17	0.92	0.17
528	1:1	0.78	0.44	2.74	1.06	0.92	0.34	0.92	0.34
528 – 530.8	Good	0.25	0.30	1.12	0.85	0.28	0.26	0.28	0.26
	2:1	0.50	0.60	2.24	1.70	0.56	0.52	0.56	0.52
530.8 – 535.2	Good	1.52	0.30	3.49	0.85	1.93	0.30	1.93	0.30
	3:1	4.56	0.60	10.47	1.70	5.79	0.60	5.79	0.60
535.2 - 537	Good	0.67	0.02	1.76	0.11	0.62	0.01	0.62	0.01
	4:1	2.68	0.04	7.04	0.22	2.48	0.02	2.48	0.02
Total Vegetation		3.22	0.84	9.11	2.34	3.75	0.74	3.75	0.74
Habitat Mitigation Required		8.52	1.68	22.49	4.68	9.75	1.48	9.75	1.48

¹ - Grassland mitigation was calculated using a two to one mitigation ratio.

In accordance with Executive Order 13112 on Invasive Species and the Executive Memorandum on Beneficial Landscaping, landscaping will be limited to seeding and replanting the ROW with native plant species where possible.

To mitigate impacts to resident fish and wildlife resources, the bridge designs would consider the placement of support columns that would enable fish passage and maintain natural in-stream structures. The proposed bridge underpasses would accommodate the movements and needs of resident wildlife, and minimize habitat fragmentation and degradation. Compensatory mitigation would occur on LLELA property using planting specifications outlined in the Compensatory Mitigation Plan. Mitigation plans would be developed for land and water resources, if necessary.

Fill or excavation within flood storage (above the conservation pool elevation (522') and below the flood pool elevation (537')) would be mitigated between the conservation pool elevation and the flood pool elevation of Lewisville Lake with an equal volume to prevent the loss of flood storage. The mitigation would occur on the Garza-Little Elm (Lake Dallas) dam (**Appendix K**). Appropriate amounts would be excavated to offset flood storage impacts.

The USACE has provided two options for removing the dam material. The first option consists of excavating the dam materials down to the natural contours of the lake bottom to prevent unexcavated materials from posing a boating hazard. This scenario poses potential problems associated with water quality and the means of transporting the material to the mainland. The second scenario would consist of excavating the dam materials to elevation 528 (the 5 year flood elevation), which is approximately 6 feet above the normal conservation pool level. This second option would also require a portion of the spoils be utilized to fill eroded portions of the dam, thereby forming a flat-grassed surface that would be drivable by USACE personnel. This alternative also includes the placement of riprap along unprotected adjacent areas of the flood storage mitigation area, and the installation of permanent buoys to mark water hazards during high water periods. The second mitigation scenario was selected because it has much less water quality impacts than the other scenario and would be a more conventional construction method.

Impacts resulting from the dam material extraction would be mitigated in accordance with all applicable local, state, or federal regulations. The contractor would be required to rebuild/restore any land or roads leading to the mitigation site damaged by construction activities. The project engineer through coordination with the Lewisville Lake USACE Lake Manager would select the mitigation sites.

The following two options have been investigated as BMPs to prevent debris and oil from washing from the bridge into Lewisville Lake. One of these BMPs will be implemented upon final design of the bridge.

Option 1: Bridge deck drain, piping system and centrally located oil/water separators.

This option would consist of constructing 4' x 2' bridge deck drains at intervals so stormwater does not pond past the outside lane of the two traffic lanes in each direction. These deck drains would also be placed at locations that correspond to the bridge bents for maximum support. Once these bridge deck drains collect the stormwater, it would funnel into a suspended piping system of up to 21" in diameter beneath the bridge. The piping system would convey the stormwater to the four exterior corners of the bridge, where it would enter into four separate 6' x 6' x 8' underground junction boxes. Upon entering these junction boxes, heavier solids would settle to the bottom of the boxes, and oil and floating debris would collect upon the surface of the stormwater. An oil and debris stop device would be used inside each junction box to retain the accumulated oil, floating debris, and settled solids and allow clean water to exit the junction box through an outlet pipe. Once the clean water exits the junction box, the stormwater would enter into a grassy swale, which would serve to further clean the water and discharge it into the lake.

The junction boxes would need to be maintained at intervals recommended by the manufacturer. This includes removing the settled solids content of the boxes and replenishing them with clean water.

Option 2: Bridge deck drain and individual oil/water separators.

This option would consist of constructing individual oil/water separators at each bridge deck drain location. The bridge deck drains would be positioned at the same intervals as in Option 1. There would not be a suspended piping system to convey the stormwater. Once the stormwater enters into the deck drains, it would drop into individual 3' x 3' x 4' structures supported by the bridge pier caps. These structures would have the same, but smaller, oil/water separator devices used in Option 1, which would only allow clean water to exit the structures and drain directly into the lake. Rock riprap would be placed beneath the structures outside of the normal pool elevation to prevent erosion. The individual structures would need to be maintained the same way as Option 1 at the interval recommended by the manufacturer.

VIII. SUMMARY

The proposed facility is a proposed toll bridge instead of the previously proposed toll-free bridge. This change would necessitate the addition of toll plaza structures and approaches, which would require an additional 0.43-acre of Federal land to be disturbed. Construction of the Lewisville Lake toll bridge and approaches would have minor impacts to waters of the U.S. across Lewisville Lake and along an unnamed tributary of Lewisville Lake. During and following construction, soils would be protected from erosion and re-vegetated with native grass species. Construction-related activities would be closely monitored to ensure protection of unknown cultural resources.

The preferred alternative (Alternative 2) of the proposed toll bridge would require 47,000 cubic yards of fill within the flood storage of Lewisville Lake. Fill within the flood storage would be mitigated within Lewisville Lake. The preferred alternative would require 0.43 acre more ROW than the freeway facility. All vegetation displaced by the 4.49 acres of ROW would be mitigated in accordance with typical

USACE guidelines. The engineer in coordination with the USACE Lewisville Lake Project Manager would select all mitigation sites.

Similar to the preferred alternative in the PEA, the preferred alternative in the TEA would not have any significant negative impacts to the existing geology, soils, ground water, wetlands, socioeconomic amenities, or parklands and is not likely to adversely affect plant or animal species that are proposed or listed as threatened or endangered. The most significant change would be primarily socioeconomic in that the toll bridge users would be required to pay a fee. However, the installation of the proposed toll bridge would provide a direct route across the lake, which would substantially reduce the mileage and time required to drive around the lake. The tollway, similar to the freeway, is not anticipated to create significant adverse cumulative impacts to physical resources, land use, cultural resources, water quality, wetlands, aquatic resources, floodplains, vegetation, wildlife, threatened or endangered species, recreation, hazardous materials, ambient noise levels, or air quality.

All of the additional impacts as a result of the addition of the proposed toll plaza are summarized by alternative in **Table 5** below:

Table 5: Effects of the Change of the Freeway to a Tollway

Resource	PEA Alternative	Tollway Facility		
		Alternative 1 Side Slopes	Alternative 2 Retaining Walls	Alternative 3 Bridge
ROW ¹	18.72 acres	26.11 acres	19.15 acres	19.15 acres
ROW (width) ²	80 feet	80 to 325 feet	80 to 175 feet	80 to 175 feet
Project Length	5.24 miles	5.24 miles	5.24 miles	5.24 miles
Bridge Height	Minimum of 52 feet of clearance above the uncontrolled spillway elevation.	Minimum of 52 feet of clearance above the uncontrolled spillway elevation.	Minimum of 52 feet of clearance above the uncontrolled spillway elevation.	Minimum of 52 feet of clearance above the uncontrolled spillway elevation.
Flood Storage ¹	33,000 cubic yards	84,000 cubic yards	47,000 cubic yards	2,500 cubic yards ³
Total Fill ¹	73,000 cubic yards	137,000 cubic yards	95,000 cubic yards	--- ⁴
Area of fill ⁵	4.06 acres	11.45 acres	4.49 acres	4.49 acres
Woodland Impacts ¹	3.22 acres	9.11 acres	3.75 acres	3.75 acres
Grassland Impacts ¹	0.84 acre	2.34 acres	0.74 acre	0.74 acre
¹ - Values are approximate. ² - Tollway and freeway facilities utilize an 80-foot wide ROW, except the proposed toll plaza between approximate Station 71+00 to Station 91+00. ³ - Approximate value reflecting flood storage displaced by bridge columns. ⁴ - The use of a bridge would not require the use of fill on USACE property. ⁵ - Approximate acreage covered by proposed toll plaza and bridge on USACE property.				

Based on review of information contained in this TEA, it is concluded that the out granting of Government lands for the construction of the Lewisville Lake Toll Bridge project is not a major Federal action, which would significantly affect the quality of the human environment within the meaning of Section 102(2) (c) of the NEPA of 1969, as amended. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.