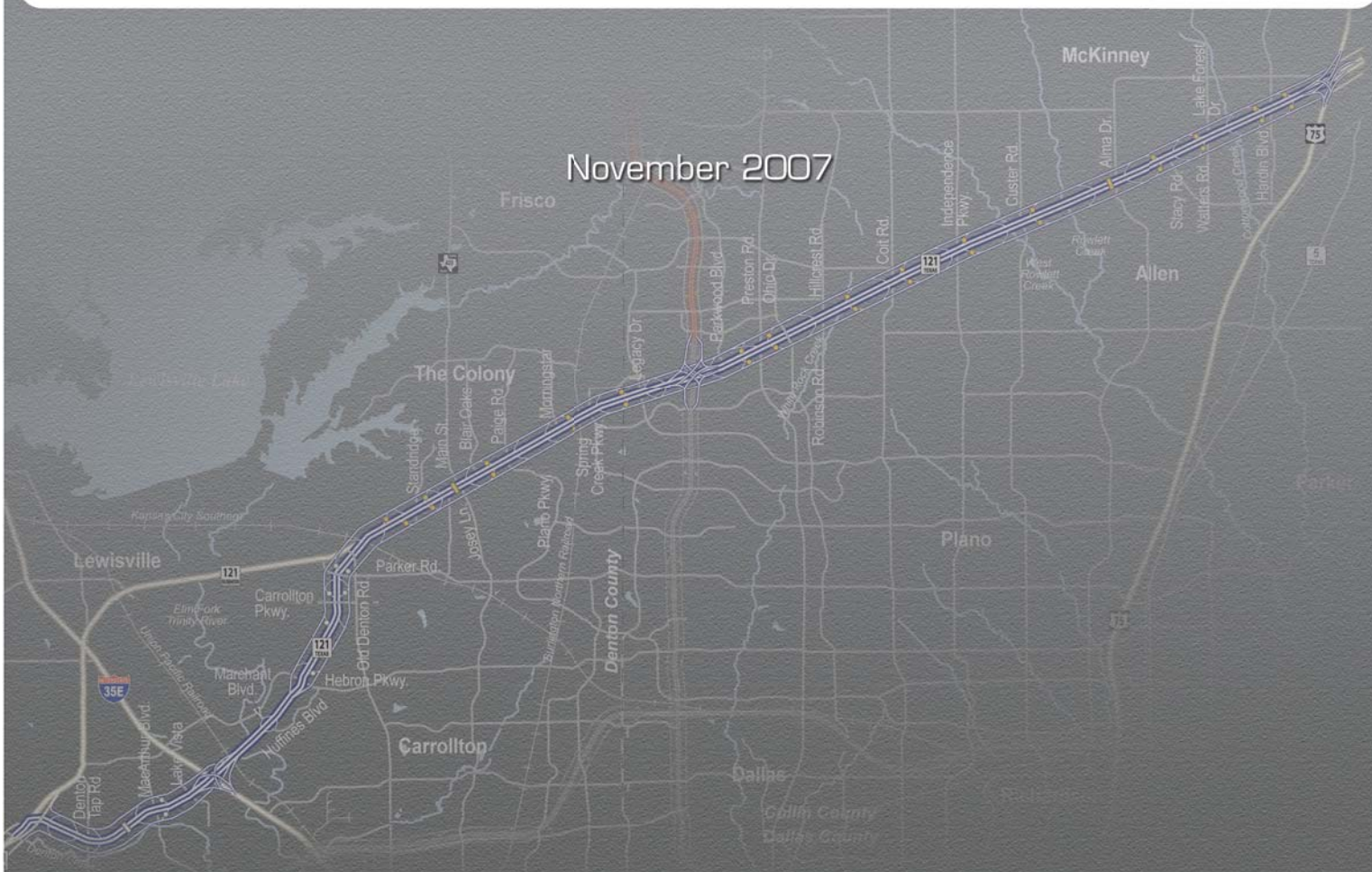
SH 121 Engineering Report

November 2007



Prepared by

HNTB

NTTA
NORTH TEXAS TOLLWAY AUTHORITY

HNTB Corporation
Engineers Architects Planners

5910 West Plano Parkway
Suite 200
Plano, Texas 75093

Telephone (972) 661-5626
Facsimile (972) 661-5614
www.hntb.com

HNTB

Mr. Jorge Figueredo
Executive Director
North Texas Tollway Authority
P.O. Box 260729
Plano, Texas 75026

November 2, 2007

Dear Mr. Figueredo:

We are pleased to submit the attached report describing the engineering features of the State Highway 121 Project as proposed for construction by the Authority. The report includes estimates of construction cost for the project, estimates of annual operation and maintenance costs and exhibits showing the plan upon which the estimates are based.

The conclusions of the report based on the engineering studies indicate that the Project can be constructed to US 75 for an estimated project cost of $698,120,000 exclusive of interest and financing costs. It is also estimated that construction of the Project can be completed in approximately 48 months after construction begins, allowing the project to be open to traffic by January, 2012.

We wish to acknowledge the cooperation, advice and assistance of the staff, legal counsel, traffic engineers, the financial advisors of the North Texas Tollway Authority, the Texas Department of Transportation and Collin County for their efforts in obtaining the majority of the necessary right-of-way to permit the construction of the SH 121 Tollway Project.

Respectfully Submitted,

Stephanie L. Halliday

Stephanie L. Halliday, P.E.
Project Director

North Texas Tollway Authority Board of Directors

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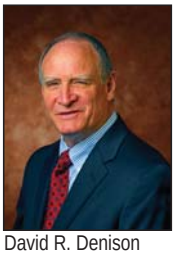
David R. Denison


Robert K. Shepard


Gary Base


William W. Meadows


Alan E. Sims


Bob Day


Michael R. Nowels


Victor T. Vandergriff

Executive Staff

Jorge Figueredo - Executive Director

Rick Herrington - Deputy Executive Director

Susan Buse - Chief Financial Officer


Jorge Figueredo


Rick Herrington


Susan Buse

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Executive Summary

Introduction

The North Texas Tollway Authority (NTTA) is a regional tollway authority and a political subdivision of the state of Texas, which was created in accordance with Chapter 366 of the Texas Transportation Code. The NTTA is authorized to acquire, design, construct, maintain, repair and operate turnpike projects; to raise capital for construction projects through issuance of turnpike revenue obligations; and to collect tolls to operate, maintain and pay debt services on those projects in Collin, Dallas, Denton and Tarrant counties in Texas. The NTTA has two representatives from each of these four counties on its Board of Directors as well as one member appointed by the Governor of Texas from a county adjacent to the NTTA's four-county service area. The NTTA is dedicated to fulfilling its mission, which is to provide a fiscally sound system of innovative toll facilities, services and solutions that improves the mobility, quality of life and economy of the North Texas region.

This report describes the location, engineering design features, construction cost estimates and estimates of operation and maintenance costs of the proposed State Highway 121 (SH 121) Toll Project (the "Project") in Collin, Dallas and Denton counties from Business SH 121 in Denton County to US Highway 75 (US 75) in Collin County, a distance of approximately 26 miles. In addition, this report includes the engineering design standards, typical sections and project plan and profile for the Project.

Project Description

The Project extends northeasterly from Business SH 121 in Denton County to US 75 in Collin County and continues to serve as a primary northeast-southwest traffic artery in the corridor area between IH 35E and US 75. The corridor area served by SH 121 continues to experience significant growth in commercial, retail and residential development. SH 121 is also a primary arterial to the Dallas-Ft. Worth (DFW) International Airport. The purpose of the Project described in this report is to complete, expand, and improve the roadway to meet the growing traffic demand in Collin and Denton counties. The Texas Department of Transportation (TxDOT) has completed and opened to traffic the frontage roads for the entire length of the Project. The Project is broken into five segments for purposes of managing and expediting the design and construction (refer to the Project map on page 2).

- Segment One (1), the most southwesterly portion of the Project extends seven (7) miles from Denton Tap Road/ Denton Creek to FM 2281 (Old Denton Road). All bridge structures, ramps, frontage roads, six (6) main lanes pavement and video tolling system (no toll tag readers) in this Segment were constructed by TxDOT and opened to traffic in July 2006, as a six-lane video tolled facility. The NTTA is responsible for constructing soundwalls, additional signing, pavement markings, landscaping and installing an all electronic tolling collection (ETC) (toll tag readers and video) and an Intelligent Transportation System (ITS). The NTTA's improvements are scheduled for completion by September 2008.
- Segment Two (2), the mid-western half of the Project, extending nine (9) miles from FM 2281 to Hillcrest Road, is under construction by TxDOT and is scheduled for completion by the end of January 2008. TxDOT is constructing all bridge structures, ramps and six (6) main lanes pavement. The NTTA is responsible for constructing additional signing, pavement markings, landscaping and installing an all-ETC and ITS system. The NTTA's improvements are scheduled for completion by September 2008.
- Segment Three (3), the mid-eastern half of the Project, extending seven (7) miles from Hillcrest Road to Lake Forest Drive, is currently being designed by the NTTA. The existing frontage roads and diamond interchange at Custer Road were constructed and opened to traffic by TxDOT. The NTTA is responsible for constructing mainlane pavement and bridge structures, signing, pavement markings, landscaping and installing an all-ETC and ITS system. Construction completion is scheduled for January 2010.

- Segment Four (4), the most easterly portion of the Project, extends three (3) miles from Lake Forest Drive and terminates approximately one-half mile east of US 75 at Medical Center Drive, a major arterial facility in the City of McKinney. The NTTA is responsible for constructing a four-level interchange with direct connecting ramps at SH 121 and US 75. Landscaping, all-ETC toll collection system and ITS system will also be provided in this segment. Service roads will provide access to US 75 from SH 121 until this interchange is completed. This segment is planned for construction completion by January 2011.
- Segment 5, the one third (1/3) mile long middle portion of the Project, is currently a three-level interchange at the intersection of the Dallas North Tollway (DNT) and SH 121. The existing three-level interchange will remain and be converted by the NTTA to a five-level interchange with direct connecting ramps. This segment is planned for construction completion by January 2012.

Each of the 38 ramp connections to the Project will have an overhead gantry to allow for placement of ETC equipment. There are three main lane gantries located on the Project near Denton Tap Road (Segment 1), Main Street (Segment 2) and east of Custer Road (Segment 3). Each main lane ETC gantry will provide for eight toll collection lanes (four each direction) that will be equipped with both TollTag and TxTag collection capability. All toll collection lanes are dedicated, non-stop express lanes to expedite the flow of traffic through the gantries and provide for ease of maintenance. Refer to the appendix for tolled main lane gantry and ramp connection locations.

Project Costs

The current estimated cost of the Project (Segments 1-5), for the three lane section currently being designed, is $638,810,715, while the estimated cost for the future fourth lane capacity improvements along Segments 1-5 is $59,309,300. The total Project cost including the future capacity improvements is $698,120,000. The required 350 to 400-foot-wide Project right-of-way (ROW) was acquired by TxDOT, Collin County, Dallas County, Denton County and the cities of Plano, Frisco, Allen and McKinney. The estimated cost does not include funds for ROW acquisition for minor widening required at the interchanges at SH 121/US 75 and SH 121/DNT, where a total of seven parcels are required prior to construction and will be acquired by TxDOT at its cost.

Segments 1, 2 and 3 are scheduled for bidding in January 2008. Quantities of the major construction items were developed from construction plans and include grading, drainage, bridges, retaining walls, soundwalls, gantries, ETC and ITS equipment, landscaping and related elements of construction. The estimated quantities and the unit prices for similar construction in the Dallas area were used to estimate the total construction cost. The unit prices are based on costs expected to be received through the competitive bidding process in the first quarter of 2008. Quantities of the major construction items for Segments 4 and 5 were developed from conceptual schematic plans prepared by TxDOT. Construction plans are scheduled to be completed for Segments 4 and 5 by late 2008.

Several factors, including unforeseen escalation of prices and wages, labor or material shortages and changes in economic conditions can significantly affect (escalate or reduce) construction costs. Appropriate contingencies are added to the cost of the Project to cover the unforeseen escalations. The estimated Project cost reflects our professional judgment of the construction industry; and it is our belief that the Project can be constructed within the limits described for the estimated cost given herein. However, due to the nature of the construction industry we cannot, and will not, guarantee that the actual Project cost will not vary from the estimated cost.

Environmental Considerations

An environmental assessment (EA) and finding of no significant impact (FONSI) re-evaluations were developed for TxDOT to determine the social, economic and environmental effects of tolling Segments 1 and 2 of the Project. Both of the environmental documents were cleared by the Federal Highway Administration (FHWA) on April 14, 2006. Additionally, an environmental re-evaluation and conceptual toll plan was prepared for TxDOT for Segments 3 and 4 of the Project. A Decisional Memorandum approving the environmental re-evaluation and conceptual toll plan was signed by FHWA on October 12, 2007. The environmental document for Segment 5 of the Project is currently in development. The environmental document was sent to the Environmental Affairs Division on March 29, 2007. Based on the investigations conducted, the Project will have no significant impacts on the quality of the human environment and have no serious effects on the factors that were evaluated and is expected to be environmentally cleared.

Under Section 404 of the Clean Waters Act, the U.S. Army Corps of Engineers (USACE) regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Therefore, authorization by the USACE in the form of a nationwide permit has been obtained for Segments 1 and 2 for the discharge of dredged or fill materials or for construction of box culverts and/or bridges in waters of the United States, which exist on the Project site. Coordination with the USACE for Segments 3-5 has not been initiated. It is anticipated that remaining Section 404 activity would be authorized under NWP #14, with coordination.

Schedule

Segment 1, 2, and 3 are scheduled for bidding in January 2008. The NTTA improvements for Segments 1 and 2 are scheduled for completion by September 2008. Segment 3 is scheduled to open to traffic in January 2010. Segment 4 is scheduled to open to traffic in January 2011 and Segment 5 is scheduled to open to traffic in January 2012. Refer to Table 1 for milestone schedule dates.

Table 1: SH 121 Milestone Schedule Dates

Segment	Notice to Proceed	Commence Construction	Service Commencement
1 and 2	October 12, 2007	March 2008	September 1, 2008
3	October 12, 2007	March 2008	January 1, 2010
4	October 12, 2007	February 20, 2008	January 1, 2011
5	October 1, 2008	October 26, 2008	January 1, 2012

Introduction

The SH 121 Toll Project (the "Project") extends northeasterly from Business SH 121 in Denton County to US 75 in Collin County, a total length of twenty-six (26) miles, and continues to serve as a primary east-west traffic artery in the corridor area between IH 35E and US 75. The corridor area served by SH 121 continues to experience significant growth in commercial, retail and residential development and is a primary arterial to the Dallas-Ft. Worth (DFW) International Airport. The purpose of the Project described in this report is to meet the growing traffic demand in Collin and Denton counties.

In March 2007, the Regional Transportation Council (RTC) requested the NTTA to furnish a proposal to design, build, operate and maintain the Project. NTTA submitted the SH 121 proposal to the RTC on May 18, 2007. The RTC recommended NTTA be selected to deliver the Project at a meeting on June 14, 2007. In addition, the Texas Transportation Commission (TTC) selected NTTA for the Project on June 28, 2007, provided that all terms and conditions of the contract and funding be met and accepted.

Description of Project

SH 121 Corridor

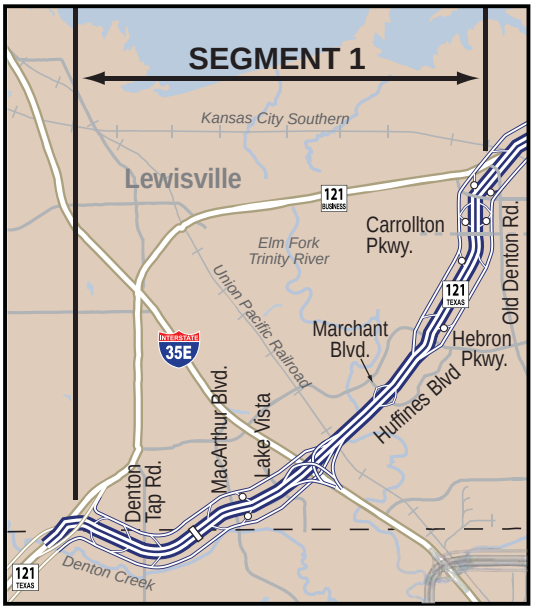
The original SH 121 Corridor connects the Fort Worth Central Business District (CBD) to US 75 in the city of McKinney, which is the county seat for Collin County. The SH 121 corridor provides access to and from the highly developed residential areas of the greater Fort Worth area and the cities of Coppell, Lewisville, Carrollton, Plano, Frisco and McKinney. The original SH 121, approximately 70 miles in length, was built as a two-lane undivided roadway.

To facilitate convenient design and construction, the Project was divided into five (5) segments. All segments of the Project utilize the same typical section of three main lanes in each direction that are separated with a continuous concrete traffic barrier for improved safety and traffic flow. (See Appendix Pages 2-3). Parallel northbound and southbound frontage roads consisting of three lanes in each direction are complete and open to traffic by TxDOT. Additional capacity improvements in the form of adding a fourth lane in each direction for the entire length of the Project are planned for the future by the NTTA. The addition of the fourth lane to Segments 1 and 2 and Segments 3 thru 5 is scheduled for January 2012 and January 2015, respectively.

SH 121 Segment 1

In 2006, TxDOT completed the construction of Segment 1, from Denton Creek to FM 2881 (Old Denton Road). Segment 1 includes three main lanes in each direction for a length of 7.05 miles, including northbound and southbound frontage roads. It was opened to traffic by TxDOT in July 2006 as an all electronic Tollway utilizing video tolling.

A main lane toll gantry was constructed by TxDOT and is located just east of Denton Tap Road for video tolling of all main lanes. Toll gantries also exist at each ramp east of MacArthur Boulevard to collect tolls via video tolling from customers accessing SH 121 from service roads. Segment 1 planned improvements by NTTA include new sound walls, main lane gantry, ramp gantries, additional signing, landscaping, pavement markings, tolling and ITS improvements. All improvements are scheduled for completion by September 2008. Toll Tag readers and video equipment will be placed at 8 existing ramp locations to collect tolls from customers accessing SH 121 from service roads. Segment 1 plan and profile are shown on Plates 2 through 8 in the appendix.



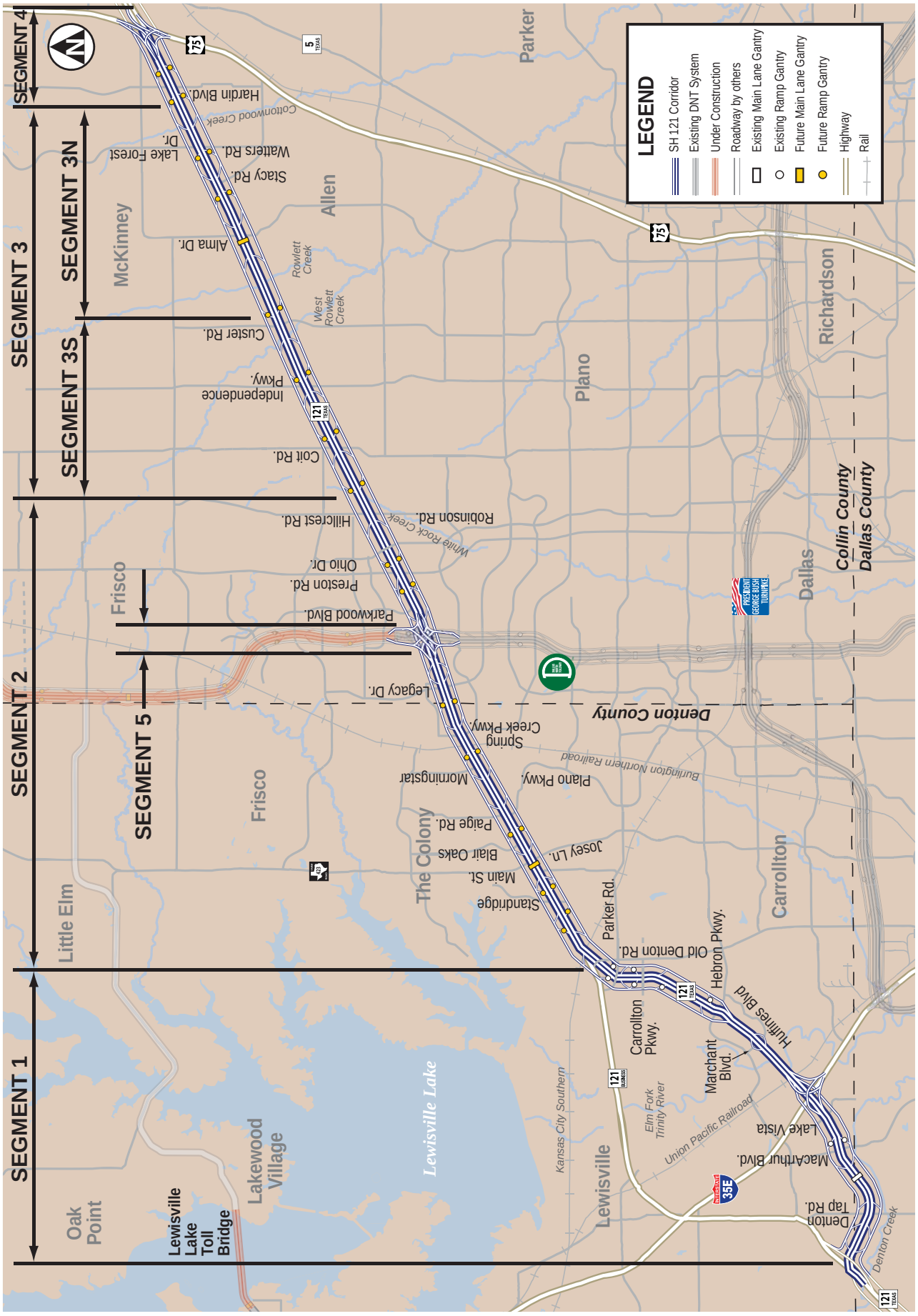
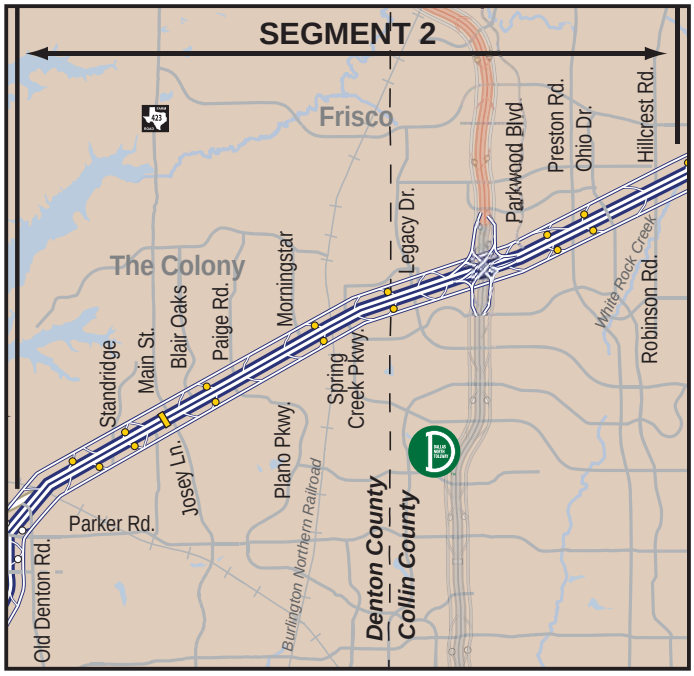


Figure 1 – SH 121 Corridor Location and Segments

SH 121 Segment 2

The main lane construction of Segment 2 is under construction by TxDOT and is scheduled for completion by January 2008. Segment 2 begins at the ramps just west of FM 2281 (Old Denton Road) to just east of Hillcrest Road, a length of 9.02 miles. Improvements planned for this section are the same as those identified for Segment 1. A new main lane toll gantry will be located just west of Main Street for Toll Tag readers and video tolling of all main lanes. Toll gantries will be placed at 14 ramp locations to collect tolls from customers accessing SH 121 from service roads. Segment 2 plan and profile are shown on Plates 9 through 17 in the appendix.

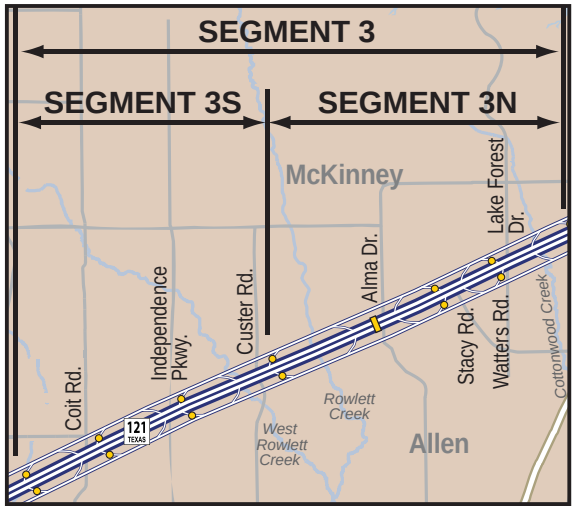


SH 121 Segment 3

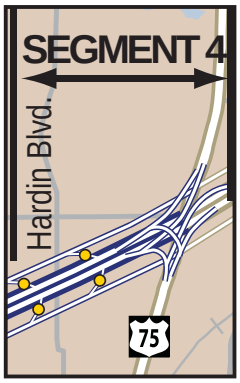
The main lane construction of Segment 3 begins just east of the Hillcrest Road overpass and extends northeasterly approximately 6.88 miles, terminating at the west side of the Watters Road overpass. Segment 3 involves design and construction of the six main lanes, main lane and ramp gantries, landscaping, signing, pavement markings, tolling and ITS systems.

Segment 3 is divided into two sections for ease of design and construction. Segment 3S begins just east of the Hillcrest Road overpass and terminates just east of the Custer Road overpass. Segment 3N begins just east of the Custer Road overpass and terminates on the west side of Lake Forest Drive/Watters Road overpass.

A main lane toll gantry is located just east of Custer Road for ETC tolling of all main lanes. Toll gantries will be placed at 12 ramp locations along Segment 3 to collect tolls from customers accessing SH 121 from service roads. Segment 3 construction is scheduled for completion by January 2010. Segments 3S and 3N plan and profile are shown on Plates 17 through 23 in the appendix.

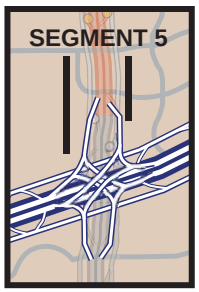


SH 121 Segment 4



The main lane construction of Segment 4 begins at the west side of the Watters Road overpass and terminates at the Medical Center Drive intersection for a length of 2.94 miles. Design and construction of the four-level US 75 interchange with SH 121 and the reconstruction of portion of US 75 are also included in Segment 4. Toll gantries will be placed at four ramp locations to collect tolls from customers accessing SH 121 from service roads. Construction is scheduled for completion by January 2011. Segment 4 plan and profile are shown on Plates 23 through 25 in the appendix.

SH 121 Segment 5



Segment 5 involves the design and construction of improvements to the existing three-level interchange at the DNT and SH 121 to provide a fourth and fifth level of direct connecting ramps between the DNT and SH 121, as well as new ramp access to the Legacy Business Park area. The direct connecting ramps will provide for direct access in each direction between the DNT and SH 121 and greatly improve traffic flow at this interchange. All SH 121 and DNT frontage roads have been constructed and are open to traffic. Construction is scheduled for completion by January 2012. Segment 5 main lanes are 0.33 miles long and the plan and profile are shown on Plate 14 in the appendix.

Existing Condition Inspection and Assessment

In July 2007, the NTTA conducted detailed, independent, visual inspections of the completed Project roadway, frontage roads, shoulders, service roads, drainage systems, bridges, retaining walls, signage and toll gantries on Segments 1 and 2. These inspections were made for the purpose of evaluating the general condition of these assets and identifying any deficiencies requiring maintenance. Based on data obtained from the visual inspection, a condition rating was determined for all existing pavements, structures, walls, signs and toll collection equipment. The inspection revealed that the completed roadway facility and structures are in excellent condition overall and exhibit minor wear consistent with the age of the facility. Current maintenance programs will ensure continued excellent serviceability.

Engineering Geology

A geotechnical investigation was undertaken in conjunction with the design of the Project. Subsurface borings were made at locations along the alignment of the roadway to determine how the surface conditions might affect the design and construction of the roadway, bridges and retaining walls. Laboratory testing of soil samples were made to determine the nature and characteristics of the materials to be encountered.

Geologically, the Project alignment is within the outcrop of the Austin Chalk Limestone Formation, which is generally overlain by residual soils. Localized ancient buried stream channels are also present. The Project site primarily consists of stiff to hard clay and silty clays and is classified as Site Class C (stable condition) for seismic site classification. The subsurface conditions along the proposed alignment have been divided into four principal geologic units which are fills, residual soils, Austin Formation-Tan Limestone and Austin Formation-Grey Limestone.

The geotechnical analysis indicates that, in general, no major stability or settlement problems are anticipated for embankment construction on the existing subsurface materials. Drilled shaft-type foundations are being used for all bridge structures.

Design Standards

The design of the Project will conform to *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO) and the *Roadway Design Manual* and *Bridge Design Guide* published by TxDOT. The Project will also be designed to comply with the technical requirements of FHWA and NTTA design guidelines.

Roadway

The Project (existing and proposed sections) has been designed for a safe operating speed of 70 miles per hour. Wherever possible, desirable values for designs will be used to maximize safety. The entrance and exit ramps will be designed to provide a smooth and safe transition between the SH 121 main lanes and the service roads using 50-mph design criteria.

The Project will initially provide six traffic lanes, three in each direction. The median width varies from 28 feet to 52 feet throughout the length of the Project. A concrete median barrier will be placed between opposing directions of traffic over the entire length of the Project to prevent cross-over accidents. Should additional lane capacity be required in the future, the median will accommodate one additional standard 12-foot-wide lane in each direction, while maintaining a center median barrier.

The right (outside) shoulder will be 10 feet wide and the left (inside) shoulder will be 12 feet wide to allow a disabled vehicle to stop without interfering with the through traffic lanes. Both shoulders will be constructed of concrete and will match the adjoining pavement section. In sections with the paving grade below natural ground, a concrete shoulder with traffic-rail protection along retaining walls will be employed.

Ramps will typically be 14 feet in width with an eight-foot-wide outside shoulder and two-foot inside shoulder. In restricted areas, it may be necessary to reduce the width of the ramp pavement. However, in all ramp locations, adequate shoulder and ramp pavement width will be provided to allow traffic to pass a stalled vehicle.

The pavement lanes will be clearly marked. In addition, overhead lighting as well as direct message signs (DMS) will provide warning and direction to give drivers additional information about the upcoming roadway conditions.

Pages 2-3 in the appendix show existing and proposed typical cross sections of the Project. The positions of the service roads relative to the main lanes are shown on the typical sections. The existing typical sections vary from having no main lanes with two lane frontage roads in each direction to three main lanes and three frontage lanes in each direction.

Pavement

The pavement for the Project will consist of 13-inch-thick, continuously reinforced Portland cement concrete placed on a four-inch asphalt-stabilized base over 12 inches of the subgrade treated with lime for increased stability. This pavement cross section provides a suitably rigid pavement design for potential increases in truck traffic along the Project.

The shoulders will be constructed with the same thickness and materials as the main lanes. As stated previously, concrete traffic rails will be provided along the outside shoulders, where necessary, for added safety.

Structures

All structures have been designed for HS 20 live loading and conform to AASHTO's *Standard Specifications for Highway Bridges*. Bridges will be steel-reinforced concrete construction. Retaining walls will be steel-reinforced concrete and reinforced-earth construction.

The eight-lane bridge structures will be consistent with the approaching roadways. Typically, the Project bridges will provide three, 12-foot traffic lanes in each direction with each directional roadway on a separate structure. The outside and inside shoulders will be 10 feet and 22 feet in width plus one foot for a traffic rail on each side, which creates a typical total bridge width of 70 feet in each direction.

Drainage

The rapid and efficient removal of storm water from the pavement is an important consideration in the design process. Drainage for the Project will consist of a system of inlets and pipes along with the existing natural swales and artificial conduits.

For this Project, significant drainage areas were determined, culverts sized; and major drainage structures were identified. All drainage for the Project will be by gravity. All drainage designs conform to standard TxDOT, NTTA and local municipality practices and methods. The cost of constructing the drainage system for the Project is included in the Project Cost Estimates section of this report. All drainage for the existing Tollway sections were designed using the same design criteria and are in place and fully operational.

System-Wide Design Guidelines

The NTTA has proposed to use its system-wide design guidelines and standards for Segments 3, 4 and 5, which include structural signing, bridges, retaining walls, ROW fencing, lighting, toll gantry and landscape elements to promote visual consistency on all NTTA facilities. These aesthetic elements are provided to enhance the NTTA customers' driving experience and maximize safety for the motorists. The proposed Segments 3, 4 and 5 guidelines will match the design guidelines used on the DNT extension at SH 121. Segments 1 and 2 will remain as built, except for modifications to the toll gantries, bridge fencing, ROW fencing, landscaping, logos and colors of the walls and bridge beams.

Landscape

The NTTA will select key areas of the Project that serve as important interfaces with the surrounding communities for landscape planting. These focus areas would typically include five location types or structures; interchanges, mainlane gantries, underpasses, overpasses, and roadway medians. These focus areas will be carefully examined within the context of the whole system and prioritized for improvements. Plant materials will be carefully selected for specific characteristics such as low water requirement, native or adapted qualities, and seasonal interest.

Illumination

Adequate illumination is essential on urban controlled-access projects to improve nighttime visibility and maximize safety. The design of the illumination system conforms to TxDOT's *Traffic Operations Manual, Highway Illumination, April 1995*. Illumination of main lane entry and exit points will consist of lighting standards located in accordance with design criteria. Additional illumination will be provided at the toll gantries to improve visibility and operations with special attention given to design in order to control light pollution.

Signing

Signing is used extensively on high-volume roadways to inform, warn and control drivers. Therefore, it must be an integral part of the design process. Guide signs, which provide motorists information on routes, destinations and attractions, along with regulatory and warning signs, are included on the Project and conform to the Manual of Uniform Traffic Control Devices (MUTCD) and TxDOT guidelines.

Signs on the Project will be reflective to enhance visibility at night and also designed to withstand high wind loads. Roadside mounted signs and overhead signs will be utilized, as necessary, to ensure that the signs are clearly visible to the motorists. In addition to signs along the Project, trailblazer signs will be installed on major arterials in the vicinity of the Project to direct motorists to the nearest SH 121 access.

Toll Collection

All toll collection systems on the Project will be 100-percent open road tolling (ORT), using an all electronic toll collection (ETC) system. There are no provisions for cash tolling collections. Vehicles that are equipped with a Toll Tag or TxTag transponders will be tolled electronically as they travel through the toll gantries. Any vehicles using the Project that do not have these transponders will be notified by mail of their tolls by NTTA and be requested to obtain a transponder. TxDOT currently is using video tolling as its method of toll collection on Segment 1. Segment 1 will be retrofitted to the NTTA's ORT system for uniformity in toll collection on the NTTA system.

Each of the 38 ramp connections to the Project will have an overhead gantry to allow for placement of ORT-Zone equipment. There are three main lane gantries located on the Project near Denton Tap Road (Segment 1), Main Street (Segment 2) and Alma Road (Segment 3). Each main lane ETC gantry will provide for eight toll collection lanes (four each direction) that will be equipped with both TollTag and TxTag collection capability. All toll collection lanes are dedicated, non-stop express lanes to expedite the flow of traffic through the gantries and provide for ease of maintenance.

All vehicles using the Project will be monitored with video-enforced toll collection systems. Vehicles which are not equipped with a TollTag or TxTag will be detected and will be billed monthly by linking their license plate data to their registration information. A conceptual 3D rendering shows an overhead view of a typical SH 121 ETC gantry in Figure 2.

Sound Mitigation

Where warranted in accordance with the TxDOT and NTTA Sound Mitigation Policy, the NTTA is building sound walls to mitigate sound levels which exceed acceptable FHWA Noise Abatement Criteria along the Project. Through the environmental review process, it was determined that only Segments 1 and 2 in Denton County met the requirements for traffic noise abatement.

Right-Of-Way

The NTTA has the authority to acquire property and easements by purchase or condemnation for the construction, maintenance and operation of toll roads. Based on the proposed location of roadways, bridges and intersections, the ROW limits have been established. Based on the current plans for the Project, limited additional ROW and easement acquisition will be necessary. ROW for most of the Project was previously acquired by TxDOT, NTTA, Collin and Denton Counties, the cities of Allen, Frisco, Plano and McKinney. Additional ROW of 17.98 acres, a total of seven parcels, will be required at the proposed interchanges at SH 121/DNT and SH 121/US 75. TxDOT is in the process of acquiring this additional ROW, prior to construction of these segments at their expense.

Figure 2 – Main lane ETC gantry 3D view

Utility Adjustments

The Project is located in an area with various utilities; and only a minor amount of utility relocation will be necessary. No major utility relocations are needed within the corridor. An estimate of NTTA costs for the utility adjustments that will be needed for the Project is included in the estimated Project cost. Approximately $150,000 of the utility relocation cost for the Project must be paid by the NTTA due to previous easement rights or impact due to value engineering revisions.

Public Hearing

A public hearing for Segments 3 and 4 was held on February 26, 2007 to provide the public an opportunity to comment on the proposed design and environmental re-evaluation required for the Conceptual Toll Plan (CTP) for the Project. The Project received support from the affected governmental agencies and favorable comments from the public. Final documentation has been approved by the FHWA.

Environmental Considerations

The design and construction of the Project are compliant with the National Environmental Policy Act (NEPA) and adhere to environmental commitments contained in the approved environmental documents.

An environmental assessment (EA) and a finding of no significant impact (FONSI) Re-evaluation were developed by HNTB Corporation to determine the social, economic and environmental effects of tolling Segments 1 and 2 of the Project. Both of the environmental documents were cleared by the FHWA on April 14, 2006. Additionally, an environmental re-evaluation was prepared by HNTB Corporation for Segments 3 and 4 of the Project for TxDOT and has received NEPA approval. Final documentation has been forwarded to the FHWA for review and approval. Segment 5 of the Project is currently in development. A Categorical Exclusion for Segment 5 was sent to the Environmental Affairs Division on March 29, 2007.

Based on the investigations conducted, the Project will have no significant impacts on the quality of the human environment and have no serious effects on the factors that were evaluated. Implementation of the proposed tolling of SH 121 would not appreciably increase the potential for impacts beyond those considered in previous environmental documents and subsequent/anticipated approvals. No further environmental documentation beyond the documents mentioned above would be required.

The commercial and residential development that results from the construction of SH 121 will have a positive economic impact. Improving the mobility in the area will make the parcels of land adjacent to the proposed corridor more attractive and increase their land value. In addition, the commercial development will increase the tax base in the area and provide additional jobs. The corridor will also have a positive economic effect on the properties in the surrounding area due to the improved mobility and access. The proposed alignment for the SH 121 Corridor will not separate or isolate any existing neighborhoods and will improve residents' access to other areas of the Dallas-Fort Worth region.

This Project meets all air and water quality requirements. An air-quality analysis was conducted by modeling the anticipated carbon monoxide (CO) levels resulting from the Project. It was determined that the Project would not adversely impact CO levels. The Project will not hinder the Texas State Implementation Plan to meet National Ambient Air Quality Standards (NAAQS). In addition, no long-term water quality impacts are expected from the Project. Control measures will be taken during the construction process to minimize water pollution. These measures include preserving existing vegetation, limiting the amount of disturbed earth and utilizing temporary erosion control practices.

The Project should not have a significant impact on exterior noise levels according to the Noise Abatement Criteria for the Design Year 2010 as defined by the *Guidelines for Analysis and Abatement of Highway Traffic Noise*.

Commitments and Permits

All permits for Segments 1 and 2 have been obtained and require no further action. Section 404 permits for the proposed construction of the SH 121 main lanes from east of Hillcrest to US 75 and the interchange of SH 121 and US 75 would need to be acquired by NTTA prior to construction. Formal coordination with the USACE would be required prior to any Nationwide Permit (NWP) being issued. Unregulated upland habitat mitigation of 11 acres of trees is to be planted at Lake Lavon. Coordination with the Lake Lavon Manager for the time and location of the plantings would be required. Additionally, 11.4 acres of regulated habitat mitigation is required for riparian impacts within Segment 4.

Project Cost Estimates

Quantities of major construction items were estimated based on construction plans at the 90-percent completion level. Major items include grading, drainage, paving, bridges, retaining walls and construction-related items. The estimated quantities and the unit prices for construction items on similar projects in the Dallas area were used to estimate the total construction cost. The estimated unit prices expected to be received through the competitive bidding process in the first quarter of 2008 was used to establish project costs.

Table 2: Estimated Cost Summary

No.	Description	Cost
1	Segments 1, 2	$14,163,718
2	Segments 3W, 3E	$130,427,785
3	Segment 4 (SH 121/ US 75 Interchange	$155,085,553
4	Segment 5 (SH 121/DNT Interchange)	$92,843,188
5	Toll Gantries, Equipment	$17,626,759
6	Construction Management	$33,138,619
7	Miscellaneous Construction*	$21,172,723
Subtotal (1-7) Construction		$464,458,346
8	Plans, Specifications, and Estimates (PS&E)	$37,213,460
9	PS&E Administrative	$11,437,618
10	Other Agency Costs	$150,000
Subtotal (8-10) Engineering		$48,801,078
11	Project Contingencies	$125,551,288
Project Total (1-12)		**$638,810,700**

**The estimated miscellaneous construction cost includes the costs of construction material testing, utility relocations, proposed right-of-way and easements, landscape and ITS equipment installation.*

The estimated Project Total cost to construct future fourth lane capacity improvements is $59,309,300.

Table 2 shows a summary of the estimated project costs for the Project. The total Project costs include engineering, legal and administrative, material testing and utility relocation costs that are NTTA's responsibility. The estimated Project cost for the three lane section currently being designed is $638,810,715, while the Project cost for the future fourth lane capacity improvements is $59,309,300. The total Project cost including the future capacity improvements is $698,120,000.

Several factors, including unforeseen escalation of prices and wages, labor or material shortages and changes in economic conditions, can significantly affect (escalate or reduce) construction costs. The estimated Project cost reflects our professional judgment of the current construction industry and with future adjustment for inflation, it is our belief that the various sections of the Project can be constructed within the limits described for the estimated cost given herein. However, due to the nature of the construction industry, we cannot and will not guarantee that the actual Project costs will not vary from the estimated cost.

Operation and Maintenance

Estimated costs of operations and maintenance of the Dallas North Tollway (DNT) system, including increases in operating costs associated with the Project, have been prepared.

Estimates are based on the NTTA's current system operations and maintenance model for the DNT system. In addition, the estimates also assume that NTTA will continue to operate under the administration and management that currently exists as well as continuing to operate in a manner that will fulfill the commitments as set forth in agreements with TxDOT.

The costs of administration, management, maintenance of roadways and structures, electronic toll collection, contract maintenance activity and miscellaneous other costs associated with the operation of system are included in the estimates. The estimated annual Operations and Maintenance Fund (OMF) and Reserve Maintenance Fund (RMF) expenses for the Project are as given in Table 3 on page 10.

Table 3: Estimate of Annual Operations and Maintenance Expense

Year	Existing DNT System	SH 121	Proposed DNT System, Including SH 121	Reserve Maintenance Fund Estimate for SH 121
2008	90,877,700	3,486,000	94,363,700	-
2009	89,270,337	10,745,000	100,015,337	-
2010	86,803,137	21,630,000	108,433,137	-
2011	89,193,284	22,225,000	111,418,284	-
2012	91,650,004	22,836,000	114,486,004	415,000
2013	94,174,074	23,463,000	117,637,074	3,861,000
2014	96,767,318	24,109,000	120,876,318	397,000
2015	99,432,612	24,772,000	124,204,612	6,881,000
2016	102,170,882	25,454,000	127,624,882	5,029,000
2017	104,985,106	26,153,000	131,138,106	1,361,000
2018	107,876,319	26,872,000	134,748,319	10,716,000
2019	110,847,610	27,611,000	138,458,610	155,000
2020	113,900,127	28,370,000	142,270,127	14,481,000
2021	117,037,075	29,151,000	146,188,075	-
2022	120,260,722	29,952,000	150,212,722	3,768,000
2023	123,573,397	30,776,000	154,349,397	7,712,000
2024	126,976,493	31,622,000	158,598,493	3,950,000
2025	130,473,469	32,492,000	162,965,469	11,416,000
2026	134,066,852	33,386,000	167,452,852	14,905,000
2027	137,759,238	34,303,000	172,062,238	2,123,000
2028	141,553,295	35,245,000	176,798,295	123,712,000
2029	145,451,763	36,215,000	181,666,763	-
2030	149,457,459	37,211,000	186,668,459	112,056,000
2031	153,574,276	38,234,000	191,808,276	1,401,000
2032	157,804,189	39,286,000	197,090,189	42,950,000
2033	162,150,252	40,367,000	202,517,252	9,379,000
2034	166,616,603	41,477,000	208,093,603	8,511,000
2035	171,205,470	42,617,000	213,822,470	191,061,000
2036	175,921,165	43,789,000	219,710,165	4,380,000
2037	180,767,095	44,993,000	225,760,095	134,137,000
2038	185,745,758	46,230,000	231,975,758	8,256,000
2039	190,861,748	47,501,000	238,362,748	56,489,000
2040	196,118,762	48,807,000	244,925,762	25,148,000
2041	201,520,592	50,149,000	251,669,592	6,032,000
2042	207,071,141	51,529,000	258,600,141	235,029,000
2043	212,774,415	52,947,000	265,721,415	4,610,000
2044	218,635,532	54,404,000	273,039,532	188,453,000
2045	224,657,721	55,901,000	280,558,721	8,929,000
2046	230,845,331	57,438,000	288,283,331	93,753,000
2047	237,203,828	59,017,000	296,220,828	16,081,000
2048	243,737,800	60,640,000	304,377,800	13,220,000
2049	250,451,965	62,308,000	312,759,965	299,024,000
2050	257,350,166	64,022,000	321,372,166	16,202,000
2051	264,438,383	65,783,000	330,221,383	4,383,000
2052	271,722,732	67,593,000	339,315,732	11,535,000
2053	279,207,467	69,452,000	348,659,467	3,373,000
2054	286,897,989	71,363,000	358,260,989	9,695,000
2055	294,800,849	73,326,000	368,126,849	-
2056	302,921,748	75,344,000	378,265,748	15,746,000
2057	311,265,543	77,416,000	388,681,543	-
2058	319,839,256	79,546,000	399,385,256	1,353,000

NOTE: To determine operation and maintenance cost for the proposed project, an estimate of the personnel and expenses required to operate each department was developed. The sum of these expenses comprises the SH 121 O&M cost estimate in 2007 dollars. This estimate was then escalated by a rate of 3.0% per year.