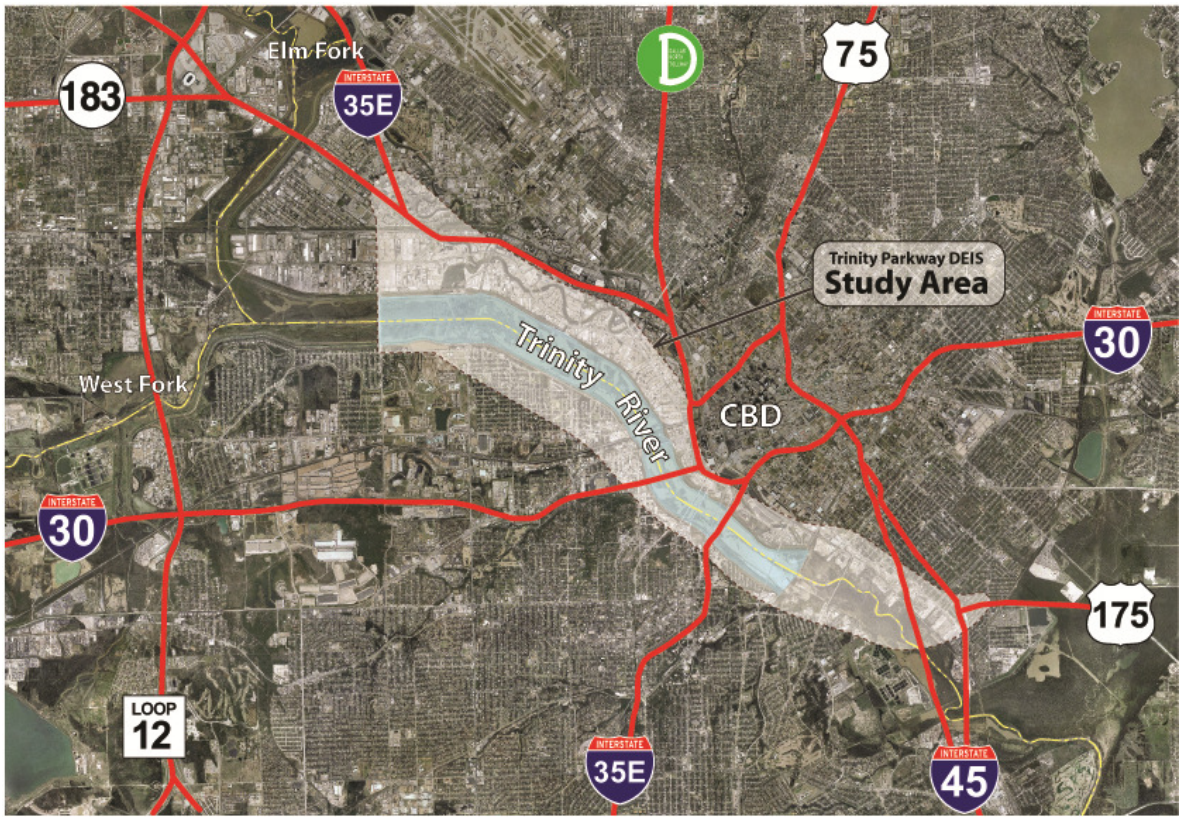
FHWA-TX-EIS-02-02-D

DRAFT ENVIRONMENTAL IMPACT STATEMENT AND SECTION 4(f) EVALUATION

TRINITY PARKWAY

FROM IH-35E/SH-183 TO US-175/SH-310
DALLAS COUNTY, TEXAS



U.S. Department of Transportation Federal Highway Administration

Texas Department of Transportation

NTTA NORTH TEXAS TOLLWAY AUTHORITY

FEBRUARY 2005

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FHWA-TX-EIS-02-02-D

TRINITY PARKWAY
FROM IH-35E/SH-183 TO US-175/SH-310, DALLAS COUNTY, TEXAS

DRAFT ENVIRONMENTAL IMPACT STATEMENT
AND SECTION 4(f) EVALUATION

Submitted Pursuant to 42 U.S.C. 4332 (2)(c), 49 U.S.C. 303, and
40 CFR 230

By the:
U.S. Department of Transportation
Federal Highway Administration
Texas Department of Transportation
North Texas Tollway Authority

Cooperating Agency:
U.S. Environmental Protection Agency

1/28/05
Date of Approval

for Federal Highway Administration

1-28-05
Date of Approval

for Texas Department of Transportation

01/21/05
Date of Approval

for North Texas Tollway Authority

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Abstract: This action is the construction on either existing and/or new location of the Trinity Parkway as a limited-access toll facility from IH-35E/SH-183 to US-175/SH-310 in the City of Dallas, Dallas County, Texas. Two main corridors and variations have been examined for ways to provide an important reliever route facility through this section of Dallas County. The social, economic, and environmental impacts of the proposed construction are analyzed and discussed in this document.

Comments on the Draft EIS are due 45 days from the date the Notice of Availability is published in the *Federal Register* and should be sent to the North Texas Tollway Authority, Plano, Texas.

Price per copy: $80.00 *(Additional shipping fees are not included in this price)*

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FOREWORD

The National Environmental Policy Act of 1969 (NEPA) establishes a process that requires the preparation of detailed environmental documentation when federal actions are proposed with potentially significant environmental impacts. A Draft Environmental Impact Statement (DEIS) identifies the probable environmental consequences (beneficial and/or adverse) of each alternative, including ways to mitigate unavoidable impacts.

This DEIS has been prepared according to the regulations of the U.S. Department of Transportation's (USDOT) Federal Highway Administration (FHWA) [23 Code of Federal Regulations (CFR) Section (§) 771]. These regulations prescribe the policies for implementing NEPA and the regulations of the federal Council on Environmental Quality (CEQ) (40 CFR § 1500-1508). This document is also consistent with the rules and regulations detailed in the October 28, 1993, *Federal Register* (FR), Volume 58, Number 207 (58 FR 207) (23 CFR § 450.318), *Statewide Planning; Metropolitan Planning Rule for Major Investment Studies.*

This DEIS is based on and is consistent with the area's financially constrained Metropolitan Transportation Plan (MTP) *Mobility 2025 – 2004 Update* and the *2004-2006 Transportation Improvement Program* (TIP). The *Mobility 2025 – 2004 Update* was approved in January 2004 by the Metropolitan Planning Organization (MPO) – the North Central Texas Council of Governments (NCTCOG), and was found to conform to the applicable State Implementation Plan (SIP), Clean Air Act Amendments (CAAA) of 1990, and conformity rules by the FHWA and Federal Transit Administration (FTA) on April 8, 2004.

On August 18, 2004, the USDOT announced the Trinity Parkway project had been selected as one of six new nationwide priority projects subject to Executive Order (EO) 13274 *Environmental Stewardship and Transportation Infrastructure Project Reviews*, signed by President Bush on September 18, 2002. EO 13274 was issued to enhance environmental stewardship while streamlining the decision making process for major transportation projects. For priority projects on the USDOT list, federal agencies shall, to the maximum extent practicable, expedite their reviews for relevant permits or other approvals; and take related actions as necessary, consistent with available resources and applicable laws, including those relating to safety, public health, and environmental protection.

The organization, format, and content of this document are based on FHWA Technical Advisory T 6640.8A for preparation of environmental projects and documents. The structure of this document is as follows:

- **Executive Summary**: The summary briefly discusses all important project issues. Readers are advised to refer to the complete text and exhibits in the DEIS for details.
- **Chapter 1 – Purpose and Need for Action**: This chapter discusses the project justification and support. It describes the project planning status, system linkages, capacity issues, transportation demand, modal interrelationships, safety issues, and roadway deficiencies.
- **Chapter 2 – Alternatives Considered**: This chapter reviews the project's history leading up to the selection of the range of alternatives, describes the alternatives under consideration, and those alternatives that have been withdrawn from consideration.
- **Chapter 3 – Affected Environment**: This chapter describes the overall physical, biological, cultural, and socioeconomic conditions as they currently exist in the project study area.
- **Chapter 4 – Environmental Consequences**: This chapter provides a detailed description of the anticipated environmental impacts associated with the proposed action.
- **Chapter 5 – Preliminary Section 4(f) Evaluation**: This chapter describes the potential impacts to § 4(f) resources that may be affected by the proposed action.
- **Chapter 6 – Financial Analysis and Evaluation**: This chapter provides details concerning cost estimates and funding mechanisms associated with the proposed action.
- **Chapter 7 – Mitigation Measures and Commitments**: This chapter discusses the proposed mitigation measures to avoid or minimize the effects described in **Chapters 4** and **5** of this DEIS.
- **Chapter 8 – List of Preparers**: This chapter provides a list of the principal authors of this DEIS and consultants who prepared technical studies. It describes their academic and professional background.
- **Chapter 9 – Circulation of DEIS**: This chapter lists all of the agencies, organizations, and individuals to which copies of this document are sent.
- **Chapter 10 – Comments and Coordination**: This chapter provides a review of the cooperating agencies, project development team, and scoping/public involvement process.
- **Chapter 11 – Commonly Used Acronyms**
- **Chapter 12 – Index of Words**
- **Chapter 13 – Bibliography**

[END OF FOREWORD]

EXECUTIVE SUMMARY

S-1 INTRODUCTION

An Environmental Impact Statement (EIS) provides the public and federal, state, and local agencies with the assurance that project sponsors have evaluated, addressed, and documented project-related social, economic, and environmental concerns. The Federal Highway Administration (FHWA), North Texas Tollway Authority (NTTA), Texas Department of Transportation (TxDOT), and the City of Dallas are the sponsors of the Trinity Parkway project.

The United States (U.S.) Environmental Protection Agency (EPA) has agreed to be a cooperating agency for this Draft EIS (DEIS). A cooperating agency is an organization, other than a lead agency, which has jurisdiction by law or with special expertise with respect to environmental impacts due to a major federal action that would affect the quality of the human environment. The EPA has special expertise in the areas of National Environmental Policy Act (NEPA) compliance, Clean Air Act (CAA) conformity, and Section (§) 404(b)(1) guidelines for specification of disposal sites for dredged or fill material.

This DEIS presents the socioeconomic, environmental, and engineering information necessary to satisfy NEPA regulatory requirements. Detailed technical information is provided in supporting documentation that is appropriately referenced in this DEIS. Data summarized in this DEIS are provided in detail in the technical support documents and reports prepared specifically for this project. This DEIS evaluates the traffic benefits and impacts, natural resource impacts, economic costs, environmental consequences, and mitigation strategies associated with potential transportation improvement alternatives along the Trinity Parkway corridor between the IH-35E/SH-183 interchange (northern terminus) and the US-175/SH-310 interchange (southern terminus) in the City of Dallas, Dallas County, Texas.

The DEIS details the impacts on socioeconomic, environmental, and cultural resources due to reasonable build alternatives. The DEIS provides detailed descriptions of the project's Purpose and Need for Action **(Chapter 1)**, Alternatives Considered **(Chapter 2)**, Affected Environment **(Chapter 3)**, Environmental Consequences **(Chapter 4)**, Preliminary Section 4(f) Evaluation **(Chapter 5)**, Financial Analysis and Evaluation **(Chapter 6)**, Mitigation Measures and Commitments **(Chapter 7)**, and other topics as described below.

The Preliminary § 4(f) Evaluation has been prepared consistent with § 4(f) of the U.S. Department of Transportation (DOT) Act of 1966, as amended [49 United States Code (USC) 303]. Similar language is included in 23 Code of Federal Regulations (CFR) § 771.135. A § 4(f) resource is any significant publicly-owned park, recreation area, or wildlife and waterfowl refuge, or any significant historic site. Numerous §

4(f) protected resources are located in the study area, including parks/recreation areas and historic resources.

During the comment period for this document, NTTA will conduct a public hearing to solicit comments from the general public, agencies, and other interested parties (see also **Section S-6** regarding integration and coordination issues with reasonably foreseeable flood control and recreational improvements in the corridor). At the conclusion of the DEIS circulation period, a Final EIS (FEIS) would be prepared that would identify and analyze a preferred alternative, which may be one of the alternatives examined in the DEIS. The FEIS would also be made available to the agencies and the public.

Completion of the environmental review and impact documentation process, followed by a signed Record of Decision (ROD) by the FHWA, would permit the proposed action to proceed to final design and construction phases. The ROD issued by FHWA would be issued in accordance with 23 USC § 109(h), which directs final project decisions be made in the best overall public interest, taking into account:

- The need for fast, safe, and efficient transportation;
- Public services;
- A broad array of social, economic, and environmental effects, and
- The costs of eliminating or minimizing adverse effects.

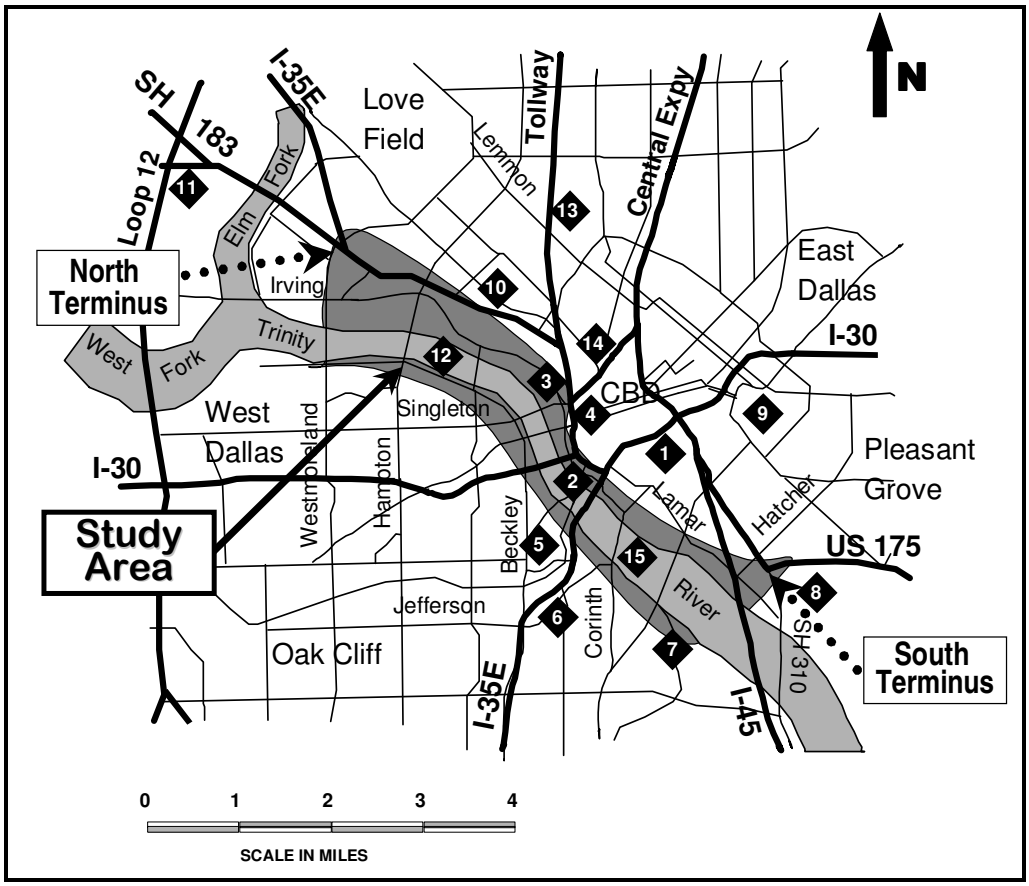
Final design occurs after the receipt of preliminary design and environmental approvals. It includes the integration of mitigation measures into design, right-of-way acquisition, and utility relocation; advertisement of the construction plans; and award of construction contracts. Compensatory mitigation commitments would normally be implemented during the construction phase. During construction, the multi-phased design/construction sequencing of this project may allow certain segments to be opened before completion of all the project's components.

S-2 PROJECT DESCRIPTION

The NTTA proposes to design, construct, operate, and maintain a limited-access toll facility from the IH-35E/SH-183 interchange to the US-175/SH-310 interchange, a distance of approximately 9 miles, in the City of Dallas. The proposed action is known as the Trinity Parkway and would provide a needed reliever route around the existing freeway loop, which encircles downtown Dallas. The proposed action is consistent with the area's financially constrained Metropolitan Transportation Plan (MTP) *Mobility 2025 – 2004 Update* and 2*004-2006 Transportation Improvement Program* (TIP), which were found to conform to the Clean Air Act Amendments (CAAA) of 1990 by the USDOT on April 8, 2004. Additionally, the project

comes from an operational Congestion Management System (CMS) that meets all the requirements of 23 CFR Parts 450 and 500. The project vicinity is shown on **Figure S-1**.

FIGURE S-1. PROJECT VICINITY MAP



Places of Interest

1 – Canyon
2 – Mixmaster
3 – Lower Stemmons
4 – West End and Dealey Plaza
5 – Methodist Medical Center
6 – Dallas Zoo
7 – Cadillac Heights
8 – Rochester Park
9 – Fair Park
10 – Parkland Hospital
11 – Texas Stadium
12 – Dallas Floodway
13 – Dallas North Tollway
14 – Woodall Rodgers Freeway
15 – DART Rail River Crossing

Notes:

- IH-35E north of Dallas Central Business District (CBD) is referred to as "Stemmons Freeway."
- IH-35E south of the Dallas CBD is referred to as "South R.L. Thornton Freeway."
- IH-30 west of the Dallas CBD is referred to as the "Tom Landry Freeway."
- IH-30 east of the Dallas CBD is referred to as "East R.L. Thornton Freeway."

The proposed facility would consist of six mixed-flow main lanes, local street interchanges, and freeway-to-freeway interchanges at the north terminus, south terminus, Woodall Rodgers Freeway, and IH-45.

Additional interchange connections are included, but vary among the build alternatives considered in this DEIS (see **Table S-1**). Toll collection facilities would comprise main lane plazas, ramp plazas, and ancillary facilities. The proposed tollway would be constructed in stages, with fewer lanes initially than the ultimate facility. Additional capacity would be added as traffic demand and conditions warrant. Actual construction of the project may also be accomplished in sections, meaning that specific roadway segments may be completed and opened to traffic before the completion and opening of the entire length of the facility. Funding for the proposed project is anticipated to be provided by local, state, and federal sources, and through the collection of tolls.

The study area roadways include Interstate Highways (IH) 30, 35E, and 45, US Highway 175, State Highways (SH) 183 and 310, and numerous local arterial streets. Notable features include the IH-35E/IH-30 interchange on the west edge of downtown Dallas, locally known as the "Mixmaster," the depressed segment of IH-30 south of the downtown, locally known as the "Canyon," and the segment of IH-35E from the IH-35E/IH-30 interchange north to the Dallas North Tollway (DNT), locally known as the "Lower Stemmons" corridor. These roadways currently experience congestion and safety problems due to geometric deficiencies, limited capacity, and increasing traffic volumes. These roadways are anticipated to operate at worsening congestion levels in the future.

No final recommendations for a preferred alternative are made in this DEIS. NTTA is awaiting public and agency comment on the DEIS. During the public comment period, the regulatory agencies, the public, and other interested parties are invited to provide comments on the technical analyses presented in the DEIS. All additional information and relevant comments would be evaluated and considered prior to recommending a preferred alternative in the FEIS.

S-3 PURPOSE AND NEED FOR ACTION

The primary purpose of the Trinity Parkway is to reduce traffic congestion on IH-35E, IH-30, and other major transportation facilities within the Trinity Parkway study area in order to improve mobility, safety, and increase accessibility to businesses and public facilities. Population and employment growth within the Dallas-Fort Worth (DFW) metropolitan area during the last several decades, combined with other traffic generating factors, has led to unacceptable levels of congestion on IH-35E and IH-30 in the vicinity of the Dallas CBD. The effects of this congestion – increased traffic accidents and rising costs due to travel delays – suggest the need to take action. Other transportation problems in the study area stem from a poorly developed roadway network that is constrained in its ability to meet the mobility and access needs of the study area's population, local commuters, through traffic, and major employment and public facilities. Regional population and employment growth projections, public and private development

initiatives, local land use plans and policies, and an anticipated increase in trade-related trucking activity indicate that study area congestion problems would continue to worsen unless action is taken.

Efforts to improve traffic flow and safety on IH-35E, IH-30, and other major roadways in the study area are already taking place, such as traffic signal and intersection improvements, high-occupancy vehicle (HOV) facilities, transportation system management/travel demand management (TSM/TDM) strategies, intelligent transportation systems (ITS), public transportation (bus and rail transit), and bicycle/pedestrian improvements. Other improvements to the transportation system are planned for the future, including major upgrades to the Canyon/Mixmaster/Lower Stemmons corridors (i.e., Project Pegasus). Long-range plans also call for substantial new investments in transit infrastructure along with programs and policies to curb travel demand, encourage more transport-efficient land use patterns, and generally provide for more alternatives to single-occupant vehicle (SOV) travel. However, long-range traffic forecasts have shown that even with these improvements, programs, and policies there would remain a high level of congestion on IH-35E, IH-30, and other major transportation facilities in the study area.

Due to the multiple planning objectives under consideration in the study area (i.e., transportation, recreation, flood control, economic development, and environmental preservation), compatibility with local planning objectives is an important consideration. Compatibility and/or synergy with local development plans are included among the project purposes and needs (see **Section S-6 Other Agency Actions**).

Throughout the project planning process, stakeholders have stressed that a major transportation improvement is likely to influence and shape local development. Local government agencies, as well as private citizens and developers, all anticipate some improvements or changes with respect to traffic circulation and economic development within the Trinity Parkway study area and beyond. Therefore, this secondary purpose is included to assure specific consideration of local compatibility issues.

This DEIS focuses upon the best solution for managing traffic congestion in the study area given the current state of infrastructure, limited financial resources, environmental constraints, and the needs of the local and regional community. This document presents the alternatives that have been developed through a process involving the FHWA, NTTA, TxDOT, the project consultants, local officials, and the public. The following summarizes the objectives of this project:

- Improve mobility, reduce congestion, and accommodate future traffic demands;
- Minimize the physical, biological, economic, and social effects on the environment;
- Provide compatibility with local development plans;
- Act on voter approval for the Trinity Parkway project; and
- Provide enhancements of modal interrelationships.

S-4 ALTERNATIVES CONSIDERED

Based on the results of additional engineering and traffic analyses related to existing and future traffic projections as well as resource agency and public comments, a total of seven alternatives (six build alternatives and one No-Build Alternative) are being considered with respect to their transportation benefits, socioeconomic and environmental impacts (beneficial and/or adverse), and costs. Five of the build alternatives, along with other alternative variations, were developed after a lengthy public participation process and publication of TxDOT's *Trinity Parkway Corridor (TPC) Major Transportation Investment Study* (*MTIS*). A sixth build alternative was added to the DEIS after further public input and consultation with the Dallas City Council in the fall of 2003. Certain TPC MTIS alternatives no longer under consideration would be unable to meet the project objectives and/or would have had greater environmental impacts. These alternatives are discussed in **Chapter 2 Alternatives Considered** of the DEIS. The six build alternatives that were advanced for further analysis were those that met the purpose and need, avoided or minimized adverse environmental impacts, or were supported by local governments and/or various public/private groups.

Various regional transportation initiatives – such as improvements to existing roadways, construction of new roadways, implementation of TSM/TDM and ITS strategies, extensive public transportation improvements, and HOV facilities – have been included in the DFW metropolitan area long-range MTP (*Mobility 2025 – 2004 Update*). As part of the broader transportation system, these long-range plan elements are neither intended nor able to satisfy fully the specific purpose of and need for the Trinity Parkway.

This DEIS provides a complete description of each alternative under consideration, including estimated right-of-way and construction costs. The Trinity Parkway alternatives are identified as:

- Alternative 1 – No-Build
- Alternative 2A – Irving/Industrial Boulevard - Elevated
- Alternative 2B – Irving/Industrial Boulevard - At-Grade
- Alternative 3A – Combined Parkway - Riverside (Original)
- Alternative 3B – Combined Parkway - Riverside (Modified)
- Alternative 4 – Split Parkway - Riverside
- Alternative 5 – Split Parkway - Landside

The proposed facility would generally consist of four to six main lanes and, in most areas, would be constructed as main lanes only, without frontage roads. Access to the main lanes would be controlled, meaning that vehicles may enter and exit the roadway only at designated on- and off-ramps. Access/service roads would be completed to restore severed access and may be provided where requested by local officials, and subsequently judged appropriate. **Table S-1** summarizes the physical characteristics for each of the Trinity Parkway alternatives.

TABLE S-1. PHYSICAL CHARACTERISTICS OF THE TRINITY PARKWAY ALTERNATIVES

Characteristics	Trinity Parkway Alternatives						
	1 (No-Build)	2A	2B	3A	3B	4	5
Roadway Design							
Number of Through Lanes	---	4-6	4-6	4-6	4-6	4-6	4-6
Travel Lane Width (feet)	---	12	12	12	12	12	12
Posted Speed Limit (mph)	---	55	55	55	55	55	55
Trinity Parkway Access							
At IH-35E/SH-183	---	Direct connection via ramps	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Commonwealth	---	None	None	Half diamond interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At Westmoreland/ Mockingbird	---	None	None	Half diamond interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At Hampton/Inwood	---	Full diamond interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Wycliff/Sylvan	---	Full diamond interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Woodall Rodgers	---	Direct connections SB-EB, WB-NB, NB-EB, and WB-SB	Same as Alt. 2A	Same as Alt. 2A	Direct Connections SB-EB and WB-EB	Direct connection via ramps	Same as Alt. 4
At Commerce	---	None	None	Half diamond interchange	None	Same as Alt. 3A	Same as Alt. 3A
At Houston/Jefferson	---	Half diamond interchange	None	Full diamond interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At IH-35E	---	None	None	Direct connections NB-WB and EB-SB	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At Corinth	---	Full diamond interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Martin Luther King Jr. Boulevard (MLK)	---	Full diamond interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At IH-45	---	Direct connection via ramps	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Lamar	---	None	None	Half diamond interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At SH-310	---	Half diamond interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A

TABLE S-1. PHYSICAL CHARACTERISTICS OF THE TRINITY PARKWAY ALTERNATIVES

Characteristics	Trinity Parkway Alternatives						
	1 (No-Build)	2A	2B	3A	3B	4	5
At US-175	---	Direct connection via main lanes	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
Bridges							
Hampton/Inwood Bridge	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
Wycliff/Sylvan Bridge	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
Continental Viaduct	---	No Change	No Change	Modified for ramp connections	Modified for ramp connections and main lane passage	Same as Alt. 3A	West end modified for main lane passage
Woodall Rodgers Bridge	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
SP Railroad Bridge	---	No Change	No Change	No Change	No Change	No Change	West end modified for main lane passage
Commerce Viaduct	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
Houston/Jefferson Viaducts	---	Modified for ramp connections	No Change	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
IH-35E Bridges	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
Corinth Viaduct	---	No Change	No Change	Modified for ramp connections	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
AT&SF Railroad Bridge	---	East end modified for main lane passage	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
IH-45 Bridge	---	Modified for ramp connections	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 3A	Same as Alt. 2A	Same as Alt. 2A

NB = Northbound; **SB** = Southbound; **EB** = Eastbound; **WB** = Westbound

The total estimated cost of the Trinity Parkway (including construction and right-of-way acquisition) ranges from approximately $668 million (Alternative 3A) to more than $1.3 billion (Alternative 2A). **Table S-2** summarizes the estimated length, right-of-way, and costs for each of the Trinity Parkway alternatives.

TABLE S-2. TOTAL LENGTH, RIGHT-OF-WAY, AND ESTIMATED COSTS

Alternative	Length (Miles)	Right-of-Way (Acres)	Estimated Right-of-Way Cost	Estimated Construction Cost	Estimated Total Cost
1 (No-Build)	---	---	---	---	---
2A	8.83	252.1	$224 million	$1,099 million	$1,323 million
2B	8.83	342.3	$182 million	$770 million	$952 million
3A	8.67	393.1	$42 million	$626 million	$668 million
3B	8.67	393.5	$51million	$640 million	$691million
4	8.84	495.2	$50 million	$676 million	$726 million
5	8.90	393.6	$55 million	$864 million	$919 million
Note: All costs shown in 2003 dollars, rounded to the nearest million. Project costs are expected to increase in future years due to inflation.					

S-5 ENVIRONMENTAL CONSEQUENCES

This DEIS presents an examination of existing environmental features within the study area, including the existing roadway corridors as well as other potential transportation corridors that were identified in the TPC MTIS. The DEIS also examines impacts from construction as well as secondary and cumulative impacts. **Chapter 4 Environmental Consequences** describes these evaluations in comparison with the No-Build Alternative.

Detailed impacts, both beneficial and adverse, were assessed in accordance with applicable laws and regulations for the existing resources, including traffic and transportation features, socioeconomic conditions, cultural resources and parklands, natural resources, man-made environment, and visual/aesthetic quality. **Chapter 5 Preliminary Section 4(f) Evaluation** describes potential impacts to protected resources consistent with § 4(f) of the DOT Act of 1966. Where appropriate, avoidance, minimization, and mitigation strategies were identified. **Chapter 7 Mitigation Measures and Commitments** provides a detailed description of the potential mitigation measures and commitments being considered for the proposed action. Specific mitigation measures and commitments would be identified for the preferred alternative and described in the FEIS.

Each of the alternatives presented in this DEIS, other than the No-Build Alternative, would result in some level of transportation benefit, and some level of adverse effect to community resources, floodplains and wetlands, vegetation and wildlife habitat, surface water quality, visual quality, and cultural resources. Each alternative would require the acquisition by NTTA of new rights-of-way, and would therefore displace human land uses, residents, and businesses. Noise impacts would occur at some level for each of the alternatives considered, including the No-Build Alternative. This DEIS provides a summary of the

analyses of impacts to these resources and identifies potential mitigation measures that will enable decisions to be made on the preferred alternative. **Table S-3** compares the alternatives considered in this DEIS against important factors and impact categories that permit distinctions to be made about each alternative.

TABLE S-3. COMPARISON OF DEIS ALTERNATIVES

Comparison Factors	Unit of Measure	Trinity Parkway Alternatives						
		1 (No-Build)	2A	2B	3A	3B	4	5
Roadway Characteristics								
Total Length	Miles	---	8.83	8.83	8.67	8.67	8.84	8.90
Total Land Converted to Right-of-Way	Acres	---	252.1	342.3	393.1	393.5	495.2	393.6
Total Cost (Construction + Right-of-Way)	2003 Dollars	---	$1,323M	$952M	$668M	$691M	$726M	$919M
Traffic Utilization								
Commonwealth to Hampton/Inwood	Year 2025 ADT	---	108,600	108,600	109,900	91,000	109,900	109,900
Hampton/Inwood to Wycliff/Sylvan		---	95,500	95,500	98,200	97,200	98,200	98,200
Wycliff/Sylvan to Woodall Rodgers		---	116,000	116,000	112,700	105,700	112,700	112,700
Woodall Rodgers to Houston/Jefferson		---	114,200	114,200	109,200	82,700	109,200	109,200
Houston/Jefferson to Corinth		---	93,300	93,300	102,700	93,300	102,700	102,700
Corinth to MLK		---	110,400	110,400	98,300	89,600	98,300	98,300
MLK to IH-45		---	110,300	110,300	102,800	112,500	102,800	102,800
IH-45 to US-175		---	130,600	130,600	127,900	130,800	127,900	127,900
Measures of Effectiveness								
Daily VMT	Year 2025 (M)	15.69	16.17	16.17	16.20	16.20	16.20	16.20
Daily VHT	Year 2025	484,959	474,644	474,644	474,619	475,878	474,619	474,619
Average Speed (mph)	Year 2025	32.35	34.07	34.07	34.14	34.04	34.14	34.14
Lane Miles	Year 2025	2,417	2,470	2,470	2,470	2,486	2,470	2,470
Congestion Delay (Vehicle-Hours)	Year 2025	152,804	139,328	139,328	138,652	138,652	138,652	138,652
Percent Lane Miles at LOS E or F	Year 2025	42.34	38.14	38.14	38.58	38.45	38.58	38.58
Socioeconomic								
Consistent with Regional Plans/Policies	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Consistent with Local Plans/Policies (Balanced Vision Plan)	Yes/No	No	No	No	No	Yes	No	No
Local Government Support	Yes/No	No	No	No	No	Yes	No	No
Potential for Joint Development	Yes/No	No	No	No	Yes	Yes	Yes	Yes
Residential Relocations	Number	---	13	9	8	8	13	24

TABLE S-3. COMPARISON OF DEIS ALTERNATIVES

Comparison Factors	Unit of Measure	Trinity Parkway Alternatives						
		1 (No-Build)	2A	2B	3A	3B	4	5
Commercial Displacements	Number	---	281	234	23	31	26	35
Community/Public Facility Displacements[1]	Number	---	3 (4)	4 (7)	---	---	---	4 (7)
Consistent with EJ Order	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parks and Recreational Impacts (Trinity River Greenbelt Park)	Acres	---	---	---	171	152	205	14
Physical Environment								
Meets Air Quality Standards	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Noise Receivers Impacted	Number	---	209	202	128	128	166	226
Hazardous Material Sites Impacted [2]	Number	---	27	28	15	15	16	20
Water Quality Impacts	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Visual Impacts	Low/Med/High	Low	High	Med	Med	Med	Med	Med
Natural Environment								
100-Year (Base) Floodplain Impacts	Acres	---	39	56	345	333	442	324
Wetlands and Waters of the U.S.	Acres	---	---	<3	155	155	153	<6
Threatened/ Endangered Species	Yes/No	No	No	No	No	No	No	No
Impacts to High-Quality Wildlife Habitat [3]	Acres	---	7	7	7	7	7	7
Grassland	Acres	---	---	---	121	121	220	---
Section 4(f) Involvement								
Potential § 4(f) Properties Involved – NRHP Historic Districts	Number	---	1	1	---	---	---	---
Potential § 4(f) Properties Involved – NRHP Historic Bridges	Number	---	2	1	5	5	5	6
Potential § 4(f) Properties Involved – NRHP Historic Properties	Number	---	4	1	---	---	---	1

Notes: **M** = Millions; **ADT** = Average Daily Traffic; **VMT** = vehicle miles traveled; **VHT** = vehicle hours traveled; **LOS** = Level of Service; **NRHP** = National Register of Historic Places; **EJ** = Environmental Justice; **mph** = miles per hour; **§** = Section; **<** = less than the quantity shown; **---** = no impacts anticipated for this alternative.

1. The first number is the number of facilities where a displacement occurs. The number in parenthesis is the total number of buildings displaced at these facilities.
2. Hazardous waste/material sites within or adjacent to proposed right-of-way.
3. Woodland impacts associated with USACE DFE Lamar Levee construction.

Toll Road Effects

As a candidate toll facility, the Trinity Parkway may require additional right-of-way to accommodate toll plazas and other amenities unique to toll facilities. The amount of additional right-of-way, if any, is subject to design decisions to be made later in the project development process. Additional amounts of developed or undeveloped land uses may be converted to Trinity Parkway right-of-way. No residential, commercial, or community facilities are expected to be displaced because of additional right-of-way required for toll plazas. The FEIS would provide a better estimate of whether and how much additional right-of-way is required at such locations, and provide more specific information about the direct land use impacts.

Consideration is also given to whether there is a disproportionate impact on minority and low-income populations resulting from operation of the Trinity Parkway as a toll road. Generally speaking, because all motorists pay the same toll regardless of their income, the toll for using the Trinity Parkway would constitute a greater burden on lower income motorists. The estimated cost to travel the Trinity Parkway (approximately 9 miles) is a full-length toll of $1.00. However, the actual toll to be charged on opening day and beyond has not yet been established and is subject to ongoing consideration by NTTA. The network of existing toll-free roads within the study area is available to motorists who wish to avoid paying tolls. Development of this toll road is anticipated to remove vehicular traffic from area toll-free roads and therefore be an anticipated benefit to low-income populations that may choose to use the toll-free roads.

S-6 OTHER AGENCY ACTIONS

Several local, state, and federal government agencies are in the process of planning, implementing, or constructing various small and large-scale projects within the Trinity Parkway study area. Representative agencies include the City of Dallas, Dallas County, TxDOT, North Central Texas Council of Governments (NCTCOG), and the U.S. Army Corps of Engineers (USACE). These projects involve flood control, transportation, recreation, utilities, land use planning, and environmental restoration. Detailed descriptions of these agency actions are provided in **Chapter 3 Affected Environment**.

Some of these projects or portions thereof are considered potential joint development projects along with the proposed action. Specific joint development projects may include all or portions of the following:

- City of Dallas – *Trinity River Corridor Master Implementation Plan-Balanced Vision Plan* (see **Section 3.1.1.1**);
- USACE – *FPEIS, Upper Trinity River Basin, Trinity River, Texas* (2000). Dallas Floodway EIS and City of Dallas Locally-Preferred Plan (LPP) (see **Section 3.5.7**); and
- USACE – *DFE* (1999) (see **Section 3.5.7**).

Potential joint development with these projects involves integrating transportation infrastructure and non-highway uses into coordinated multi-use actions that complement one another. Since these types of projects are usually developed independently, it requires considerable coordination to achieve mutual goals. Highway projects can be integrated with the development of bikeways, parks, and other public or private undertakings, and may fit better into the overall fabric of the community than if they were developed separately.

The FHWA proposes to publish this initial DEIS as a decision making document regarding the identification of a preferred alternative for the Trinity Parkway. The FHWA recognizes, depending on which alternative is identified as the preferred alternative, there may be integration and coordination issues with the reasonably foreseeable flood control and recreational improvements proposed by the USACE and City of Dallas within the Dallas Floodway, which are further described throughout this DEIS. Since the Trinity Parkway project includes build alternatives located within and outside of the Dallas Floodway, and a preferred alternative has not yet been identified, it is not possible to fully determine the degree of integration with other proposed floodway improvements at this time.

Once a preferred alternative for the Trinity Parkway has been identified, the following actions can be expected to occur:

1. If a build alternative is identified <u>within the Dallas Floodway</u>, subsequent NEPA documentation, which would further address the lakes, flood control, environmental restoration, and recreational improvements proposed in the Dallas Floodway would be developed.
2. If a build alternative is identified <u>outside of the Dallas Floodway</u>, FHWA/TxDOT/NTTA would proceed to finalization of the Trinity Parkway FEIS (i.e., an FEIS would be prepared) independent of the proposals by USACE and the City of Dallas in the Dallas Floodway.
3. If <u>No-Build</u> is identified as the preferred alternative, FHWA/TxDOT/NTTA would stop work on the Trinity Parkway DEIS and pertinent study materials would be forwarded to the City of Dallas. The proposals by the USACE and City of Dallas in the Dallas Floodway would not be directly affected by this alternative, and would be processed independently (refer to **Chapter 2 Alternatives Considered** for a complete description of the alternatives evaluated for the proposed action).

These specific development strategies (Options 1, 2, and 3) are further described in a letter to the FHWA prepared and signed by representatives of the NTTA, USACE, and City of Dallas, dated January 29, 2003 (see **Appendix A, Page A-47**). This letter affirms each respective agency's concordance in the proposed strategies for preparation of this DEIS. These strategies were adopted due to the potential complexity and interrelated nature of the "reasonable and foreseeable actions" being considered by these agencies.

Once the DEIS comment period has been completed, the above strategies will be reevaluated. These potential joint development projects are fully described in **Chapter 3 Affected Environment**. The anticipated effects (beneficial and adverse) associated with construction of the Trinity Parkway together with these other agency actions are described in **Chapter 4 Environmental Consequences**.

Either Option 1 or Option 2 (i.e., a Trinity Parkway build alternative is identified as the locally-preferred alternative) would lead to the publication of a FEIS. Under Option 1, FHWA recognizes that if subsequent NEPA documentation raises substantial unforeseen issues, which affect the transportation analysis, there may need to be revisions or a reevaluation of the transportation sections of the EIS and it is conceivable, in such event, that the interim locally-preferred alternative may need to change. Such a change would include public/agency involvement and be fully disclosed in the FEIS. Completion of the environmental review and impact documentation process, followed by a signed ROD by the FHWA, would permit the proposed action to proceed to the final design and construction phases.

S-7 UNRESOLVED ISSUES AND AREAS OF CONTROVERSY

Unresolved Issues

The majority of issues that need to be resolved fall into the categories of permitting, mitigation, and agency/public coordination. These issues are addressed in **Chapter 4 Environmental Consequences**, **Chapter 7 Mitigation Measures and Commitments**, and **Chapter 10 Comments and Coordination**. The following provides a summary of the remaining issues that need further resolution before the proposed action may be implemented.

Agency and Public Review/Coordination

This document will be circulated to local, state, and federal agencies, and will be available for public review and comment before the Public Hearing. New information may result from this review and coordination process, which could alter the proposed action. Such commentary and change would be documented appropriately as required by NEPA.

Identification of Preferred Alternative

The preferred alternative for the proposed action would be recommended by the NTTA Board of Directors in consultation with the City of Dallas, TxDOT, FHWA, and other involved agencies. Identification of the preferred alternative would be based on public and agency comments, construction cost and engineering design considerations, environmental impacts and mitigation requirements, and toll feasibility.

Joint Development Issues

The proposed action is being considered for potential joint development with major flood control and recreational projects proposed by the USACE and City of Dallas. Coordination and consultation with the USACE and City of Dallas has been initiated, but would not be completed until a preferred alternative for the Trinity Parkway has been identified. New information may result from this coordination and consultation process, which could alter the proposed action. Such information and change would be documented appropriately as required by NEPA.

Access to Trinity Park

The proposed action may affect access to planned recreational improvements for the Dallas Floodway (Trinity Park). Coordination and consultation with the City of Dallas has been initiated, but would not be completed until a preferred alternative has been identified.

Right-of-Way Acquisition and Relocations/Displacements

The build alternatives would require residential relocations and displacement of businesses. Relocation coordination would occur during the right-of-way acquisition process. The NTTA, in cooperation with the City of Dallas, would assume right-of-way acquisition responsibility and would utilize existing relocation policy and procedures.

Cultural Resources

Historic and cultural resources have been identified within the project study area. Coordination with the State Historic Preservation Officer (SHPO) under § 106 of the National Historic Preservation Act (NHPA) was initiated by letter, dated June 5, 2002. However, given the variance of the alternatives under consideration, the § 106 process would not be completed until a preferred alternative has been identified. The results of the §106 review would be documented accordingly.

Prohibition of Heavy Trucks

A restriction on heavy truck use is being considered for the proposed action. Prohibition of heavy trucks would require approval by the FHWA and City of Dallas.

Areas of Controversy

Coordination with local, regional, state, and federal agencies and with interested organizations, groups, and individuals indicated major areas of concern to be:

- Housing displacements;
- Relocation of businesses;
- Loss of affordable housing;

- Loss of riparian vegetation and habitat;
- Air quality, noise levels, and noise barrier location;
- Impacts on historic properties;
- Increase in traffic at the southern terminus location (US-175/SH-310);
- Effect of the project on existing/planned parks;
- Visual impacts caused by the large-scale structures and views of cuts and fill and sound walls;
- Secondary and cumulative effects;
- Scope of the project;
- Lack of alternatives; and
- Funding of the project.

These issues have been addressed in this DEIS. Further coordination with the City of Dallas, FHWA, NTTA, TxDOT, USACE, and other agencies and interested parties would continue during the subsequent NEPA process, and design phases of the project. Specific impacts are described in **Chapter 4 Environmental Consequences**, and mitigation measures are described in **Chapter 7 Mitigation Measures and Commitments**.

In May 2000, a lawsuit was filed by various opponents to the Trinity River Project in U.S. District Court. The suit seeks an injunction against the USACE to stop the DFE project. The plaintiffs challenged that the DFE FEIS did not comply with NEPA. In April 2002, the court ruled the USACE FEIS needed further supplementation. The court remanded the matter to the USACE for further consideration of the cumulative impacts of other similar, reasonably foreseeable future projects in the same geographic area as the DFE, including the Trinity Parkway (proposed action).

The court further ordered that construction of the DFE be stopped until the USACE complied with the court's order. In response, the USACE prepared a Supplemental FEIS (SFEIS) to address the court's order. An initial public meeting was held in July 2002 to address scoping of cumulative impacts and a second meeting was held in January 2003 to review the draft SFEIS. In May 2004, the court issued a "Final Judgment" and ordered the plaintiffs' claims in the case "Dismissed with Prejudice" (i.e., the case is dismissed for good reason and the plaintiffs are barred from bringing an action on the same claims). In addition, the court ordered the April 2002 preliminary injunction "Dissolved," and concluded the defendants had complied with the terms of the injunction.

In December 2000, a lawsuit was filed in District Court in Dallas County against the City of Dallas challenging the validity of the city's 1998 bond election. A total of $84 million of bond proceeds for transportation improvements within the Trinity River corridor, including the Trinity Parkway, were

authorized by the election. The NTTA, along with others, intervened in the case. The following is a chronological summary of the case proceedings:

- Fall 2001 – the trial court granted summary judgment on behalf of the City of Dallas and NTTA.
- October 2001 – the case was appealed to the 5th District Court of Appeals.
- June 2002 – the Court of Appeals issued an opinion affirming the trial court's ruling.
- July 2002 – a petition was filed by the plaintiffs requesting the Texas Supreme Court issue a "Writ of Review" on the ruling by the Court of Appeals.
- October 2002 – the plaintiff's petition for a "Writ of Review" was denied.
- November 2002 – a petition was filed by the plaintiffs requesting a "Rehearing."
- December 2002 – the plaintiff's petition for a "Rehearing" was denied.
- February 2003 – the Texas Supreme Court issued a final order affirming the Court of Appeals ruling. On February 10, 2003, the Texas Supreme Court officially designated the case as "Case Stored" (i.e., Supreme Court Disposition is Final).

S-8 OTHER FEDERAL ACTIONS REQUIRED

Regardless of which alternative is identified as the preferred alternative, implementation of this project would require several permits, certifications, and technical reviews at various federal and state levels of jurisdiction. Because this is a state-sponsored project, the relevant federal and state authorities supersede all local jurisdictions. Furthermore, since project funding is to be derived from a combination of shared state and federal highway-related monies, the lead federal agency is the FHWA, which reviews, approves, and thus guides NTTA in the sponsorship of this project. As permit applicant, NTTA must fulfill all steps in the multi-level permit process. The anticipated federal actions and approvals for this project include those listed in **Table S-4**.

TABLE S-4. ANTICIPATED FEDERAL PERMITS AND APPROVALS

Federal Agency	Regulated Activity	Required Permit or Approval
U.S. Army Corps of Engineers	Regulates placement of dredged or fill material into waters of the U.S.	Clean Water Act, § 404
	Basic Project Purpose	Clean Water Act, § 404
	Regulates work in navigable waters of the U.S.	Rivers and Harbors Act, § 10
	Trinity River Corridor CDC Process	Corridor Development Certificate (CDC) permit review and commenting authority. Section 404 permit is required for CDC permit approval.
	NEPA	Commenting authority
	Protection of existing Dallas Floodway and authorized Dallas Floodway Extension project purposes	Review of project features on direct and indirect impacts to USACE projects to include flood conveyance operation and maintenance and environmental restoration and mitigation of project features
Advisory Council on Historic Preservation (ACHP)/SHPO	NHPA § 106	Memorandum of Agreement (MOA)/Programmatic Agreement between FHWA, SHPO, and the ACHP
	Section 4(f)	Commenting authority.
U.S. Environmental Protection Agency	Clean Water Act	§ 404 permit review and veto authority
	Clean Air Act	Compliance and enforcement of regulations
	NEPA	Commenting authority
U.S. Fish and Wildlife Service	Fish and Wildlife Coordination Act	Reviews/comments on federal actions that affect wetlands and other waters, including § 404 permit applications. May prepare Biological Assessment for preferred alternative
	NEPA	Commenting authority
	Migratory Bird Treat Act (MBTA)	Reviews/comments on federal actions that could harm migratory bird species.
U.S. Department of Interior	Land and Water Conservation Fund Act (LWCF)	§ 6(f) review authority
	NEPA/§ 4(f)	Commenting authority
	NHPA § 106	Commenting authority
U.S. Department of Housing and Urban Development	NEPA/§ 4(f)	Commenting authority
U.S. Department of Transportation (USDOT) – Federal Highway Administration (FHWA)	NEPA/§4(f)	DEIS, FEIS, § 4(f), and ROD approval
	Toll Agreement	Toll Agreement between FHWA, TxDOT, and NTTA
	Interstate Access Agreement	Interstate Access Agreement between FHWA, TxDOT, and NTTA
	23 CFR § 650.805 Bridges Not Requiring U.S. Coast Guard (USCG) Permit	Responsible under 23 USC § 144(h) to determine if a USCG permit is not required for bridge construction
USDOT – Federal Aviation Administration	Navigable Airspace	Conformance Requirement for Obstruction Marking and Lighting
USCG	Regulates navigable waterways of the U.S.	Rivers and Harbors Act, § 9
	General Bridge Act of 1906	Regulates permitting for bridge construction in and over waters of the U.S.
Federal Emergency Management Agency (FEMA)	EO 11988 (Floodplain Management)	Reviews/comments on federal actions that affect floodplains, including § 404 permit applications
	National Flood Insurance Act Flood Disaster Protection Act	Changes to FEMA maps require a Conditional Letter of Map Revision (CLOMR)
	Trinity River Corridor CDC Process	CDC permit review and commenting authority
	City of Dallas Fill Permit	Permit review and commenting authority

S-9 UNAVOIDABLE ADVERSE IMPACTS

The Trinity Parkway build alternatives would not result in unavoidable adverse impacts that cannot be mitigated and, therefore, reduced to a minimum. **Chapter 7 Mitigation Measures and Commitments** provides a description of proposed mitigation measures and commitments to address environmental impacts associated with the proposed action.

[END OF EXECUTIVE SUMMARY]

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Chapter 1

Purpose and Need for Action

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CHAPTER 1
PURPOSE AND NEED FOR ACTION

1.0 INTRODUCTION

Transportation improvements are necessary in the Trinity Parkway corridor to address current and projected transportation needs and facility deficiencies. The primary purpose of the Trinity Parkway project is to provide a safe and efficient transportation solution to manage traffic congestion and improve safety in the area of the Dallas CBD. The project particularly focuses on congestion in the IH-30/IH-35E (Mixmaster) interchange on the west edge of downtown Dallas; the depressed segment of IH-30 (Canyon) south of the CBD; and the segment of IH-35E from the Mixmaster north to the DNT (Lower Stemmons).

The proposed project is located in the DFW metroplex of north central Texas. The study area is located on the west side of the Dallas CBD in central Dallas County (see **Figure 1-1**). The area boundary extends from the Dallas CBD to the east to West Dallas on the west. The southern boundary is the US-175/SH-310 interchange, and the northern boundary is the IH-35E/SH-183 interchange. The study area includes the Dallas Floodway, a federal flood conveyance and levee system carrying the main stem drainage flows of the Trinity River. **Figure 1-2** shows the project study area and is intended to provide a reference for place names used throughout this DEIS.

The NTTA, in cooperation with TxDOT and FHWA, have prepared this DEIS to fulfill their responsibilities as joint lead agencies for the proposed construction of the Trinity Parkway reliever route. FHWA is the lead federal agency for the study. The EPA has agreed to be a cooperating agency for this DEIS.

The remainder of this chapter describes the purpose and need for transportation improvements in the Trinity Parkway study area and summarizes the planning context for the development of the project proposals. Subsections within this chapter include a description of the proposed project and its history, a description of the study area's characteristics and congestion problems, and details of the planning process in the context of long-range local and regional transportation goals.

FIGURE 1-1. REGIONAL STUDY AREA MAP

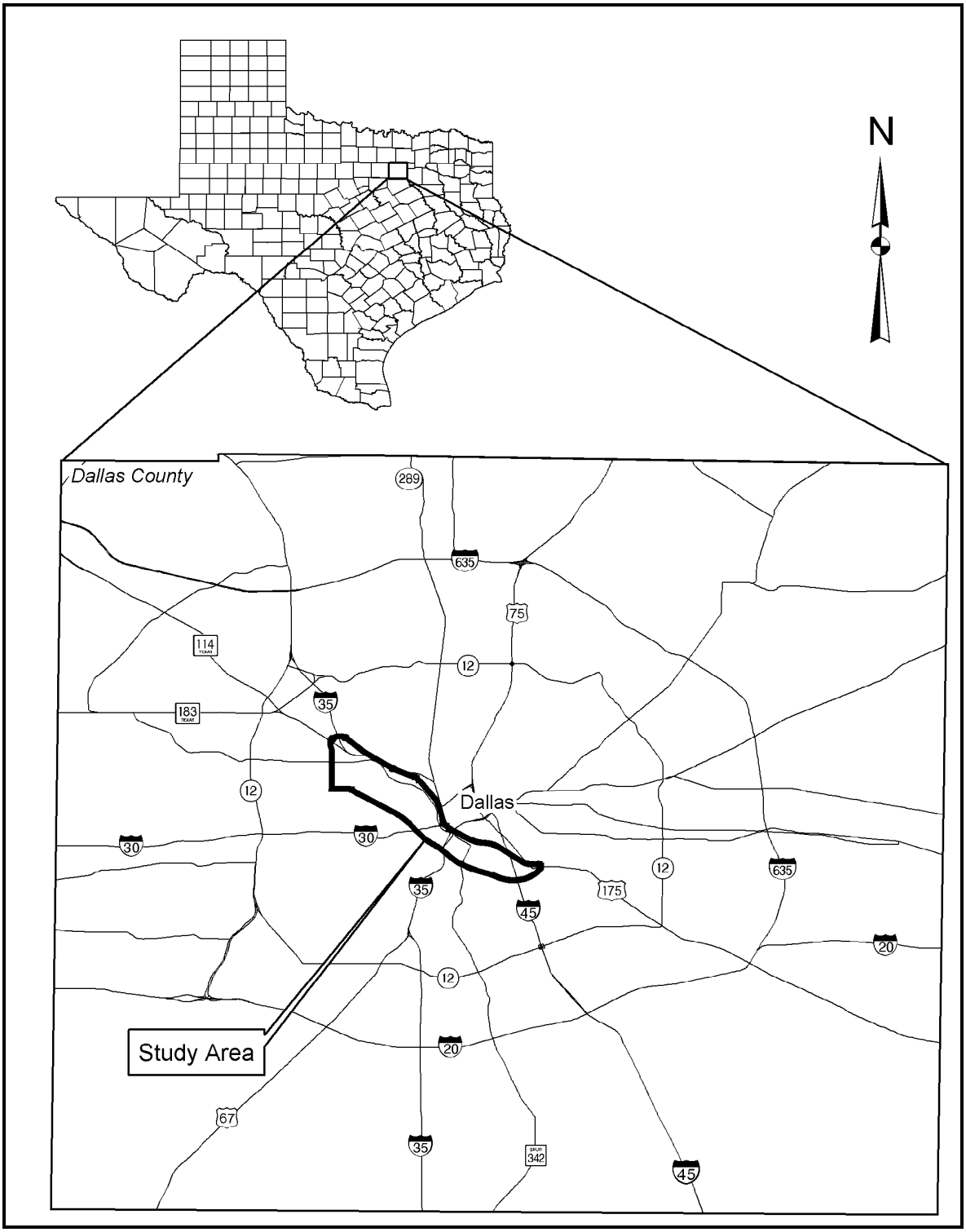
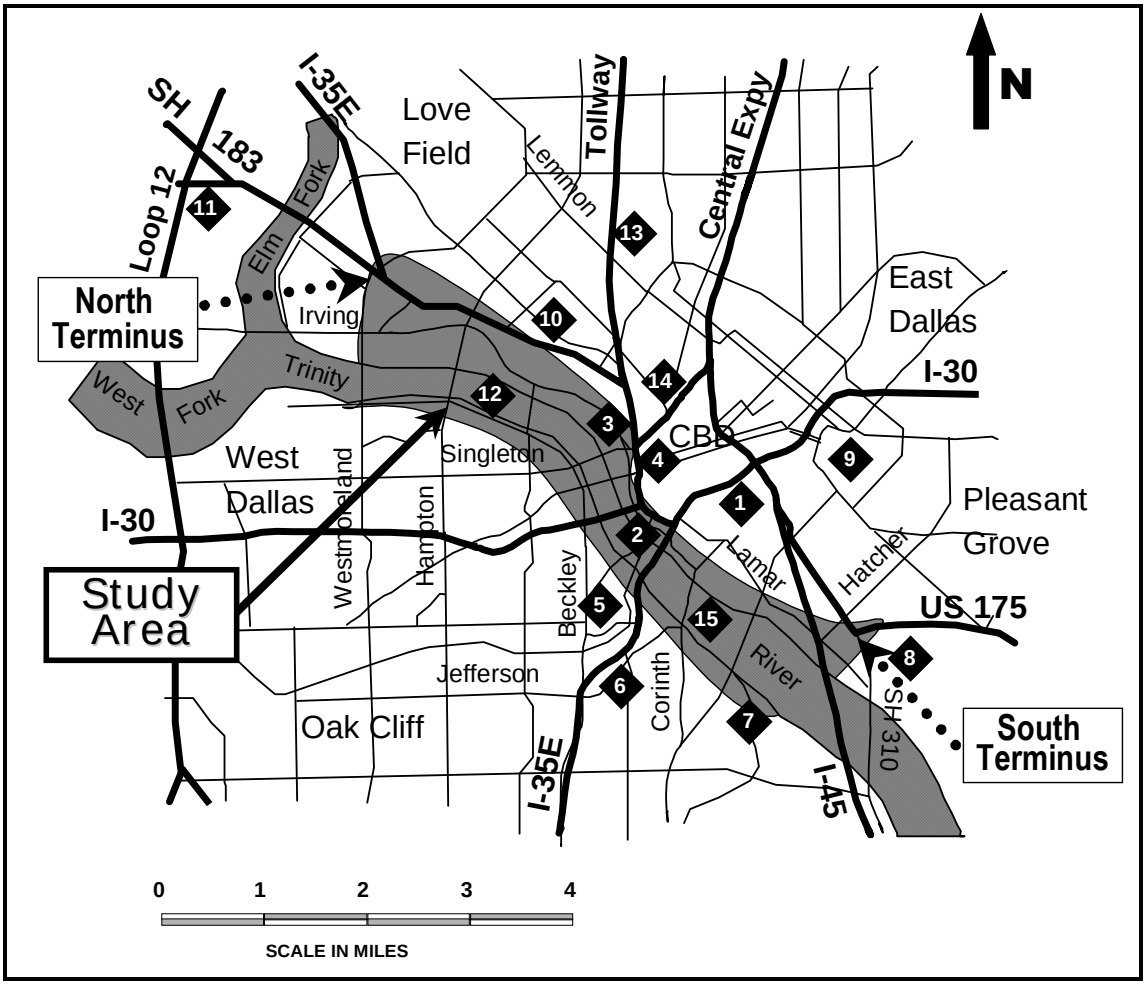


FIGURE 1-2. PROJECT AREA MAP



Places of Interest

1 – Canyon (IH-30)
2 – Mixmaster (IH-35E/IH-30)
3 – Lower Stemmons (IH-35E)
4 – West End and Dealey Plaza
5 – Methodist Medical Center
6 – Dallas Zoo
7 – Cadillac Heights
8 – Rochester Park
9 – Fair Park
10 – Parkland Hospital
11 – Texas Stadium
12 – Dallas Floodway
13 – Dallas North Tollway
14 – Woodall Rodgers Freeway
15 – DART Rail River Crossing

1.1 PROJECT DESCRIPTION

The proposed action is the construction of a limited-access toll facility from the IH-35E/SH-183 interchange (north terminus) to the US-175/SH-310 interchange (south terminus), a distance of approximately 9 miles, in the City of Dallas, Dallas County, Texas. The proposed action would provide a needed reliever route around the existing freeway loop, which encircles downtown Dallas.

If implemented, the Trinity Parkway would consist of four to six mixed-flow main lanes, local street interchanges, and freeway-to-freeway interchanges at the north terminus, south terminus, and Woodall Rodgers Freeway, and IH-45. Additional interchange connections are included, but vary between each of the build alternatives considered in this DEIS (see **Chapter 2, Table 2-5 Interchange Access Comparison**). Access roads would be added along the parkway route to restore property access where it currently exists, subject to agency justification and approval due to cost, engineering considerations, or other impacts. Toll collection facilities would comprise main lane plazas, ramp plazas, and ancillary facilities.

The Trinity Parkway is proposed to be constructed in stages in some segments, with fewer lanes initially than the ultimate facility. **Plates 2-8** and **2-9** at the end of **Chapter 2** show examples of the proposed staged construction applied to two roadway alternatives. Additional capacity may be added as traffic demand and conditions warrant, and subject to funding availability and other agency considerations. Actual construction of the project may also be accomplished in sections, meaning that specific roadway segments may be completed and opened to traffic prior to the completion and opening of the entire length of the facility. Funding for the proposed project is anticipated to be provided by local, state, and federal sources, and through the collection of tolls. **Chapter 2 Alternatives Considered** describes the proposed action in detail.

The FHWA has developed general criteria that must be met in the selection of logical termini for a transportation project and in the documentation of its independent utility [23 CFR § 771.111(f)]. These criteria state that a proposed action shall:

- Connect logical termini (major crossroads, population centers, major traffic generators, or major highway control elements) and be of sufficient length to address environmental matters on a broad scope (ensure a meaningful analysis);
- Have independent utility or independent significance (be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made); and
- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

As presented in this DEIS, the logical termini for the purpose of evaluating alternatives and impacts of the proposed improvements are junctions at IH-35E/SH-183 and US-175/SH-310, respectively. The proposed action has independent utility and would not preclude other foreseeable transportation improvements.

1.2 PURPOSE AND NEED

The purpose of the Trinity Parkway is to reduce congestion on IH-35E, IH-30, and other major transportation facilities within the Trinity Parkway study area in order to improve mobility, safety, and increase accessibility to businesses and public facilities. The transportation needs in the Trinity Parkway study area, simply stated, are:

- There is insufficient transportation capacity (freeway lanes, city streets, transit, etc.) in the Canyon/Mixmaster area near downtown Dallas to carry needed trips flowing north-south (generally along IH-35E) and east-west (generally along IH-30). This is most evident in the morning and evening rush hours on weekdays, with the heaviest traffic flows northbound and westbound in the morning hours, and southbound and eastbound in the evening hours. On an average weekday, there is traffic congestion for more than 6 hours in the Canyon/Mixmaster, with average speeds as low as 20 mph during the peak-hour. The severity of traffic congestion is evidenced by the designation of the Mixmaster as one of the top ten "Most Notorious Traffic Bottlenecks" in the nation by the American Automobile Association (AAA).

- The traffic problems in the Canyon and Mixmaster are made worse by the layout of main lanes, service roads, ramps, and surface streets in the area, which fail to properly provide for the routes and destinations of the traveling public. The types of secondary problems include forced lane changes, abrupt and unexpected merges, weaves, and exits, missing connections for direct freeway-to-freeway movements, high accident rates, and poor access for emergency response.

The need for action in the Trinity Parkway corridor is further described in **Section 1.8**. The problems in the corridor are the result of many causes, including high population growth, changing employment patterns, trade-related transportation, lack of alternative routes, and high use of SOVs. These problems result in many effects, including slow travel speeds, extended hours of congestion, accidents, increased air pollution, and poor attraction of businesses to adjacent areas. Population and economic growth projections for the region indicate that corridor congestion problems would continue to worsen unless action is taken.

Congestion in the Trinity Parkway corridor also slows travel for many miles along freeways feeding into the city center, such as IH-35E (Stemmons and South R.L. Thornton Freeways), IH-30 (Tom Landry Freeway and East R.L. Thornton Freeway), SH 183 (Airport Freeway), SH-114, and IH-45. Proposals for improving outlying segments of these freeways would not be entirely effective and cannot be effectively implemented until traffic capacity is increased in and around the downtown area.

1.3 PROJECT HISTORY

The proposed Trinity Parkway reliever route has been part of the long-range transportation plan in the Dallas area since the mid-1960s, and remains an integral component of current transportation plans and programs. The following summarizes the history of the project and its predecessor proposals and proponents.

- The 1965 *DFW Regional Transportation Study,* prepared by local government agencies and the State Department of Highways and Public Transportation (SDHPT) (predecessor of TxDOT), identified a major thoroughfare corridor extending westward from the Dallas CBD along the Trinity River to a point west of Belt Line Road in the City of Irving. The plan called for a new freeway or "River Freeway," which would serve as an extension of Woodall Rodgers Freeway westward along the east levee of the Dallas Floodway.

- In 1969, the Dallas Park Board published the *Coordinated Plan – Open Space Development Trinity River System in Dallas, Texas*. This plan called for multiple uses of the Dallas Floodway, including recreation, drainage, transportation, water supply, flood control, effluent disposal, and utility service. One of the major non-recreation components specified in the plan was the proposed Trinity River Freeway.

- In 1972, the Industrial Properties Corporation donated a major portion of the Dallas Floodway land to the City of Dallas for use as park and transportation facilities, including roadways, navigation, and flood protection. The donation was a 930-acre tract of land situated between the Dallas Floodway east and west levees, from approximately 2,100 feet west of Hampton Road to the AT&SF Railroad Bridge at the southern end of the floodway. The City of Dallas used the donation to request a $2.23 million grant from the U.S. Department of Housing and Urban Development (HUD) to acquire the remaining privately-owned property between the floodway levees. The city acquired all the remaining privately-owned property between the levees by January 1, 1974, and included in the deeds of purchase the provision for use as park and transportation facilities.

- In 1973, the Texas Turnpike Authority (TTA) (predecessor of NTTA) completed the first detailed study of this corridor. The study, titled *Trinity Route of the Dallas-Fort Worth Turnpike*, included a schematic design for a facility to serve the projected increase in traffic volumes within the Dallas to Fort Worth corridor. The schematic design showed a multi-lane highway generally following the Trinity River floodplains between Dallas and Fort Worth, having a length of over 27.5 miles.

- In 1975, the City of Dallas published *A Preliminary Design Report for Town Lake for the City of Dallas, Texas*. This plan provided details for construction of a lake and surrounding parks in the floodplain of the Trinity River between downtown Dallas and Oak Cliff. According to the report, the Town Lake project could make a major contribution to regional transportation system through its assistance to the proposed Trinity River Freeway. The report indicated widening the east levee upstream from the lake could provide a foundation for the thoroughfare.

- In 1980, the Dallas County Commissioners Court published the *Dallas County Open Space Plan*. One of the planned major public works projects described in the plan was the proposed "Trinity Valley Parkway." The plan showed a general alignment following the Trinity River floodplain from the western limits of Dallas County to IH-45 southeast of downtown Dallas.

- In 1984, the City of Dallas published the *Chain of Lakes Park Plan*. According to this plan, the Chain of Lakes Park would encompass a series of lakes, recreational facilities, outdoor special event areas, athletic facilities, open space areas, etc., extending from Oak Cliff to the confluence of the Elm Fork and West Fork of the Trinity River. The plan indicated a "reserved zone" approximately 150 feet in width along the inside of each levee had been reserved for future roadways, extending from Corinth Street upstream to the confluence of the Elm Fork and West Fork.

- In 1986, the NCTCOG approved a Metropolitan Transportation Plan (MTP) (*Mobility 2000*) for the DFW metropolitan area as part of a federally mandated program. The "Trinity Parkway" was among the new projects recommended in *Mobility 2000.*

- In 1988, the TTA completed an exploratory investigation of possible routes for the "Trinity Turnpike." The West Fork and Trinity River segments connected SH-121 northeast of the Fort Worth CBD with US-175 and IH-35E southeast of the Dallas CBD.

- In 1996, the TxDOT initiated the *Trinity Parkway Corridor (TPC) MTIS.* This MTIS was completed in order to develop a locally preferred plan (LPP) to address transportation problems within the Trinity Parkway corridor, and to integrate with community plans and goals for the Dallas Floodway. The TPC MTIS developed a seven-element, multi-modal plan of action for the corridor, one of which was the Trinity Parkway reliever route (proposed action) (see **Section 1.4 Trinity Parkway Corridor MTIS**).

- On September 10, 1997, the Dallas City Council approved the TxDOT TPC MTIS, including endorsement of the "Split Parkway Riverside" route of the Trinity Parkway as the locally preferred

plan. The Dallas County Commissioners Court on September 30, 1997, and the Dallas Area Rapid Transit (DART) Board of Directors also approved this plan on October 28, 1997.

- On March 12, 1998, the Regional Transportation Council (RTC) adopted a resolution officially integrating the Trinity Parkway proposed action plan into the MTP (*Mobility 2020*). Since that time, the Trinity Parkway has been integrated into the MTP *Mobility 2025 – 2004 Update.*

- On May 2, 1998, Dallas voters authorized the issuance of General Obligation Bonds, which included $84 million for the Trinity Parkway reliever route and $34 million for other proposed transportation improvements in the corridor.

- In 1998, in view of substantial regional shortfalls and delays in funding of needed highway projects, and of the perceived feasibility of the Trinity Parkway reliever route as a toll road, a decision was made among local transportation funding agencies to assign the advanced development of the Trinity Parkway to NTTA. This was followed by resolutions of the Dallas City Council and the Dallas County Commissioners Court requesting that NTTA "take such actions and conduct such studies as may be necessary to determine the viability of jointly developing and financing all or some portion of the Trinity Parkway with a combination of turnpike revenue bonds, city bonds, and federal and/or state transportation funds." Subsequently, on November 18, 1998, the Dallas City Council authorized an Interlocal Agreement with the NTTA for completion of an EIS and preliminary design schematics.

- On June 16, 1999, the FHWA, in cooperation with the NTTA, TxDOT, and the City of Dallas, issued a Notice of Intent (NOI) in the *Federal Register* to officially begin preparation of the Trinity Parkway DEIS.

- On December 12, 2000, the FHWA issued a supplementary NOI in the *Federal Register* to include in the EIS an evaluation of the proposed City of Dallas Lake Plan, which is located in the Dallas Floodway portion of the Trinity Parkway study area. The supplementary NOI was issued because additional analysis would be needed to fully address the impacts of potential joint development of these projects (see **Section 1.11** of this chapter).

1.4 REGIONAL PLANNING CONTEXT

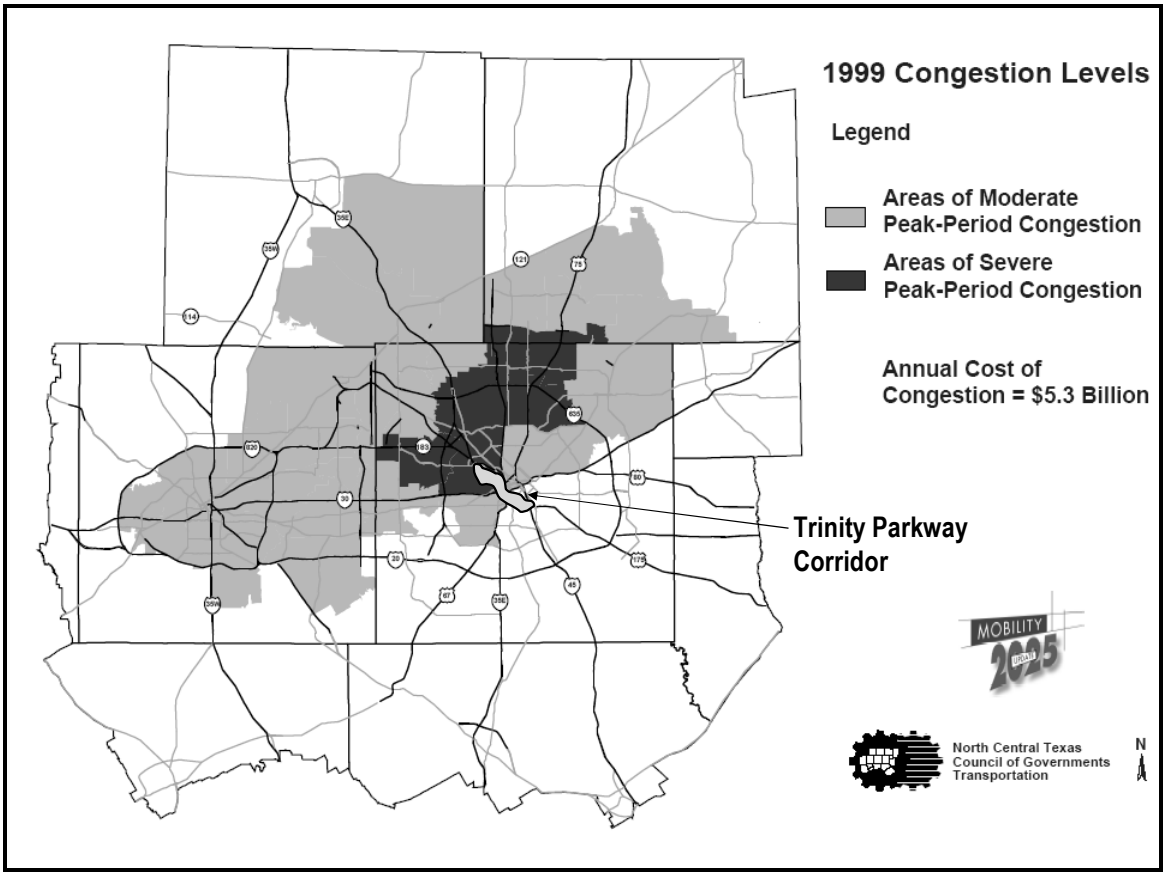
NCTCOG serves as the Metropolitan Planning Organization (MPO) for transportation in the DFW area. It serves a 16-county metropolitan region centered around Dallas and Fort Worth. Since the early 1970s, MPOs have had the responsibility of developing and maintaining a MTP. The MTP is federally mandated; it serves to identify transportation needs, and guides federal, state, and local transportation expenditures. There have been seven metropolitan transportation plans in the DFW region, starting in 1974. The current plan is titled *Mobility 2025 – The Metropolitan Transportation Plan – 2004 Update* (published January 2004).

A major emphasis of the *Mobility 2025 - 2004 Update* is the management of the regional transportation system. As required by ISTEA/TEA-21, the plan is constrained to match available financial resources. The plan is also in conformity with the SIP for air quality as required by the federal CAA. The *Mobility 2025 - 2004 Update* focuses on cost-effective improvements, identifying additional funding sources for needed transportation improvements, and more aggressive strategies to manage the regional transportation system.

Mobility 2025 – 2004 Update presents a system of transportation improvements needed to maintain mobility in the DFW area over the next 25 years and serves as a guide for the expenditure of state and federal funds for the region. Its development was coordinated among local governments, transit authorities, NTTA, and TxDOT. The plan was formulated through a process of forecasting future travel demand, evaluating system alternatives, and selecting options which best meet the mobility needs of the region. A major emphasis of the MTP is management of the regional transportation system.

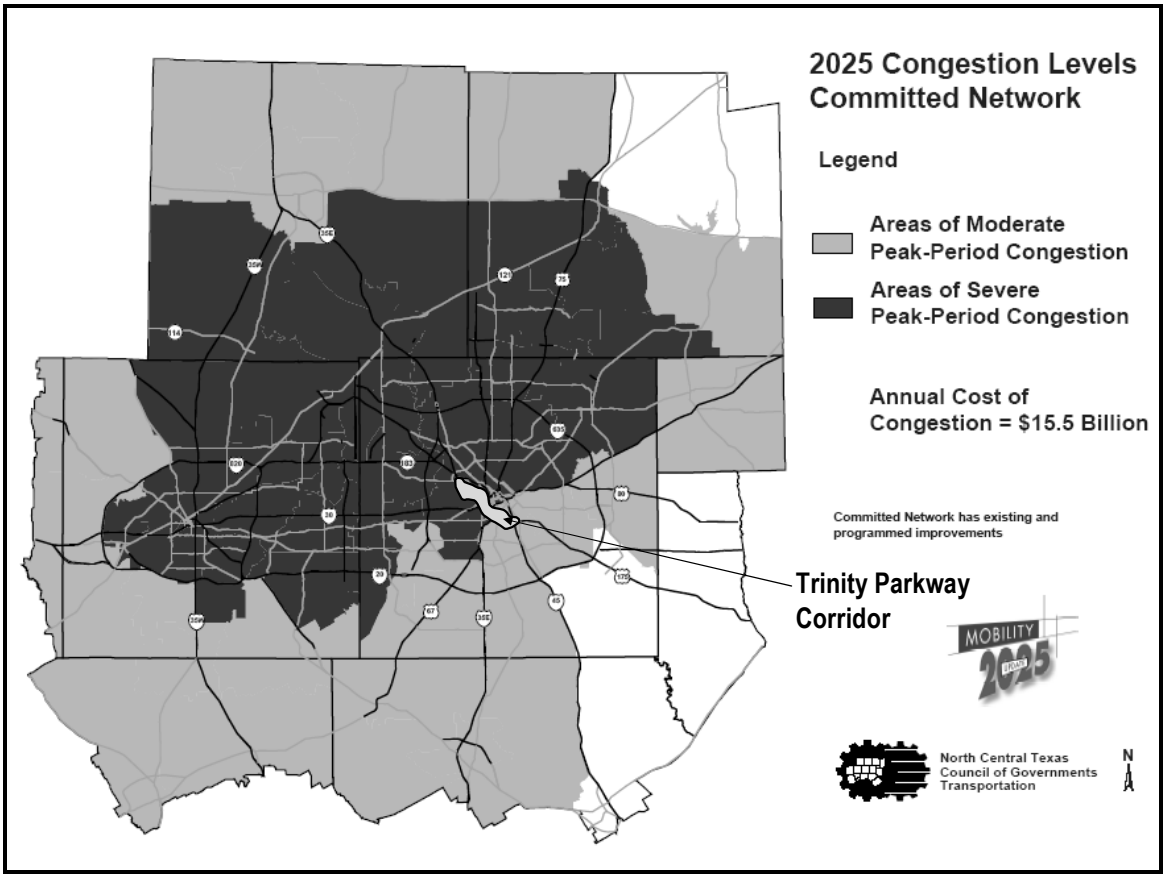
The MTP was developed in accordance with federal planning requirements. The development of the plan was guided by a set of goals, which were presented and refined at technical workshops, policy meetings, and public meetings. The travel forecasting conducted for the MTP illustrates various scenarios of congestion in the DFW metropolitan area based on assumptions regarding the extent of transportation improvements in place**.** **Figure 1-3** illustrates the baseline condition, representing congestion levels during the peak hour under existing conditions for 1999.

FIGURE 1-3. 1999 CONGESTION LEVELS



A second evaluation of the committed transportation system was conducted to determine the impact of projected 2025 traffic volumes on existing transportation facilities and those committed for construction as part of the TIP. The committed system includes projects that have completed feasibility and design stages of development, have acquired right-of-way, and are scheduled for construction or are under construction. The existing plus committed system would not maintain the 1999 level of service (LOS); therefore, it was concluded additional improvements beyond the committed system would be needed. **Figure 1-4** illustrates the congestion levels during the peak hour in 2025 if only the committed projects are implemented.

FIGURE 1-4. 2025 CONGESTION WITH COMMITTED NETWORK ONLY

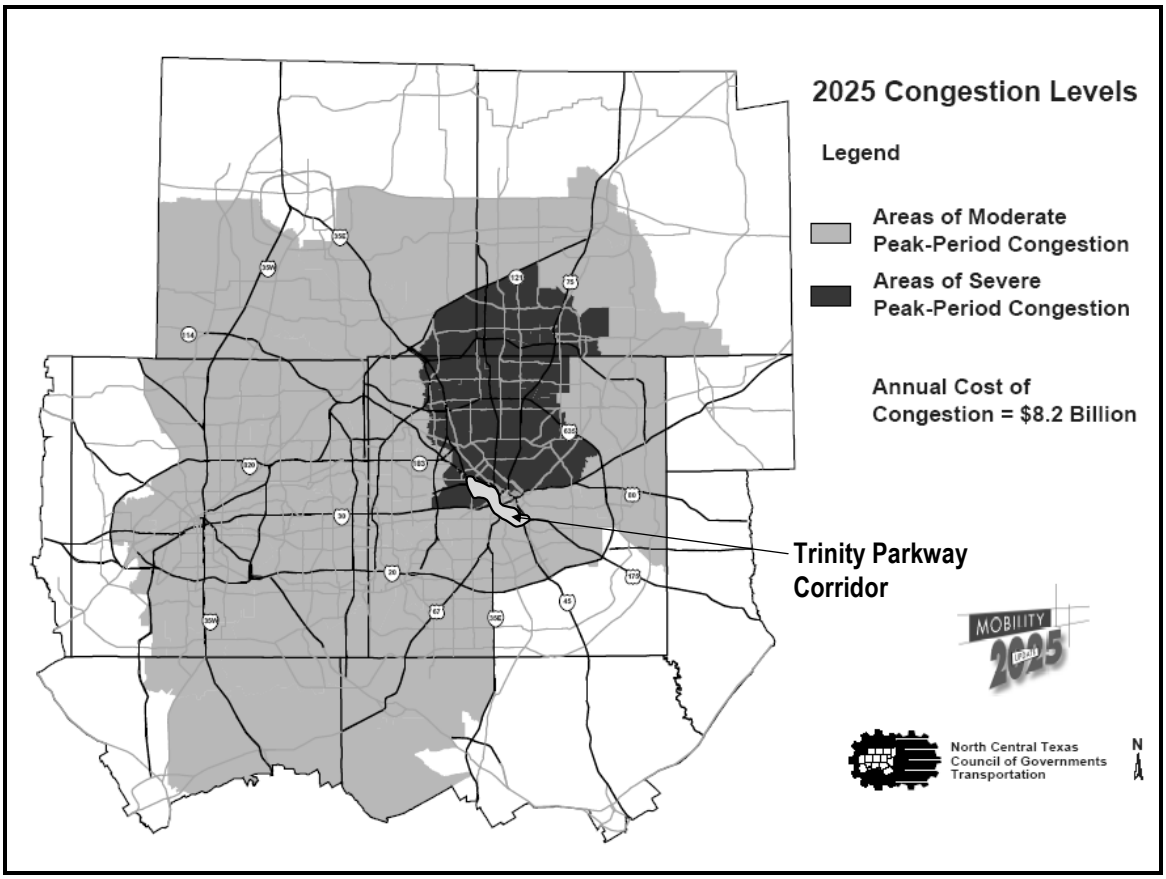


The DFW metropolitan area has also been designated as a non-attainment area for ozone by the EPA. In accordance with the metropolitan planning regulations, the MTP must include a congestion management system (CMS) to systematically address congestion. The evaluation of additional transportation system improvements beyond the committed system began with a detailed assessment of transportation improvements that would not require building additional facilities for SOVs. Various improvements/modes including congestion management strategies, bicycle and pedestrian facilities, rail facilities, and HOV lanes were investigated prior to determining the need for additional freeway capacity improvements.

Transportation system performance information was developed as a product of the DFW Regional Transportation Model (DFWRTM) throughout the MTP development process. This information guided development of the system alternatives and indicated the impact of various improvements. The improvements recommended in the MTP include regional congestion management strategies, bicycle and pedestrian facilities, high occupancy vehicle/managed (HOV/M) lanes, light-commuter rail and bus transit improvements, intelligent transportation system (ITS) technology, freeway and tollway lanes, and improvements to the regional arterial and local thoroughfare system such as intersection improvements and signal timing. The MTP includes more than $45 billion (1999 dollars) in recommended improvements.

The MTP indicates that the implementation of this system will maintain close to current mobility levels in the DFW metropolitan area. **Figure 1-5** illustrates the congestion level for 2025 with the recommended improvements.

FIGURE 1-5. 2025 CONGESTION WITH MOBILITY 2025 – 2004 UPDATE RECOMMENDATIONS



The freeway and tollway system evaluation in the MTP recommends the construction of the Trinity Parkway as a new staged tollway facility between the proposed termini locations of IH-35/SH-183 and US-175/SH-310, both in Dallas County, Texas. The Trinity Parkway is a substantial and long-standing component of the region's long-range transportation plan. It would provide a needed reliever route around the Dallas CBD, balancing programmed capacity improvements on the radial freeways IH-35E, IH-45, SH -183, SH-114, and IH-30. Proposals for improving outlying segments of these freeways could not be effectively implemented until traffic capacity is increased in and around the downtown area. The inclusion of the Trinity Parkway in the MTP also indicates regional support. Various municipalities and agencies such as NCTCOG, TxDOT, DART, Dallas County, and the City of Dallas have demonstrated long-term support for the project.

1.5 TRINITY PARKWAY CORRIDOR MTIS

This section provides an overview of the federal Major Investment Study (MIS) process and includes a summary of the published TxDOT *Trinity Parkway Corridor MTIS*.

1.5.1 Overview of the Federal MIS Process

Major Investment Studies (MIS) are called for in § 450.318 of the joint FHWA/FTA (1993) planning regulations. This requirement was triggered by the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, the 1990 Clean Air Act Amendments (CAAA), and the NEPA of 1969. A major investment is officially described as a "highway or transit improvement of substantial cost that is expected to have a substantial effect on capacity, traffic flow, level of service, or mode share at the transportation corridor scale." The ISTEA and new implementing regulations required the DOT to consider a broad range of evaluation criteria during the preparation of "corridor" or "sub-area" studies. In response to the ISTEA, the DOT promulgated new joint planning regulations affecting the FHWA and FTA (58 FR 207).

The corridor or sub-area planning approach provides broader involvement of the local community in developing the design concept and scope of proposed major transportation investments. The planning and decision making process is coordinated with the MPO and other affected agencies, such as the state departments of transportation. In addition, integrated environmental analysis must be conducted, as well as modal trade-off analyses. Effective collaboration with diverse interest groups is extremely important during evaluation of alternatives and development of a consensus plan.

MIS procedures stress the integration of social, economic, and environmental considerations early in planning analyses and transportation decision making. The factors identified in the ISTEA reflect the general policy goals of the legislation. For instance, the MIS must include provisions for achieving compliance with clean air goals by conforming to the State Implementation Plan (SIP). In addition, the principles and specific requirements of the NEPA philosophy and policy mandates are stressed throughout the planning regulation. The MIS is not a separate requirement, but a more targeted sub-element of the planning process that draws on the general integration of planning within the broader NEPA principles.

At the time of initiation of the TPC MTIS (1996), there were two strategies available for coordinating the MIS process with NEPA documentation requirements (23 CFR § 450.318). These were called "Option 1" and "Option 2" as follows.

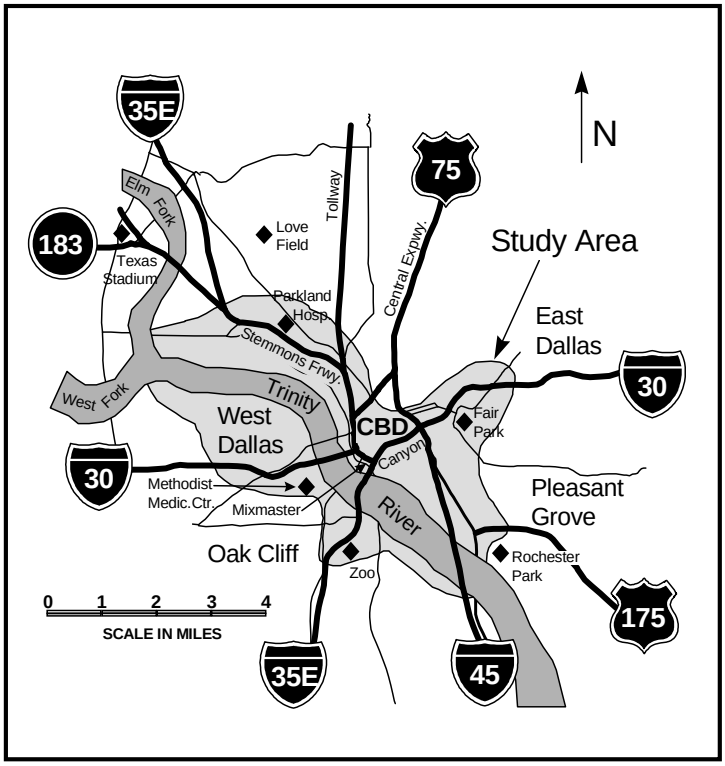
- Option 1: The MIS is completed prior to beginning the NEPA documentation process; and
- Option 2: The NEPA documentation process is completed concurrent with the MIS selection of the preferred alternative.

On June 9, 1998, the Transportation Equity Act for the 21st Century (TEA-21) was enacted as Public Law (PL) 105-178. One of the major NEPA provisions implemented under TEA-21 was MIS integration. Under this provision, the MIS is no longer a separate process, but must be integrated, as appropriate, as part of the analyses required to be undertaken pursuant to the agency's planning provisions and the NEPA (TEA-21 § 1308).

1.5.2 Summary of Trinity Parkway Corridor MTIS

TxDOT conducted the TPC MTIS in 1996 and 1997, and the findings of the study were published in *Study Report, Trinity Parkway Corridor*, March 1998 [TxDOT Dallas District, Control-Section-Job (CSJ) No. 0918-45-121,122]. The TPC MTIS study area is shown on **Figure 1-6**.

FIGURE 1-6. TXDOT MTIS STUDY AREA



The TPC MTIS was prepared in accordance with “Option 1” of the then current MIS process. The MTIS focused on transportation needs in the area of the Dallas CBD. The TPC MTIS study area extended beyond the downtown to cover a reasonable area of influence of the Canyon, Mixmaster, and Lower Stemmons segments on area transportation facilities.

The TPC MTIS used a three-stage process to develop a recommended plan of action. The first stage identified the transportation demand on the roadway and rail transit system within the study area and analyzed conceptual improvements that might serve this demand. The second stage developed preliminary alignments of alternatives identified for further study from the first-stage process. The third stage developed layouts of alternatives identified for further study from the second stage. Third stage alternatives were screened and combined to form a recommended plan of action.

The TPC MTIS recommended plan of action is composed of seven elements, which include improvements to existing facilities, promoting alternative transportation modes, and new facility construction. These include:

1. Enhanced work trip reduction measures;
2. Bicycle and pedestrian facilities;
3. Enhanced transportation facility management;
4. Improvements to the Canyon, Mixmaster, and Lower Stemmons Freeway corridors;
5. Extension of Woodall Rodgers Freeway westward across the Dallas Floodway to connect to Singleton Boulevard and Beckley Avenue;
6. A continuous HOV system through the Canyon, Mixmaster, and Lower Stemmons corridors; and
7. A Trinity Parkway reliever route (proposed action).

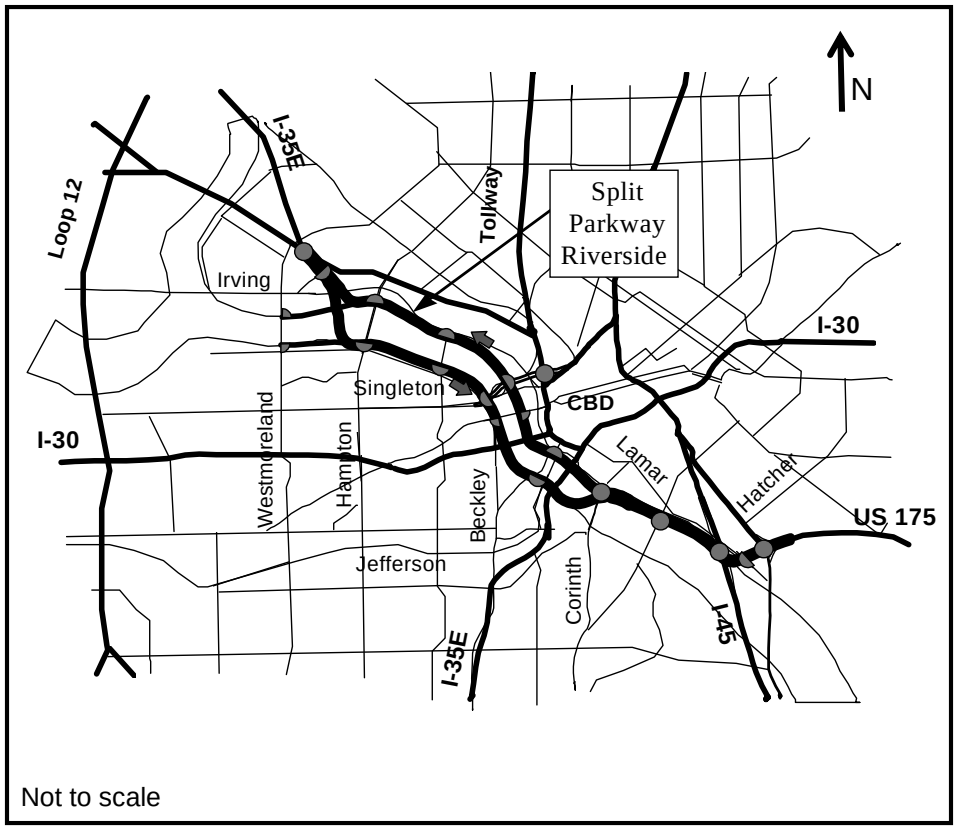
Various agencies, including NTTA, TxDOT, Dallas Area Rapid Transit (DART), and the City of Dallas have taken responsibility for implementation of portions of the plan. Item 7 from the plan, the proposed Trinity Parkway reliever route, is the subject of this DEIS. The TPC MTIS indicated that an eight-lane reliever route (reducing to six lanes in the southern segment) would provide approximately 50 percent of the goal for transportation capacity improvement in the Canyon, Mixmaster, and Lower Stemmons Freeway corridors (see **Figure 2-1**). Details concerning the transportation capacity goal and the evaluation of alternatives conducted during the TPC MTIS are provided in **Chapter 2 Alternatives Considered**.

During the TPC MTIS process, three potential corridors were considered in detail during the study:

1. IH-35E;
2. Irving/Industrial Boulevard; and
3. The Dallas Floodway.

Based on the evaluation of social, economic, and environmental effects; construction and right-of-way costs; engineering considerations; and extensive agency/public involvement, a reliever route alternative located primarily within the Dallas Floodway was identified as the Locally Preferred Alternative (LPA). The concept adopted for this alternative was an eight-lane split parkway (reducing to six lanes in the southern segment) with controlled access and a design speed of 50 mph with a posted speed limit of 45 mph. The general location of the LPA reliever route is shown on **Figure 1-7**.

FIGURE 1-7. TRINITY PARKWAY RELIEVER ROUTE (MTIS LPA)



The possibility of implementing the Trinity Parkway reliever route as a toll facility was outlined in the TxDOT TPC MTIS. However, as noted in **Section 1.3**, the agreements to pursue the toll facility implementation did not occur until some time after completion of the original study. The toll proposal is being pursued due to regional transportation funding shortfalls; the expectation that substantial delays in implementation of the roadway would occur if non-toll funding is used; and the obligation that toll facilities be pursued according to the RTC's policy of evaluating toll feasibility on all new freeway facilities in new rights-of-way. As a result, NTTA has been designated to take the lead on Trinity Parkway as it is being pursued as a toll facility. NTTA is the Regional Tollway Authority, organized under Chapter 366 of the

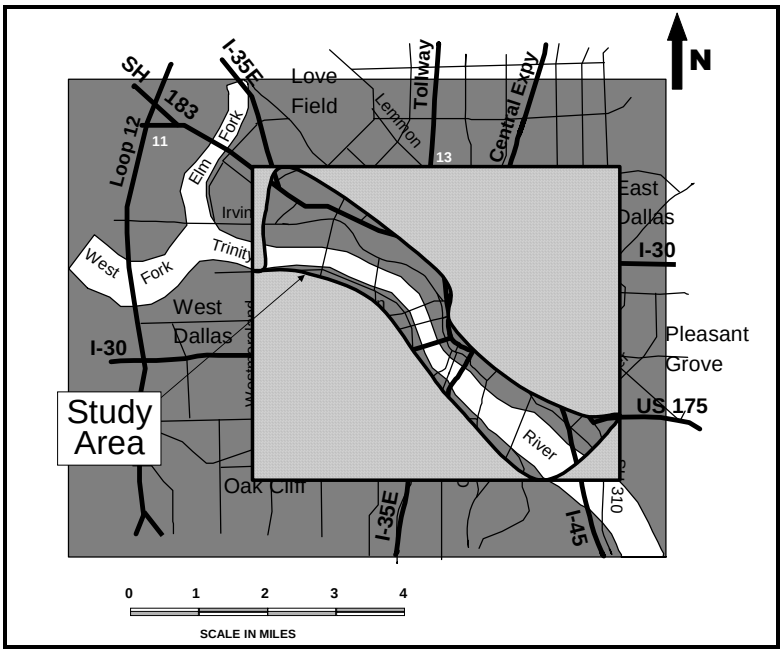
Texas Transportation Code, for the area of Collin, Dallas, Denton and Tarrant counties in north central Texas.

The conversion of the road to a toll facility has caused some modifications to the original TPC MTIS reliever road concept. Aside from the obvious changes (i.e., toll plazas, etc.) needed for the operation of a toll facility, the operating speed of the facility has been changed from 45 mph to 55 mph, and the facility has been reduced to six-lanes throughout. The speed change is required to allow a more attractive travel time advantage on the toll road compared to other available toll-free (tax supported) roads. The change in speed has affected access control on the roadway, preventing previously proposed left side exits from the roadway main lanes to the adjacent park areas. This issue is further discussed in **Sections 2.4.2** of this DEIS. The implementation of tolls has also reduced the traffic projections on the roadway below the volumes otherwise projected for a toll-free (tax supported) facility. This has allowed a reduction in the number of lanes (from eight to six) in the northern segment of the facility. The lane reduction has also been supported by the Dallas City Council as part of their deliberations for the *Balanced Vision Plan for the Trinity River Corrido*r (City of Dallas, 2003). During the public input stages for this planning study, the council stated a preference that the roadway not exceed six lanes due to scale and visual impact concerns in the vicinity of the Dallas Floodway.

1.6 OVERVIEW OF THE STUDY AREA

The Trinity Parkway DEIS study area is narrowed from the original study area in the TPC MTIS to focus more specifically on the reliever route corridor. **Figure 1-8** shows the DEIS study area.

FIGURE 1-8. TRINITY PARKWAY DEIS STUDY AREA



The study area is influenced by a number of important traffic generators, including the Dallas CBD, Stemmons corridor, and communities in south and west Dallas. In addition, major tourist/visitor attractions are located near the study area, including the Dallas West End Historic District, Reunion Arena, and the American Airlines Center Arena. The West End Historic District includes Dealey Plaza, the location where President John F. Kennedy was assassinated in November 1963.

1.7 PURPOSES OF THE PROPOSED ACTION

The seven proposed project alternatives, including the No-Build Alternative, evaluated in this DEIS are considered in terms of how well they meet the following project purposes:

- **Improve Mobility, Reduce Congestion, Increase Safety, and Accommodate Future Travel Demands**

  As is further detailed in **Sections 1.8.1** through **1.8.9,** capacity constraints on existing streets, highways, and transit systems in the study area have resulted in severe congestion and high accident rates. The proposed facility should reduce congestion and increase safety near downtown Dallas, offer improved access to employment centers, and offer travel time savings, both for those who use the facility as well as for users of other streets in the corridor. The proposed facility should also accommodate projected future travel demands in the study area.

- **Minimize the Physical, Biological, and Socioeconomic Effects on the Human Environment**

  The Trinity Parkway study area includes the environmental setting of the Dallas Floodway and Trinity River, and several of the proposed build alternatives are located within or near the

floodway. This major area of open space provides biological resources, water/wetland resources, recreation resources (existing and planned), and aesthetic resources. In addition, the study area includes certain areas that may be susceptible to adverse social, economic, and environmental impacts, including established businesses, residential neighborhoods, and cultural resources. Citizens of these areas have expressed a high level of interest in the potential impacts (beneficial and/or adverse) associated with the Trinity Parkway. Avoiding, minimizing, and mitigating adverse impacts will be of great importance to the development of the Trinity Parkway project.

- **Provide Compatibility with Local Development Plans**

  Due to the multiple planning objectives under consideration in the project study area (i.e., transportation, recreation, flood control, economic development, and environmental preservation), compatibility with local planning objectives is an important consideration. Compatibility and/or synergy with local development plans should be considered among the project purposes and needs**.** Throughout the project planning process, stakeholders have stressed that a major transportation improvement is likely to influence and shape local development. Local government agencies, as well as private citizens and developers, all anticipate some improvements or changes with respect to traffic circulation and economic development within the Trinity Parkway corridor. Therefore, this secondary purpose is included to assure specific consideration of local compatibility issues.

- **Act on Voter Approval for the Trinity Parkway Project**

  The Trinity Parkway project is endorsed for financial support in the City of Dallas Bond Program, which voters approved on May 2, 1998. The Trinity Parkway reliever route is considered one of the highest priority transportation projects in the City of Dallas. The 1998 Bond Program provides $84 million toward the construction of the proposed Trinity Parkway.

- **Provide Enhancement of Modal Interrelationships**

  As previously mentioned, the proposed facility would help to reduce traffic congestion along the major roadway corridors throughout the study area. This would have a direct beneficial effect in improving DART bus service because buses are presently experiencing the same congestion as other vehicles traveling through the study area, particularly during the peak periods. DART has a large number of bus routes within the study area serving local and commuter patrons. Several of these routes cross the study area near planned interchanges and could provide additional intermodal connections.

1.8 THE NEED FOR ACTION

The effects of traffic congestion in the City of Dallas are widespread and directly affect the mobility of people and goods. These effects include increased travel time, increased fuel consumption, and lost productivity of people and businesses. Each year, the Texas Transportation Institute (TTI) publishes The Urban Mobility Study for selected U.S. urban transportation systems, including the City of Dallas. A summary of the study results for the City of Dallas from 1982 through 2001 is on file.

This study shows gradually worsening trends in all measures of transportation across the Dallas area. Of particular note is a finding that in 2001, 63 percent of peak period travel occurred in congested conditions. The study indicates that in 2001, Dallas citizens spent an average of 36 hours delayed in traffic and spent an estimated total of $2.735 billion in lost time and wasted fuel. This is equal to about $710 per person per year or about $2.73 per person per workday (TTI, 2003).

1.8.1 Traffic Volumes and Level of Service

Existing and Forecasted Traffic Volumes

In November 2003, NCTCOG completed the traffic study for the Trinity Parkway project based on the modeling assumptions in the MTP *Mobility 2025 - 2004 Update*. For the purposes of the study, traffic volumes are expressed as average daily traffic (ADT). The ADT volumes reflect average travel conditions on a particular highway rather than daily or seasonal variations. Forecasted volumes, which were developed from the NCTCOG's DFWRTM, are based on historic traffic counts and associated growth trends, data from regional and local plans that include present and future land use and development trends, and demographic data such as changes in population and employment. **Table 1-1** summarizes forecasted traffic (2025) for various segments of study area roadways**.**

TABLE 1-1. FORECASTED ADT UNDER THE NO-BUILD ALTERNATIVE

Roadways	Forecasted Conditions (2025)
IH-35E	
North of SH-183	137,100
SH-183 to DNT	250,900
DNT to IH-30	177,600
South of IH-30	203,700
IH-30	
West of IH-35E	170,000
East of IH-35E	180,400
East of IH-45	220,500
SH-183	
West of IH-35E	156,600
US-175	
East of SH-310	88,800
IH-45	
North of Trinity River	103,000
US-75	
North of IH-30	176,300
North of Woodall Rodgers	196,200
Source: NCTCOG DFWRTM. Trinity Sub-area Model Run (No-Build) November 2003. **ADT** = Average Daily Traffic; **IH** = Interstate Highway	

Capacity and Level of Service

Capacity analyses were conducted to determine year 2025 LOS for various segments of existing study area highways and arterials. LOS is a measure of the roadway's ability to handle traffic demand. Traffic parameters and roadway design factors such as ADT volumes, peak-hour volumes, truck percentages, number of driving lanes, lane widths, vertical grades, passing opportunities, presence or absence of traffic signals, and access type/spacing affect the LOS. The Transportation Research Board has established guidelines for appropriate LOS on roadways. **Table 1-2** defines LOS ranges from "A" to "F" in order of decreasing operational quality.

TABLE 1-2. LEVEL OF SERVICE DEFINITIONS FOR ROADWAYS

LOS	Density Range (passenger cars /mile/lane)	Minimum Speed (mph)	Description
A	0-11	70.0	The operation of vehicles is virtually unaffected by the presence of other vehicles, and operations are constrained only by the geometric features of the highway and by drive performances.
B	>11-18	70.0	Although the presence of other vehicles becomes noticeable, drivers have slightly less freedom to maneuver. Minor disruption in the traffic flow can be easily absorbed. Average speeds are the same as in LOS A.
C	>18-26	>50	The influence of traffic density on traffic operation becomes marked. The ability to maneuver is clearly affected. Minor disruptions can cause serious local deterioration in service, and queues will form behind any significant disruption.
D	>26-35	45 - 60	The ability to maneuver is severely restricted due to traffic congestion. Travel speed is reduced with the increase in traffic volume. Minor disruption can be absorbed without extensive queues forming and the service deteriorating.
E	>35-45	42 -50	Represents operation at or near capacity, an unstable flow. The densities vary, depending on the free-flow-speed. Vehicles are operating with minimum spacing. Disruptions often cause queues to form and services deteriorate to LOS F.
F	> 45	<30	Represents forced or breakdown flow. Sections of the facility are operating at near capacity. Operations within the queues are highly unstable and vehicles experience stop-and-go operation and excessive delays.

Source: Transportation Research Board**,** National Research Council, Washington, D.C. 2000.

Note: The traffic operation on freeways is characterized by three performance measures: Density which is defined as the number of passenger vehicles per mile per lane, Speed as defined in terms of mean passenger speed per mile per lane, and Volume-to-capacity ratio. All these factors are interrelated and can be calculated on two of the measures are known. Each of these measures indicates how well the highway accommodate traffic flow.

Predicted future LOS for various roadway segments as shown in **Table 1-3** indicate that the majority of segments would operate at LOS “E” or LOS “F.” This is characterized by slower travel speeds and unstable traffic flow operations, resulting in stop-and-go long backups and delay.

TABLE 1-3. FORECASTED LOS UNDER THE NO-BUILD ALTERNATIVE

Roadway	2025 LOS (Peak Hour)
IH-35E	
North of SH-183	E
SH-183 to DNT	F
DNT to IH-30	E
South of IH-30	F
IH-30	
West of IH-35E	F
East of IH-35E	F
East of IH-45	F
SH-183	
West of IH-35E	F
US-175	
East of SH-310	E
IH-45	
North of Trinity River	E
US-75	
North of IH-30	F
North of Woodall Rodgers	F

Source: NCTCOG DFWRTM. Trinity Sub-area Model Run, November 2003.
LOS = Level of Service; **IH** = Interstate Highway

Under these conditions it is likely that some traffic would continue to divert to local city streets and other secondary roadways, placing additional traffic demands on routes not intended to function as a regional, state, and national travel route. The existing roadway network would not operate efficiently, and it is likely accident frequency would increase if no improvements are made in the study area.

1.8.2 Regional Travel Growth

Rapid growth in the DFW region is surpassing the transportation system's ability to accommodate it, resulting in increased traffic congestion. In 1990, the DFW region ranked second nationwide and surpassed all Texas cities in daily travel per person. Transportation demand for the DFW region was 125 million vehicle miles of travel (VMT) in 1999, meaning that on a typical weekday drivers travel a total of approximately 125 million miles on area freeways, arterials, and local streets. Regional VMT steadily increased from 66 million in 1980 to 125 million 1999. This represents an 89 percent increase over this 19-year period. Average VMT per person has also increased from 22.8 miles per day in 1980 to 27.6 miles per day in 1999, representing a 21 percent increase per person. Factors involved in increased VMT include:

- Increasing automobile ownership;
- Increased suburbanization (see **Section 1.8.3**);
- Reduction in vehicle occupancies (see **Section 1.8.4**); and
- Population and employment growth (see **Section 1.8.5**).

The increased travel is having a negative impact on the DFW area roadway system. While travel is increasing, revenues to support construction and maintenance of the roadway system have not kept pace with the resulting travel demand. A substantial increase in VMT occurred between 1980 and 1999. However, highway expenditures during the same period remained relatively constant in real terms. This imbalance between travel demand and roadway supply has resulted in a substantial increase in congestion and roadway maintenance needs.

In contrast to the DFW area experience, the pace of VMT growth in the U.S. as a whole has slowly declined during most of the post-World War II period, as the various demographic factors that propelled VMT growth have slowed, and in some instances even stopped altogether. These factors include rapid growth in the driving age population, large-scale entry of women into the U.S. work force, declines in the size of American households, and increasing geographic dispersion of the nation's metropolitan areas. Since these developments are not likely to continue at their historical pace, travel growth should continue to slow during the next century to rates well below the post-war average. In fact, national automobile and light-truck VMT growth has averaged less than 2.5 percent annually since 1988, after increasing by more than 4 percent per year from 1982 to 1988.

1.8.3 Increased Suburbanization

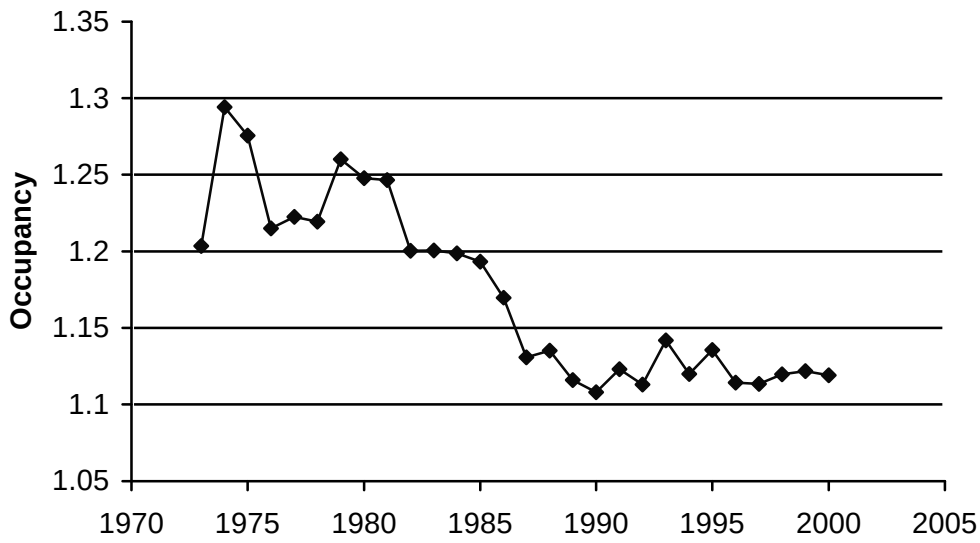
The travel patterns of area residents have been altered due to changes in land use associated with suburbanization, a growth pattern sometimes referred to as "urban sprawl." In the past, commuting patterns involved a high percentage of trips to the central city. Today's commuting patterns are more widely scattered as inter- and intra-suburban travel has increased. There is a reduced ability to provide effective transit service for this type of travel because of the dispersal of destinations. As a result, the private automobile has become the dominant mode of travel in the DFW metropolitan area.

Since distances between employment, retail, and residential areas tend to be greater in suburban areas, trip frequencies, trip lengths, and travel times also tend to be greater. The DFW area has experienced suburbanization much like the rest of the U.S. Households located near the central city (i.e., urban residential) travel approximately 70.0 miles per day, while households in rural areas travel approximately 110.0 miles per day (NCTCOG, *Mobility 2025 - 2004 Update*).

1.8.4 Reduction in Vehicle Occupancies

Residents in the metropolitan Dallas area use several different modes of transportation to travel to and from work. In 1990, approximately 79 percent of the residents drove alone, 14 percent car pooled, 2 percent worked at home, 2 percent used public transit, 2 percent walked, and 1 percent used other means of transportation, such as bicycling. Historically, the proportion of travel by people driving alone has been generally increasing in Dallas, with a corresponding decline in average vehicle occupancies. **Figure 1-9** shows the historical data for vehicle occupancies in Dallas County from 1973 to 2000.

FIGURE 1-9. 1973 TO 2000 VEHICLE OCCUPANCIES



Source: TxDOT, 2000b.

Figure 1-9 shows that average vehicle occupancy in Dallas County had steadily declined through the 1970s and 1980s, leveling out in the last decade. Regional efforts toward transit and HOV implementation are expected to begin an upward trend in vehicle occupancies over the next decades, and thereby slow down the growth in VMT. The MTP (*Mobility 2025 - 2004 Update*) projects average vehicle occupancy of 1.25 in the year 2025.

1.8.5 Regional Population and Employment Growth

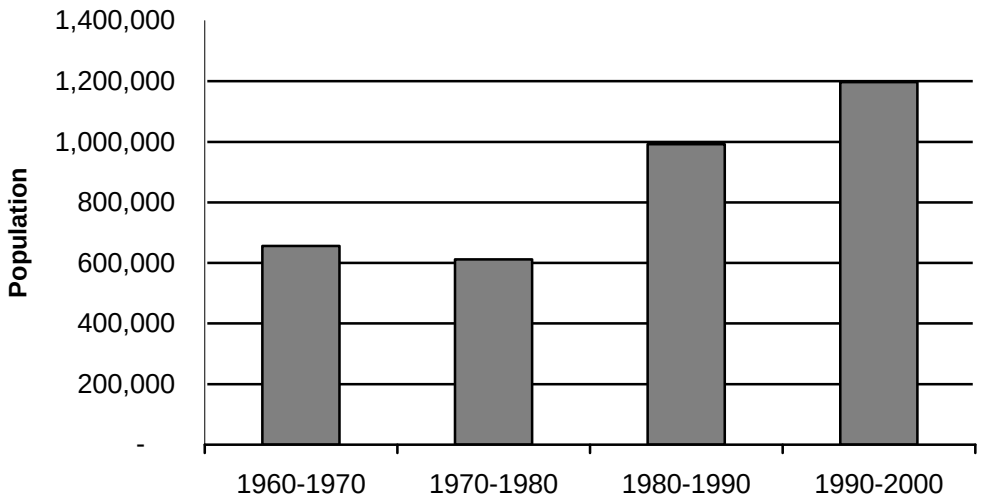
Population

According to the U.S. Census Bureau, the 2000 population of the DFW region (DFW refers to the NCTCOG 16-county north central Texas region) is 5,309,277, which is larger than the population of 31 U.S. states. The DFW region grew by 1,197,529 people or 29.1 percent between 1990 and 2000 – more

than twice the national growth rate of about 13 percent during the same period. This represents an average annual growth rate of around 2.6 percent. The region is a major economic, social, and political center of both Texas and the U.S., with rapid growth in population and employment expected to continue. DFW is now the largest regional economy in Texas, comprising approximately 30 percent of the state's economy, 24 percent of population, 31 percent of population growth, 35 percent of employment growth, and 29 percent of gross sales. By the year 2030, the region is expected to attract over four million new residents and over two million new jobs.

The DFW region is one of the fastest-growing large urban areas in the nation and has joined a group of nine U.S. metropolitan regions with populations exceeding 5 million people (NCTCOG, 2003e). **Figure 1-10** shows the regional population increase by decade from 1960 through 2000.

FIGURE 1-10. REGIONAL POPULATION INCREASE BY DECADE (1960-2000)



Source: NCTCOG, 2003e.

The total population of the DFW region at the start of 2003 was estimated as 5,714,150. The region has achieved a growth rate of over 150,000 persons per year for the past four years, and a rate of over 100,000 persons per year for the three prior years. Recent economic uncertainty has not slowed down the remarkable pace at which the region continues to grow.

The four core counties in the region (Collin, Dallas, Denton, and Tarrant) captured 85 percent of all regional growth in the 1990s or 847,100 persons. In 2002, these counties captured 82 percent of all regional growth, adding 128,000 persons. Dallas County added over 27,000 persons in 2002 and now has 2,285,600 persons (NCTCOG, 2003d).

Employment

From 1990 to 2000, employment in the DFW region grew 45.9 percent adding 935,107 non-construction jobs for a year 2000 total of 3,158,200. These employment figures represent an average increase of approximately 93,500 jobs per year since 1990. The labor market performance of the late 1990s was the strongest in a decade both nationally and locally.

During this period of exceptional growth, the City of Dallas continued to dominate regional employment by capturing approximately 24 percent of all job growth (228,664) bringing their total employment base to 1,038,314. Employment within the city is focused substantially in traditional core markets in the CBD and the Stemmons corridor, both of which directly influence the Trinity Parkway study area. **Table 1-4** summarizes recent employment trends for the major cities in the region from 1990-2000.

TABLE 1-4. EMPLOYMENT TRENDS FOR TOP FIVE CITIES (1990-2000)

City	1990 Employment	2000 Employment	1990-2000 Total Change	1990-2000 Percent Change
Dallas	809,650	1,038,314	228,664	28.2
Fort Worth	330,350	449,793	119,443	36.2
Irving	106,600	165,435	58,835	55.2
Plano	54,450	115,048	60,598	111.3
Richardson	57,750	94,792	37,042	64.1

Source: NCTCOG, 2003b.

Note: The NCTCOG 2000 employment estimate report includes 71 cities within Collin, Dallas, Denton, Rockwall, and Tarrant counties as well as portions of Ellis, Johnson, Kaufman, and Parker counties.

Table 1-5 provides a summary of projections for DFW metropolitan area population and employment for 2000 through 2030. The NCTCOG metropolitan area demographic forecast is conducted for the 10 counties surrounding the DFW urban core (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties).

TABLE 1-5. DFW DEMOGRAPHIC FORECAST (2000-2030)

Demographic Statistic	2000	2010	2020	2030
Population	5,067,400	6,328,200	7,646,600	9,107,900
Employment	3,158,200	3,897,000	4,658,700	5,416,700

Source: NCTCOG, 2003c.

Notes: (a) Population increases of approximately 135,000 persons per year.

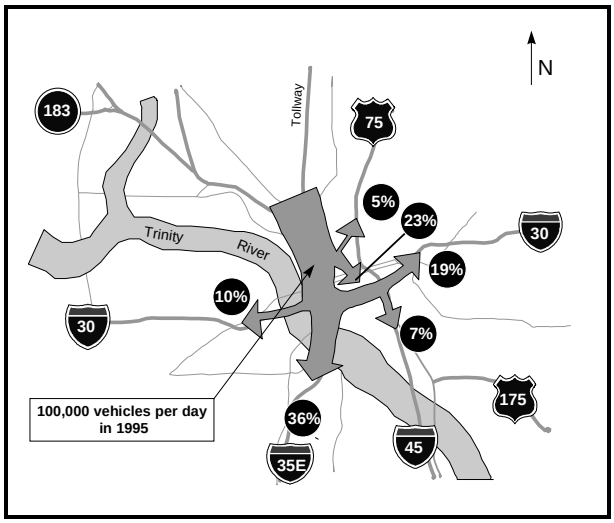
(b) Employment increase of approximately 75,000 jobs per year.

As shown in **Table 1-5**, the DFW metropolitan area is expected to have approximately 9.1 million residents in 2030, supporting approximately 5.4 million jobs. On average, the region is expected to add population at a rate of approximately 135,000 persons per year and employment at a rate of approximately 75,000 jobs per year over the 30-year period. This is equivalent to adding nearly four cities the size of Dallas, or nearly eight cities the size of Fort Worth in this time period.

1.8.6 Traffic Flow Characteristics near the Dallas CBD

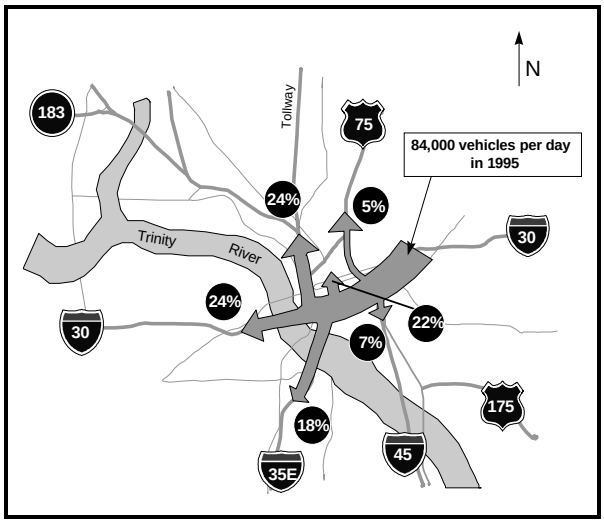
Figures 1-11 through **1-14** from the TPC MTIS show the directional distribution of traffic originating from the radial freeways around the Dallas CBD. These figures are based on 1995 traffic data provided by the NCTCOG and are expected to be reasonably representative of the current directional distribution.

FIGURE 1-11. DAILY TRAFFIC ENTERING THE MIXMASTER FROM THE NORTH



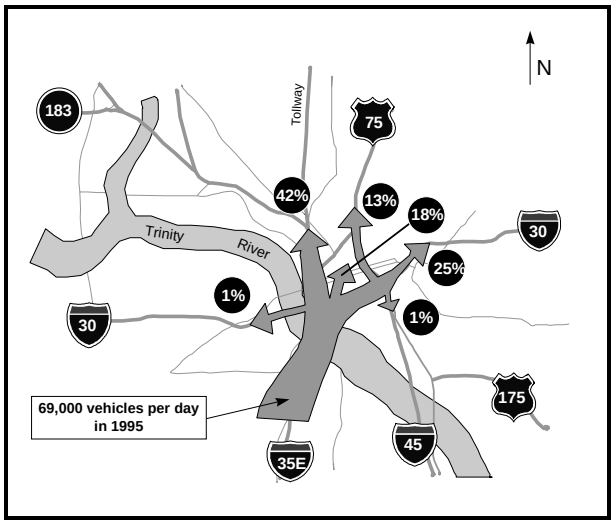
Note: Not to scale

FIGURE 1-12. DAILY TRAFFIC ENTERING THE MIXMASTER FROM THE EAST



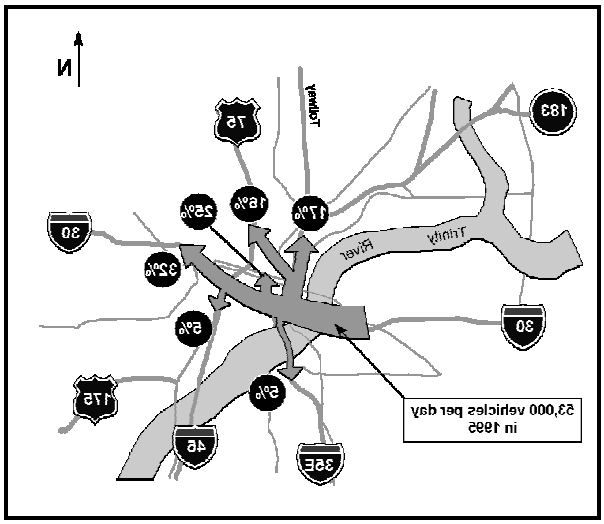
Note: Not to scale

FIGURE 1-13. DAILY TRAFFIC ENTERING THE MIXMASTER FROM THE SOUTH



Note: Not to scale

FIGURE 1-14. DAILY TRAFFIC ENTERING THE MIXMASTER FROM THE WEST



Note: Not to scale

Figures 1-11 through **1-14** indicate that approximately one out of every five drivers on the Canyon/Mixmaster system is destined for downtown Dallas. The remaining four out of five drivers are trying to travel past the downtown to other destinations. This travel pattern is very different from the original intent and use of the freeway system in the 1960s, which was focused on the downtown as the primary destination (TxDOT, 1998b).

Under current conditions, the Canyon, Mixmaster, and Lower Stemmons segments are critically congested and operate in a stop-and-go traffic condition every business day. The American Automobile Association (AAA) named the Mixmaster in 1996 and again in 2000 as one of the top ten "*Most Notorious Traffic Bottlenecks*" in the nation.

On a typical weekday morning, northbound traffic on IH-35E queues from the Dallas Zoo (12th Street) to the Dallas North Tollway exit, a distance of approximately 4.3 miles. Eastbound traffic begins to queue west of the Trinity River Bridge (Wycliff/Sylvan Avenue), with the queue continuing through the entire Canyon area on IH-30, a distance of approximately 3.3 miles. Westbound queues stretch from Ferguson Road to the Mixmaster, a distance in excess of 5.0 miles. Similar queuing problems occur during the evening rush hours on IH-35E and IH-30 in the opposite directions.

The Canyon, Mixmaster, and Lower Stemmons Freeway segments were built between 1958 and 1962. Notably, the existing Commerce Street interchange with IH-35E was in place at the time of the John F. Kennedy assassination and was used as an escape route from Dealey Plaza by the presidential motorcade. These freeway segments present numerous shortfalls when measured against current design standards. Some of the most notable shortfalls are:

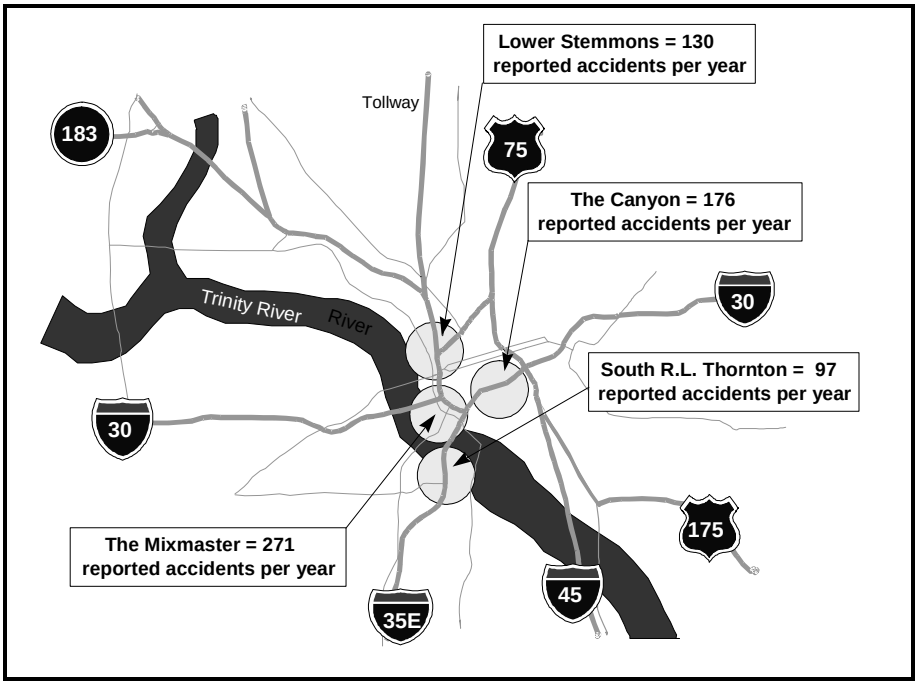
- Traffic going southbound on IH-35E through the Mixmaster must make an exiting movement (from the right lanes) in order to stay on IH-35E south of the Mixmaster.
- Traffic traveling between the southern segment of IH-35E (South R.L. Thornton) and the western segment of IH-30 (Tom Landry Freeway) must exit the freeway to Industrial Boulevard in order to access the interchange.
- There are numerous left-hand entries and exits, such as the northbound entrance from Commerce Street to IH-35E and the westbound exit from IH-30 to south IH-35E.

1.8.7 Safety

The volume of traffic in the Canyon, Mixmaster, and Lower Stemmons corridors, along with the complexity of merges and weaving in the area has resulted in a high rate of accidents. In addition, the inefficient layout of ramps and service roads in the area slows emergency response and prevents efficient detouring of traffic around accident sites. **Figure 1-15** shows the accident history for these segments expressed as an annual average for the period from 1997 to 1999. This is based on listings of reported accidents provided by the TxDOT Dallas District. The data includes accidents resulting from roadway geometric deficiencies, driver error, adverse weather conditions, construction hazards, and poor roadway conditions. The accident rates in the Canyon, Mixmaster, and Lower Stemmons corridors appear to be more than double the nationally reported accident rates for U.S. Highways (approximately 210 annual accidents per

100.0 million vehicle miles of travel, compared to an FHWA reported average for highways of around 80 annual accidents per 100.0 million vehicle miles of travel).

FIGURE 1-15. AVERAGE ANNUAL ACCIDENT RATES IN THE STUDY AREA – 1997 TO 1999



The lane curvature and design speed at some locations has also caused a high number of truck overturns and load spills. On November 14, 1996, accidents in the Mixmaster involving two separate truck incidents completely shut down IH-35E for 6 hours.

As traffic volumes increase on the study area roadways, the numbers of accidents would also be likely to increase. Increased traffic volumes lead to increased congestion, which interrupts normal traffic flow, leads to a greater number of vehicle conflicts, and tends to result in a greater number of accidents. This trend is seen under existing conditions and is expected to continue. In the future, without improvements, additional study area roadway links and intersections are likely to have “higher than expected” accident rates. In addition, as traffic continues to spread to other secondary roads to avoid congestion on major roads, these roads are likely to experience deterioration in safety as well.

The Trinity Parkway project proposes a reliever route around the Canyon, Mixmaster, and the Lower Stemmons area, without addressing construction or modifications to the existing highways. This is because TxDOT is the lead agency in developing proposals for capacity and safety improvements in the Canyon, Mixmaster, and Lower Stemmons (i.e., Project Pegasus), as well as the extension of Woodall

Rodgers Freeway. Several hundreds of millions of dollars of improvements are separately programmed for these facilities (partially committed to date).

1.8.8 Assumed Horizon Year System

The horizon year for the Trinity Parkway study has been set at the year 2025. This matches the adopted planning horizon used by NCTCOG in the current MTP (*Mobility Plan 2025 – 2004 Update*). Additionally, an interim target date of year 2013 has been set to evaluate the influence of staged construction of improvements.

The projection of future traffic conditions is based on many assumptions, which have to be estimated from the best available current information. These assumptions include population growth, modal choices in future years, projected vehicle occupancies, and an assumption of what improved facilities would be in place in future years. The following paragraphs discuss these factors as they apply to the Trinity Parkway corridor modeling.

Projections of future population in the DFW area were developed by the Research and Information Services Department of the NCTCOG and are discussed in **Section 1.8.5**. These data on population and employment patterns are used by many agencies in the region to plan future services and facilities. The NCTCOG has utilized these demographic projections, along with statistical data on trip patterns and purposes, to develop traffic modeling for future years in the Trinity Parkway study area.

Assumptions regarding the road and transit systems, which should be in place at the horizon year (2025), are based on existing and committed projects and the improvements planned in the MTP (*Mobility 2025 – 2004 Update*). The following list summarizes the other assumptions included in the future conditions model:

- DART rail transit is assumed to be in place to the full extent shown on the current service plan. This includes light rail lines to South Oak Cliff, Pleasant Grove, West Oak Cliff, North Central, Northwest Corridor (Farmers Branch and Irving), and Garland and commuter rail lines to Irving and Fort Worth.
- All committed road improvements included in the *2004-2006 TIP* are assumed to be in place (see **Table 1-9**). This includes the Trinity River crossing at Hampton Road.
- All freeway and HOV improvements in the *2004-2006 TIP* outside of the study area are assumed to be in place. For the purposes of traffic modeling, freeway and HOV improvements in the Canyon, Mixmaster, and Lower Stemmons corridors are assumed to be in place by year 2025.

- Trip reduction programs under the regional CMS are assumed to be in place and having effect. This includes programs for car pools, van pools, and employer transit pass subsidies.
- The system management initiatives programmed under the regional CMS is assumed to be in place. This includes reconstruction of intersections in the study area upgrading and sequencing of signal light installations, and bottleneck removals on freeways.
- The projected average vehicle occupancy rate for all road vehicles in the study is assumed to be 1.25 at the horizon year (2025).
- The extension of Woodall Rodgers Freeway westward across the Dallas Floodway connecting to Singleton Boulevard and Beckley Avenue is assumed to be in place.

The population and facility assumptions listed above form the baseline condition, against which all alternatives developed in the DEIS are modeled. Additionally, the current traffic modeling is based on toll conditions on the Trinity Parkway. That is to say, the traffic projections are reduced from those that might be expected on a “toll-free” (tax-supported) road to reflect the sensitivity of motorists to paying tolls.

1.8.9 Future Year Traffic Conditions

Assuming the baseline improvements are in place, the year 2025 model projections show very unfavorable traffic conditions. The modeling data show an increasing bottleneck effect in the downtown area, with hours of congestion growing from 6 to 9 hours per day. This would result in an overlapping of the morning and afternoon peaks into a continuous period of congestion.

The model shows the effect of adding more population and traffic pressure to an already highly congested system of roads. The time of congestion gets longer because the system is only capable of metering through a limited amount of traffic per hour. As a result, people are forced to substantially change their work hours, to seek other longer routes through any available streets, or to change jobs or residences in order to avoid protracted delays on the freeways. **Table 1-6** provides a summary of the modeled daily travel demand performance for the Trinity Parkway study area in the horizon year 2025.

TABLE 1-6. DAILY TRAVEL DEMAND PERFORMANCE SUMMARY FOR THE STUDY AREA

Performance Measure	2025 No-Build	2025 (Alts. 2A and 2B)	2025 (Alts. 3A, 4, and 5)	2025 (Alt. 3B)
Vehicle Miles of Travel	15,690,135	16,173,272	16,204,436	16,196,542
Vehicle Hours of Travel	484,959	474,644	474,619	475,878
Average Speed (mph)	32.35	34.07	34.14	34.04
Lane Miles	2,417	2,470	2,479	2,486
Congestion Delay (vehicle hours)	105,024	97,683	96,912	97,565
Percent Lane Miles at LOS E or F	42.34	38.14	38.58	38.45
Annual Cost of Congestion ($mil)	426.7	396.8	393.7	396.4

Source: NCTCOG DFWRTM.

Notes:
1. Vehicle Miles Traveled (VMT) = the total number of miles driven by all vehicles in the area on an average day.
2. Vehicle Hours of Travel (VHT) = the total time spent driving vehicles in the area on an average day.
3. Average Speed (mph) = VMT divided by the VHT.
4. Congestion Delay (vehicle hours) determines whether vehicles are experiencing substantial delays on the roadways and gauges the degree that congestion can be reduced by the various alternatives.
5. Percent Lane Miles at LOS E or F = % (percent) of lane miles operating in congested conditions at LOS E or F.
6. Alternatives 2A and 2B are located primarily along Irving/Industrial Boulevards. Alternatives 3A, 3B, 4, and 5 are located primarily along the Dallas Floodway. All of the Trinity Parkway alternatives, including the No-Build Alternative (Alternative 1) are fully described in **Chapter 2 Alternatives Considered**.
7. **LOS** = level of service; **mph** = miles per hour

As shown in **Table 1-6**, the measures Congestion Delay and Annual Cost of Congestion are substantially higher for the No-Build Alternative. **Chapter 2 Alternatives Considered** provides additional information regarding the No-Build Alternative and the build alternatives.

1.9 OTHER TRANSPORTATION PLANNING INFLUENCES

1.9.1 Interstate Context and Through-Traffic Growth

The interstate system of national defense highways was initiated after World War II to provide a nationwide network of limited-access highways to link key population centers. These highways serve a vital role in the metropolitan Dallas area and in the entire north central Texas region.

The IH-35 corridor serves the central U.S. from Mexico to Canada. Interstate traffic travels along IH-35E through the Dallas area from Mexico and cities such as Laredo, San Antonio, and Austin to the south and the cities of Denton, Oklahoma City, Kansas City, Des Moines, Minneapolis, and Duluth to the north. The IH-35E segment in Dallas has also become a main thoroughfare for residents and commuters. Interstate travelers and truck drivers must compete with Dallas commuters for limited capacity on the interstate highways in and around the city, especially in the Canyon, Mixmaster, and Lower Stemmons corridors. Even when drivers plan well to avoid peak hours in the Dallas area, they must travel interstates with congestion problems and a high number of accidents and incidents during a major portion of daylight hours.

After the ratification of NAFTA in 1993, accommodating increases in trade traffic has become an important issue for the region. Since NAFTA was enacted, trade from the DFW area to Mexico and Canada has increased substantially. Approximately 80 percent of overland trade between the U.S. and Mexico travels through Texas. In addition, Texas leads the nation in exports to Mexico. In 2001, the value of trade between DFW, Canada, and Mexico totaled more than $1.7 billion.

The IH-35 corridor was identified in the ISTEA as Corridor 23, which designates IH-35 as a national high-priority trade route. Currently, the IH-35 corridor carries approximately 32 percent of all NAFTA-related traffic in the state. Referred to as the NAFTA "Superhighway," this major north-south route represents a "backbone" of goods movement. The Interstate also connects to other major regional trade routes, such as IH-20, IH-30, IH-45, IH-635, IH-820, and US-75.

As IH-35 corridor trade increases in the future, the travel demands will continue to grow, placing additional pressures on a burdened interstate system and arterial facilities in the areas around Dallas. In order to prevent an overburdening of the local roadway network, additional capacity must be provided to serve the current and future demands for the movement of people and goods within the region.

In response to growth in interstate traffic in Texas, Texas Governor Rick Perry and the Texas Transportation Commission announced in January, 2002 the creation of the *Trans Texas Corridor Plan*. The plan envisions transportation corridors across Texas, having a total length of approximately 4,000 miles and providing a major addition to the interstate highway network. The corridors conceptually have a right of way width of up to 1,200 feet, and encompass roadway, freight rail, passenger rail and utility components. The *Trans Texas Corridor Plan* identifies four priority corridors, one of which crosses Texas is a north-south orientation, generally parallel to and to the east of IH 35. The plan can be described as being in an exploratory phase at the current time, with funding sources and construction schedules not firmly established. Additional information on the proposal is available from TxDOT (www.dot.state.tx.us).

The IH-35 TransTexas facility has a potential to reduce traffic in the Trinity Parkway corridor due to the routing of some portion of the long-distance interstate traffic around Dallas. However, this is not judged to substantially affect the need for the project. The Trinity Parkway is primarily a commuter route and is proposed to be restricted to automobiles only. There is a relatively small portion of the overall traffic volume in the region that is attributable to pass-through interstate traffic. Pass-through travelers, and particularly long distance freight operators, are also more likely to avoid travel in peak hours through the region. The Trinity Parkway is sized based on the findings of the regional MTP. This study shows that even with all components of the MTP in place, there is still a projected "severe" peak hour congestion in the Trinity Parkway corridor at year 2025 (see **Figure 1-5**). The TransTexas Corridor Plan may reduce the hours of congestion, but not to the extent that the programming for the parkway would be changed.

1.9.2 Tourists/Visitors

The City of Dallas is the number one visitor destination in Texas, attracting 14.2 million visitors annually. It is one of the leading convention cities in the nation, attracting nearly 4 million convention delegates per year, who contribute more than $4.0 billion to the local economy. The majority of these conventions are held in the Dallas CBD area, which includes the Dallas Convention Center and other major hotel/convention facilities. There are approximately 49,000 hotel rooms in the Dallas area. The direct economic impact from travel expenditures on the local economy is estimated to be $6.6 billion, with the travel industry providing 122,000 jobs in the Dallas area and indirectly providing an additional 172,000 jobs.

A primary tourist attraction in Dallas is the West End Historic District, a National Register of Historic Places (NRHP) district comprising over 20 city blocks in the northwest section of downtown, adjacent to IH-35E and Woodall Rodgers Freeway. The district features a renovated warehouse district and includes Dealey Plaza, the location of the President John F. Kennedy assassination. Tourist attractions in and around Dealey Plaza include the historic Texas School Book Depository and 6th Floor Museum and the John F. Kennedy Memorial Plaza. Expanding north from the West End Historic District is the new 70-acre "Victory" development, which includes the American Airlines Center Arena used for professional ice hockey, basketball, and other public events.

The West End Historic District is a nationally recognized entertainment district and major tourism anchor for the City of Dallas, attracting an estimated 7 million people annually. More than 10,500 employees working for more than 300 different businesses and agencies are located in the district. An estimated 40,000 more employees work in nearby office buildings. In addition, businesses within the district contribute over $110 million in annual sales to the local economy.

1.9.3 Intermodal Considerations

Intermodal freight facilities provide an economical means for goods to reach distant markets and distribution points by linking two or more methods of transport. North central Texas has one of the most extensive surface and air transportation networks in the world, providing extensive trade opportunities for the more than 600 motor/trucking carriers and almost 90 freight forwarders that operate out of the area.

The U.S. class I railroads coordinate shipping activities with trucking companies at four intermodal freight centers located on or near major highway corridors around Dallas. Several of these facilities are serviced by major highways and freight rail lines, such as Union Pacific (UP), Burlington Northern and Santa Fe (BNSF), and Kansas City Southern (KCS). At these intermodal facilities, containers and truck trailers are

transferred between truck and rail modes. For example, the BNSF Intermodal and Carload Transportation Center at Alliance Airport north of the City of Fort Worth is one of the largest facilities of its kind in the U.S. The nearest intermodal freight facility to the Trinity Parkway corridor is the old Southern Pacific Miller Yard (now operated by UP Railroad Company), located at IH-45 and Linfield Road, approximately 2.0 miles south of the southern terminus (US-175/SH-310).

DFW International Airport is located approximately 11 miles northwest of the study area. The airport is a major national and international hub, ranked third in the U.S. in total passenger activity. The airport covers more than 29.8 square miles, ranking it as the second largest in the U.S. in terms of land area. In 2002, the airport handled 52,828,491 passengers, 765,109 operations (take-offs and landings), and 739,041 tons of cargo. The airport is also host to a 2,500-acre foreign trade zone. During the next 20 years, the airport plans to spend approximately $5.5 billion to expand its passenger, cargo, and other facilities. This expansion is projected to generate nearly $69 billion to the regional economy over the next two decades, creating 53,000 additional jobs and personal income totaling $34 billion. Dallas Love Field, located approximately 2.0 miles north of the study area, also maintains air cargo facilities and handles approximately 24,000 tons per year. The airport serves a mix of commercial flights and general aviation. In 2002, the airport served approximately 5.6 million passengers and 245,564 aircraft operations.

1.9.4 Proposed DFW Strategic Routing System

In response to the need to improve freight mobility in the region and the projected growth in both national and international trade, TxDOT has proposed a “strategic routing system” to address goods movement in north central Texas. The strategic routing system is a comprehensive approach to goods movement planning and is planned to consist of the following elements:

- The deployment of ITS including traveler information dissemination and advanced traffic management;
- Highway capacity enhancements along major freight corridors, such as IH-35, IH-45, and connector routes;
- Freeway and arterial bottleneck removals;
- Interchange improvements; and
- Freight facility access improvements.

The combined goal of these elements is the reduction and/or elimination of freight mobility impediments, as well as improved safety. One element of the strategic routing system is the ITS deployment along the IH-35 NAFTA corridor. The use of existing and planned traveler information technologies and systems will help the mobility of trucks and traffic that use this corridor. The application of real-time traffic information

to drivers either en-route (e.g., via changeable message signs or in-vehicle devices) or pre-trip (e.g., via electronic kiosks), will allow decision-making to plan a trip more efficiently. For instance, route selections can be made based on known congestion and incident information. This could allow an information service provider to provide assistance to drivers by suggesting alternative travel routes. The IH-35 corridor is a prime target for improvements recommended by the strategic routing system concept. Other heavily used freight travel corridors are also targeted for improvements.

1.9.5 Other Recent and Planned Improvements

Several transportation improvement projects, separate from this study, have been implemented, planned, or are currently being evaluated in the study area. **Table 1-7** provides a summary of key projects.

TABLE 1-7. KEY TRANSPORTATION PROJECTS IN THE STUDY AREA

Project	Proposal	Status
TxDOT – Dallas District		
IH-30 at Trinity River	Bridge Reconstruction	Detailed Design
IH-30 (Canyon)	Reconstruction with HOV	Preliminary Design
IH-30 (Canyon)	Ramp Reversals/Auxiliary Lane Installation	Complete
IH-35E at Trinity River	Bridge Replacement	Preliminary Design
IH-35E (Mixmaster)	Reconstruction with HOV	Preliminary Design
IH-35E (Lower Stemmons)	Reconstruction with HOV	Preliminary Design
IH-35E – Southbound Frontage Road	Extension from Edison Street to Hi Line Drive	Complete
IH-35E – IH-30 to US-67 (South RLT)	Reversible (Interim) HOV Lane Installation	Complete
Corinth Street Viaduct	Bridge Couplet	Planning Phase
Houston Street Viaduct	Bridge Rehabilitation	Detailed Design Complete & Let
Continental Avenue Viaduct	Bridge Rehabilitation w/ Potential Conversion to Pedestrian Only Use	Planning Phase
Hampton/Inwood Bridge	Bridge Replacement	Detailed Design
Woodall Rodgers Extension	New Bridge Crossing	Preliminary Design
City of Dallas and Dallas County		
Sylvan/Wycliff Bridge	Bridge Replacement	Preliminary Design
Beckley Avenue	Widen to Six Lanes	Preliminary Design
Commerce Street Viaduct	Bridge Maintenance	Complete

Source: NCTCOG, 2001a.
Note: The status indicated is as of December 2003.

1.10 CONSISTENCY WITH REGIONAL PLANNING

The development of proposed alternatives for Trinity Parkway is a result of a long-standing effort. Since the mid-1960s, a roadway along this corridor has been included in the long-range MTPs, and many local thoroughfare systems were drawn from these plans. The Trinity Parkway would serve as a regional facility by creating a reliever route needed to allow motorists to bypass the Canyon, Mixmaster, and Lower Stemmons corridors near the Dallas CBD. The need for the project has been justified by regional traffic

and design studies. This project fits well into the regional transportation system and would reduce traffic congestion, increase mobility and safety, and allow more efficient movement of people and goods through the study area and beyond.

1.10.1 Consistency with Metropolitan Transportation Plan

As stated in **Section 1.4**, the MTP is federally mandated and guides federal, state, and local transportation expenditures. There have been seven metropolitan transportation plans in the DFW region, starting in 1974. The current MTP is titled *Mobility 2025 – The Metropolitan Transportation Plan – 2004 Update* (published January 2004).

The current MTP represents a system of transportation improvements needed to maintain mobility in the DFW metropolitan area through the year 2025, and serves as a guide for the implementation of multi-modal transportation improvements, policies, and programs. The recommendations of the MTP reflect ongoing efforts to implement mobility projects, programs, and policies, including the latest information available from ongoing major investment studies in the region. The plan includes sustainable development initiatives, recognizing the relationship between community development and transportation. The MTP also recognizes the need to provide a balanced transportation system, responsive to all residents, including historically under-served populations. This is analyzed based on Executive Order (EO) 12898 (1994) and Title VI (Title VI of the Civil Rights Act of 1964), measuring mobility and accessibility for the identified protected class populations and non-protected class populations.

As stated in **Section 1.4**, the current MTP includes the Trinity Parkway as a major element of the freeway/tollroad plan. This project and the associated Canyon/Mixmaster/Lower Stemmons (i.e., Project Pegasus) reconstruction are seen as a prerequisite for the efficient implementation of the radial freeways and HOV systems, which surround downtown Dallas.

1.10.2 Consistency with the DFW Travel Demand Forecast

Travel demand forecasting is the process used to predict travel behavior and resulting demand for a specific future horizon year, based on assumptions dealing with land use, the number and character of trip makers, and the nature of the transportation system. The travel demand forecasting for Trinity Parkway has been carried out by NCTCOG using the DFWRTM for the design year 2025. All proposed CMS strategies, rail and bus transit recommendations, and HOV and managed facility recommendations are included in the baseline conditions. The DFWRTM is the same model as used by NCTCOG for *Mobility 2025 – 2004 Update*, and is therefore consistent with the DFW Travel Demand Forecast.

Table 1-8 summarizes the regional performance for Dallas County on the validated 1995 and 1999 systems, and the *Mobility 2025 – 2004 Update*.

TABLE 1-8. ALTERNATIVE PERFORMANCE SUMMARY FOR DALLAS COUNTY

PERFORMANCE MEASURE	1995 EXISTING	1999 VALIDATION	MOBILITY 2025 - 2004 UPDATE
Population	1,925,370	2,021,124	2,756,475
Employment	1,391,760	1,594,792	2,477,602
Average Trips Per Person per day	3.0	3.1	3.0
Vehicle Miles of Travel (Millions per day)	53.5	61.8	96.1
Percent Time Spent in Delay	32.5	36.6	35.9
Percent Lane Miles Congested	38.9	46.3	55.3
Annual Cost of Congestion ($Millions)	$2,260	$3,006	$4,409
Source: NCTCOG**,** *Mobility 2025 - 2004 Update.*			

The freeway/toll road system evaluation component of the MTP recommends the construction of the Trinity Parkway between the proposed termini locations of IH-35/SH-183 and US-175/SH-310 as a staged toll road facility. In the regional travel model, the toll road is assumed to be stage constructed (six-lanes in the northern segment and four-lanes in the southern segment) in 2015, and fully constructed by 2025.

1.10.3 Consistency with CMS Commitments/Congestion Reduction Strategies

The CMS is a systematic process for managing congestion that provides information on transportation system performance and on alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet state and local needs. The CMS is developed, established, and implemented as part of the metropolitan transportation planning process for all Transportation Management Areas (TMA's) in Texas. The proposed action was developed from the NCTCOG operational CMS, which meets all requirements of 23 CFR § 500.109.

Although major capital investments are still needed to meet the growing travel demand, the CMS also develops lower-cost strategies that complement the capital investment recommendations. The result is more efficient and effective transportation systems, increased mobility, and leveraging of resources. The CMS involves the following programs and activities:

- TDM;
- TSM;
- Advanced Transportation Management;
- Analysis of expected benefits and costs for TDM and TSM strategies; and
- Other projects.

Operational improvements and travel demand reduction strategies are commitments made by the region at two levels the program level and project level implementation. Program-level commitments are inventoried in the regional CMS, which was adopted by the NCTCOG. They are included in the financially constrained MTP and future resources are reserved for their implementation.

The CMS element of the plan carries an inventory of all project commitments (including those resulting from MIS') detailing the type of strategy, implementing responsibilities, schedules, and expected costs. At the project programming stage, travel demand reduction strategies and commitments would be added to the regional TIP or included in the construction plans. The regional TIP provides for programming of these projects at the appropriate time with respect to the SOV facility implementation and project-specific elements.

Committed congestion reduction strategies and operational improvements within the project study area will consist of signalization/intersection improvements, pedestrian/bicycle facilities, rail transit, ITS, HOV, lane additions, and a park-and-ride rail station. **Table 1-9** lists individual operational improvement projects within the study area taken from the current MTP.

TABLE 1-9. OPERATIONAL IMPROVEMENT PROJECTS WITHIN THE STUDY AREA

Project Location	TIP Project Code	Project Type	Implementing Agency	Year of Implementation	Total Project Cost
Various Locations	788.0000	Intersection Improvement	City of Dallas	2003	$4,955,000
Commonwealth at IH-35E	788.0004	---	---	---	---
Inwood Road at Irving Boulevard	914.0000	Intersection Improvement	City of Dallas	2002	$144,000
SH-356 (Irving Boulevard) at Mockingbird Lane	2216.0000	Intersection Improvement	Dallas County	2002	$800,000
Dallas County - IH-30, IH-35E, IH-635, US-67	2493.1000	ITS	TxDOT-Dallas	2000	$2,700,000
Dallas County - IH-30, IH-35E, IH-635, US-67, Woodall Rodgers Freeway	2493.2000	ITS	TxDOT-Dallas	1997	$1,600,000
Hampton Road/Inwood Road from Canada Drive to Harry Hines Boulevard	3069.0000	Addition of Lanes	TxDOT-Dallas	2002	$22,365,000
TRE/ Railtran from Dallas County Line to Dallas CBD	4189.0000	Rail Transit	DART	1994	$30,495,000
Katy Trail	11018.0000	Bike/ Pedestrian	City of Dallas	2004	$3,100,125
Colorado at Jefferson	11025.0000	Intersection Improvement	City of Dallas	2002	$216,320
Beckley	11040.0000	Intersection Improvement	City of Dallas	2002	$297,440
Beckley at Colorado	11040.0000	---	---	---	---
Beckley at W. Commerce	11040.0000	---	---	---	---
Convention Center Light Rail Pocket Track	11044.0000	Rail Transit	DART	2002	$2,311,873
TRE Double-Tracking from Medical/Market Station to Union Station	11047.0000	Rail Transit	DART	2001	$2,087,488
TRE Platform at AA Arena	11093.0000	Park & Ride/Rail Station	DART	2002	$7,019,152
Misc. Double-Tracked Segments For TRE from Union Station to Centreport Station	11095.0000	Rail Transit	DART	2002	$34,979,786
IH-30 from IH-35E to IH-635	11126	ITS	TxDOT-Dallas	2002	$3,613,947
IH-35E from Loop 12 to SH-183	11128	ITS	TxDOT-Dallas	2002	$1,890,000
Dallas Co. Speed & Incident Reporting	11137	ITS	TxDOT-Dallas	2001	$4,240,000
Spur-366 from IH-35E to Beckley/Singleton	11232	New Roadway	TxDOT-Dallas	2003	$58,000,000
Cedars Station/South Side Pedestrian (DART)	11315	Bike/ Pedestrian	DART	2003	$5,665,213
Light Rail Extension from West End Station to Frankford Road	12043	Rail Transit	DART	2001	$18,750,000
SH-342 from 8th Street to Industrial Boulevard	0048-01-035	Addition of Lanes	TxDOT-Dallas	2004	$15,960,001
Spur-366 from IH-35E to Beckley/Singleton Intersection	0196-07-018	New Roadway	TxDOT-Dallas	2003	$58,000,001
West Fork And Elm Fork at Corinth Street	0918-45-196	Bike/ Pedestrian	TxDOT-Dallas	2003	$1,750,000
IH-30 from East of Sylvan Avenue to IH-35E	1068-04-023	Addition of Lanes	TxDOT-Dallas	2003	$24,300,000
Singleton Boulevard from Hampton Road to Canada Drive	DAC 212	Addition of Lanes	Dallas County	2005	$9,960,000

Source: NCTCOG, 2004.

Notes: The projects listed above include transportation improvements within the study area. These do not include regional projects or programs, such as alternative fuels, TDM, etc.

A total of 37 traffic signal improvement projects (TIP Project Code 775.0000) were identified within the study area. The total project cost indicated is allocated for citywide traffic signal improvements. This table includes pertinent information from the *Trinity Parkway Corridor MTIS and Mobility 2025 - 2004 Update.*

In an effort to reduce congestion and the need for SOV lanes in the region, the NTTA, TxDOT, and the NCTCOG will continue to promote appropriate congestion reduction strategies through the congestion management and air quality (CMAQ) program, the CMS, and the MTP. According to the NCTCOG, the congestion reduction strategies considered for this project would help alleviate congestion in the SOV study boundary, but would not eliminate it.

1.11 OTHER AGENCY ACTIONS

Several local, state, and federal government agencies are in the process of planning, implementing, or constructing various small- and large-scale projects within the Trinity Parkway study area. Representative agencies include the City of Dallas, Dallas County, TxDOT – Dallas District, NCTCOG, and the USACE – Fort Worth District. These projects include flood control, transportation, recreation, utilities, land use planning, and environmental restoration (see **Section 3.1.1.3**). Details concerning the transportation projects in the study area are presented in **Section 3.2.7**. Assessments of the anticipated effects of the Trinity Parkway in regard to these other agency actions are provided in **Chapter 4 Environmental Consequences**.

Section 1.11.1 provides a description of the City of Dallas' "Trinity River Corridor Project" and its relationship to the Trinity Parkway. This includes background information on the 1998 City of Dallas Bond election; a brief description of individual projects included within the bond program; potential joint development projects (see **Sections 1.11.2** through **1.11.4**); and references to other relevant sections of the DEIS where additional details can be found.

1.11.1 City of Dallas Trinity River Corridor Project

The City of Dallas has widely publicized its "Trinity River Corridor Project," which is actually a generic name for a series of proposed projects which occur along the main stem and Elm Forks of the Trinity River in Dallas. This project is being managed by a separate Trinity Project office within the city. The project elements are described in detail on the City of Dallas website: www.trinityrivercorridor.org.

The Trinity River Corridor Project is funded from the May 2, 1998 City of Dallas Bond election, in which voters approved $246 million for multiple projects along the main stem and Elm Forks of the Trinity River in Dallas. The Trinity Parkway study area overlays a portion of the cities' Trinity River Project corridor, and the city Trinity River bonds include an $84 million direct contribution towards the cost of the Trinity Parkway. However, the projects within the 1998 bond program each have <u>independent purpose and utility</u>, and generally could proceed whether or not other projects in the program are successfully implemented. In order to provide a better understanding regarding these projects, the following is a

master list of Dallas Trinity River bond items, along with comments on any interrelationships each item may have with the Trinity Parkway:

- Elm Fork Improvements. This item includes floodplain management actions, recreational amenities, environmental restoration and mitigation in the area of the Elm Fork of the Trinity River, generally north of Regal Row in Dallas and well beyond the Trinity Parkway study area. The bond allocation for this item included funding for both a study and a portion of the implementation of improvements. This project is independent of the Trinity Parkway (see **Section 4.24.2**).

- Great Trinity Forest Improvements. This item provides $41.8 million for public acquisition of land within the "Great Trinity Forest," an approximate 6,000 acre forested area located along the main channel of the Trinity River, beginning downstream of the DART Rail Crossing (see **Figure 1-2, Place of Interest #15**) and continuing about 7.0 miles to IH-20. In addition to land acquisition, the project includes an interpretive learning center, hike and bike trails, equestrian facilities, canoe launches and gateway parks. This project is independent of the Trinity Parkway (see **Section 3.3.2.3**).

- Woodall Rodgers Extension. This item provides $28 million in matching funds, intended to support a partnership with TxDOT to upgrade the proposed Woodall Rodgers extension from a conventional bridge to a long-span "signature" bridge. The Woodall Rodgers extension provides an alternative route for traffic from Oak Cliff and West Dallas, connecting to downtown Dallas area and avoiding the Canyon and Mixmaster. The Woodall Rodgers extension has independent utility, and would serve traffic even if Trinity Parkway were not in place. However, the Trinity Parkway build alternatives all assume that the extension is in place, and use this roadway as a point of access to downtown Dallas (see **Section 1.9.5, Chapter 2,** and **Section 3.2.7**).

- Beckley Avenue Improvements. This item provides $6 million for the widening of existing Beckley Avenue to six lanes from IH-30 to Singleton Boulevard. This project is independent of the Trinity Parkway (see **Sections 1.9.5, Chapter 2,** and **Section 3.2.7**).

- Dallas Floodway Extension. This item provides $24.7 million in matching funds intended to be spent in partnership with USACE for an extension of flood protection improvements downstream of the existing end of the Dallas Floodway levee system. The project includes levees protecting the Lamar Street and Cadillac Heights subdivision areas, a chain of wetlands, trail systems, and environmental restoration features. The project has independent purpose and utility, focused primarily on flood control and environmental restoration. It is intended to be separately funded by

the City and USACE, and does not require Trinity Parkway to be in place to be effective. The DFE project is further described in **Sections 1.11.2, 3.1.1.3,** and **3.1.1.4** of this DEIS.

- Dallas Floodway Improvements. This item covers development of lakes and recreational facilities along the Dallas Floodway, generally from Westmoreland Road to the DART Rail Crossing. The City of Dallas intends to develop these improvements in partnership with USACE, which has an interest in providing flood damage reduction and environmental restoration along the Dallas Floodway as part of its Upper Trinity River Feasibility Study. The Dallas Floodway improvements anticipated by USACE and the City have independent purpose and utility, and could proceed with or without the Trinity Parkway. However, these projects could have interrelationship and synergy with several of the Trinity Parkway alternatives and therefore, are being considered as potential joint development projects along with the Trinity Parkway (see **Sections 1.11.3, 1.11.4, 3.1.1.3,** and **3.1.1.4**). For instance, some of the Trinity Parkway build alternatives considered in this DEIS occupy portions of the floodway, and the roadway embankments could contribute both to strengthening of the floodway levees and to excavation of the city-proposed lakes. The City and USACE Dallas Floodway improvements are, therefore, given substantial emphasis in this DEIS, and are subject to special tiered environmental processing as further described in **Section 1.12.3** of this chapter.

- Trinity Parkway (Proposed Action). This item provides $84 million in matching funds directly in support of the development of the Trinity Parkway. The kinds of expenditures anticipated include engineering costs, right of way acquisition, and construction. Although the city has spent some of these funds to date on the preliminary engineering and environmental studies for the Trinity Parkway, the majority of the bonds funds would not be spent if the No-Build Alternative were adopted as a result of this DEIS.

1.11.2 USACE Dallas Floodway Extension Project

The DFE is a flood control project proposed by the USACE, with the City of Dallas as the local sponsor. Major components of the project include construction of a chain of wetlands, generally on the western edge of the Trinity River floodplain from the area of the DART light-rail bridge downstream to Loop 12, a distance of approximately 4.6 miles. The project also includes construction of levee systems on the eastern edge of the floodplain, from the area of the DART Bridge downstream to Rochester Park, and on the western edge around Cadillac Heights. Other elements of the project include trail systems and environmental restoration and mitigation features (see **Section 3.1.1.3**). The DFE project has been separately processed through an EIS, and a ROD for the project was signed on December 1, 1999.

The Trinity Parkway DEIS considers the DFE as a preexisting project. From the perspective of hydraulic and hydrologic analyses, the DFE project is considered to be in place. The same approach is taken with respect to specific environmental effects (e.g., wetland loss, grassland impacts, and archaeological impacts). In other words, if the DFE has already accounted for these issues in certain areas they are not double-counted in this DEIS. The Trinity Parkway schematic plans also respect the alignment and grades of the USACE proposed levee on the eastern side of the Trinity River in the area downstream of the DART light-rail bridge. Due to uncertainties in the timing of construction of the USACE project, the cost estimates for earthwork, land acquisition, and related items shown in this DEIS do not rely on the USACE project being in place prior to the proposed Trinity Parkway. This is done to keep the estimates conservative. However, if the USACE project actually precedes the construction of the Trinity Parkway, and depending on the preferred alternative identified (see **Chapter 2 Alternatives Considered**), there may be some cost savings to the Trinity Parkway project due to prior construction work and acquisitions done for the DFE project. Additional details concerning the DFE project is provided throughout this DEIS.

1.11.3 USACE Upper Trinity River Project – Possible Dallas Floodway Improvements

The USACE - Fort Worth District is currently studying the Upper Trinity River Basin and published a *Final Programmatic Environmental Impact Statement, Upper Trinity River Basin, Trinity River, Texas* in June 2000, which received a ROD on September 15, 2000. This Final Programmatic EIS (FPEIS) served as an update to the public on the past 10 years of progress with the ongoing Upper Trinity River Feasibility Study and other associated projects. The document also summarizes the USACE progress with its ongoing EIS for the Dallas Floodway, which is being conducted for the City of Dallas as part of the Upper Trinity River Feasibility Study. The USACE is considering possible flood control improvements that are focused on the Dallas Floodway segment from the DART light-rail bridge (southeast of downtown), upstream to the general area of the confluence of the West Fork and Elm Fork of the Trinity River. These flood control improvements may include development of conveyance lakes, raising of the Dallas Floodway Levees, and modification of the abandoned AT&SF Railroad Bridge. Other USACE initiatives for this Dallas Floodway segment may include environmental restoration features, such as channel meanders and revegetation, while also providing recreation facilities (see **Section 3.1.1.3**). The City of Dallas intends to act as the cost sharing local sponsor for this USACE project.

In regard to the possible Dallas Floodway improvements by the USACE, the Trinity Parkway DEIS makes the following assumptions for Dallas Floodway transportation alignment alternatives (see **Chapter 2**):

- For the purposes of hydraulic modeling, the Dallas Floodway levees are assumed to be as is. Any levee raise by USACE would be subsequently addressed with their ongoing EIS. The FPEIS indicates that a 2-foot levee raise above the Standard Project Flood (SPF) elevation may be

pursued. The location of the lakes identified in the City of Dallas' master plan (see **Sections 1.11.4** and **3.1.1.3**) would be subject to full excavation, but not impoundment. A USACE/City of Dallas initiative may convert these excavated areas into two lakes subsequent to the start of the Trinity Parkway project.

- For the purposes of other environmental impacts (e.g., vegetation, wetlands, cultural resources, etc.), the levee modifications necessary for transportation alternatives within the Dallas Floodway are addressed within this DEIS. Any further environmental impacts of a levee raise would be subsequently addressed with the USACE's ongoing EIS.

- The abandoned AT&SF Railroad Bridge is considered to be left in place.

- The other environmental restoration features being considered by the USACE for the Dallas Floodway are assumed not to be in place.

1.11.4 Trinity River Corridor Master Implementation Plan and Balanced Vision Plan

The City of Dallas has developed a conceptual master plan for extensive development of recreational facilities, environmental restoration, and lakes for the Dallas Floodway. This information is published in the *Trinity River Corridor, Master Implementation Plan, Lake Design and Recreational Amenities Report* (City of Dallas, 1999b) and amended by a supplementary city report *A Balanced Vision Plan for the Trinity River Corridor* (BVP) (City of Dallas, 2003). The plan represents a 10-year vision for the Dallas Floodway to be achieved with city and federal/state partnerships. The master plan incorporates three large lakes proposed to be located within the Dallas Floodway. Two approximately 75-acre lakes would be located between the Continental Street and Corinth Street Bridge crossings of the Trinity River, requiring the river channel to be realigned to the west around the berm-protected lakes. The third berm-protected lake of approximately 80 acres would be located on the west over-bank of the floodway in the area of Westmoreland Road. All of the proposed lakes would be located off-channel, and subject to infrequent inundation so that a higher quality of lake water can be maintained. The lakes would also have a mixture of edge treatments, ranging from promenades to natural banks. The water sources for maintaining lake levels may be the Central Wastewater Treatment Plant (CWWTP) return discharges and groundwater. All lakes may be implemented with city, USACE, and NTTA joint participation (see **Sections 3.1.1.3** and **3.1.1.4**).

The master plan for the Dallas Floodway is closely related to the Trinity Parkway plan because lake excavation presents an available source of earth fill material for roadway embankments (see **Chapter 2 Alternatives Considered**). Furthermore, for Alternatives 3A, 3B, 4, and 5 the lakes serve to mitigate the

effects of the parkway embankments on floodway conveyance and to some extent offset the effect of embankments on valley storage. Finally, it is expected that the earth borrow needed for a tollway within the floodway would require that all three city lakes be fully excavated in a first phase of tollway construction. Thus, if a river alternative (Alternative 3A, 3B, 4, or 5) is identified as the preferred alternative, the tollway construction within the Dallas Floodway would create efficiencies for both the tollway construction and the ultimate development of Dallas Floodway lakes. Having such an available and close source of embankment material would benefit the tollway project, while the lakes could be fully excavated as part of the tollway project. These initiatives would need to be closely coordinated as the projects proceed.

In regard to the proposed Dallas Floodway improvements by the City of Dallas, the Trinity Parkway DEIS makes the following assumptions for Dallas Floodway transportation alignment alternatives:

- For the purposes of hydraulic modeling, the location of the lakes identified in the city's master plan would be subject to full excavation, but not impoundment. A USACE/City of Dallas initiative may convert these excavated areas into lakes subsequent to the start of the tollway project. Any further city work concerning edge treatment for the lakes would not be part of the transportation project.

- Recreation and environmental restoration initiatives by the city would not be considered part of the transportation project.

Additional details concerning the above-mentioned projects, as well as other agency actions planned within the Trinity Parkway study area, are described throughout this DEIS, including **Chapter 2 Alternatives Considered**, **Chapter 3 Affected Environment**, **Chapter 4 Environmental Consequences,** and **Chapter 6 Financial Analysis and Evaluation**.

1.12 PLANNING CONTEXT

This section provides a description of the decision framework and includes an outline of the process to be followed to approve, construct, and operate the proposed action. Included is a discussion concerning the role of the DEIS in project development.

1.12.1 Decision Framework

The first step in the decision process concerning the proposed action was adoption and implementation of the TxDOT TPC MTIS into the MTP (*Mobility 2025* and subsequent plans). This MTIS process concluded

with the selection of a recommended plan of action (see **Section 1.5.2**), which was required before beginning the NEPA documentation process. FHWA is processing the proposed reliever route action independently from, but in coordination with, the remaining elements of the TPC MTIS recommended plan of action. These remaining elements will be addressed in separate MIS and/or NEPA documents prepared by others.

NTTA is required to fulfill the requirements of the NEPA by satisfying regulations and guidelines promulgated by the federal CEQ and FHWA. These regulations and guidelines require a process ensuring that reasonable and feasible alternatives are evaluated and their related environmental impacts thoroughly assessed.

In June 1999, the NTTA initiated the next phase of the project development process for the proposed action… preparation of this DEIS. The DEIS phase is intended to provide a basis for identifying the most appropriate transportation improvement for the study area. The documentation presented in this DEIS was prepared in accordance with CEQ (40 CFR § 1500-1508) and FHWA regulations (23 CFR § 771).

1.12.2 Role of the DEIS in Project Development

The information presented in this DEIS is based on preliminary environmental/engineering studies and reflects comments received during public/agency review and coordination activities and information from the TxDOT TPC MTIS (see **Section 1.5.2**). The purpose of this DEIS is to assist decision makers in the assessment of impacts associated with the reasonable build alternatives, including the No-Build Alternative. This DEIS will serve as the primary document to facilitate review of the proposed action by federal, state, and local agencies, as well as the general public. The DEIS documents the purpose and need for the project and includes a discussion of the alternatives considered. It details the anticipated social, economic, and environmental impacts associated with the proposed action and provides a discussion of potential mitigation measures.

1.12.3 The Next Stage of the Process

FHWA proposes to publish this DEIS for the Trinity Parkway as a decision-making document regarding transportation improvements in the Trinity Parkway study area. FHWA recognizes that there may be integration and coordination issues with foreseeable flood control and lake improvements proposed by the USACE and City of Dallas within the Dallas Floodway, as previously described in **Sections 1.11.2** through **1.11.4** of this chapter. However, since the Trinity Parkway DEIS includes alternative routes located within and outside the Dallas Floodway, it is not possible to fully determine the degree of integration with other proposed floodway improvements at this time.

This DEIS document will be circulated for a minimum 45-day public review and comment period. During this time, the document will be made available to all interested and concerned parties, including private citizens, community groups, the business community, elected officials, and public agencies. A Public Hearing will also be held to receive comments. Following circulation and public/agency review of this document, all public comments received will be evaluated and responses will be prepared. Subsequently, the FHWA, TxDOT, and the NTTA Board of Directors will make a decision on the identification of a preferred alternative. At the conclusion of this effort, one of the following development strategies can be expected to occur:

1. If a build alternative is identified <u>within the Dallas Floodway</u>, subsequent NEPA documentation, which would further address the lakes, flood control, environmental restoration, and recreational improvements proposed in the Dallas Floodway, would be developed.
2. If a build alternative is identified <u>outside of the Dallas Floodway</u>, FHWA/TxDOT/NTTA will proceed to finalization of the Trinity Parkway FEIS (i.e., an FEIS would be prepared) independent of the proposals by USACE and the City of Dallas in the Dallas Floodway.
3. If <u>No-Build</u> is identified as the preferred alternative, FHWA/TxDOT/NTTA will stop work on the Trinity Parkway DEIS and pertinent study materials would be forwarded to the City of Dallas. The proposals by the USACE and City of Dallas in the Dallas Floodway would not be directly affected by this alternative, and would be processed independently (refer to **Chapter 2 Alternatives Considered** for a complete description of the alternatives evaluated for the proposed action).

These specific development strategies (Options 1, 2, and 3) are further described in a letter to the FHWA prepared and signed by representatives of the NTTA, USACE, and City of Dallas, dated January 29, 2003 (see **Appendix A, Page A-47**). This letter affirms each respective agency's concordance in the proposed strategies for preparation of this DEIS. These strategies were adopted due to the potential complexity and interrelated nature of the "reasonable and foreseeable actions" being considered by these agencies. Once the DEIS comment period has been completed, the above strategies will be reevaluated. These potential joint development projects are fully described in **Section 3.1.1.4**. The anticipated effects (beneficial and adverse) associated with construction of the Trinity Parkway together with these other agency actions are described in **Chapter 4 Environmental Consequences**.

Either Option 1 or Option 2 (i.e., a Trinity Parkway build alternative is identified as the locally-preferred alternative) would lead to the publication of a FEIS. Under Option 1, FHWA recognizes that if subsequent NEPA documentation raises substantial unforeseen issues, which affect the transportation analysis, there may need to be revisions or a reevaluation of the transportation sections of the EIS and it is conceivable, in such event, that the interim locally-preferred alternative may need to change. Such a change would include public/agency involvement and be fully disclosed in the FEIS. Completion of the environmental

review and impact documentation process, followed by a signed ROD by the FHWA, would permit the proposed action to proceed to the final design and construction phases.

The ROD issued by the FHWA would be made in accordance with 23 United States Code (USC) § 109(h), which directs that final project decisions be made in the best overall public interest, taking into account:

- The need for fast, safe, and efficient transportation;
- Public services;
- A broad array of social, economic, and environmental effects; and
- The costs of eliminating or minimizing adverse effects.

[END OF CHAPTER 1]

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Chapter 2

Alternatives Considered

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CHAPTER 2
ALTERNATIVES CONSIDERED

2.0 INTRODUCTION

This chapter presents and describes the alternatives considered for meeting the purpose and need for the Trinity Parkway, including those eliminated from further analysis. In accordance with guidelines provided in FHWA's Technical Advisory T 6640.8A, both build and no-build alternatives have been considered. In addition to an assessment of traditional approaches to increasing capacity, this chapter provides a discussion of congestion management strategies and public transportation alternatives considered as part of the planning process for the proposed Trinity Parkway. A recommended alternative is not identified in this document. The identification of a preferred alternative would not be made until after consideration of impacts and public hearing comments (see **Section 1.12.3 The Next Stage of the Process**).

Potential alternatives were evaluated according to the project's purpose and need as described in **Chapter 1 Purpose and Need for Action**. Six build alternatives are considered in this DEIS. These are identified as Alternatives 2A, 2B, 3A, 3B, 4, and 5. The No-Build Alternative is identified as Alternative 1. This DEIS provides an objective evaluation of the six build alternatives and the No-Build Alternative. Each alternative is described in detail in **Section 2.3** of this chapter.

2.1 SUMMARY OF ALTERNATIVES ANALYSIS FROM THE TRINITY PARKWAY CORRIDOR MAJOR TRANSPORTATION INVESTMENT STUDY

As previously discussed in **Chapter 1 Purpose and Need for Action**, the Trinity Parkway DEIS builds on the work completed by TxDOT for the TPC MTIS. The published TPC MTIS report, *Study Report, Trinity Parkway Corridor*, March 1998, provides the foundation for the alternatives analysis used in the current study and provides the reasons that the current DEIS is more narrowly focused on a roadway project, rather than a more expansive list of transportation alternatives, such as transit, bicycle-pedestrian facilities, and/or congestion management initiatives. The TPC MTIS developed these proposals and established a plan of action that encompasses an appropriate range of transportation modes and funding sources. This DEIS is intended to advance only one component from the TPC MTIS, the Trinity Parkway reliever route (proposed action). Readers who desire to learn more about the TPC MTIS are encouraged to contact Advance Project Development at the TxDOT – Dallas District Office at (214) 320-6100 to obtain a copy of the published report [TxDOT Dallas District, Control-Section-Job (CSJ) No. 0918-45-121,122].

2.1.1 MTIS Alternatives Analysis

As stated in **Chapter 1 Purpose and Need for Action**, the TPC MTIS evaluated alternative plans for solving the Trinity River corridor transportation problems, focusing on congestion relief in the Canyon/Mixmaster/Lower Stemmons corridors. The study process occurred between the first quarter of 1996 and the third quarter of 1997, and the study report was published in the first quarter of 1998. The study analyzed a very large number of alternatives, all of which had to be acted on at some level of detail to move the process forward. The work started with identification of the transportation problem and ended with the identification of a locally preferred plan of action, one component of which was the Trinity Parkway reliever route.

The alternatives analyses process involved a gradual reduction in the number of alternatives, with promising alternatives moved forward and less desirable alternatives set aside. Alternatives were developed and evaluated based on their ability to meet the project purpose and need of the study. This analysis process reduced the number of alternatives over time and allowed a higher level of detailed analysis on the remaining candidates. Comparisons of alternatives for the Trinity Parkway corridor were developed under the following categories:

- Environmental Effects
- Social and Economic Effects
- Mobility Benefits
- Cost Effectiveness and Affordability
- Compatibility with Other Corridor Projects
- Effects During Construction

Within each category, criteria were developed for comparing the performance of individual alternatives. For instance, the environmental category included criteria for effects on wetlands, air quality, noise, archaeological and historic sites, etc. The subdivision into categories was for convenience and was not intended to imply any kind of ranking or relative importance.

Various types of measurements were developed for the Trinity Parkway corridor study. The measurements were both quantitative and qualitative depending on the type of information involved. Quantitative measurements were used where possible. No attempt was made to merge the results of various criteria into one score based on weighting factors or other means. The aim was to compare the alternatives within each criterion so that an alternative could be seen performing, on average, better or worse than the group. The set of criteria used to evaluate alternatives, and the measurements applied to each, were subject to review by the stakeholders, and feedback from the public was received at each stage of the study.

A high level of engineering detail was impractical early in the study because of the large number of alternatives that stakeholders requested to be processed. The set of criteria and analysis techniques used in the early stages was simplified to allow the efficient processing of a large number of alternatives.

During the course of the alternatives analysis process, minimum performance goals were established by consensus of the stakeholders for some or all of the criteria used. For instance, it was decided to reject alternatives that fail to serve a certain minimum number of person trips per day. Similarly, alternatives that cause substantial net loss of wetlands or woodlands were rejected. Some of these minimum goals were already set by federal and/or state regulations. For instance, the federal CAA places several specific restrictions on transportation projects in the DFW region because the area is not in current compliance with the air pollution standard for ozone.

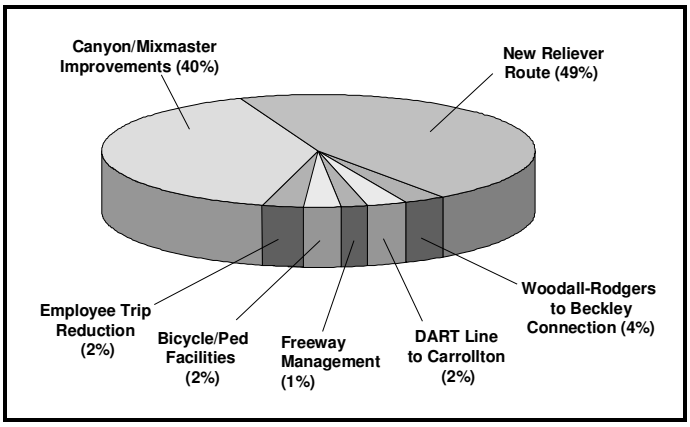
2.1.2 MTIS Adopted Plan of Action

Based on the alternatives analysis process and public and agency coordination undertaken for the TPC MTIS, the following plan of action was recommended, subject to appropriate environmental and engineering processing and clearances:

1. Enhanced work trip reduction measures;
2. Bicycle and pedestrian facilities;
3. Enhanced transportation facility management;
4. Improvements to the Canyon, Mixmaster, and Lower Stemmons Freeway;
5. Extension of Woodall Rodgers Freeway and improvements to Beckley Avenue;
6. A continuous HOV system through the Canyon, Mixmaster, and Lower Stemmons Corridors; and
7. A Trinity Parkway reliever route (proposed action).

Figure 2-1, obtained from the TxDOT TPC MTIS, shows the plan of action represented as a pie chart, with sizes of individual slices shown in proportion to the approximate amount of transportation improvement provided. The chart is based on an overall goal from the TPC MTIS of providing an additional 250,000 daily person trips of capacity added or demand reduced in the Canyon, Mixmaster, and Lower Stemmons corridors. The pie chart is somewhat simplified because the various action items have slightly different proportionate shares in different segments of the corridor. Nevertheless, the chart emphasizes the importance of Items 4 (Canyon/Mixmaster/Lower Stemmons) and 7 (proposed action) to the overall transportation solution.

FIGURE 2-1. TRINITY PARKWAY CORRIDOR MTIS PLAN OF ACTION



2.1.3 Supporting Transportation Improvements (No-Build Alternative)

The No-Build Alternative for the DEIS is defined as the currently planned transportation improvements defined in the NCTCOG's MTP *Mobility 2025 - 2004 Update* excluding the proposed action. Existing roadways would continue to be operated and maintained. The improvements identified are those that could be funded by projected transportation revenues, which are estimated to be $45 billion (2004 dollars) for the region through the year 2025. Of this $45 billion, 31.3 percent or $14.1 billion is for operation and maintenance (NCTCOG, *Mobility 2025 - 2004 Update*).

Transportation improvements within the Trinity Parkway study area are ongoing in a continuing effort by local, state, and federal agencies to address the travel needs of this growing region. A variety of improvements are currently underway and others are planned for future years, including improvements to existing roadways and several traffic congestion management programs, policies, and projects. In addition to the Trinity Parkway, the majority of these major improvements are elements of the TPC MTIS recommended plan of action.

This section briefly summarizes ongoing transportation improvements in the study area and includes a discussion concerning their potential to assist in accomplishing the Trinity Parkway's purpose and need. **Section 3.2 Transportation Setting (Chapter 3)** provides an additional detailed description of the existing transportation network within the Trinity Parkway study area.

<u>Improvements to Existing Roadways</u>

Chapter 1 Purpose and Need for Action of this DEIS references efforts already underway by TxDOT to improve traffic flow and safety on IH-35E and other major roadways in the study area. These improvements address deficiencies in on- and off-ramps, lane and shoulder widths, design standards, roadway configuration, geometry, and provide for additional travel lanes where possible. Additional

capacity for IH-35E, IH-30, and other major roadways within the project area is to be provided through the construction of additional mainlanes, HOV lanes, and frontage roads, which are further discussed in the following subsections.

Canyon/Mixmaster Improvements

The TPC MTIS included an extensive analysis of improvements needed for the Canyon, Mixmaster, and Lower Stemmons highway segments to develop the maximum practical vehicular capacity within, as nearly as possible, the existing right-of-way. The TPC MTIS-recommended plan for the Canyon/Mixmaster includes the following major elements:

- Construction of additional mainlanes in the Canyon, and where practical, addition of frontage along both sides;
- Reconfiguration of the Mixmaster (IH-35E/IH-30 interchange) to allow through-traffic on IH-30 and IH-35E to stay in the same lanes through the interchange, rather than being forced to change lanes under the current configuration;
- Addition of direct-connect ramps in the Mixmaster connecting IH-35E (South R.L. Thornton Freeway) to IH-30 (Tom Landry Freeway) for the northbound to westbound and eastbound to southbound traffic movements;
- Construction of collector-distributor roads alongside IH-35E in the segment from Woodall Rodgers Freeway to the connection with the DNT, with allowance for separating the traffic streams to and from Woodall Rodgers Freeway and the DNT; and
- Construction of HOV lanes and ramps serving IH-35E (Stemmons Freeway and South R. L. Thornton Freeway) and IH-30 (Tom Landry Freeway and East R. L. Thornton Freeway).

Extension of Woodall Rodgers Freeway

The TPC MTIS also recommended the extension of Woodall Rodgers Freeway west across the Trinity River to connect Singleton Boulevard and Beckley Avenue. The extension maintains a connection between Industrial Boulevard and Woodall Rodgers Freeway to the east. As proposed, the extension of Woodall Rodgers Freeway could provide an important access point from the downtown area to the Trinity Parkway (proposed action). The proposal also includes widening Beckley Avenue to six lanes from Singleton Boulevard south to IH-30.

HOV System Implementation

As previously described, the TPC MTIS recommended the construction of an HOV system to serve the major radial highways serving the Dallas CBD. The proposed HOV routes consist of the following:

- IH-30 (East R.L. Thornton Freeway) – This proposal is for a two-lane reversible HOV system serving westbound traffic during the a.m. peak period and eastbound traffic during the p.m. peak period. This system would enter the CBD area as a two-lane facility. An exit (a.m. peak period) and entrance (p.m. peak period) would be provided at the Pearl-Central area with a lane drop. The HOV lane continues west as a one-lane facility through the Canyon, providing an exit (a.m. peak period) and entrance (p.m. peak period) in the Reunion Arena area, and continues north on IH-35E, merging in the area of the Market Center near Oak Lawn Avenue.

- IH-35E (South R.L. Thornton Freeway and Stemmons Freeway) – The South R.L. Thornton proposal is for a two-lane reversible HOV system serving northbound traffic during the a.m. peak period and southbound traffic during the p.m. peak period. This HOV system would enter the Dallas CBD from the south as a two-lane facility and drop a lane with an exit (a.m. peak period) and entrance (p.m. peak period) at the Houston-Jefferson Viaducts. The HOV would continue as a one-lane facility through the Mixmaster and then north along IH-35E (Stemmons Freeway), merging in the area of the Market Center near Oak Lawn Avenue. The Stemmons Freeway HOV proposal is for a two-lane reversible HOV north of Market Center, serving southbound traffic during the a.m. peak period and northbound traffic during the p.m. peak period.

- IH-30 (Tom Landry Freeway) – This proposal is for a one-lane reversible HOV system serving eastbound traffic during the a.m. peak period and westbound traffic during the p.m. peak period. This HOV system would enter the Dallas CBD as a one-lane facility, splitting into a north segment through the Mixmaster and an east segment through the Canyon. The north segment would provide an exit (a.m. peak period) and entrance (p.m. peak period) in the Reunion Arena area and would terminate north of the Reunion Arena area with a merge to the mainlanes of IH-35E. The east segment would travel as a one-lane HOV through the Canyon, serving eastbound traffic during the a.m. peak period and westbound traffic during the p.m. peak period. This HOV lane would terminate in the area of Pearl-Central, providing ramp access to the Farmers Market area, as well as a merge to the mainlanes of IH-30 (East R.L. Thornton Freeway).

Although these major planned improvements to existing roadways within, and in the vicinity of, the study area are substantial and would prove beneficial to the transportation system, they are capable of only partially fulfilling the need for additional transportation capacity in the corridor. The TxDOT TPC MTIS estimated that the Canyon/Mixmaster/Lower Stemmons improvements, including HOV lanes, would contribute approximately 40 percent of the overall goal of providing an additional 250,000 daily person trips of capacity added or demand reduced in these corridors (see **Figure 2-1**). The travel demand analysis conducted by NCTCOG for the long-range transportation plan also shows a need for additional capacity, including construction of the Trinity Parkway.

Transportation Systems Management/Travel Demand Management

Transportation Systems Management (TSM) refers to a set of transportation policies or strategies that were first articulated in the 1970s as a means of managing existing highway facilities more efficiently in order to move more vehicles without automatically resorting to widening or new construction. The most prominent TSM strategies in use today include traffic signal timing, improvements in intersection geometry, and the designation of HOV lanes. While still focused on increasing roadway capacity, TSM strategies introduced the idea of relatively low-cost measures that can be implemented primarily within existing roadway rights-of-way.

As transportation planning began to shift from moving vehicles to moving people, a set of strategies called Travel Demand Management (TDM) emerged. The goal of TDM strategies is to reduce the number of vehicles on the road, particularly during peak travel periods. This is done through various programs and policies aimed at increasing the number of occupants per vehicle, encouraging motorists to avoid driving during morning, noon, and evening "rush hours," and encouraging people to use alternative modes of transportation for some of their trips. Examples include parking preferences and price breaks for van pools or car pools, creation of HOV lanes for use by buses, car pools and van pools, "flex time" in the workplace to allow people to travel outside the most congested times, and improved transit service. Other programs and policies focus on improving peoples' access to what they need so that not every trip has to involve getting in one's car and driving long distances. This approach involves the integration of transportation planning with broader urban design and land use initiatives, such as higher densities, mixed land use, and increased use of telecommunications.

These TSM/TDM programs and policies are all strongly encouraged by and made an integral part of the NCTCOG long-range transportation plan and associated funding. Their implementation and success is subject to a number of factors including project approvals by government agency sponsors, the degree of employer participation, changes in local land development regulations, and even human behavior and travel preferences. A variety of TSM/TDM measures is currently included in the congestion management programs for the DFW metropolitan area. They also form part of the long-range multi-modal transportation system plan for this area. Over time, efforts aimed at increasing the use of alternative travel modes through the application of various TSM/TDM programs and policies will prove beneficial. Still, these measures alone cannot fully address the purpose of and need for the Trinity Parkway.

As described previously in **Chapter 1**, the roadway network parallel to IH-35E is largely characterized by disjointed major and minor arterials, resulting in congestion and operating inefficiencies. TSM/TDM measures are not designed to address this type of problem and therefore cannot offer a complete solution. For the large portion of the traveling public that is expected to continue to rely on private automobiles for their primary mode of travel, TSM/TDM strategies alone would not meet future travel

needs. This conclusion is supported by NCTCOG's long-range transportation plan (*Mobility 2025 - 2004 Update*), which recommends the expansion of the roadway system – including construction of the Trinity Parkway – in addition to public transportation improvements and other TSM/TDM strategies.

Intelligent Transportation Systems

ITS represent an array of technology aimed at reducing traffic congestion and improving traffic safety. ITS includes the use of video surveillance cameras and speed and volume detectors for monitoring traffic and detecting traffic incidents such as accidents or vehicle breakdowns. Information from the cameras and detectors is typically monitored at a centralized location, such as a traffic management center. More advanced systems offer remote control of intersection signals and ramp meters and the ability to communicate information to motorists through roadside changeable message signs, highway advisory radio and television broadcasts, and the Internet.

The DFW metropolitan area is currently involved in the planning, programming, and implementation of ITS programs and projects. Traffic monitoring and incident detection and response systems are currently operating on portions of the freeway system in Dallas. Operation of the TxDOT – Dallas District/DART satellite traffic management center is ongoing, and funds have been committed for a permanent traffic management center in the Dallas area. The ITS components of the TxDOT traffic management centers include closed-circuit television, lane control signals, dynamic message signs, ramp meters, mobility assistance controls, and vehicle detectors on the limited-access facilities. NTTA has existing ITS components on its facilities to support toll road operations, and is currently working on software and other interoperability issues with a goal to fully integrate its systems into the TxDOT ITS regional system.

Table 1-9 in **Chapter 1** provides a summary of the various ITS measures currently planned for major roadway segments in the Trinity Parkway study area. The deployment of ITS throughout the north Texas region will help reduce delays caused by high traffic volumes, accidents, and other incidents and enhance emergency responses. In addition, the use of automatic vehicle identification (AVI) and other electronic payment systems allows motorists to pay tolls with little or no delay, resulting in reduced congestion in and around toll plazas.

Public Transportation

One major transit authority, DART, serves the City of Dallas and a group of surrounding cities. DART provides bus, rail, para transit (dial-a-ride), van pool services, and manages the HOV system in the Dallas area. More than $5.0 billion of fixed-guideway transit (i.e., light/commuter rail or bus way) improvements were included for DART (in both exclusive and shared costs) in NCTCOG's long-range MTP (*Mobility 2025 - 2004 Update*). Along with the existing network, this fixed-guideway network is located within "principal transit corridors," specially designated areas that would feature frequent service and transit-

supportive infrastructure and land use. These corridors generally originate in the Dallas CBD and radiate out to the suburban communities surrounding the city.

Although extensive, the public transportation network assumed for the DFW metropolitan area in 2025 is not capable of alleviating the need for roadway improvements. The travel demand analysis conducted by NCTCOG for the long-range MTP still shows a need for improvements to the Canyon/ Mixmaster/Lower Stemmons corridors and for construction of the Trinity Parkway. Public transportation accounts for a relatively low percentage of trips in the DFW metropolitan area. Whereas the long-range MTP generally assumes growth in transit use, there nevertheless remains a heavy reliance on privately owned vehicles. Public transportation also has difficulty in cost-effectively serving lower density suburban and rural areas, which generate longer distance trips through the study corridor. The long-range transit plan for the Dallas metropolitan area is a radial system centered on improved access to the Dallas CBD. Although beneficial, the existing and proposed fixed-guideway transit system is not designed to fully correct the mobility deficiencies within the study corridor.

Bicycle and Pedestrian Improvements

Bicycle and pedestrian improvements focus on providing cost-effective, safe access for bicycles and pedestrians. These improvements also develop strategies for increasing the use of bicycles as an alternative means of transportation. National research suggests that bicycle commuting occurs most often when the distance from home to work is 5.0 miles or less. One mile or less is considered to be a reasonable distance for walking from home to work. Bicycling and walking can also be considered as an effective mode of transportation for home to school, entertainment, shopping, traveling between and within residential neighborhoods, and recreation. Currently, about 5 percent of the commuters in the region either walk or bicycle to work. The goal established in *Mobility 2025 - 2004 Update* is 8 percent.

The largest bicycle facility in the region is the 300+-mile system of signed, on-street bicycle routes in the City of Dallas. The system was designed to provide bicyclists assistance in finding routes around Dallas that minimize interaction with high-speed, high-volume traffic and maximize opportunities for increased bicycle usage on the existing roadway system. A total of nine signed, on-street bicycle routes are located in the Trinity Parkway study area (see **Section 3.2.5 Non-Motorized Transportation: Pedestrian and Bicycle Use**).

The *Mobility 2025 - 2004 Update* plan also proposes the construction of several new facilities in a bicycle network called the regional veloweb. The veloweb is essentially a series of small roads designed for use primarily for fast-moving bicyclists. The purpose of the veloweb is to provide regional connectivity to interregional routes that favor bicycle travel to encourage increased use of the bicycle for utilitarian purposes. The veloweb is also designed to encourage concurrent pedestrian transportation use. Several

veloweb links are planned within the Trinity Parkway study area, which includes the Katy Trail, Trestle Trail, and Great Trinity Trail.

Summary

The supporting transportation improvements detailed in this section (i.e., improvements to existing roadways, TSM/TDM, ITS, public transportation, and bicycle/pedestrian improvements) cannot separately or collectively satisfy the purpose of and need for the Trinity Parkway project. All of the programmed improvements described above are scheduled for implementation in the *Mobility 2025 - 2004 Update* plan. Even with all of these supporting transportation improvements assumed to be in place, TxDOT's TPC MTIS showed that the addition of the Trinity Parkway to the transportation network was required to reduce congestion on major roadways in the study area and to provide needed relieving lanes to offload traffic from the radial highways SH-183, IH-35E, and US-175 and IH-45. All of the *Mobility 2025 – 2004 Update* projects, including the Trinity Parkway, provide a balanced transportation system to improve the transportation network and manage congestion throughout the region. Additional information concerning transportation system impacts are provided in **Section 4.4** of this DEIS.

2.2 ROADWAY ALTERNATIVES CONSIDERED AND WITHDRAWN

The TPC MTIS developed specific roadway alternatives on corridors now under consideration in the EIS. The roadway proposals were developed with varied operational assumptions such as freeway, parkway, tollway, reversible lanes, and High-Occupancy Vehicle/High-Occupancy Toll (HOV/HOT) lanes. (Note that "High Occupancy Toll" lanes, also referred to as "Managed" lanes, refer to specific operating strategies, where HOV users are charged no tolls or reduced tolls, and SOV users are charged full tolls). The four corridors considered in the TPC MTIS were:

1. IH-35E;
2. Irving/Industrial Boulevard;
3. The east Trinity River levee; and
4. The west Trinity River levee.

All of the corridors were considered between the identical termini locations (IH-35E/SH-183 and US-175/SH-310) used in this DEIS.

Several alternative cross sections and operational scenarios were developed for each of these four corridors. Alignments were selected based on three general strategies for providing needed capacity improvements:

1. providing all HOV/HOT and general-use lane reliever capacity;
2. providing only HOV/HOT capacity; and
3. providing only general-use lane reliever capacity.

Tables 2-1, 2-2, 2-3, and **2-4** provide an abbreviated record of the range of alternatives considered. As stated in **Section 2.1**, additional information regarding these alternatives can be obtained from the TPC MTIS published report.

TABLE 2-1. IH-35E (STEMMONS FREEWAY) CORRIDOR ALIGNMENTS

Alignment	Description
I35-1a	Four-lane elevated freeway with two at-grade HOV/HOT lanes and two additional general-purpose lanes (eight additional lanes total) with compensatory widening [55 feet on each side]. Requires rebuilding IH-35E within project limits.
I35-1b	Eight-lane elevated freeway with two at-grade HOV/HOT lanes (10 additional lanes total) with minimal compensatory widening [12 feet on each side]. Requires rebuilding IH-35E within project limits.
I35-2a	Two-lane elevated HOV/HOT lanes with two at-grade HOV/HOT lanes on IH-35E (four additional lanes total) with minimal compensatory widening [12 feet on each side]. This alignment requires totally rebuilding existing IH-35E within the project limits.
I35-2b	Two-lane elevated HOV/HOT lanes with two at-grade HOV/HOT lanes (two additional lanes total). Takes two existing general-purpose lanes from IH-35E with no compensatory widening. Requires rebuilding existing IH-35E within project limits.
I35-3	Four-lane at-grade HOV/HOT lanes (four additional lanes total) with compensatory widening [36 feet on each side]. This alignment requires totally rebuilding existing IH-35E within the project limits.
I35-4	Four-lane at-grade HOV/HOT lanes. Requires four existing general-purpose lanes from IH-35E with no compensatory widening.
I35-5a	Two-lane HOV/HOT lanes on elevated structure (two additional lanes total) with no widening required. Provides HOV/HOT capacity without taking or rebuilding any existing general-purpose lanes on IH-35E.
I35-5b	Two-lane at-grade HOV/HOT lanes on IH-35E. Takes two existing general-purpose lanes from IH-35E with no compensatory widening.
I35-5c	Two-lane at-grade HOV/HOT lanes on IH-35E (two additional lanes total) with compensatory widening. Requires rebuilding IH-35E within project limits.

TABLE 2-2. IRVING/INDUSTRIAL BOULEVARD CORRIDOR ALIGNMENTS

Alignment	Description
IND-1	Eight-lane elevated freeway with two elevated HOV/HOT lanes (10 additional lanes total) with compensatory widening [47 feet on each side]. Existing Irving/Industrial Boulevard remains in place. Requires reconstruction or double decking of lanes to connect back to the Mixmaster area.
IND-2	Four-lane at-grade freeway with four-lane at-grade HOV/HOT lanes and access roads (eight additional lanes total) with right-of-way widening [247 feet on one side]. Existing Irving/Industrial Boulevard replaced with access roads. Requires reconstruction or double decking of lanes at Mixmaster area.
IND-3	Eight-lane at-grade “super” thoroughfare with grade separation at major intersections (eight lanes replaced existing six lanes). Requires right-of-way widening of 20 feet on each side. Requires rebuilding existing Irving/Industrial Boulevard within project limits.
IND-4	Four-lane elevated HOV/HOT lanes (four additional lanes total). Requires right-of-way widening of 12.5 feet on each side of the existing roadways. Existing Irving/Industrial Boulevard remains in place.
IND-5	Two-lane elevated HOV/HOT lanes (two additional lanes total) on a “T” bridge within the existing median of Irving/Industrial Boulevard. Requires no additional right-of-way. Existing Irving/Industrial Boulevard remains in place.

TABLE 2-3. TRINITY PARKWAY CORRIDOR ALIGNMENTS

Alignments	Description
TL-1a, TL-1b, and TL-1c	Directional parkway along both levees (five lanes on each side with three reversible lanes). Requires reconstruction of 12 and 16 cross- street bridges, respectively.
TL-2a, TL-2b, and TL-2c	Conventional thoroughfare along the east or west levee (six lanes with median).
TL-3a, TL-3b, and TL-3c	Asymmetrical thoroughfare along both levees (six lanes on each side – four lanes in one direction and two in the opposite direction). Requires reconstruction of eight and 16 cross-street bridges respectively.
TL-4a, TL-4b, and TL-4c	Split freeway along both levees with southbound lanes on the west levee and northbound lanes on the east levee (four lanes on each side). Requires reconstruction of eight and 16 cross-street bridges, respectively.
TL-5a, TL-5b, and TL-5c	Full freeway section along the east levee (eight lanes). Requires reconstruction of six and eight cross-street bridges, respectively.
TL-7a, TL-7b, and TL-7c	Divided parkway along both levees (four lanes on each side). Requires reconstruction of eight and 16 cross-street bridges, respectively.
TL-6a, TL-6b, and TL-6c	HOV/HOT lanes along the east levee (two lanes). Requires reconstruction of six cross-street bridges each.
TL-8a, TL-8b, and TL-8c	Full freeway section along the east or west levee with two-lane HOV/HOT lanes (eight lanes total). Requires reconstruction of six and eight cross-street bridges, respectively.

TABLE 2-4. TRINITY PARKWAY CORRIDOR – SOUTHERN TERMINUS

Alignment	Description
1 - Lamar Street	Full eight-lane parkway following the alignment of Lamar Street, with access roads replacing Lamar Street.
2 - Railroad	Full eight-lane parkway generally following the east side of the UP Railroad.
3 - East Levee	Full eight-lane parkway generally following the proposed east Lamar Levee extension.
4- Split West-East Levee	Split eight-lane parkway generally following the proposed Dallas Floodway levee extensions.
5 - Combined East Levee/Railroad	Full eight-lane parkway following the proposed east Lamar Levee extension down to MLK, then following the east side of the UP Railroad.

The conclusion drawn from the TPC MTIS roadway analysis was that a full expansion of capacity on IH-35E was not practical, primarily due to excessive cost, extreme difficulties in carrying additional lanes through the Mixmaster, and adverse impacts on adjacent properties. The preferred approach was to place HOV/HOT lanes along IH-35E (primarily as an elevated structure), to expand and improve the Canyon and Mixmaster to the extent practical due to physical constraints, and to seek additional capacity through a reliever along another route. At the time of the TPC MTIS, the reliever was generally believed to be best located along the Dallas Floodway. However, additional route alternatives along Irving/Industrial Boulevard have been included in this DEIS for more detailed consideration because of interest from the environmental community.

The TPC MTIS included developmental work on route alternatives along the Trinity River corridor, specifically TL-5a (a combined parkway with eight general-purpose lanes along the riverside of the east levee), TL-7a (a split parkway with four general-purpose lanes along the riverside of both levees), and TL-7c (a split parkway with four general-purpose lanes along the landside of both levees).

2.3 DESCRIPTION OF THE DEIS ALTERNATIVES

As previously described in **Section 2.1**, the alternatives advanced from the TPC MTIS for further analysis in the DEIS only address the reliever route component of the TPC MTIS recommended plan of action. In accordance with FHWA Technical Advisory T 6640.8A, a representative number of the most reasonable alternatives are to be presented and evaluated in an EIS. This serves to simplify and focus the consideration of social, economic, and environmental impacts on a representative number of reasonable build alternatives. To meet the FHWA requirements and in response to comments received from the public and agency officials during the DEIS scoping process, six build alternatives and the No-Build Alternative are advanced for further consideration and analysis in this DEIS. Five of the build alternatives (Alternatives 2A, 2B, 3A, 4 and 5) were developed early in the study period. A sixth build alternative (Alternative 3B) was added to the DEIS after further public input and consultation with the Dallas City Council in the fall of 2003. In addition, a design option involving Trinity Parkway access to/from IH-35E (South R. L. Thornton Freeway) is considered for each build alternative. The City of Dallas as well as several involved public groups requested this addition.

As previously described in **Chapter 1 Purpose and Need for Action**, the TPC MTIS recommended an interim LPA for the reliever route, which is shown in **Figure 1-7**. This alternative, with modifications, is identified within the DEIS as Alternative 4. Although this was the LPA identified during the TPC MTIS, all alternatives in this DEIS are under equal consideration and the identification of a preferred alternative will not be made until the results of the DEIS circulation and the public involvement process have been fully evaluated.

2.3.1 No-Build Alternative

The No-Build Alternative (Alternative 1) represents the case in which the Trinity Parkway is not constructed. Other transportation improvements, including those identified in the MTP (*Mobility 2025 - 2004 Update*), may or may not be constructed, depending on project development and funding availability issues for each such improvement. **Section 1.8.8 (Chapter 1)** and **Section 2.1.3 (Chapter 2)** describe the planned roadway and transit system improvements, bicycle/pedestrian, ITS, and TSM/TDM measures assumed to be included in the baseline condition for the study area. All of these improvements comprise the No-Build Alternative.

There are costs involved with the No-Build Alternative, however, and these include:

- Maintenance of the existing system – the longer improvements and/or reconstruction are postponed, the higher this figure becomes;

- Increased vehicle operating costs on under-designed, inadequate facilities;
- Increased costs due to higher rates of accidents and incidents on existing facilities;
- The monetary value of time lost by motorists due to lower operating speeds, congested roadway conditions, and restricted maneuverability on area roadways;
- The intangible costs associated with the inconvenience for emergency services and annoyance for average motorists caused by the above deficiencies; and
- Increased costs of other programmed improvements to the Canyon/Mixmaster/Lower Stemmons Corridors due to lack of the proposed action (Trinity Parkway) which could otherwise provide a detour route during construction.

The No-Build Alternative has the advantage of avoiding any adverse impacts associated with new construction, such as relocation, land use changes, and environmental disruption. Another important advantage is that it could allow construction funds to be shifted to other projects. Although the No-Build Alternative avoids construction impacts, the problems associated with the lack of a northwest-southeast reliever route around downtown Dallas remain. The costs associated with the No-Build Alternative along with the adverse impacts related to traffic congestion, such as air pollution, noise, and decreased pedestrian and vehicular safety could create an undesirable urban environment that would have more long-term adverse impacts than the short-term construction impacts.

In all but no-growth scenarios, the No-Build Alternative is by necessity a deferral of difficult choices. Growth will eventually cause congestion so intolerable that action would be unavoidable. When that time comes, right-of-way acquisition in developed areas of the corridor may be significantly more expensive and disruptive, and construction costs would likely be higher. The community could end up paying a high cost for their lack of action.

As previously described in **Chapter 1 Purpose and Need for Action**, the MTP (*Mobility 2025 – 2004 Update*) includes a Trinity Parkway reliever route, which is a key element to the functioning of the plan. Implementation of the No-Build Alternative would seriously jeopardize the balance and efficiency of the entire transportation system by not addressing any of the stated project needs.

2.3.2 Description of the Build Alternatives

Six build alternatives have been identified as reasonable for meeting the purpose and need of the Trinity Parkway. These are identified as Alternatives 2A, 2B, 3A, 3B, 4, and 5. **Plates 2-1** through **2-6** show the schematic plans for these alternatives. **Plate 3-1** at the end of **Chapter 3** shows the alternatives on an aerial photograph. Each of the build alternatives shares common northern and southern termini. The northern terminus is located at the Stemmons Freeway (IH-35E) interchange with John W. Carpenter

Freeway (SH-183). The southern terminus is at the US-175 interchange with SH-310. All of the proposed build alternatives would be designated as toll roads with controlled-access, with grade separations at crossings of existing highways and local arterial streets. The facilities for toll collection have a similar basic layout in each alternative, with main-lane toll plazas and ramp toll plazas in similar locations for each. Some alternatives may have reduced numbers of ramp plazas if specific ramp connections are not feasible due to geometric constraints. Alternative 3B differs in that it has only one main-lane plaza (located at the north end), rather than two main-lane plazas (north and south) as shown for the other alternatives. Because the southern main-lane plaza is deleted for Alternative 3B, the northern main-lane plaza must collect approximately twice as much toll as the northern plazas in other alternatives to pay for the entire length of the parkway trip at one location.

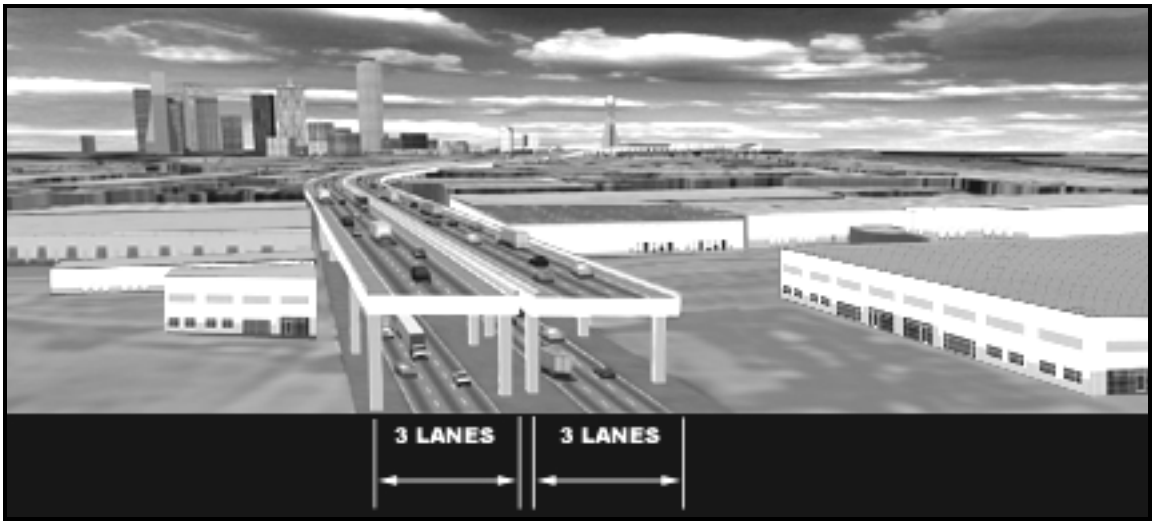
It should be noted that all of the build alternatives rely to some extent on the proposed extension of Woodall Rodgers Freeway for connection to the northern area of the Dallas CBD. This project is being processed separately as an environmental assessment by the TxDOT - Dallas District (CSJ No. 0196-07-018). The Woodall Rodgers Freeway extension project is funded in part by the City of Dallas using proceeds from the May 2, 1998 bond election. The Woodall Rodgers Bridge over the Dallas Floodway is proposed to be a “signature” bridge over the City of Dallas lake proposed in the area.

The following paragraphs describe each of the six build alternatives indicating their location with respect to key features of the natural and human environment. The overall length, estimated right-of-way, and construction costs for each build alternative are summarized in **Table 2-7** (see **Section 2.3.10 Comparison of Alternatives**).

2.3.3 Alternative 2A (Irving/Industrial Boulevard – Elevated)

Alternative 2A is formed by the combination of TPC MTIS alignments IND-1 (north segment) and 1 (south segment) (see **Tables 2-2** and **2-4**). Alignment IND-1 has been modified to exclude two elevated HOV/HOT lanes shown in the TPC MTIS. These lanes are now planned along the IH-35E corridor. IND-1 has also been narrowed (from eight lanes) in the northern segment to provide six main lanes throughout. Alignment 1 (south segment) has been modified from an at-grade version in the TPC MTIS to an elevated version in this DEIS.

FIGURE 2-2. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 2A INDUSTRIAL BOULEVARD – ELEVATED

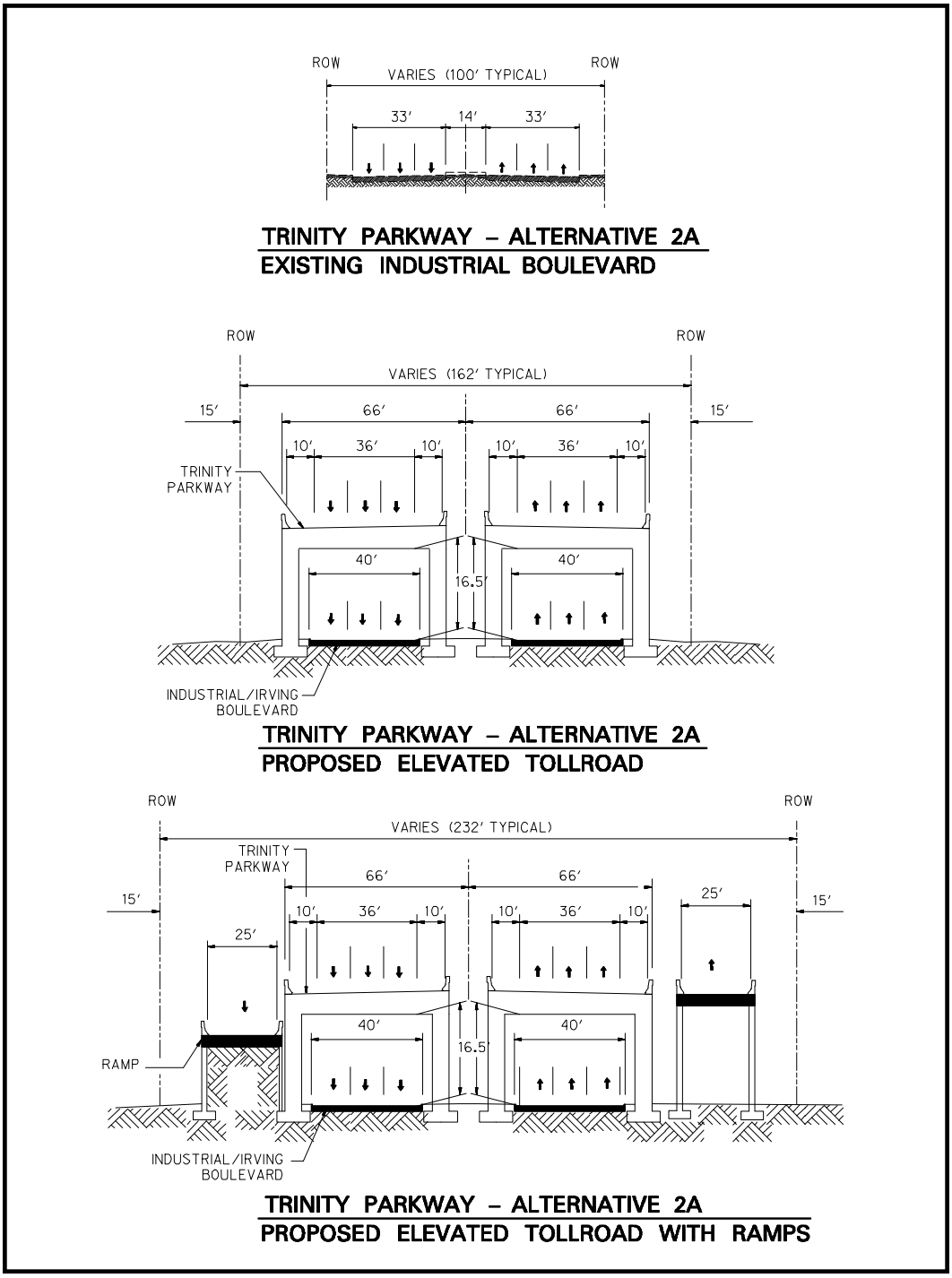


Alternative 2A travels south-west from the IH-35E/SH-183 interchange, passing over Commonwealth Boulevard, and turning to the south-east to follow Irving Boulevard. The route follows Irving and Industrial Boulevards for approximately 5.6 miles, passing south of downtown, and reaching Corinth Street near the Longhorn Ballroom site. In this segment, the roadway is installed as a double-deck structure, above the existing city streets. Irving/Industrial Boulevards are almost totally reconstructed with this alternative to resolve conflicts with the supporting structures for the tollway above. The roadways nevertheless remain in service to serve local access and through traffic movement. South of Corinth Street the route follows a new alignment for approximately 1.2 miles, bending in an easterly direction to reach Lamar Street east of MLK. From this point, the route travels south-east along Lamar Street as a double-deck roadway, including an overpass of IH-45. The route then turns east at Starks Street and follows it to the US-175/SH-310 interchange.

It should be noted that Alternatives 2A and 2B both follow Lamar Street (TPC MTIS Southern Alignment 1) south of Corinth Street, whereas Alternatives 3A, 3B, 4, and 5 follow the levee of the proposed Dallas Floodway Extension (DFE) and the UP Railroad (TPC MTIS Southern Alignment 5). Alignment 1 has been chosen in this area because it continues the same concept as used in the northern part of the corridor along Irving/Industrial Boulevard (double-deck above an arterial street). As a practical matter, the southern ends of Alternatives 2A and 2B could follow the same southern segment route as used for Alternatives 3A, 3B, 4, and 5.

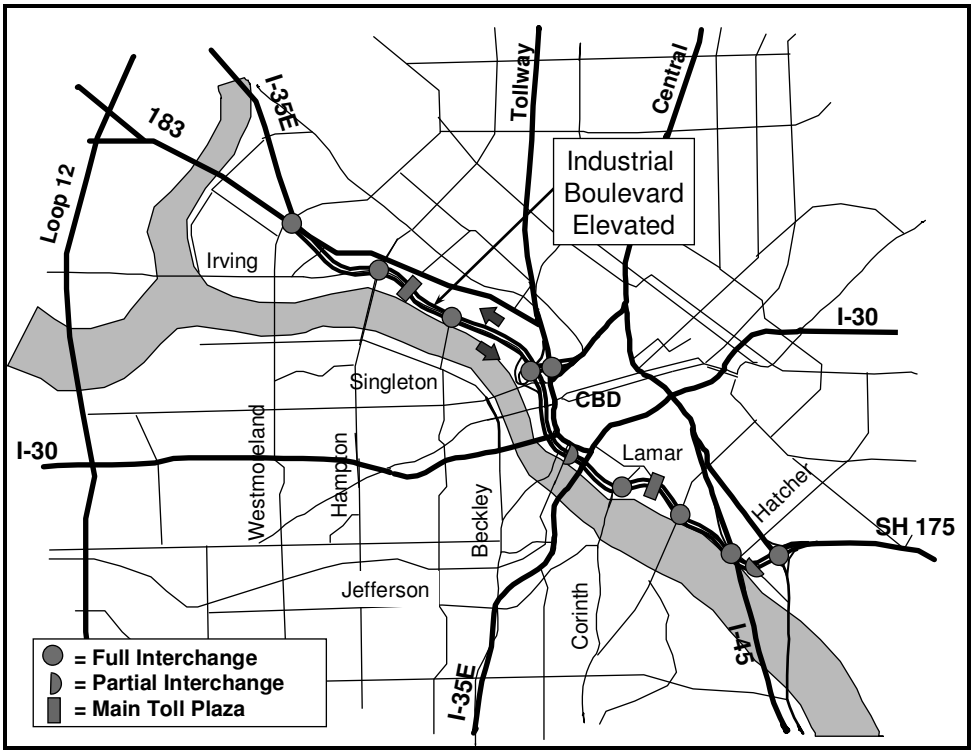
Figure 2-2 shows a computer-generated rendering of Alternative 2A, with the bridgework graphically cut away to show the local street underneath. **Figure 2-3** shows the typical cross-section, and **Figure 2-4** shows a layout map of the alignment. **Plate 2-1** at the end of this chapter provides the schematic plan.

FIGURE 2-3. ALTERNATIVE 2A - INDUSTRIAL BOULEVARD (ELEVATED) TYPICAL SECTIONS



Note: There are typically three main lanes of travel in each direction (six lanes total). Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps.

FIGURE 2-4. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 2A



There are typically three lanes in each direction of travel (six lanes total), with the proposed tollway mainlanes each 12 feet in width. The proposed right-of-way varies depending on the need for ramps, the locations of toll plazas and ancillary buildings, and other geometric considerations. The width is typically 162 feet in segments with mainlanes, but no ramps. The width is typically 225 feet in segments where entry or exit ramps are present. Additional width is required at toll plazas and may be required at other locations due to geometric considerations. In segments built as a double-deck over city streets, the tollway structure would be elevated to provide 16.5 feet of clearance above the pavement surface. The structure would be typically supported on four columns, one on each side of the city street and one in the center median. A standard concrete traffic barrier separates northbound and southbound traffic, and paved shoulders are provided adjacent to the inside and outside lanes.

The existing right-of-way on Irving/Industrial Boulevards is typically 100 feet in width. Substantial property acquisition is needed because the proposed tollway is wider than the existing road and because the tollway cannot precisely follow the existing centerlines of Irving/Industrial Boulevards due to differences in design speed and curvature. Additional property acquisition is also needed at specific locations due to the influence of main toll plazas, ramp plazas, and ancillary buildings.

Alternative 2A is approximately 8.83 miles in length, requires approximately 281 acres of right-of-way, and would cost approximately $1.32 billion to construct. Other major improvements associated with Alternative 2A include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Freeway, and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff, Corinth Street, MLK, and Lamar Street/SH-310; and
- Half diamond interchange at the Houston/Jefferson Street Viaducts.

2.3.4 Alternative 2B (Irving/Industrial Boulevard – At-Grade)

Alternative 2B is formed by the combination of preliminary alignments IND-1 (north segment) and 1 (south segment) (see **Tables 2-2** and **2-4**). Alignment IND-1 has been modified to be an at-grade facility and excludes two elevated HOV/HOT lanes, which are now planned along the IH-35E corridor. Similar to Alternative 2A, the facility is modified to six main-lanes throughout. The existing lanes on Irving/Industrial Boulevards and Lamar Street are replaced as access (frontage) roads. The location of this alignment is similar to Alternative 2A. **Figure 2-5** shows a computer-generated rendering of Alternative 2B.

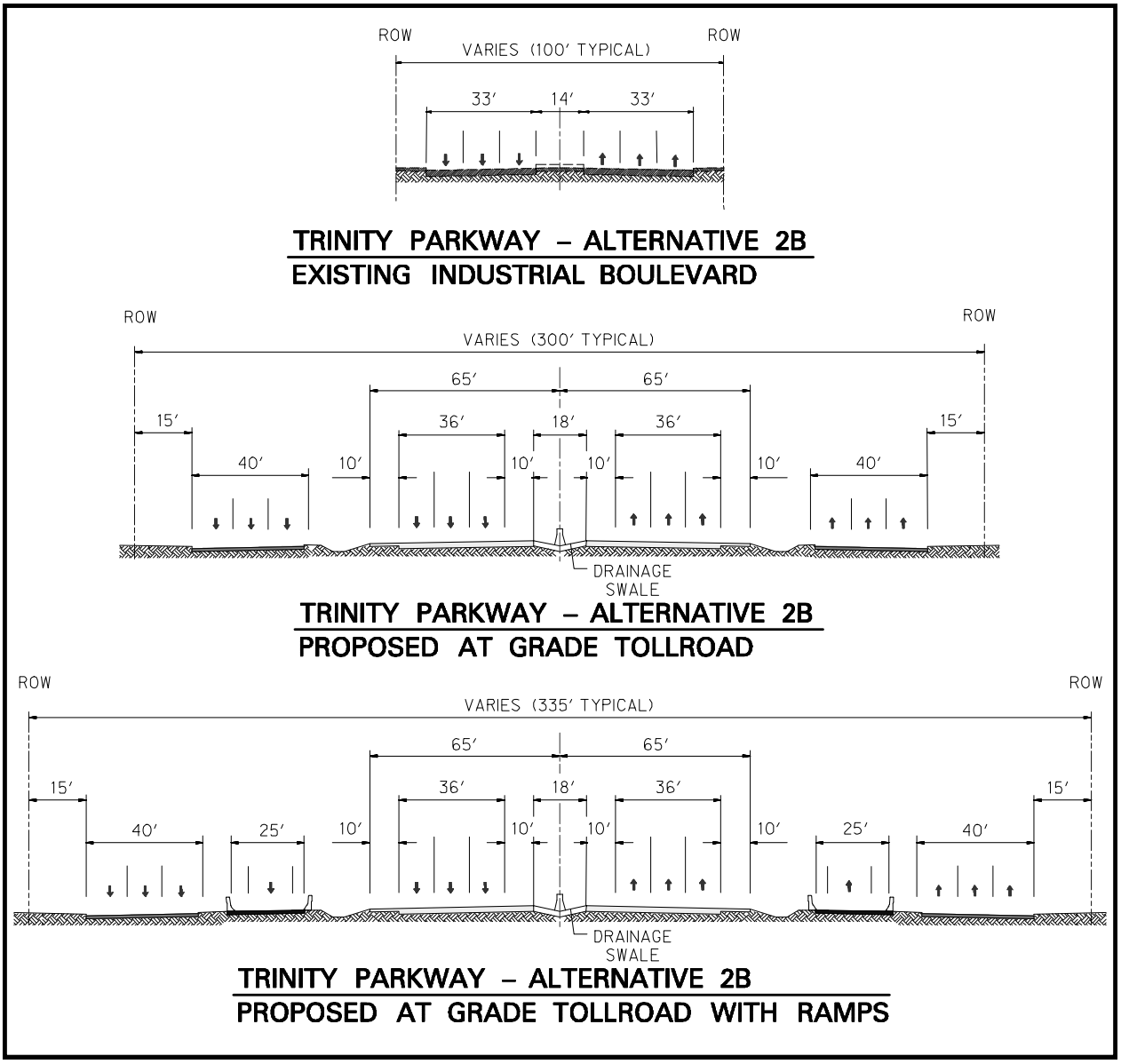
FIGURE 2-5. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 2B INDUSTRIAL BOULEVARD – AT-GRADE

Alternative 2B travels south-west from the IH-35E/SH-183 interchange, passing over Commonwealth Boulevard and turning to the south-east to follow Irving Boulevard. Similar to Alternative 2A, the route follows Irving and Irving/Industrial Boulevards for approximately 5.6 miles to Corinth Street. However, in this segment, the road is installed predominantly at-grade, with service roads provided to make up for the

loss of the arterial streets. One-way service roads on each side of the tollway serve local access and through traffic. South of Corinth Street, the route follows a new alignment for about 1.2 miles, bending in an easterly direction to reach Lamar Street east of MLK. From this point, the route travels southeast along Lamar Street as a double-deck structure, identical to that proposed for Alternative 2A. The southern terminus of Alternative 2B is the same as Alternative 2A, with the route following Starks Street to the US-175/SH-310 interchange. The same comment made above for Alternative 2A regarding use of TPC MTIS Southern Alignment 5 applies to Alternative 2B.

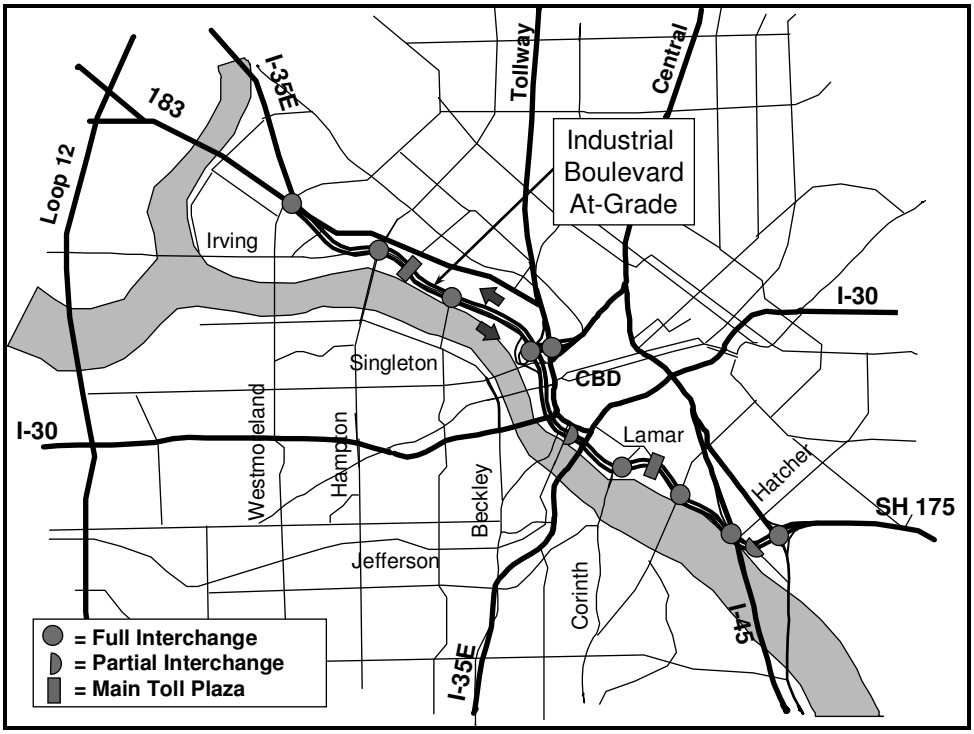
Figure 2-6 shows the typical design cross-section, and **Figure 2-7** shows a route map of the alignment. **Plate 2-2** at the end of this chapter provides the schematic plan.

FIGURE 2-6. ALTERNATIVE 2B - INDUSTRIAL BOULEVARD (AT-GRADE) TYPICAL SECTIONS



Note: There are typically three main lanes of travel in each direction (six lanes total). Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps.

FIGURE 2-7. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 2B



There are typically three lanes in each direction of travel (six lanes total), with the proposed tollway mainlanes each 12 feet in width. The proposed right-of-way varies depending on the need for ramps, the locations of toll plazas and ancillary buildings, and other geometric considerations. The width is typically 300 feet in segments with mainlanes, but no ramps. The width is typically 335 feet in segments where entry or exit ramps are present. Additional width is required at toll plazas, ancillary buildings, and may be required at other locations due to geometric considerations. The tollway overpasses city arterial streets along this segment with the structures elevated to provide 16.5 feet clearance above the pavement surface. A standard concrete traffic barrier separates northbound and southbound traffic, and paved shoulders are provided adjacent to the inside and outside lanes.

The existing right-of-way on Irving/Industrial Boulevard is typically 100 feet in width. Substantial property acquisition is needed because the proposed tollway is wider than the existing road and because the tollway cannot precisely follow the existing centerlines of Irving/Industrial Boulevards due to differences in design speed and curvature. Additional property acquisition is also needed at specific locations due to the influence of main toll plazas, ramp plazas, and ancillary buildings.

Alternative 2B is approximately 8.83 miles in length, requires approximately 370 acres of right-of-way, and would cost approximately $952 million to construct. Other major improvements associated with Alternative 2B include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Freeway, and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff, Corinth Street, MLK, and Lamar Street/SH-310; and
- Half diamond interchange at the Houston/Jefferson Street Viaducts.

2.3.5 Alternative 3A (Combined Parkway – Original)

Alternative 3A is formed by the combination of preliminary alignments TL-5a (north segment) and 5 (south segment) (see **Tables 2-3** and **2-4**), except that the main-lanes are modified to six lanes throughout. The alternative is called "Original" to differentiate it from the "modified" version of Combined Parkway (Alternative 3B) which was generated based on Dallas City Council input in the fall of 2003 (see **Section 2.3.6**). From the IH-35E/SH-183 interchange, this alternative travels south-west, passing over Commonwealth Boulevard and Irving Boulevard, reaching the Dallas Floodway in the area west of Hampton/Inwood Road. The alignment then turns south along the riverside of the east floodway levee.

In the floodway segment, the tollway is placed on an earthen embankment, set typically about 2 feet above the 100-year flood level to provide appropriate protection of the road against inundation. However, at points where the alignment meets existing bridge crossings of the floodway, the tollway is depressed to pass under the existing structures. At these locations, a floodwall along the riverside of the tollway is provided to protect the roadway from inundation during a 100-year flood event. Additionally, pump stations are provided to drain the low points of the road at times that the Trinity River is in flood stage. The proposed roadway embankment is offset sufficiently from the face of the existing levee so that a proposed raising of the levee tops (under consideration by the City of Dallas and USACE) can be constructed without the need for retaining walls. The median of the roadway is of sufficient width to allow up to five feet of vertical difference in grades between the northbound and southbound lanes without the use of retaining walls. This feature will allow the northbound lanes to be elevated above the grade of the southbound lanes in some areas, to allow northbound drivers/occupants to see the floodway area more readily.

Alternative 3A follows the riverside edge of the east floodway levee south-east to the DART light rail Bridge, a total distance of 5.6 miles. The alignment then crosses the levee and follows the landside of the future USACE DFE east levee extension (Lamar Levee) to IH-45, where it passes under the mainlanes of the Interstate. The route then turns east, passes over Lamar Street, and follows Starks Street to the US-175/SH-310 interchange.

Figure 2-8 shows a computer-generated rendering of Alternative 3A, **Figure 2-9** shows the typical design section, and **Figure 2-10** shows a route map of the alignment. **Plate 2-3** at the end of this chapter provides the schematic plan.

FIGURE 2-8. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 3A COMBINED PARKWAY – ORIGINAL

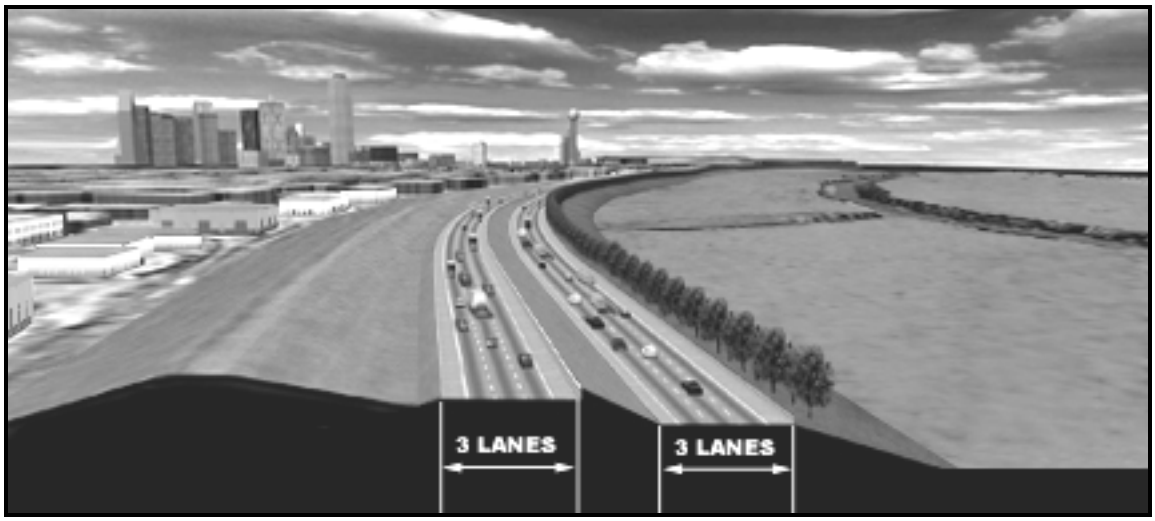
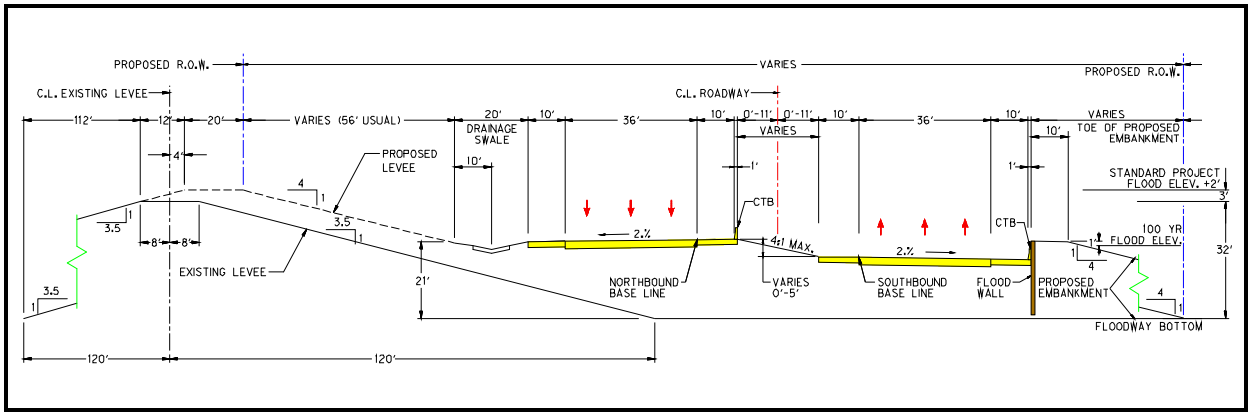


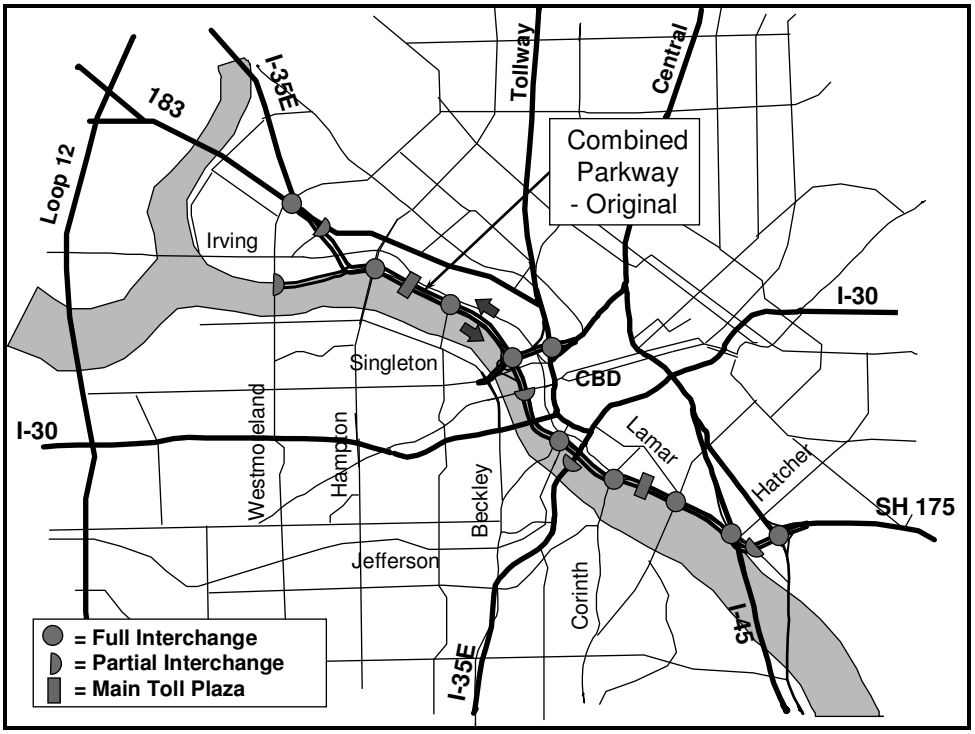
FIGURE 2-9. ALTERNATIVE 3A - COMBINED PARKWAY (ORIGINAL) TYPICAL SECTION



Notes:

1. There are typically three main lanes of travel in each direction (six lanes total). Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps.
2. Flood elevations, levee heights, and slopes vary. Those used in the section are typical.
3. Modifications and improvements to existing levees are to be performed by others.

FIGURE 2-10. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 3A



The proposed tollway main-lanes are each 12 feet in width. There are typically three lanes in each direction of travel (six lanes total). The proposed right-of-way varies depending on the need for ramps, the locations of toll plazas and ancillary buildings and other geometric considerations. In the floodway segment, the width is typically 332 feet, which is measured from the crest of the levee to the toe of the tollway embankment (note that this width includes some levee slopes, which may ultimately be the responsibility of the city or USACE, rather than NTTA). In long segments on structure, the right-of-way width is typically 180 feet. Additional width is required at toll plazas, ancillary buildings, and may be required at other locations due to geometric considerations. Paved shoulders are provided adjacent to the inside and outside lanes. The center median is typically protected on both sides by a standard concrete traffic barrier. In the segment near downtown Dallas, the inside shoulders are reduced below the standard width of 10 feet in order to clear existing piers of the historic bridges – Continental, Commerce, Corinth and Houston (see **Section 3.3.1 Cultural Resources** regarding historic bridge issues). **Plate 2-3** at the end of this chapter provides a detail of the segment with reduced inside shoulders.

Alternative 3A is approximately 8.67 miles in length, requires approximately 394 acres of right-of-way, and would cost approximately $668 million to construct. Other major improvements associated with Alternative 3A include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Extension, and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff, Houston/Jefferson Streets, Corinth Street, MLK, and Lamar Street/SH-310;
- Half diamond interchanges at Commonwealth, Westmoreland/Mockingbird, and Commerce Street; and
- Floodwall protection at major Bridge underpasses, which include Hampton/Inwood Road, Wycliff/Sylvan Street, Woodall Rodgers Extension, UP Railroad Bridge, IH-30, IH-35E, Corinth Street, and DART Bridge.

2.3.6 Alternative 3B (Combined Parkway – Modified)

The original Combined Parkway (Alternative 3A) was presented in concept in the July 1999 scoping meeting for the Trinity Parkway DEIS, and was developed during the early stages of preparation of this DEIS. Alternative 3B (Combined Parkway-Modified) was added to the list of DEIS build alternatives at the request of the City of Dallas in the fall of 2003. The alternative was developed as part of a yearlong planning study of the Trinity River corridor initiated by the City of Dallas Mayor Laura Miller and former Dallas County Judge Lee Jackson. The study is published in the report *A Balanced Vision Plan for the Trinity River Corridor* (City of Dallas, 2003). Alternative 3B is a variant of the original Combined Parkway, and is distinguished by geometric changes primarily deletion and modification of ramps, in the general area of downtown Dallas and proposed City of Dallas floodway lakes (see **Section 1.11.4**). The city has requested that Alternative 3B be included in the DEIS due to its reduced ramp intrusion in the floodway area compared to Alternative 3A, and its revision of the parkway tolling plan to exclude any main toll plazas from the floodway.

From the IH-35E/SH-183 interchange, Alternative 3B travels south-west, passing over Commonwealth Boulevard and Irving Boulevard, reaching the Dallas Floodway in the area west of Hampton/Inwood Road. The alignment then turns south along the riverside of the east floodway levee. In the floodway segment, the tollway is placed on an earthen embankment, set typically about 2 feet above the 100-year flood level to provide appropriate protection of the road against inundation. However, at points where the alignment meets existing bridge crossings of the floodway, the tollway is depressed to pass under the existing structures. At these locations, a floodwall along the riverside of the tollway is provided to protect the roadway from inundation during a 100-year flood event. Additionally, pump stations are provided to drain the low points of the road at times that the Trinity River is in flood stage. The proposed roadway embankment is offset sufficiently from the face of the existing levee so that a proposed raising of the levee tops (under consideration by the City of Dallas and USACE) can be constructed without the need for retaining walls. The median of the roadway is of sufficient width to allow up to 5 feet of vertical difference in grades between the northbound and southbound lanes without the use of retaining walls.

This feature will allow the northbound lanes to be elevated above the grade of the southbound lanes in some areas, to allow northbound drives/occupants to see the floodway area more readily.

Alternative 3B follows the riverside edge of the east floodway levee southeast to the DART light rail bridge, a total distance of 5.6 miles. The alignment then crosses the levee and follows the landside of the future USACE DFE east levee extension (Lamar Levee) to IH-45, where it passes under the mainlanes of the Interstate. The route then turns east, passes over Lamar Street, and follows Starks Street to the US-175/SH-310 interchange.

Figure 2-11 shows a computer-generated rendering of Alternative 3B, **Figure 2-12** shows the typical design section, and **Figure 2-13** shows a route map of the alignment. **Plate 2-4** at the end of this chapter provides the schematic plan.

FIGURE 2-11. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 3B COMBINED PARKWAY – MODIFIED

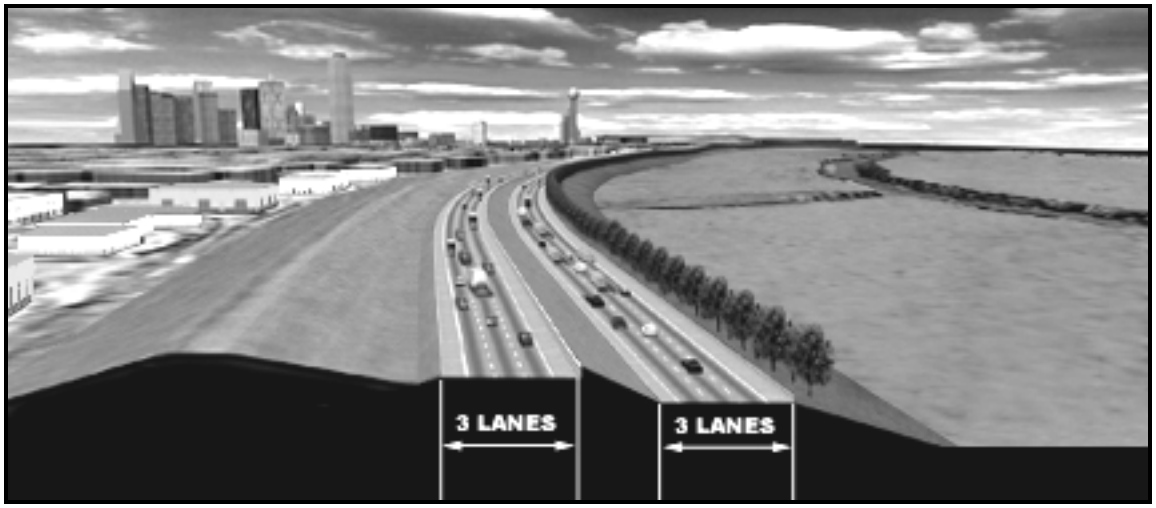
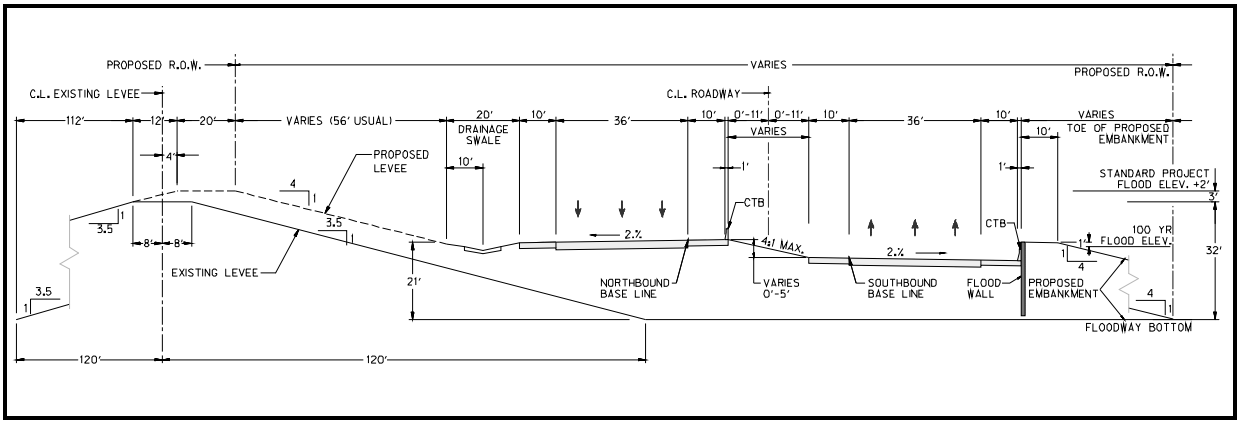


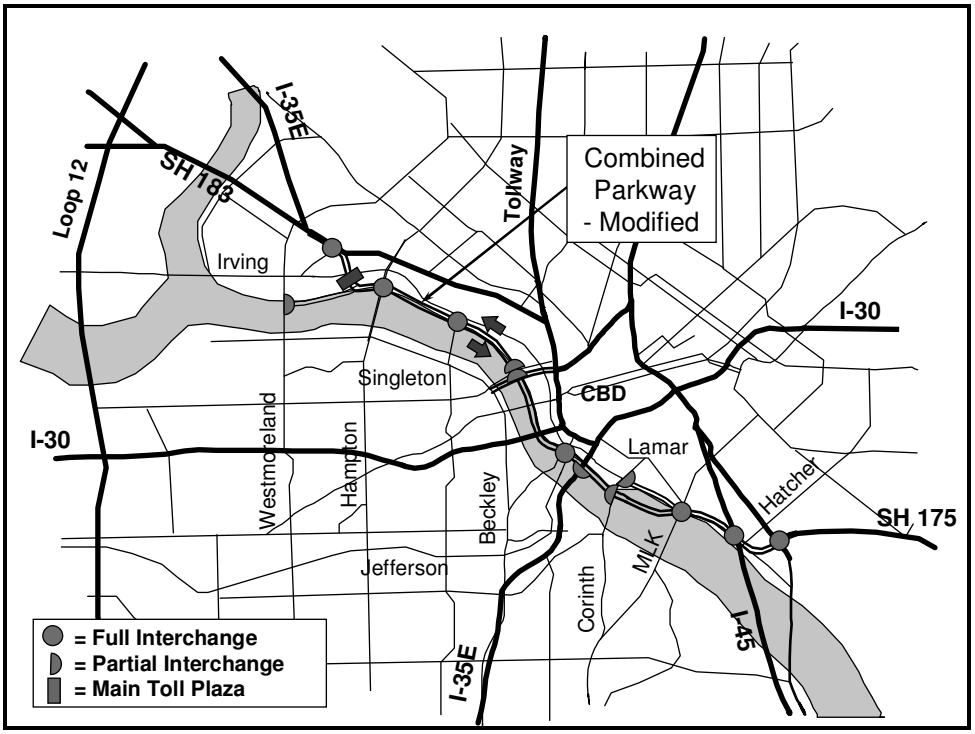
FIGURE 2-12. ALTERNATIVE 3B - COMBINED PARKWAY – (MODIFIED) TYPICAL SECTION



Notes:

1. There are typically three main lanes of travel in each direction (six lanes total). Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps.
2. Flood elevations, levee heights, and slopes vary. Those used in the section are typical.
3. Modifications and improvements to existing levees are to be performed by others.

FIGURE 2-13. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 3B



The proposed tollway mainlanes are each 12 feet in width. There are typically three lanes in each direction of travel (six lanes total). The proposed right-of-way varies depending on the need for ramps the locations of toll plazas and ancillary buildings, and other geometric considerations. In the floodway segment, the width is typically 332 feet, which is measured from the crest of the levee to the toe of the

tollway embankment (note that this width includes some levee slopes, which may ultimately be the responsibility of the city or USACE, rather than NTTA). In long segments on structure, the right-of-way width is typically 180 feet. Additional width is required at toll plazas and ancillary buildings, and may be required at other locations due to geometric considerations. Paved shoulders are provided adjacent to the inside and outside lanes. The center median is typically protected on both sides by a standard concrete traffic barrier. In the segment near downtown Dallas, the inside shoulders are reduced below the standard width of 10 feet in order to clear existing piers of the historic bridges – Continental, Commerce, Corinth, and Houston (see **Section 3.3.1 Cultural Resources** regarding historic bridge issues). **Plate 2-4** at the end of this chapter provides a detail of the segment with reduced inside shoulders.

As noted in the introductory paragraph to this **Section 2.3.6**, the tolling scheme for the parkway is modified in Alternative 3B in order to exclude main toll plazas from the Dallas Floodway. Whereas the other five build alternatives each have two main plazas (north and south), Alternative 3B is proposed to have only one (north) main plaza. Because the southern main plaza is eliminated, the toll at the northern main plaza is increased to pay for the entire parkway trip in one installment, rather than in two installments for the other alternatives. Additionally, the northern main plaza is relocated out of the floodway area to the vicinity of Irving Boulevard, where the plaza is located on structure (see **Figure 2-13**). In other alternatives, the northern plaza is located between Hampton and Sylvan Streets, and the southern main plaza is located between Corinth Street and Martin Luther King Jr. Boulevard.

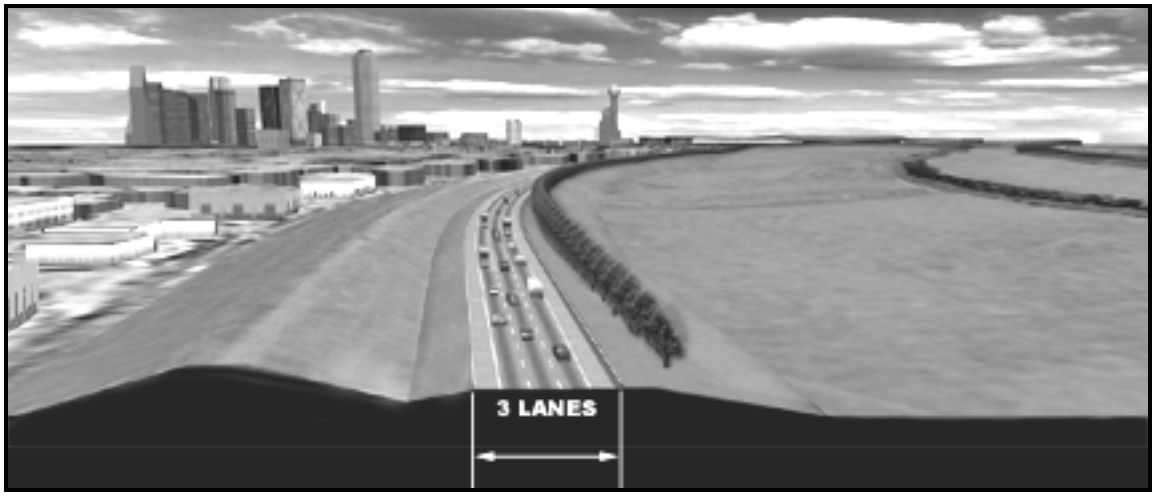
Alternative 3B is approximately 8.67 miles in length, requires approximately 396 acres of right-of-way, and would cost approximately $691 million to construct. Other major improvements associated with Alternative 3B include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Extension, (north-side only) and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff, Houston/Jefferson Streets, MLK, and Lamar Street/SH-310;
- Half diamond interchanges at Commonwealth, Westmoreland/Mockingbird, Continental and Corinth Streets;
- Direct connection to Corinth/Industrial intersection via a braided ramp pair originating in the area of MLK; and
- Floodwall protection at major bridge underpasses, which include Hampton/Inwood Road, Wycliff/Sylvan Street, Woodall Rodgers Extension, UP Railroad Bridge, IH-30, IH-35E, Corinth Street, and DART Bridge.

2.3.7 Alternative 4 (Split Parkway – Riverside)

Alternative 4 is formed by the combination of preliminary alignments TL-7a (north segment) and 5 (south segment) (see **Tables 2-3** and **2-4**), with the main-lanes modified to six lanes throughout. From the IH-35E/SH-183 interchange, this alternative travels south-west, passing over Commonwealth Boulevard and Irving Boulevard, reaching the Dallas Floodway in the area west of Hampton/Inwood Road. From this point, Alternative 4 splits, with the southbound lanes bridging across the Trinity River to the riverside face of the west levee and the northbound lanes remaining on the riverside face of the east levee. The alignment remains in a split configuration along the Dallas Floodway to a point just east of IH-35E for a total split distance of approximately 4.2 miles. **Figure 2-14** shows a computer-generated rendering of the northbound lanes of Alternative 4.

FIGURE 2-14. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 4 SPLIT PARKWAY – RIVERSIDE (ONLY NORTHBOUND LANES ARE SHOWN)



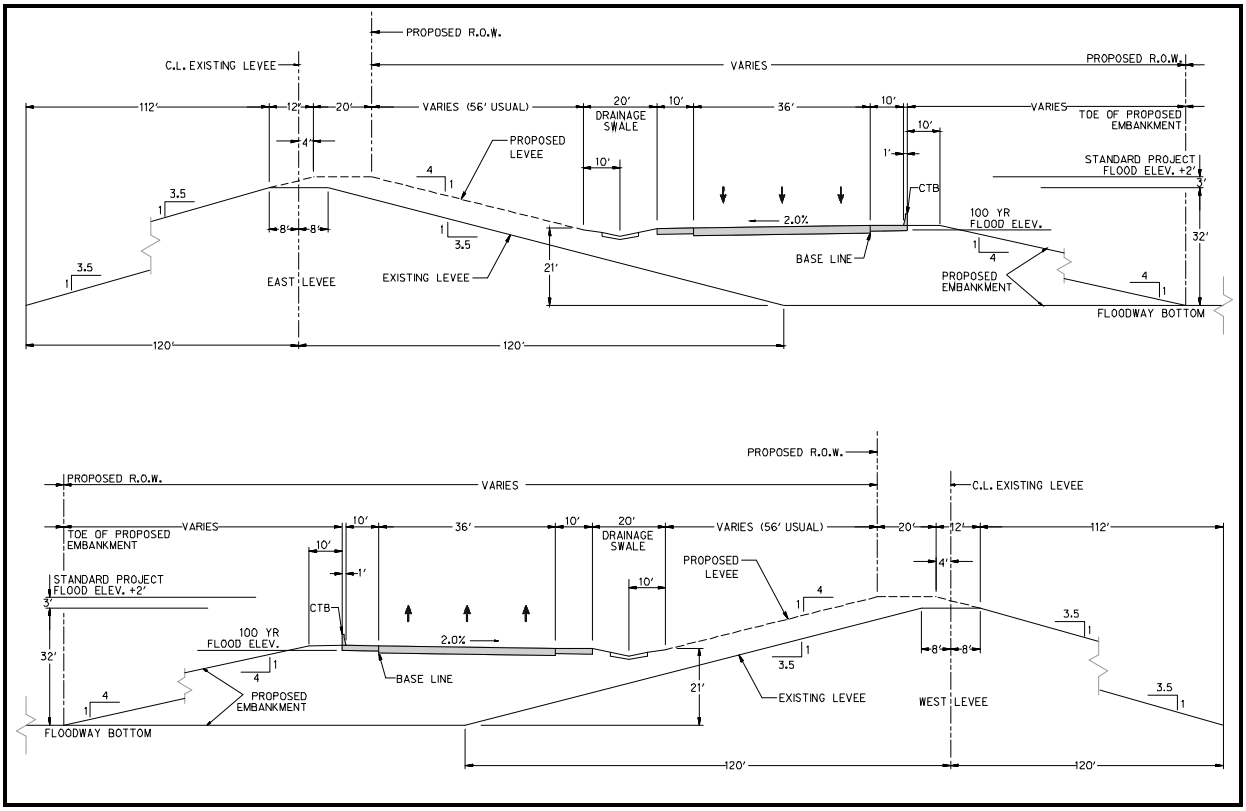
In the floodway segment, the tollway is placed on earthen embankments, set typically about 2 feet above the 100-year flood level to provide appropriate protection of the road against inundation. However, at points where the alignment meets existing bridge crossings of the floodway, the tollway is depressed to underpass the existing structures. At these locations, a floodwall along the riverside of the tollway is provided to protect the roadway from inundation during a 100-year flood event. Additionally, pump stations are provided to drain the low points of the road at times that the Trinity River is in flood stage. The proposed roadway embankment is offset sufficiently from the face of the existing levee so that a proposed raising of the levee tops (under consideration by the City of Dallas and USACE) can be constructed without the need for retaining walls.

As stated above, the split configuration ends at a point east of IH-35E. The roadway then transitions back to a combined configuration with the southbound lanes crossing from the west levee to the east on a

bridge structure. The joining of the southbound and northbound lanes occurs on the east levee near Corinth Street. East of Corinth Street, Alternative 4 follows the identical route to the US-175/SH-310 interchange as described for Alternatives 3A and 3B.

Figure 2-15 shows the typical design cross-section, and **Figure 2-16** shows a route map of the alignment. **Plate 2-5** at the end of this chapter provides the schematic plan.

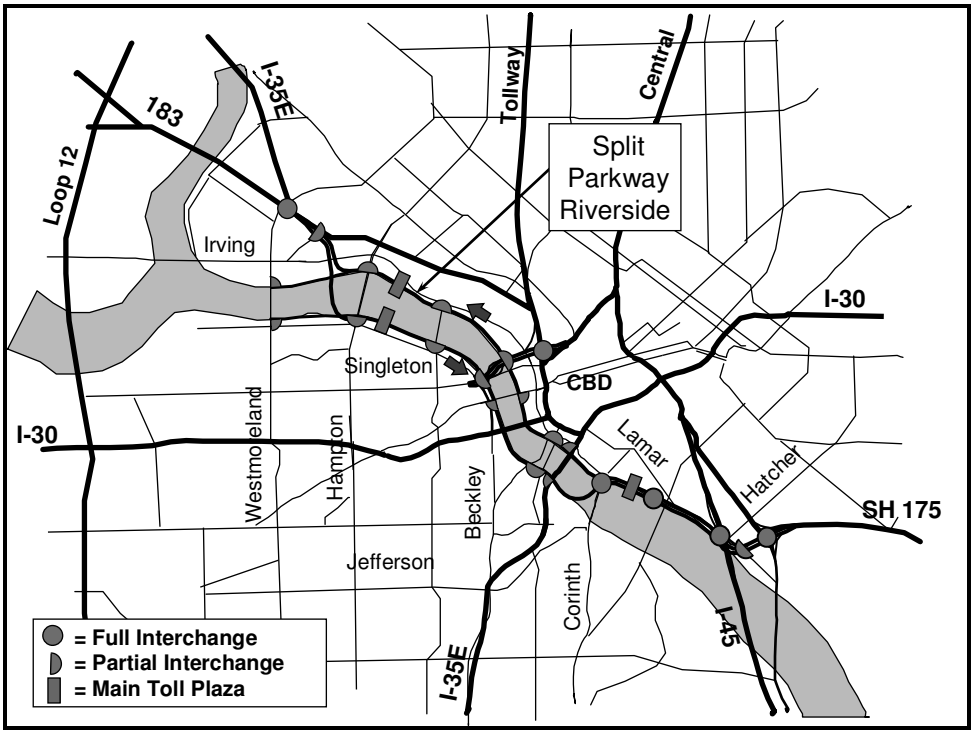
FIGURE 2-15. ALTERNATIVE 4 – SPLIT PARKWAY RIVERSIDE TYPICAL SECTION



Notes:

1. The Typical Section shows the east levee only. There are typically three lanes of travel in each direction (six lanes total) with the northbound lanes adjacent to the east levee and the southbound lanes adjacent to the west levee. Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps. The west levee section is similar to the east levee section.
2. Flood elevations, levee heights, and slopes vary. Those used in the section are typical.
3. Modifications and improvements to existing levees are to be performed by others.

FIGURE 2-16. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 4



The proposed tollway mainlanes are each 12 feet in width. There are typically three lanes in each direction of travel (six lanes total). The proposed right-of-way varies depending on the need for ramps, the locations of toll plazas and ancillary buildings and other geometric considerations. In the floodway segment, the width is typically 246 feet for each direction of travel (492 feet total), measured from the crest of each levee to the toe of the tollway embankment (note that the width includes some levee slopes, which may ultimately be the responsibility of the City of Dallas or USACE, rather than NTTA). In long segments on structure, the right-of-way width is typically 180 feet for a dual-direction roadway and 100 feet (per direction) for a single-direction roadway. Additional width is required at toll plazas and ancillary buildings, and may be required at other locations due to geometric considerations. A standard concrete traffic barrier separates northbound and southbound traffic in areas of opposing traffic. Paved shoulders are provided adjacent to the inside and outside lanes. In split segments, the center median area is protected by a standard concrete traffic barrier. Additionally, in split segments, a 20-foot drainage swale is located on the levee side of the roadway.

Alternative 4 is approximately 8.84 miles in length, requires approximately 498 acres of right-of-way, and would cost approximately $726 million to construct. Other major improvements associated with Alternative 4 include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Extension, and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff Street, Houston/Jefferson Streets, Corinth Street, MLK, and Lamar/SH-310;
- Half diamond interchanges at Commonwealth, Westmoreland/Mockingbird, and Commerce Street; and
- Floodwall protection at major bridge underpasses, which include Hampton/Inwood Road, Wycliff/Sylvan, Woodall Rodgers Extension, UP Railroad Bridge, IH-30, IH-35E, Corinth Street, and the DART Bridge.

2.3.8 Alternative 5 (Split Parkway – Landside)

Alternative 5 is formed by the combination of preliminary alignments TL-7c (north segment) and 5 (south segment) (see **Tables 2-3** and **2-4**), with the main-lanes modified to six lanes throughout. This alternative is a split configuration, much like Alternative 4, with its route very similar to Alternative 4 with the exception of being located on the landside of the river levees. The landside location has two notable effects on the roadway installation:

1. The embankment has to be installed with retaining walls along much of its landside edge to avoid spillover of fill material into the adjacent drainage sumps; and
2. The effects on local arterial streets are more pronounced, requiring rebuilding and raising of substantial lengths of these streets at points of crossing.

Figure 2-17 shows a computer-generated rendering of Alternative 5.

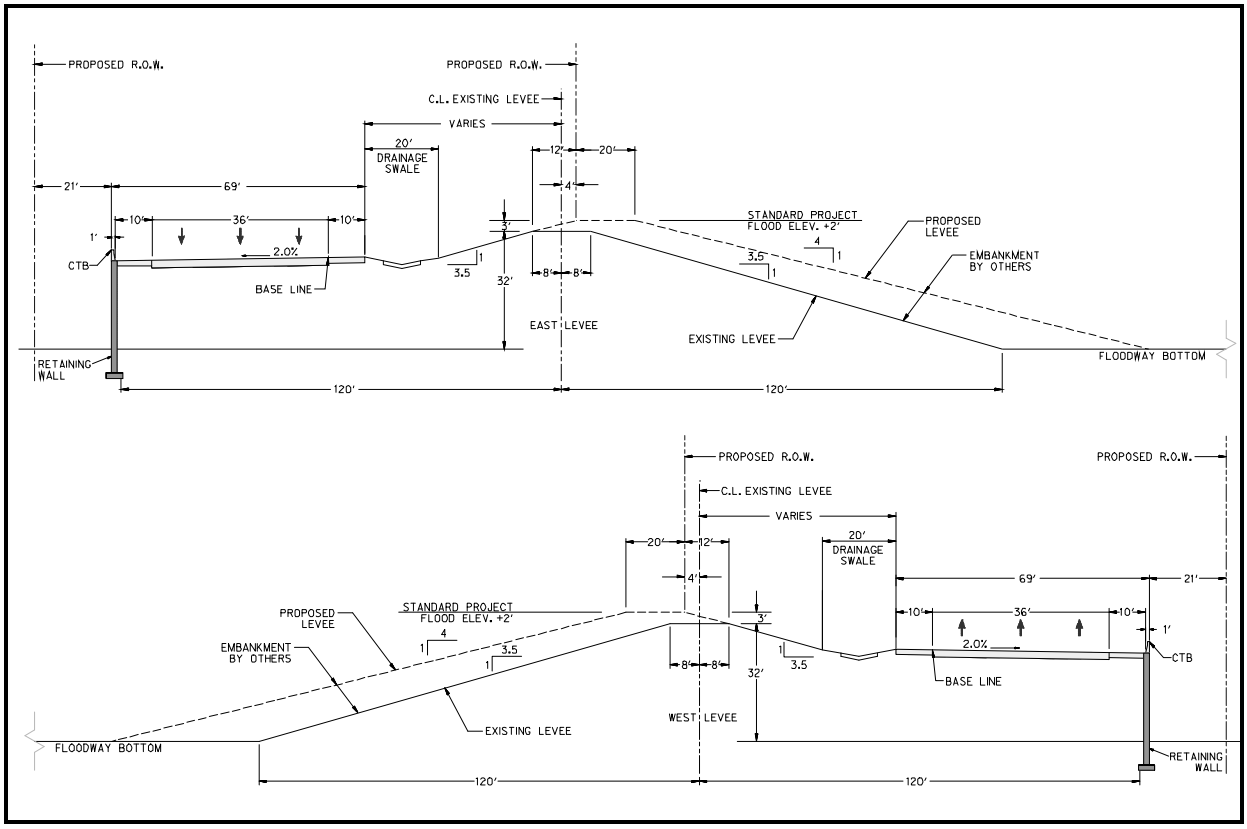
FIGURE 2-17. COMPUTER RENDERING, TRINITY PARKWAY ALTERNATIVE 5 SPLIT PARKWAY – LANDSIDE (ONLY NORTHBOUND LANES ARE SHOWN)

In the floodway segment, the tollway is placed on earthen embankments and walls set against the landside of the east and west floodway levees. This avoids the effect of inundation from the floodway, but requires the road to be designed for the normal drainage conditions in the levee-protected zones. At points where the alignment meets existing arterial roadways, the tollway is generally depressed to underpass the existing road, but at the same time the arterial must be raised, affecting adjacent property, and a bridge opening created to allow a grade separation.

Similar to Alternatives 3A, 3B, and 4, the split configuration ends east of IH-35E. The roadway then transitions back to a combined configuration with the southbound lanes crossing from the west levee to the east on a bridge structure. The joining of the southbound and northbound lanes occurs on the east levee near Corinth Street. East of Corinth Street, Alternative 5 follows the identical route to the US-175/SH-310 interchange as described for Alternatives 3A, 3B, and 4.

Figure 2-18 shows the typical design cross-section, and **Figure 2-19** shows a route map of the alignment. **Plate 2-6** at the end of this chapter provides the schematic plan.

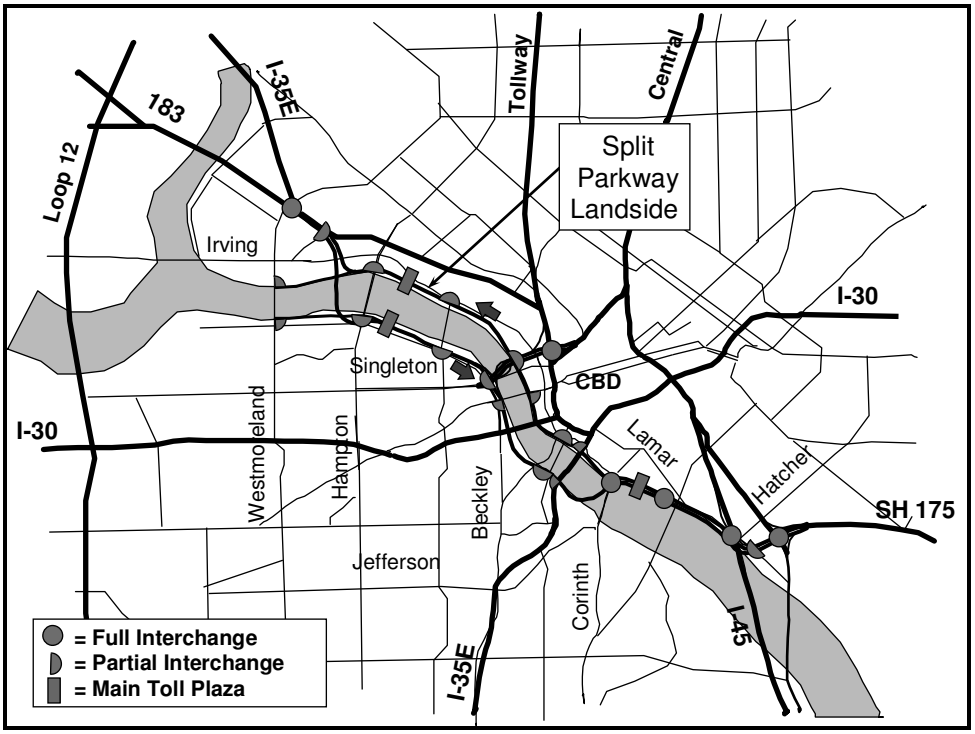
FIGURE 2-18. ALTERNATIVE 5 - SPLIT PARKWAY - LANDSIDE TYPICAL SECTION



Notes:

1. The Typical Section shows the east levee only. There are typically three lanes of travel in each direction (six lanes total) with the northbound lanes adjacent to the east levee and the southbound lanes adjacent to the west levee. Auxiliary lanes may be added in some segments, where required to properly accommodate merging areas between ramps. The west levee section is similar to the east levee section.
2. Flood elevations, levee heights, and slopes vary. Those used in the section are typical.
3. Modifications and improvements to existing levees are to be performed by others.

FIGURE 2-19. LAYOUT MAP, TRINITY PARKWAY ALTERNATIVE 5



The proposed tollway mainlanes are each 12 feet in width. There are typically three lanes in each direction (six lanes total). The proposed right-of-way varies depending on the need for ramps, the locations of toll plazas and ancillary buildings and other geometric considerations. In the floodway segment, the width is typically 150 feet for each direction of travel (300 feet total), measured from the crest of each levee to a distance outside the toe of the retaining wall (note that this width includes some levee slopes, which ultimately may be the responsibility of the City of Dallas or USACE, rather than NTTA). In long segments on structure, the right-of-way width is typically 180 feet for a dual-direction roadway and 110 feet (per direction) for a single direction roadway. Additional width is required at toll plazas and may be required at other locations due to geometric considerations. A standard concrete traffic barrier separates northbound and southbound traffic, and paved shoulders are provided adjacent to the inside and outside lanes. In split segments, both sides of the road are protected by a standard concrete traffic barrier.

Alternative 5 is approximately 8.90 miles in length, requires approximately 397 acres of right-of-way, and would cost approximately $919 million to construct. Other major improvements associated with Alternative 5 include:

- Direct connections at IH-35E/SH-183 (north terminus), US-175/SH-310 (south terminus), Woodall Rodgers Extension, and IH-45;
- Full diamond interchanges at Hampton/Inwood Road, Sylvan/Wycliff Street, Houston/Jefferson Streets, Corinth Street, MLK, and Lamar Street/SH-310; and
- Half diamond interchanges at Commonwealth, Westmoreland/Mockingbird, and Commerce Street.

2.3.9 Access to IH-35E (South R.L. Thornton Freeway) and US-175 (CF Hawn Freeway)

IH-35E (South R.L. Thornton Freeway)

As previously described in **Section 2.3 Description of the DEIS Alternatives**, a design option involving access to IH-35E (South R.L. Thornton Freeway) was considered for each of the Trinity Parkway build alternatives. As part of their 1997 resolution of endorsement for the TPC MTIS, the Dallas City Council requested that access to IH-35E be considered during the DEIS (Dallas City Council Resolution No. 972918, dated September 10, 1997). This request was also made during the scoping phase for the DEIS, notably by representatives of the Oak Cliff (West Dallas) community and towns/cities in the south-west portion of Dallas County, such as Duncanville and Cedar Hill. This issue had been partially addressed during the TPC MTIS, in which design options were developed to fully connect IH-30 and IH-35E via the Trinity Parkway. The consensus at the time was that direct connections should be provided in the Mixmaster area and via the Trinity Parkway. Full multi-directional connections could not practically be provided at both locations because of geometric and cost considerations as well as potential adverse visual, socioeconomic, and environmental impacts.

The IH-35E interchange poses design and operational challenges for all of the build alternatives. As part of the IH-35E access studies for the DEIS, it was determined that connecting ramps were not feasible for Alternatives 2A and 2B because of geometric constraints. For Alternatives 3A, 3B, 4, and 5, eastbound-to-southbound and northbound-to-westbound connections to IH-35E from the Trinity Parkway were determined to be feasible. Several different ramp options were considered for these connections. Due to geometric constraints and concerns about visual impacts in the floodway area, the ramp layouts at IH-35E are of lower capacity than directional flyovers, which might otherwise be expected for freeway-to-freeway movements. The northbound-to-westbound connection comprises a loop ramp or u-turn located at the north end of the IH-35E bridge across the floodway. The eastbound-to-southbound movement is provided at the Houston/Jefferson Street viaducts, with a southbound ramp connecting to the IH-35E frontage road at Colorado Boulevard. The various ramp options and their application are summarized in **Table 2-5** and are shown on **Plate 2-10** at the end of this chapter.

TABLE 2-5. RAMP OPTIONS AT IH-35E (SOUTH R.L. THORNTON FREEWAY)

Ramp Option	Traffic Movement	Applies to Alternatives:	Comments
Option 1	EB-SB	3A, 3B	Utilizes the Houston Street Viaduct to cross the Dallas Floodway. The Option 1 ramp at the south levee underpasses Jefferson Street and overpasses Colorado Boulevard providing free-flow movement to IH-35E.
Option 2	EB-SB	3A, 3B	Utilizes the Houston Street Viaduct to cross the Dallas Floodway. Provides signalized intersections at south levee ramp, crossing Houston Street and Jefferson Street at-grade. Compatible with City of Dallas proposed "Terrace Road" (levee top) to west. Overpasses Colorado Boulevard.
Option 3	EB-SB	4, 5	Provides signalized intersections at south levee, crossing Houston Street and Jefferson Street at-grade. Overpasses Colorado Boulevard.
Option 4	EB-SB	4, 5	Similar to Option 3, but with an additional bypass ramp under Houston Street and Jefferson Street to provide free-flow movement to IH-35E. This bypass ramp could be added to Option 3 as a future stage.
Option 5	NB-WB	3A, 3B, 4, 5	Provides the NB-WB movement at an exit to Industrial Boulevard located on the north side of the Dallas Floodway. NB-WB traffic is routed through a u-turn lane under the IH-35 bridges. Traffic then continues westward on a ramp under the Houston Street and Jefferson Street Viaducts.
Option 6	NB-WB	3A, 3B, 4, 5	Similar to Option 5, but NB-WB traffic exits to the right of the Industrial Boulevard exit ramp and uses a higher-capacity loop ramp in lieu of the u-turn lane.
Note: NB = northbound; **SB** = southbound; **EB** = eastbound; **WB** = westbound			

US-175 (CF Hawn Freeway)

All of the Trinity Parkway build alternatives directly connect to US-175 (CF Hawn Freeway) at the southern terminus (US-175/SH-310). **Plate 2-11** shows two optional ramp configurations at this terminus. Option 1 shows diamond ramps in the vicinity of Bexar Street providing access to and from Lamar Street. Option 2 shows a reversal of these ramps, focusing access to and from Bexar Street. All of the schematic plans for the build alternatives show a ramping scheme similar to Option 1(see **Plates 2-1** through **2-6**). Option 2 is a result of citizen input in the southern terminus area and can be applied to all build alternatives. The Option 2 layout also adds a set of "Texas U-Turn" lanes at the SM Wright Freeway overpass, as requested by citizens to enhance local access and circulation.

In addition to the proposed interchange connection at IH-35E, each of the Trinity Parkway build alternatives include proposed interchange connections with other major freeways and arterials in the study area. Interchanges were provided at strategic locations along the mainlanes of each build alternative. Criteria for location selection of interchanges includes characteristics such as functional classification of the intersecting roadway; traffic volumes along the intersecting roadway; and linkage with communities, recreational areas, employment areas, and potential economic development areas. **Table 2-6** provides a comparison of interchange access points proposed for each of the alternatives considered.

TABLE 2-6. INTERCHANGE ACCESS COMPARISON

Interchange Location	Trinity Parkway Alternatives						
	1 (No-Build)	2A	2B	3A	3B	4	5
At IH-35E/SH-183	---	Direct Connection via Ramps	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Commonwealth	---	None	None	Half Diamond Interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At Westmoreland/ Mockingbird	---	None	None	Half Diamond Interchange	Same as Alt 3A	Same as Alt. 3A	Same as Alt. 3A
At Hampton/Inwood	---	Full Diamond Interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt 2A	Same as Alt. 2A	Same as Alt. 2A
At Wycliff/Sylvan	---	Full Diamond Interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt 2A	Same as Alt. 2A	Same as Alt. 2A
At Continental	---	None	None	Half Diamond Interchange	Half Diamond Exchange	Half Diamond Interchange	None
At Woodall Rodgers	---	Direct Connections SB-EB, WB-NB, NB-EB, and WB-SB	Same as Alt. 2A	Same as Alt. 2A	Direct Connections SB-EB and WB-EB	Same as Alt. 2A	Same as Alt. 2A
At Commerce	---	None	None	Half Diamond Interchange	None	Same as Alt. 3A	Same as Alt. 3A
At Houston/Jefferson	---	Half Diamond Interchange	None	Full Diamond Interchange	Same as Alt. 3a	Same as Alt. 3A	Same as Alt. 3A
At IH-35E	---	None	None	NB-WB and EB-SB Connection via Ramps	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At Corinth	---	Full Diamond Interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At MLK	---	Full Diamond Interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At IH-45	---	Direct Connection via ramps	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At Lamar	---	None	None	Half Diamond Interchange	Same as Alt. 3A	Same as Alt. 3A	Same as Alt. 3A
At SH-310	---	Half Diamond Interchange	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A
At US-175	---	Direct Main-Lane Connection	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A	Same as Alt. 2A

2.3.10 Comparison of Alternatives

Table 2-7 provides a comparison of the total length, right-of-way requirements, and cost estimates for each of the alternatives considered. The construction and right-of-way cost estimates for each build alternative are shown in more detail in **Chapter 6 Financial Analysis and Evaluation**. **Chapter 6** provides a useful reference for readers needing additional information on the cost estimates and cost participation by involved agencies. Estimates are based on full build-out of each alternative. The proposed tollway costs include right-of-way acquisition, environmental mitigation, construction, 20 percent contingencies, toll facilities, park access improvements, IH-35E access, design, testing, and inspection. The costs exclude approximately $50 million in anticipated cost shares from other agencies to reconstruct the Sylvan Street Bridge, Commerce/Beckley Bridges, IH-35E Bridges, and to raise the floodway levees.

TABLE 2-7. TOTAL LENGTH, RIGHT-OF-WAY, AND ESTIMATED COSTS

Trinity Parkway Alternative	Length (Miles)	Estimated Right-of-Way (Acres)	Estimated Right-of-Way Cost	Estimated Construction Cost	Estimated Total Cost
1 (No-Build)	---	---	---	---	---
2A	8.83	252.1	$224 M	$1,099 M	$1,323 M
2B	8.83	342.3	$182 M	$770 M	$952 M
3A	8.67	393.1	$42 M	$626 M	$668 M
3B	8.67	393.5	$51 M	$640 M	$691 M
4	8.84	495.2	$50 M	$676 M	$726 M
5	8.90	393.6	$55 M	$864 M	$919 M
Note: All costs shown in 2003 dollars, rounded to millions (M). Project costs are expected to increase in future years due to inflation.					

2.3.11 Identification of Preferred Alternative

As previously mentioned in **Section 2.0 Introduction**, all alternatives presented and evaluated in this DEIS will remain under consideration through the project's public hearing and DEIS review/comment period. NTTA will identify a locally-preferred alternative after evaluating all comments received from the public hearing and availability of the DEIS for public and agency review. The locally-preferred alternative will be identified in subsequent NEPA documentation. An alternative recommendation will be made in the FEIS (see **Chapter 1 Purpose and Need for Action**).

2.3.12 Right-of-Way Considerations

As indicated in **Table 2-7**, the estimated right-of-way requirements for the Trinity Parkway build alternatives range from 252.1 acres for Alternative 2A to 495.2 acres for Alternative 4. The majority of new right-of-way required for Alternatives 2A and 2B would be acquired from commercial/light-industrial

properties and residential properties. In comparison, the majority of new right-of-way required for Alternatives 3A, 3B, 4, and 5 would be acquired from publicly owned land located within, and immediately adjacent to, the Dallas Floodway. Currently, this property is owned and maintained by the City of Dallas.

Depending on the preferred alternative identified, the City of Dallas may donate the necessary right-of-way for the Trinity Parkway from this property. However, as previously mentioned, the NTTA would not make a decision on the identification of a preferred alternative until after the engineering and environmental studies have been finalized and all public/agency comments have been evaluated.

2.3.13 Traffic Modeling – Toll Based

Figure 2-20 shows the estimated 2025 average weekday volumes for Alternatives 2A and 2B (Irving/Industrial Boulevard routes). **Figure 2-21** shows the estimated 2025 average weekday volumes for Alternatives 3A, 4, and 5 (river routes). **Figure 2-22** shows the estimated 2025 average weekday volumes for Alternative 3B (Combined Parkway – Modified). The traffic modeling is provided by the NCTCOG and assumes a toll rate of around twelve cents per mile, a rate commensurate with other toll roads in the NTTA system. The modeled traffic volumes are therefore discounted to some extent from "toll-free" (tax supported) road volumes to account for the sensitivity of individual drivers to paying a toll.

FIGURE 2-20. ESTIMATED 2025 AVERAGE WEEKDAY VOLUMES – ALTERNATIVES 2A, 2B

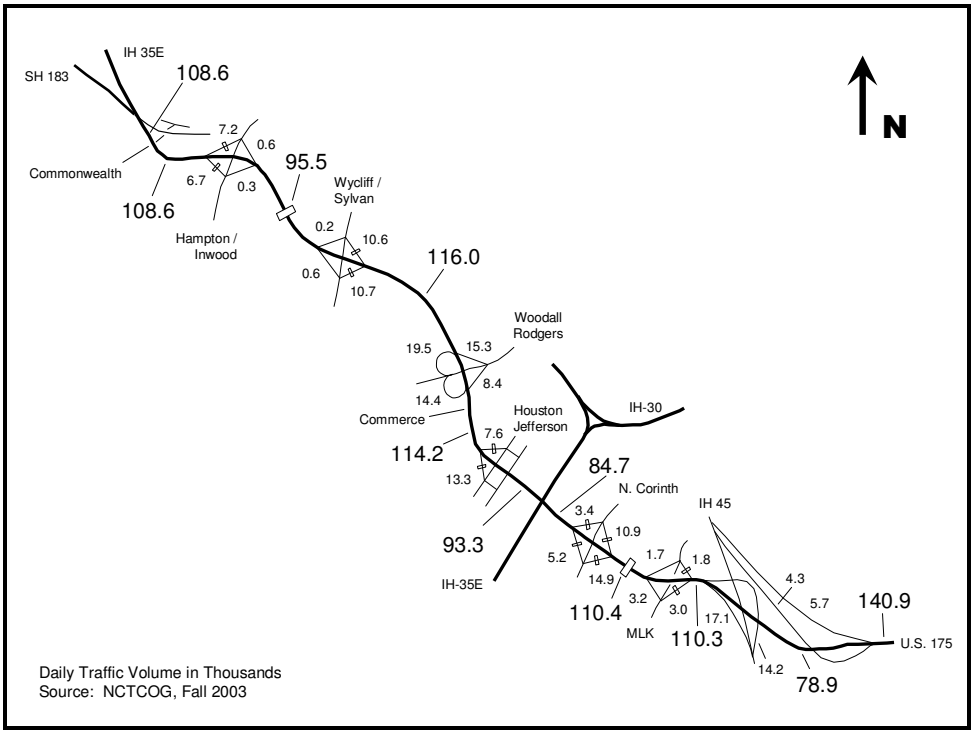


FIGURE 2-21. ESTIMATED 2025 AVERAGE WEEKDAY VOLUMES – ALTERNATIVES 3A, 4, AND 5

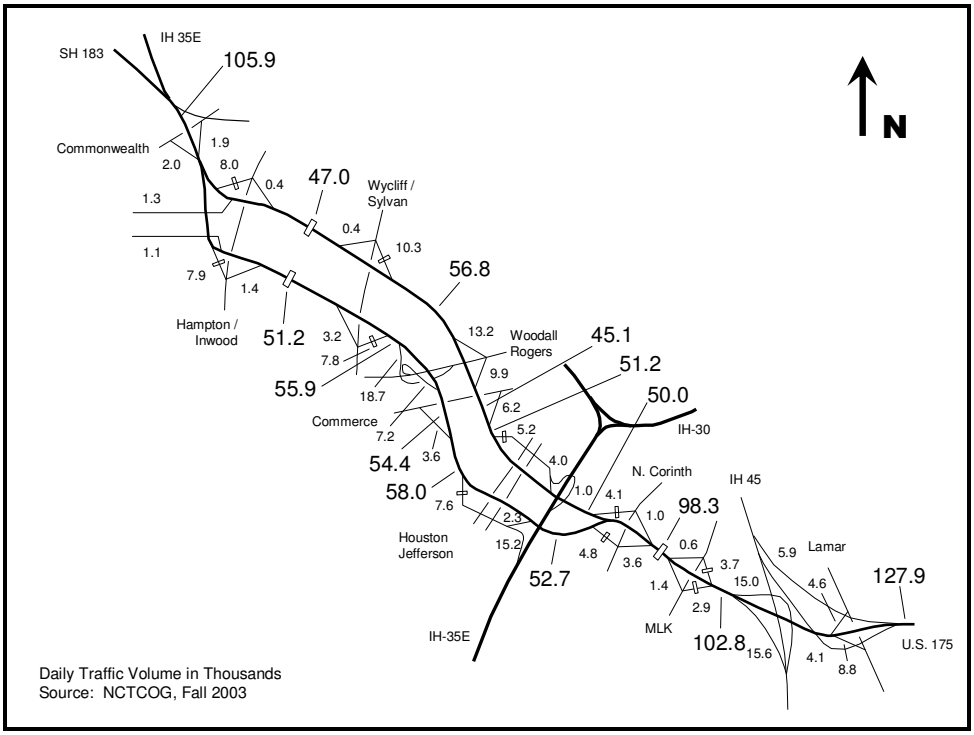
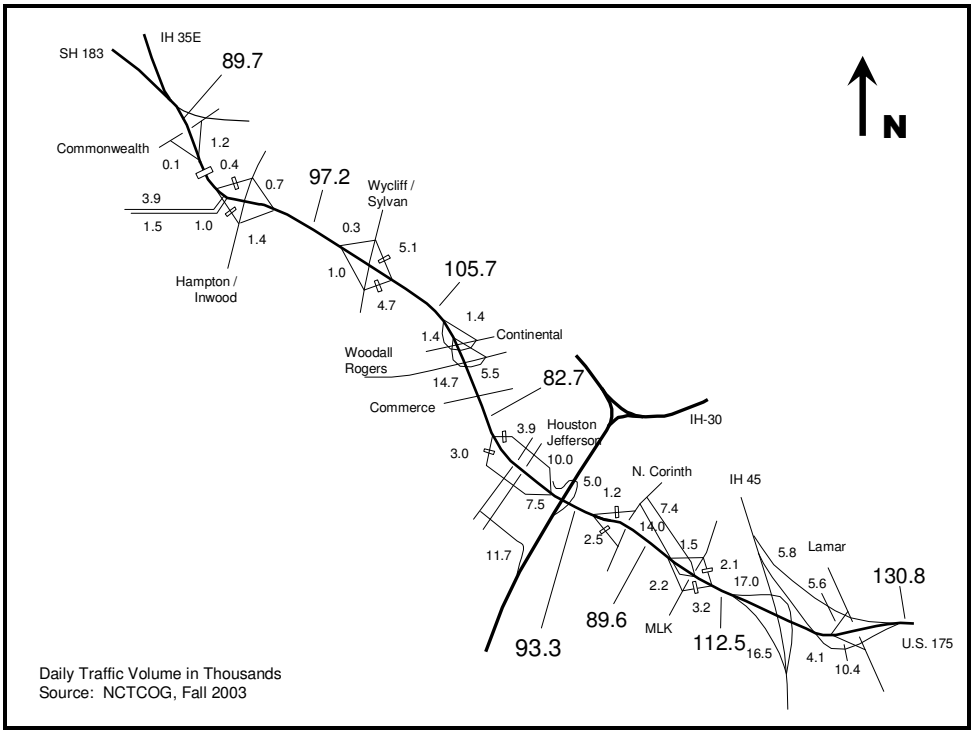


FIGURE 2-22. ESTIMATED 2025 AVERAGE WEEKDAY VOLUMES – ALTERNATIVE 3B



Figures 2-20, 2-21, and **2-22** show some differences in traffic volumes between the roadway alternatives, but these differences do not appear substantial enough to draw trends. There appear to be some localized effects due to access points and tolls, but, overall, the traffic numbers are fairly consistent between alternatives. Additional details are provided in **Section 4.4 Transportation Impacts** of this DEIS.

2.4 OTHER DESIGN CONSIDERATIONS

The following sections provide a summary of other design considerations that apply to some or all of the Trinity Parkway build alternatives. These considerations generally apply to the project purpose, "Provide Compatibility with Local Development Plans," stated in **Section 1.7**.

2.4.1 Access to Trinity Floodway Parks

As stated in **Section 1.11.4**, the City of Dallas has proposed an extensive development of recreational facilities and lakes in the Dallas Floodway. This proposal is variously affected by the build alternatives under consideration. A detailed description of the existing and planned parks and recreational areas potentially affected by the Trinity Parkway build alternatives is provided in **Chapter 3 Affected Environment**. The potential impacts to parks and recreational areas resulting from the Trinity Parkway build alternatives are described in **Chapter 4 Environmental Consequences**.

2.4.2 Design Speed and Park Access

The design concept adopted in the TxDOT TPC MTIS (based on a tax-supported road) was a low-speed parkway, with a design speed of 50 mph and a posted speed limit of 45 mph. The toll-supported version of the road considered in this DEIS is proposed to have a higher design speed of 60 mph and a posted speed limit of 55 mph. The speeds are proposed to be raised to generate more attractive time savings on the tollway versus the other available thoroughfares and freeways in the corridor. Time-saving is a value-added benefit of a toll facility and is a major consideration in a driver's decision to pay for a trip on a toll road. The change in speed is considered a prerequisite to consideration of this facility as a toll road.

An impact of the increase in speed on the tollway is the removal of left exits, which were previously discussed in the TPC MTIS as possible access routes to the Trinity Park (The TPC MTIS discussed these exits only in relation to alternative TL-7a, which was the original version of the Split Parkway Riverside). Permanent left exits are not appropriate on a high-speed facility, and therefore they have been replaced with access points from adjacent arterial streets. Typical access point locations are shown on **Plate 2-7**.

2.4.3 Federal Approval for Access to Interstate System

FHWA approval is required for any new access points to the interstate system (23 USC § 111). The NTTA will submit appropriate documentation to FHWA to request access points for interchange locations. This action is taken during the subsequent schematic design development phase after the preferred alternative has been identified.

2.4.4 Access Roads

In most areas, the Trinity Parkway would be constructed as mainlanes only without access roads. Access to the mainlanes would be controlled, meaning that vehicles may enter and exit the roadway only at designated on- and off-ramps. However, in certain areas the location of the roadway right-of-way may sever access to particular parcels of land, leaving no other means of property access. In these instances, access roads may be constructed to restore property access, or, otherwise, the affected property may be acquired or the affected property owner compensated. The locations of access roads for the build alternatives are included on the schematic plans at the end of this chapter. Access (frontage) roads are used extensively in Alternative 2B to restore access from Irving and Industrial Boulevards. Use of access roads on the other alternatives is limited.

2.4.5 Accommodation of Bicycle Facilities

Section 3.3.2.3 provides a listing of bicycle trails proposed in the corridor, including trails identified by the City of Dallas and/or listed in the current *2004-2006 TIP*. The corridor contains a number of proposed major trails, most of which are located off-road, on locations such as the Floodway levees, drainage sumps, and existing rail rights of way. The proposed tollroad would make allowance for suitable crossings for these bicycle facilities, under or over the roadway at appropriate crossing points. In the event that a bicycle facility is in place prior to the construction of the tollroad, the bicycle facility would be suitably reconstructed in the area of the tollroad to maintain its continuity and function. It is not anticipated that bicycle traffic would be accommodated on the outside lanes of access roads of the tollroad.

2.5 TOLLROAD IMPLEMENTATION ISSUES

The following sections describe issues associated with the proposal to fund the proposed Trinity Parkway as a toll road. It should be noted that the financial plan for the facility has not been developed in final detail at this time. The exact contribution of revenue bonds to the total cost of the project would be developed by NTTA at a future date, after the preferred alternative is identified and a ROD is issued by

the FHWA. The bond contribution would also be based on an Investment Grade Traffic Study, as well as the advice of bond counsels and other professionals retained by the NTTA in regard to raising funds by a public offering. It is anticipated that toll funding would only partially fund the construction of the proposed project and funding from other sources including the City of Dallas and TxDOT would be needed to fully finance the project.

2.5.1 Tollroad Justification

Because of TxDOT funding constraints and the estimated year of opening (2010), the proposed action is being considered for implementation as a limited-access toll facility with NTTA as the local sponsor. Implementing this operational concept provides a needed funding mechanism and accelerates the project schedule by an estimated 7 years**.** This allows the project to satisfy the purpose and need (see **Chapter 1 Purpose and Need for Action)** much sooner than if implemented as a TxDOT project. Further, a portion of the revenues from tolls would be used to provide full maintenance and operation of the roadway, freeing TxDOT from this on-going funding obligation. However, to construct the proposed action as a toll facility, the original design concept adopted from the TPC MTIS requires modification. The TPC MTIS recognized and provided for the toll option as an unresolved issue that might require changes to the Trinity Parkway.

Pursuant to 23 CFR § 450.318(g), a MIS "may lead to decisions that modify the project design concept and scope assumed in the plan development process. In this case, the study shall lead to the specification of a project's design concept and scope in sufficient detail to meet the requirements of the U.S. EPA conformity regulations" (40 CFR § 51).

The toll road designation for the Trinity Parkway is made for funding purposes. Developing a highway as a toll road can save both time and money. The use of toll-financed revenue bonds – which are sold to private investors at competitive interest rates – allows a project to be funded much more quickly than one that has to compete for limited tax dollars. Substantial cost savings can also be achieved by avoiding the inflationary effect resulting from years of deferred completion.

Recent experience in the DFW region demonstrates the advantages of a toll road financing approach versus conventional funding. An example is the conversion of SH-190 in suburban north Dallas to the President George Bush Turnpike. By 1995, TxDOT had estimated that 31 years and a total of $317 million had been invested in the development of SH-190. TxDOT estimated it would still need an additional $397 million to complete the project and that it would likely be the year 2015 before SH-190 could be completed using conventional funding methods. By turning the project over to the TTA (predecessor to NTTA), TxDOT estimated that the full highway would be built by 2003 at a cost savings to

the state of $292 million. This decision was taken in the context of funding shortfalls, which are still affecting the ability of TxDOT statewide to proceed with needed projects and to operate and maintain existing facilities. For instance, at the time of the SH-190 decision, the TxDOT Dallas District Office was facing a $9.4 billion revenue deficiency for transportation projects included in their *Mobility 2010* program.

The RTC, City of Dallas, Dallas County, and Dallas Regional Mobility Coalition (DRMC) have endorsed the development of the Trinity Parkway as a toll road. This decision is intended to fulfill the project's purpose and need within the shortest possible time, and to provide an income stream to help fund initial construction and long-term operation and maintenance costs. The imposition of tolls may result in less daily traffic on the Trinity Parkway compared to a "toll-free" (tax-supported) highway. As a result, other corridor roadways may experience slightly higher daily traffic volumes. However, toll roads in urban areas are expected to perform well in peak traffic periods, when they can provide a faster and more cost-effective route for congested commuter traffic. This would tend to make the peak period traffic volumes on Trinity Parkway more comparable to a non-toll alternative. Since the peak periods are the most critical times for performance of the regional transportation system and since congestion in these periods is a major factor in air quality issues, the overall performance of the toll road option is judged to be comparable to a non-toll option, and the toll option therefore meets the stated Purpose and Need of the Project. More information concerning potential traffic impacts of the Trinity Parkway alternatives are presented in **Section 4.4 Transportation Impacts** of this DEIS. More information regarding the Preliminary Financial Feasibility (toll) Analysis done for this project can be found in **Section 6.2 Cost Sharing** of this DEIS. Information about future financial analysis to be done for this project can be found in **Section 6.6 Future Traffic and Revenue Analysis**.

2.5.2 Toll Collection Facilities

Another aspect of the toll road designation is the requirement for incorporating toll booths and toll plazas into the right-of-way. The purpose of the booths and plazas is to provide a means of collecting tolls to support financially the construction, operation, and maintenance of the toll road. Toll plazas are built in various sizes and types. Main toll plazas, located across the mainlanes, typically have an operations building, personnel/equipment tunnels, and personnel parking facilities. Ramp plazas, located on designated entry or exit ramps, are less elaborate and typically do not have offices or tunnels.

Generally, toll plazas are designed to be safe and convenient for the motorist. An effective design allows for the fastest traffic to travel through the innermost lane of the barrier plaza via the use of AVI technology, such as the TollTag® technology in use by NTTA. These lanes are typically referred to in the industry as "express lanes." Automatic coin machine (ACM) users would be the next level in the middle lane(s), and the change made/receipts transactions would be in the outermost lane(s), which are

attended by toll authority staff. The arrangement of the lanes on the ramp plazas is in opposite order, with the faster traffic on the outside to facilitate exit from the tollway for AVI participants. Toll plazas typically have more lanes than the standard roadways that they serve. An old rule of thumb is that there are two toll plaza lanes provided for each lane on the approaching road (this ratio is gradually decreasing on the NTTA system as more-efficient TollTag® use becomes prevalent). The additional plaza lanes result in transitional segments of pavement, with associated widening and narrowing of the road as it passes through the plaza area.

NTTA has experienced rapid and sustained growth in the use of TollTags® on its facilities. If this trend is evident on the Trinity Parkway, NTTA may in the future convert the facility to 100 percent TollTag® usage to promote operational safety and efficiency.

Figure 2-23 is a drawing of a typical multiple-lane main toll plaza, with attended lanes, ACM lanes, and AVI lanes. The figure also shows the operations building and associated parking lot.

FIGURE 2-23. TYPICAL LAYOUT – MULTIPLE-LANE MAIN TOLL PLAZA

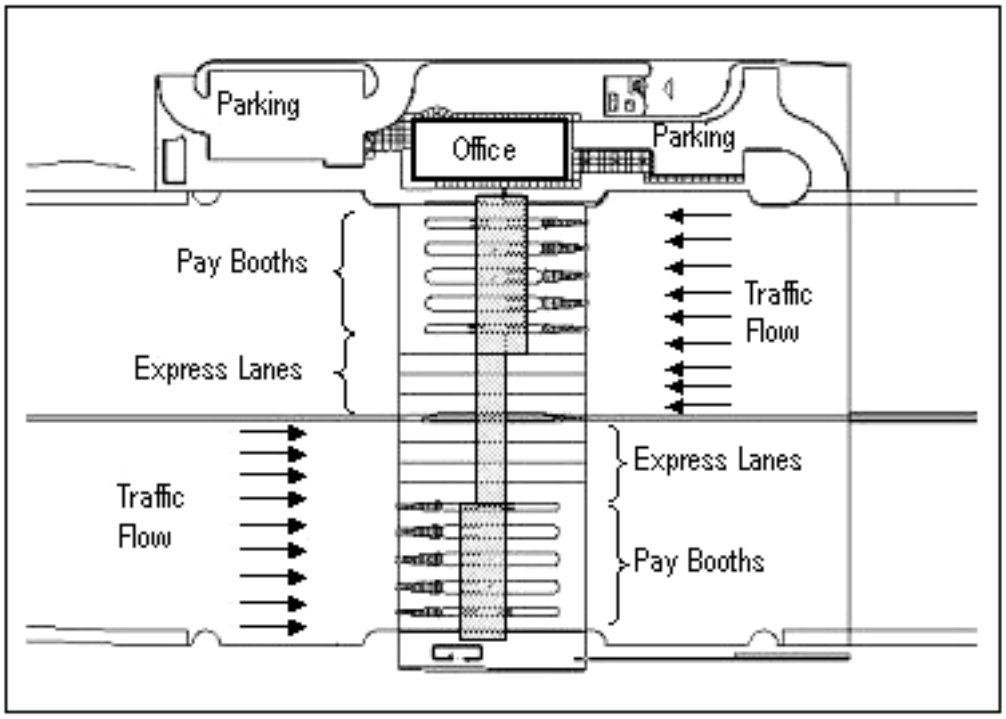
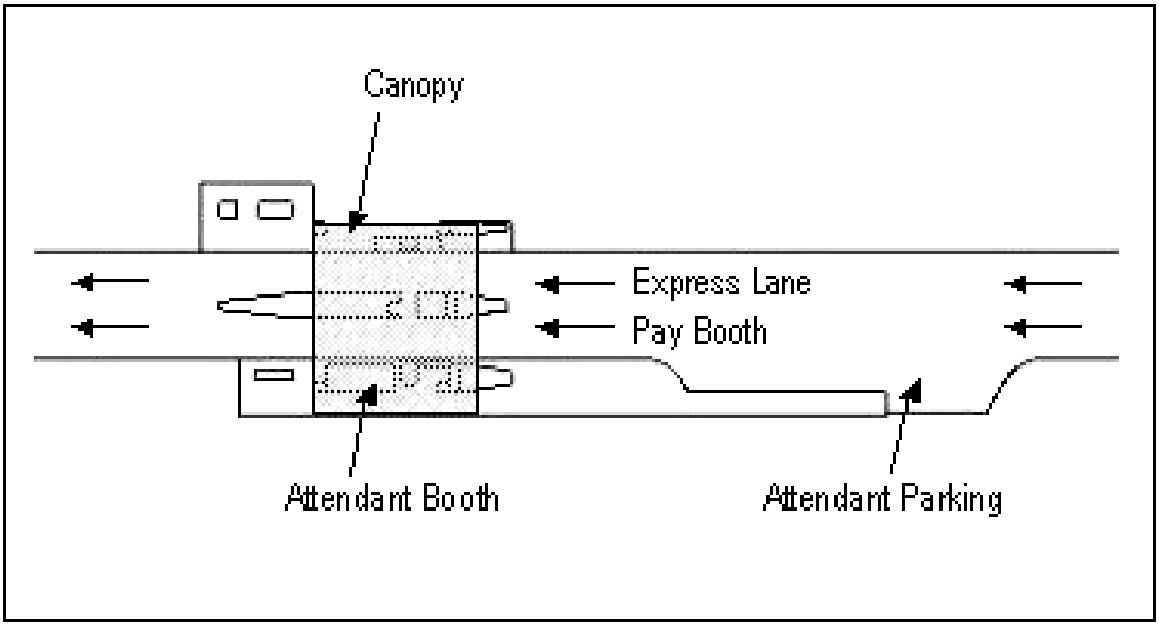


Figure 2-24 shows a typical layout for a ramp toll plaza. The drawings and typical layouts are shown for conceptual purposes only. The actual design of the toll collection facilities may differ from that depicted and would be subject to engineering and other considerations at the actual site.

FIGURE 2-24. TYPICAL LAYOUT – RAMP TOLL PLAZA



The NTTA has identified tentative locations of proposed toll plazas for the Trinity Parkway build alternatives. These locations – shown on **Plates 2-1A** through **2-6B** at the end of this chapter – are preliminary and subject to change. The FEIS will provide more detailed information about the type and location of toll plazas for the preferred alternative. In addition, it should be noted that NTTA strives to incorporate the principles of context-sensitive design (CSD) in their toll plazas (see **Chapter 7 Mitigation Measures and Commitments** for additional details concerning CSD). Using this approach, architectural treatments for toll plaza buildings are varied (within budgetary constraints) to provide designs appropriate to the physical setting and neighboring features at the plaza site. NTTA also published in fall 2003, its *System-wide Design Guidelines* manual, showing enhanced architectural, signage, and landscaping standards which would apply to the proposed Trinity Parkway.

2.5.3 Toll Agreement Requirement

Pursuant to 23 USC § 129(a)(3), if federal-aid highway funds are used for construction of, or improvements to, a toll facility or the approach to a toll facility, or if a state plans to reconstruct and convert a free highway, bridge, or tunnel previously constructed with federal-aid highway funds to a toll facility, a toll agreement is required. The toll agreement is executed between the FHWA, State Department of Transportation, and the toll authority.

The toll agreement must require that all toll revenues are first used for any of the following: debt service, reasonable return on private investment, and operation and maintenance, including reconstructing,

resurfacing, restoring, and rehabilitating work. The agreement must also include a provision regarding toll revenues in excess of those needed for the required uses mentioned above. This provision would allow these excess revenues to be used for highway and transit purposes authorized under Title 23 if the state certifies annually that the toll facility is being adequately maintained.

The issue of whether a toll facility is to become free when debt is retired or at some other future point in time or whether tolls are to be continued indefinitely is a decision to be made by the state. Decisions regarding the amount of tolls charged are made by the toll authority, which are subject to the requirements under state and local laws and regulations.

2.5.4 Staged Construction

As stated in **Section 1.1 Project Description (Chapter 1)**, the Trinity Parkway is proposed to be constructed in stages in some segments, with fewer lanes initially than the ultimate facility. **Plates 2-8** and **2-9** at the end of this chapter show examples of the proposed staged construction applied to two build alternatives (Alternatives 2B and 3B). The staging strategy anticipates initial construction of six lanes in the northern segment of the project, with four lanes in the remainder. The staging strategy shown would be expected to apply in a similar manner to all the other build alternatives. Staging the construction is expected to allow NTTA to reduce the initial cost of the roadway below the total costs shown in **Table 2-7**. The staging allows NTTA to better match the initial cost and scope of the facility to the traffic demand expected in the early years of operation. Additional capacity may be added as traffic demand and conditions warrant, and subject to funding availability and other agency considerations.

[END OF CHAPTER 2 EXCEPT FOR PLATES]

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Chapter 3

Affected Environment

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CHAPTER 3
AFFECTED ENVIRONMENT

3.0 INTRODUCTION

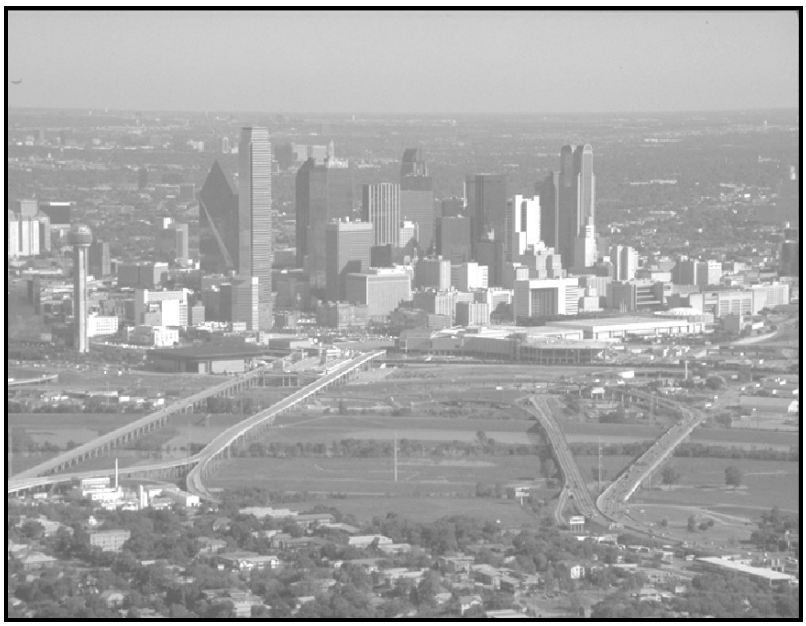
This chapter of the Trinity Parkway DEIS describes the existing social, economic, and environmental setting for the area affected by the proposed alternatives. Plates which illustrate the location of social, economic or environmental data/information are located at the end of the chapter. Assessments of the potential impacts of each alternative, including the No-Build Alternative, on the existing social, economic, and environmental setting are presented in **Chapter 4 Environmental Consequences**.

3.1 COMMUNITY SETTING

Regional Overview

The Trinity Parkway study area is located south and west of the CBD in the City of Dallas, Dallas County, Texas. Dallas is the largest city in north central Texas, consisting of 245,917 acres of land with a year 2000 population of 1,188,580. Dallas is a major distribution center, the second largest convention center in the country, and a gateway for trade resulting from NAFTA. **Plate 3-1** provides an aerial view of the project study area and surrounding land use. The study area is located on either side of the Dallas Floodway and contains residential neighborhoods and a variety of commercial/industrial areas (*The Dallas Plan,* 1994).

DALLAS CENTRAL BUSINESS DISTRICT – LOOKING NORTH



3.1.1 Existing Land Use in the Study Area

The Dallas Floodway is the dominant land use feature in the central portion of the study area. This large grassy open space is classified as flood control parkland and accounts for approximately 50 percent of the land use in the study area.

DALLAS FLOODWAY AT THE IH-35E CROSSING OF THE TRINITY RIVER

Northwest Portion of the Study Area

Mixed uses consisting of office, retail, commercial, and industrial are located at the northwestern portion of the study area. This area is referred to as the Trinity Industrial District. Land situated along and surrounding Irving Boulevard consists of industrial and commercial uses. This area is dominated by small to large distribution facilities like Miller Brewing. The Wyndham Anatole Hotel, one of the largest hotels in the Dallas area, occupies the east side of Wycliff Avenue. An area of office and retail uses is located along the northeast margin of the study area and along the northeast side of Industrial Boulevard, which is occupied by Stemmons Place offices, ExxonMobil Oil Corporation, and Aetna Healthcare.

North-Central Portion of the Study Area

The north-central portion of the study area surrounding Irving Boulevard is industrial land use, some of which is being redeveloped as commercial and retail in an area known as the Stemmons/Design District. North of Commerce Street and west of IH-35E are public facilities, including the Dallas County administrative buildings, the Lew Sterret Justice facility, and the Frank Crowley Criminal Courts buildings, which are categorized as institutional land use.

Southwest Portion of the Study Area

Land use from Hampton Road, north of Singleton Boulevard to the Dallas Floodway and east to the Continental Viaduct is predominantly single-family residential and is referred to as West Dallas. Two schools also exist in this area. In addition, this portion of the corridor contains multi-family use located just west of Sylvan Avenue along Canada Drive. A small retail area is located on the east side of Sylvan Avenue north of Singleton Boulevard.

South-Central Portion of the Study Area

Land use from Singleton Boulevard and Sylvan Avenue to the Dallas Floodway, and south to Houston Street is primarily industrial. Industrial facilities located on Singleton Boulevard and on roads adjacent to Singleton Boulevard in this area include Ryder Truck Rental and Leasing, Pioneer Concrete of Texas, auto garages, auto parts facilities, and scrap metal facilities. Industrial facilities on Commerce Street and on streets adjacent to Commerce Street in this area include a building material supply company (Long Supply Company), a number of bail bond businesses, and Jim Smith Tools. Single-family neighborhoods are situated along Main Street and surrounding streets among commercial/industrial businesses. A Dallas County school bus parking and maintenance yard, Contractors Iron and Steel Company, and Burden Brothers Mechanical Contractors are a few of the industrial facilities near Beckley Avenue.

Southeast Portion of the Study Area

The area south of IH-30 is referred to as Oak Cliff and is dominated by single-family residential with mixed commercial retail. A multi-family residential area is located between the Houston Street and Jefferson Street Viaducts. This area is a generally two-story apartment approximately 20 to 30 years old. The former Burnett Field baseball site is a large vacant tract that is located adjacent to the west side of IH-35E. The Oak Farms Dairy is located in this neighborhood adjacent to Marsalis Street.

Small wood-frame houses, vacant lots, and boarded-up houses occur east of IH-35E to the Corinth Street Viaduct in an area referred to as The Bottoms. The Eloise Lundy Recreation Center, located on the corner of Sabine Street and Denley Street, is a City of Dallas Parks and Recreation Department park and recreation center. The Townview Magnet School, also known as the Business Magnet Management Center, is located on 8th Street on the western margin of the single-family neighborhoods.

Northeast Portion of the Study Area

An area in the northeast portion of the study area referred to as South Central consists of high-density commercial/industrial land uses, which are located along south Lamar Street south to the SP Railroad. This area consists of a high concentration of large heavy industrial facilities that include Willow Distributors, Dimco Steel/Duggar Industries, the Dallas Independent School District (DISD) Transportation Department, Beall Concrete, Orbit Oxychem, and Brockway Standard Inc. Companies also located in the area are Big City Crushed Concrete, Praxair Gas, Faubion, and ITEX. Land use north of Lamar Street is predominantly single-family residential, characterized by small-frame houses and vacant lots.

Industrial facilities surrounding Industrial Boulevard and Rock Island Street include Dallas Metro Steel, Orr-Reed Wrecking, and Buckley Oil Company. Located adjacent to the Corinth Street Viaduct at Industrial Boulevard is Bighorn Core. Okon Metals and a large warehouse distribution facility are located on the northwest side of Industrial Boulevard. Also along Industrial Boulevard are several bail bond companies and beverage stores. These are in proximity to the Lew Sterrett Justice Center.

3.1.1.1 Local Land Use Plans/Policies

The intensity, timing, and character of development may be directed by local or regional comprehensive plans, general plans, or long-range plans. The goals identified in planning documents may be implemented through a variety of tools, including zoning, capital improvements, and tax incentives. A thorough understanding of these plans and mechanisms is necessary for the analysis of a transportation project's potential effect on land use.

Current land use is regulated through the Dallas City Council according to the city's Comprehensive Land Use Plan, zoning maps, and zoning ordinances. **Plates 3-2A** and **3-2B** show general land use and zoning within the study area. The city has sponsored numerous studies for potential projects along the floodway and the Trinity River corridor in southern Dallas. In 1992, the Dallas City Council initiated *The Dallas Plan* to help establish a long-range planning policy for the city. In 1994, the City Council adopted general goals and policies for the Trinity River corridor as one of six citywide strategic initiatives presented by *The Dallas Plan* (1994).

In late 1994, the Honorable Ron Kirk, former Mayor of Dallas, appointed two co-chairs to oversee a citizens' committee – the Trinity River Corridor Citizens Committee (TRCCC) – that would define specific goals and objectives for the Trinity River corridor. In May 1996, the city council adopted a TRCCC report from the 400-member committee that contained specific goals and objectives relating to flood control, transportation, recreation, economic development, and environmental restoration along the Trinity River corridor. As a result, the City of Dallas has continued to promote the policy of multi-objective

management (i.e., multiple uses that can occur within the floodplain) of the Dallas Floodway and the lower Trinity River corridor.

The *Great Trinity Forest Master Plan* (TPWD, 1997) identified several specific initiatives for environmental restoration and recreation along the Trinity River corridor. The plan was completed for Texas Parks and Wildlife Department (TPWD) and adopted by Dallas City Council in March 1997. In September 1997, the Dallas City Council adopted TxDOT's TPC MTIS (TxDOT, 1998a).

Subsequently, the aforementioned plans and studies led to a comprehensive Trinity River Corridor Bond Program that was approved by Dallas citizens in May 1998. The major initiatives for the Bond Program are listed below:

- Build the DFE;
- Create the Trinity Downtown Lakes;
- Build the Woodall Rodgers Freeway Extension;
- Redesign the Canyon/Mixmaster/Lower Stemmons;
- Develop, design, and build Trinity Trails;
- Develop the Great Trinity Forest;
- Construct the Elm Fork Levee; and
- Develop the Trinity Parkway (proposed action).

The following are additional studies which represent the diversity of planning that has occurred during the last several years in the Trinity River corridor. All of the studies have tried to revitalize the area with renewed recreation, economic development, flood control, environmental restoration, and transportation improvements. These studies include:

- *Oak Cliff Gateway TIF District* (City of Dallas, 1992a) - represents an opportunity to create a tax-increment financing (TIF) district to improve the major entry into Oak Cliff from downtown Dallas and to support economic development and neighborhood revitalization in this community.
- *The Cedars TIF District* (City of Dallas, 1992b) - created a TIF district to promote development by utilizing public investments to attract private investment.
- *The Dallas Plan* (City of Dallas, 1994) - identified the Trinity River Corridor as a core asset for the City of Dallas.
- *CBD Gateways Urban Design Study* (City of Dallas, 1996) - evaluated the need for and locations of potential downtown connections to adjoining neighborhoods.

- *The Great Trinity Forest Master Plan* (TPWD, 1997) - prepared for the TPWD. The Dallas City Council adopted the plan in 1997. It proposed an overall plan to improve recreational access to this part of the Trinity River corridor and manage its environmental resources.
- *Trinity Parkway Corridor MTIS* (TxDOT, 1998a) - conducted by TxDOT and approved by Dallas City Council in September 1997 (see **Chapter 1 Purpose and Need for Action**).
- *West Dallas Comprehensive Land Use Plan* (City of Dallas, 1998b) – adopted by the Dallas City Council in 1998. This study provides an inventory of all West Dallas land uses, as well as zoning. It discusses strategic issues/options that will influence the positive redevelopment and stability of the area.
- *10th Street Land Use Plan* (City of Dallas, 1999a) – adopted by the Dallas City Council in September 1999. The northern portion of this district is located in the Trinity River corridor. The study provides strategies to revitalize and redevelop the neighborhoods in the study area.
- *Trinity River Corridor Master Implementation Plan, Lake Design and Recreational Amenities Report* (City of Dallas, 1999b) – completed in December 1999. This study was developed to coordinate the various parks, lake, and other recreational improvements within the Trinity River corridor.
- DART *Southeast Corridor MIS* (DART, 2000a) - completed in May 2000. This study was conducted to analyze travel patterns, identify transportation issues and deficiencies, and develop a plan to address these issues in the southeast quadrant of the DART service area. DART has begun the next phase of the project, the development of preliminary engineering drawings and development of a Preliminary Engineering/EIS (PE/EIS).
- DART *Northwest Corridor MIS* (DART, 2000b) - completed in February 2000. This study developed a plan for intermodal transportation investments to improve mobility in the corridor extending from downtown Dallas through northwest Dallas, Irving, Farmers Branch, Carrollton, and Addison. DART has begun the next phase of the project, the development of a PE/EIS.
- *Moore Park Master Plan* (City of Dallas, 2001a) - identified in the *Trinity River Corridor MIP* as a proposed neighborhood gateway leading into the Trinity River. The Dallas Park Board approved this plan in August 2001. Additional details concerning Moore Park are provided in **Section 3.3.2**
- *Stemmons/Design District Land Use Plan* (City of Dallas, 2001c) – adopted by the Dallas City Council in October 2001. This district is located in the north-central portion of the study area adjacent to the Dallas Floodway east levee. The study was conducted to analyze current zoning and development needs assess the impact of recommendations from several major studies that impact the area (including the proposed action) and determine the potential for a Special Purpose District to address zoning issues that might otherwise impede future economic growth and development.

- *Trinity River Corridor Comprehensive Land Use Plan with Economic Impact Analysis and Implementation Strategy* (City of Dallas, 2002) - The City of Dallas initiated this plan to analyze the existing land uses within the Trinity River corridor and to develop land use plans related to proposed flood control and recreational improvements. The study also prepared benefit to cost comparisons of the Trinity Parkway build alternatives. The key objectives of the plan are to promote compatible land uses, define strategies to stimulate economic revitalization, and maximize the value of the Trinity River project. The methodology utilized in the plan includes quantitative assessments of alternative land use development options and associated public investments.
- *A Renaissance Plan for Dallas Parks and Recreation in the 21st Century* (Park and Recreation Department, 2002) - This plan was published in August 2002 by the Dallas Park and Recreation Department (PARD). The overall purpose of the plan is to develop an "innovative, interactive, creative, environmentally sensitive, and state-of-the-art" long range development plan for the PARD over the next 10 to 20 years (2012 to 2022). The plan includes a Capital Implementation Plan organized according to the six park maintenance districts across the city.
- *A Balanced Vision Plan for the Trinity River Corridor* (City of Dallas, 2003) - This study amended the MIP and focused on the geographic area of Dallas known as the "Trinity River Corridor" that includes the Dallas Floodway and adjacent residential and commercial/industrial areas, extending approximately 1 mile on either side of the floodway. The study was initiated by City of Dallas Mayor Laura Miller, former Dallas County Judge Lee Jackson, and interested citizens to take a new look at the possibilities for the future of the Trinity River Corridor. The study identified several key components considered to be potential joint development projects along with the Trinity Parkway (see **Section 3.1.1.4 Potential Joint Development Projects**).

  The objectives of this study were to review and critique previous study efforts and to propose an urban design vision plan for the corridor. This *BVP* recommends an urban design vision that offers an appropriate balance among the five inter-related issues of:

  - Flood Protection (see **Section 3.5.7**);
  - Environmental Restoration and Management (see **Section 3.5.7**);
  - Parks and Recreation (see **Section 3.3.2**);
  - Transportation (see **Section 3.2**); and
  - Community and Economic Development.

  The community and economic development component of the plan encourages new large-scale development at locations with enhanced access to recreation and transportation. The goal is for

these public investments to lead to revitalization and redevelopment that support existing communities, create new business, and mixed use areas.

- *Lake Configuration and Water Quality Study for the Dallas Floodway (anticipated completion date is Spring 2004)* - The City of Dallas has initiated this study to analyze the water quality of the Trinity River and reevaluate alternative lake configurations within the Dallas Floodway. The study is being performed to aid the Dallas City Council in evaluating lake design features in relation to other ongoing studies related to land use, transportation, and flood control plans. The schedule is designed so the results of this work would be available when the Dallas community begins the review of the DEIS for the Trinity Parkway.

3.1.1.2 Major Activity Centers

Several major employers or activity centers are located within, and in close proximity to, the study area and are considered major traffic generators. These include the Stemmons Industrial District and the Dallas CBD, which contains the largest concentration of businesses, hotels, and public facilities (e.g., schools, hospitals, and court/prison facilities) in the north central Texas region. These are summarized in **Table 3-1** and their locations are shown on **Plate 3-3**.

TABLE 3-1. MAJOR EMPLOYERS IN THE STUDY AREA

Plate ID Number	Name	Address	Number of Employees
1	Baker Botts LLP	2001 Ross Avenue	340
2	Health and Human Services	2377 Stemmons Freeway	420
3	Omnicom	1999 Bryan Street	1,000
4	Oak Farms	1114 North Lancaster Avenue	420
5	Locke Liddell and Sapp, LLP	2200 Ross Avenue, Suite 2200	500
6	HC Beck	1700 Pacific Avenue, Suite 3800	500
7	Paymentech	1601 Elm Street, Suite 900	600
8	Dallas County Community College	701 Elm Street	900
9	Wyndham International, Inc.	1950 North Stemmons, Suite 6100	490
10	Southwest Securities	1201 Elm Street, Suite 3500	850
11	Bank One	1700 Pacific, Suite 2100	500
12	KPMG Peat Marwick	200 Crescent Court, Suite 300	1,000
13	American Airlines Arena	Woodall Rodgers and Stemmons Freeway	1,460
14	TXU	1601 Bryan Street	2,030
15	Comerica Bank - Texas	1508 W Mockingbird Lane	310
16	United States Life Insurance	6363 Forest Park Road	450
17	Exxon-Mobil Exploration	3000 Pegasus Park Drive	2,000
18	Trinity Industries, Inc.	2525 North Stemmons Freeway	500
19	Centex Corporation	2728 North Harwood Road	1,350
20	American Electric Power	1616 Woodall Rodgers Freeway	350
21	Bank Of America	1201 Main Street	980
22	Hunt Oil Company	1445 Ross Avenue	500
23	Dallas Area Rapid Transit	1401 Pacific Avenue	450
24	Bank Of America	411 North Akard Street	1,230
25	Bank Of America	901 Main Street	1,620
26	Bank Of America	1401 Elm Street	2,280
27	Southwestern Bell	208 South Akard Street	2,400
28	Hyatt Regency Dallas	300 Reunion Boulevard	700
29	Crowley Courts Building	133 North Industrial Boulevard	990
30	Pilgrim's Pride Corporation	2411 Ferris Street	950

TABLE 3-1. MAJOR EMPLOYERS IN THE STUDY AREA

Plate ID Number	Name	Address	Number of Employees
31	Aetna U.S. Healthcare	2777 Stemmons Freeway, Suite 300	780
32	Gardere Wynne Sewell	1601 Elm Street, Suite 3000	450
33	Strasburger and Price	901 Main Street	375
34	Thompson and Knight, LLP	1700 Pacific Avenue	490
35	US Postal Service	401 DFW Turnpike	2,310
36	El Centro College	Main and Lamar Streets	700
37	City Of Dallas	2721 Municipal Street	500
38	Records Building Complex	509 Main Street	470
39	George C. Allen Courts	600 Commerce Street	430
40	Neiman Marcus	1618 Main Street	1,030
41	Neiman Marcus-Sales Support	1201 Elm Street Suite, 2800	375
42	Blockbuster Entertainment Corporation	1201 Elm Street	450
43	HKS, Inc.	1919 McKinney Avenue	420
44	Fed Deposit Insurance Corporation	1910 Pacific Avenue	700
45	Adams Mark Hotel	400 Olive Street	700
46	Taylor Publishing Company	1550 West Mockingbird Lane	800
47	St Paul Medical Center	5909 Harry Hines Boulevard	1,800
48	UT Southwestern Med Center	5323 Harry Hines Boulevard	6,530
49	Parkland Memorial Hospital	5201 Harry Hines Boulevard	6,520
50	Zale-Lipshy Uni Med Center	5151 Harry Hines Boulevard	1,000
51	Children's Medical Center Dallas	1935 Motor Street	3,000
52	Wyndham Anatole Hotel	2201 North Stemmons Freeway	1,500
53	Federal Reserve Bank Of Dallas	2200 North Pearl Street	1,020
54	Chase Bank Of Texas	2200 Ross Avenue	2,600
55	Ernst and Young	2121 San Jacinto Street	900
56	Fairmont Hotel	1717 North Akard Street	450
57	U.S. Environmental Protection Agency	1445 Ross Avenue, Suite 1200	1,150
58	U.S. Federal Bureau of Investigation	1801 North Lamar Street	450
59	City Of Dallas	2014 Main Street	900
60	U.S. Department Health and Human Services	1301 Young Street	520
61	City Of Dallas	1500 Marilla Street	2,000
62	The Dallas Morning News	508 Young Street	1,900
63	Methodist Medical Center	1441 North Beckley Avenue	2,140
64	Con-Way Southern	5020 Calvert Street	275
65	1111 Mockingbird	1111 West Mockingbird Lane	400
66	San Jacinto Tower	2121 San Jacinto Street	1,000
67	Bank One	1717 Main Street	600
68	Jenkens and Gilchrist	1445 Ross Avenue, Suite 3200	690
69	TXU Corporation	1717 Main Street, Suite 2000	300
70	Texas Industries	1341 West Mockingbird Lane	262
71	Andrews Distributing	2730 Irving Boulevard	250
72	Cybertek	7800 Stemmons Freeway, Suite 600	500
73	Lew Sterrett Justice Center N and W Towers	111 Commerce Street	365
74	Price Waterhouse Coopers	2001 Ross Avenue	1,200
75	Southwestern Financial Services	717 North Harwood Road	320
76	The Adolphus Hotel	1321 Commerce Street	400

Source: NCTCOG, 2003f.

Notes: Plate ID Numbers correspond to the locations shown on **Plate 3-3** at the end of this chapter.

Major employers in the study area include employment establishments with a minimum of 250 full-time and part-time workers as of January 1, 2003.

An employment establishment may consist of a single building or a collection of adjacent buildings occupied by one employer, such as a college campus or business park.

3.1.1.3 Other Agency Actions

Several local, state, and federal government agencies are in the process of planning, implementing, or constructing various small- and large-scale projects within the Trinity Parkway study area. Representative agencies include the City of Dallas, Dallas County, TxDOT–Dallas District, NCTCOG, and the USACE–Fort Worth District. These projects involve land use planning (see **Section 3.1.1.1**), utilities (see **Section 3.1.5**), recreation (see **Section 3.3.3.2**), and flood control (see **Section 3.5.7**). Details concerning the transportation projects in the study area are provided in **Section 3.2.7 Related Transportation Projects**.

As previously described in **Section 3.1.1.1 Local Land Use Plan/Policies**, the focus of current land use planning efforts along the Trinity River corridor, which includes the Trinity Parkway study area, attempt to revitalize the area with renewed recreation, economic development, flood control, environmental restoration, and transportation improvements. In addition, some of the major planned flood control and recreation projects, or portions thereof, are considered potential joint development projects along with the proposed action. Details are provided in the following section.

3.1.1.4 Potential Joint Development Projects

Section 3.1.1.3 Other Agency Actions provided a brief description and reference to other reasonably foreseeable projects planned by other agencies within the study area. As previously mentioned, some of these projects, or portions thereof (although independent), are considered potential joint development projects along with the proposed action.

The major joint development projects are:

- City of Dallas – *Trinity River Corridor MIP/BVP* (see **Section 3.1.1.1**);
- USACE – *FPEIS, Upper Trinity River Basin, Trinity River, Texas* (2000). Dallas Floodway EIS and City of Dallas Locally-Preferred Plan (LPP) (see **Section 3.5.7**); and
- USACE – *DFE* (1999) (see **Section 3.5.7**).

The following paragraphs provide a descriptive overview of the various components of these individual projects being considered for joint development along with the Trinity Parkway.

USACE DFE Lamar Levee

The proposed Lamar Levee would be the only component of the DFE that would be considered as potential joint development with the Trinity Parkway. The proposed Lamar Levee would extend along the

east side of the floodplain and connect to the existing floodway levee at the upstream end and to the Rochester Levee at the downstream end. Four of the Trinity Parkway alternatives would utilize the proposed Lamar Levee as a portion of the roadway embankment from the floodway levee to just downstream of the Missouri Kansas Topeka (MKT) Railroad Bridge. The proposed levee would extend a total length of approximately 16,400 feet and have an average height of approximately 20 to 30 feet. The USACE DFE recommended plan is shown on **Plate 3-5**.

Trinity River Corridor MIP/BVP

As previously described in **Section 3.1.1.1 Local Land Use Plans/Policies**, the City of Dallas has completed its MIP/BVP for the Trinity River corridor. The primary goal of the study was to determine the optimum plan for providing transportation improvements, flood control benefits, as well as recreational and economic development improvements in the Trinity River corridor. The Trinity River Corridor Balanced Vision Plan is shown on **Plate 3-4**. The joint development potential exists for utilizing the excess dirt generated from the lake excavation to be used for raising and strengthening the Dallas Floodway levees as well as the roadway embankment for Trinity Parkway alternatives that occur alongside the river levees (Alternatives 3A, 3B, 4, and 5). The lakes could have USACE cost participation if it is determined that there is federal interest for producing additional flood protection or for accommodating environmental restoration or recreation initiatives.

It is conceivable that some excavated material could be used for Alternative 2B (Industrial Boulevard – At-Grade), but this is a relatively small portion of the available material. In comparison, Alternative 2A (Industrial Boulevard – Elevated) is almost entirely on structure and would require even less fill material. A summary of the estimated excavation and fill quantities required for each of the Trinity Parkway build alternatives is provided in **Section 4.20.8 Construction Excavation and Fill Requirements**.

The MIP/BVP incorporates floodway off-channel lakes; the proposed Trinity Parkway (proposed action); a levee raise for the existing Dallas Floodway; channel meandering (in concept with the USACE's EQ plan) (see **Section 3.5.7**) located between the two major off-channel lakes; modification of the AT&SF Railroad Bridge to improve hydraulic conveyance; and trail and access development along the length of the Dallas Floodway.

The USACE anticipates completion of the Dallas Floodway EIS in the winter of 2005. This EIS will contain detailed descriptions of the direct and indirect impacts for each of the alternatives considered for the Dallas Floodway. The potential cumulative effects of the Trinity Parkway alternatives along with the potential impacts of these reasonably foreseeable joint development projects are described in **Chapter 4 Environmental Consequences**.

3.1.2 Social and Economic Conditions

This section of the DEIS discusses the social and economic conditions within the study area, focusing on a comparison of its population, demographic, employment, and income characteristics with the City of Dallas, Dallas County, and with the State of Texas. This socioeconomic information was collected for those year 2000 census tracts, which are intersected by, or adjacent, or in close proximity to, any of the Trinity Parkway build alternatives. This collection of census tracts, including census tract block groups, is referred to as the "project area" in this section of the DEIS and is shown on **Plate 3-6 Census Tracts and Block Groups**.

3.1.2.1 Population and Demographic Characteristics

Population

Regional Population Growth

As shown in **Figure 1-7** in **Chapter 1 Purpose and Need for Action,** population in this region has been steadily increasing since 1960. The DFW region was one of the fastest growing areas in the U.S. during the 1980s and 1990s. For instance, the region added 152,600 new residents in 2002, marking the fourth consecutive year the region has grown by more than 150,000 residents in 1 year and the seventh consecutive year to add over 100,000 residents. During the 1990s, over one million people were added to the region, with 70 percent of the growth occurring over the last 5 years. During this period, the average annual growth was an estimated 100,800 persons.

The four core counties (Collin, Dallas, Denton, and Tarrant) captured 85 percent of all regional growth, or 847,100 persons. Tarrant County experienced the greatest population increase in the 1990s, adding a total of 240,650 persons. With 63 percent of its growth occurring during the last 5 years of the decade, Collin County nearly doubled its population by adding 232,750 persons. Dallas County added 217,900 persons and Denton County added 155,800 persons during this 10-year period. In 2002, these four counties captured 82 percent of all regional growth, adding 128,000 persons. Dallas County added over 27,000 persons in 2002 and now has 2,285,600 persons.

Regional Population Projections

As shown in **Table 1-5** in **Chapter 1 Purpose and Need for Action,** population growth in the region is projected to increase steadily through the year 2030. During the 30-year period from 2000 through 2030, the regional population is expected to increase from approximately 5.1 million in 2000 to approximately 9.1 million in 2030. This is an increase of approximately 4 million residents (about 135,000 persons per year) at a projected population growth of approximately 56 percent.

Population in the Project Area

The NCTCOG indicates the population for the City of Dallas increased by 191,703 persons from 1,006,877 in 1990 to 1,188,580 in 2000, demonstrating an 18 percent growth rate over this 10-year time period. In comparison, population within the project area increased at a much lower growth rate of 7.3 percent (4,106 persons) from 56,145 in 1990 to 60,251 in 2000. **Table 3-2** shows population data for each of the 17 census tracts in the project area for the years 1990 and 2000. The year 2000 project area census tracts, including census tract block-groups, are shown graphically on **Plate 3-6** at the end of this chapter.

TABLE 3-2. PROJECT AREA POPULATION BY CENSUS TRACT

Census Tract	1990 Census	2000 Census	1990-2000 Total Change	1990-2000 Percent Change
20	6,246	7,271	1,025	16.4
33	1,662	2,066	404	24.3
34	1,665	1,460	-205	-12.3
39.02	2,423	2,099	-324	-13.4
40	1,709	1,496	-213	-12.5
41	1,538	1,440	-98	-6.4
42.01	4,917	5,449	532	10.8
43	4,829	2,860	-1,969	-40.8
86.03	1,971	1,687	-284	-14.4
89	3,528	2,730	-798	-22.6
100	3,265	9,614	6,349	194.5
101.01	4,242	3,766	-476	-11.2
101.02	3,649	3,460	-189	-5.2
102	2,189	2,356	167	7.6
105	2,394	2,378	-16	-0.7
106.01	4,951	5,163	212	4.3
115	4,967	4,956	-11	-0.2
Project Area Total	**56,145**	**60,251**	**4,106**	**7.3**
City of Dallas	**1,006,877**	**1,188,580**	**181,703**	**18.0**

Source: NCTCOG, 2003e.
Note: 2000 tracts include all or portions of 1990 tracts. Direct comparisons may not be exact.

Demographic Characteristics

Race/Ethnicity

The project area has a different racial and ethnic composition compared to the State of Texas, Dallas County, and City of Dallas when taken as a whole. As shown in **Table 3-3**, the majority of residents in the geographic areas of the State of Texas, Dallas County, and the City of Dallas are Caucasian. The populations do differ somewhat in their exact proportions, but generally Caucasians make up about 51 to 71 percent of these areas.

In comparison, Caucasian residents make up about 30.3 percent of the project area population. The total percentage of non-white persons in the project area is 69.7 percent. This includes persons in all non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander,

some other race, or two or more races. The largest racial group in the project area is African-American, which accounts for approximately 39.5 percent of the population. Persons of Hispanic ethnic origin (may be of any race) account for approximately 48.2 percent of the project area population.

TABLE 3-3. 2000 RACE AND ETHNICITY

Category	Project Area	City of Dallas	Dallas County	State of Texas
Total Population	60,251	1,188,580	2,218,899	20,851,820
White	18,264	604,209	1,294,769	14,799,505
Percent of total	30.3	50.8	58.4	71.0
Black or African American	23,782	307,957	450,557	2,404,566
Percent of total	39.5	25.9	20.3	11.5
American Indian	363	6,472	12,499	118,362
Percent of total	0.6	0.5	0.6	0.6
Asian or Pacific Islander	256	32,708	89,646	576,753
Percent of total	0.4	2.8	4.0	2.8
Some Other Race	15,898	204,883	311,504	2,438,001
Percent of total	26.4	17.2	14.0	11.7
Two of More Races	1,688	32,351	59,924	514,633
Percent of total	2.8	2.7	2.7	2.5
Percent Racial Minority (non-white)[1]	69.7	49.2	41.6	29.0
Hispanic Origin (any race)[2]	29,019	422,587	662,729	6,669,666
Percent of total	48.2	35.6	29.9	32.0

Source: NCTCOG, 2003e.
Notes: Some persons fall into more than one of these categories. As such, these percentages should not be combined to represent the area population, since doing so would result in duplication. For example, the percentages for racial minority populations include all income levels; and low-income populations may be a racial minority, ethnic minority, or any mix of demographic characteristics.
1. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
2. Total of persons reporting as Hispanic ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.

The distribution of race and ethnicity among 2000 census tracts in the project area is varied. A large majority of the residents in the western portion of the project area (north of Hampton/Inwood Road and west of Wycliff/Sylvan Avenue) and the southern portion of the project area (south of the Dallas CBD and east of IH-35E) are Black or African-American. In contrast, the majority of residents in the west-central portion of the project area (in West Dallas between Hampton/Inwood Road and IH-35E) are of Hispanic origin. Racial or ethnic minority groups account for the majority of the population within all 17 census tracts in the project area. Additional information about minority populations within the Trinity Parkway project area is presented in **Section 3.1.3 Neighborhoods** and **Chapter 4 Environmental Consequences**.

Age

A comparison of the ages in the population of the project area with those of Dallas County, the City of Dallas, and of the State of Texas reveals a slightly lower proportion of elderly residents (ages 65 and over) and a slightly higher proportion of younger residents (ages 19 and under) living in the project area. **Table 3-4** shows that for all four geographic areas – the project area, city, county, and the state –

population ages generally consist of about 30 to 35 percent in the 19 and under range, 60 to 65 percent in the 20-64 range, and 5 to 10 percent of people in the 65 and over range. The median age was similar for each of the areas with the project area having a slightly lower median age, and the state having a slightly higher median age.

TABLE 3-4. 2000 AGE COMPARISONS

Category	Project Area	City of Dallas	Dallas County	State of Texas
Total Population	60,251	1,188,580	2,218,899	20,851,820
Ages 19 and under	19,583	350,006	683,865	6,546,236
Percent of total	32.5	29.4	30.8	31.4
Ages 20 – 64	36,103	736,273	1,356,162	12,233,052
Percent of total	59.9	62.0	61.1	58.7
Ages 65 and over	4,565	102,301	178,872	2,072,532
Percent of total	7.6	8.6	8.1	9.9
Median Age	29.5*	30.5	31.1	32.3

Source: NCTCOG, 2003e.
Note: *Average of median age for inclusive census tracts.

3.1.2.2 Economic Conditions

The population and employment growth characteristics referenced in **Chapter 1 Purpose and Need for Action** reflects the generally robust economy experienced throughout the DFW region. The City of Dallas continues to dominate regional employment. From 1990 through 2000, employment for the city grew 28.2 percent from 809,650 in 1990 to 1,038,314 in 2000. During this period, Dallas captured 24 percent of all regional job growth (228,664) (NCTCOG, 2003b).

Certain economic indicators – such as a growing labor force and declining unemployment rates – provide even more evidence of a healthy economy. **Table 3-5** shows growth in the labor force and a decline in the unemployment rate at the local, regional, and statewide level between the years 1990 and 2000. More recently, however, **Table 3-5** shows a fluctuation in the unemployment rate at the local, regional, and statewide level between 2000 and October 2003 (most recent available). During this period, the unemployment rate for the City of Dallas fluctuated 4.2 percent, from 4.0 percent in 2000, to 9.1 percent in 2002, to 8.2 percent in October 2003. Despite the fluctuations in unemployment, the annual average labor force continued to grow at the local, regional, and statewide level during this same period.

TABLE 3-5. LABOR FORCE STATISTICS

Location	Year	Annual Average Labor Force	Annual Average Employment	Annual Average Unemployment	Annual Average Unemployment Rate (Percent)
State of Texas	1990	8,615,795	8,071,312	544,483	6.3
	2000	10,324,527	9,887,039	437,488	4.2
	2001	10,559,676	10,048,069	511,607	4.8
	2002	10,750,664	10,069,800	680,864	6.3
	Oct-2003	11,052,314	10,380,525	671,789	6.1
Dallas MSA	1990	1,546,140	1,467,668	78,472	5.1
	2000	1,963,668	1,903,514	60,154	3.1
	2001	2,029,326	1,932,955	96,371	4.7
	2002	2,044,682	1,899,395	145,287	7.1
	Oct-2003	2,068,519	1,935,805	132,714	6.4
Dallas County	1990	1,072,841	1,016,395	56,446	5.3
	2000	1,235,879	1,193,084	42,795	3.5
	2001	1,253,062	1,185,206	67,856	5.4
	2002	1,264,001	1,164,629	99,372	7.9
	Oct-2003	1,277,172	1,186,954	90,218	7.1
City of Dallas	1990	576,051	540,075	35,976	6.2
	2000	678,552	651,183	27,369	4.0
	2001	694,808	651,167	43,641	6.3
	2002	704,076	639,862	64,214	9.1
	Oct-2003	710,347	652,127	58,220	8.2

Source: Texas Workforce Commission, 2003.
Note: MSA = metropolitan statistical area.

However, a comparison of median household income and poverty status reveals less favorable economic conditions within the project area (see **Table 3-6**). In 1999 (most recent available), the project area had a median household income of $22,791 (average of median household income for inclusive census tracts), well below the City of Dallas median of $37,628, Dallas County median of $43,324, and statewide median of $39,927. An examination of the percentage of households below the poverty threshold presents a similar picture. Poverty percentages in 1999 were above the city, county, and statewide percentages for the project area and 16 out of 17 inclusive census tracts. Tract 100 was the only tract in the project area with a poverty percentage below both the city and statewide percentages. All 17 census tracts in the project area were above the Dallas County percentage.

TABLE 3-6. MEDIAN HOUSEHOLD INCOME AND POVERTY STATUS

Area	Median Household Income	Percent of Households Below Poverty Level
State of Texas	$39,927	15.4
Dallas County	$43,324	10.6
City of Dallas	$37,628	14.9
Project Area	$22,791*	34.5
Project Area Census Tracts		
20	$19,914	38.9
33	$35,375	38.9
34	$22,308	39.8
39.02	$16,061	37.0
40	$15,817	32.8
41	$14,341	40.2
42.01	$37,667	21.4
43	$27,262	27.5
86.03	$20,104	38.1
89	$23,594	21.3
100	$29,063	13.0
101.01	$19,500	33.1
101.02	$30,341	19.8
102	$7,094	74.0
105	$28,058	25.8
106.01	$30,144	24.0
115	$10,800	60.7

Source: NCTCOG, 2003e.
Notes: *Average of median household income for inclusive census tracts.
1999 Census poverty level data as reported in the 2000 Census.
The Census Bureau average poverty threshold for a family of four persons was $17,029 in 1999 and $18,979 in 2003 (most recent available).
The poverty thresholds are revised annually to allow for changes in the cost of living as reflected in the Consumer Price Index.

Table 3-6 shows 1999 income and poverty data for the census tracts that comprise the Trinity Parkway project area. As evident from the preceding discussion, the generally positive economic condition that generally applies to the City of Dallas is not universally shared in the project area. All but one project area census tract (100) had a 1999 poverty percentage well above the City of Dallas and statewide percentages. The presence of low-income populations within the project area is also evident from the median household income data. All but one of the census tracts (42.01) had lower median household incomes than the City of Dallas, Dallas County, and statewide medians. When combined, the median household income for the project area census tracts ($22,791) is much lower than the City of Dallas, Dallas County, and statewide medians. Five of the 17 tracts (39.02, 40, 41, 102, and 115) had median household incomes lower than the 1999 poverty threshold of $17,029 (average poverty threshold for a family of four).

It should be noted that the 1999 U.S. Census Bureau data do not reflect the fluctuations in local, regional, and statewide unemployment rates from 2000 through October 2003 (see **Table 3-5**). As a result, reliance on the 1999 data alone does not give an accurate picture of current economic conditions. For instance, the U.S. Census Bureau has established a year 2003 (most recent available) poverty threshold

of $18,979 (average poverty threshold for a family of four). However, it is unlikely that conditions have changed appreciably in the project area, where the 1999 poverty percentage was much higher, and the median household income much lower than the city, county, and statewide totals. Additional information about low-income populations within the Trinity Parkway project area is presented in **Section 3.1.3 Neighborhoods** and **Chapter 4 Environmental Consequences**.

3.1.2.3 Community Cohesion

Communities within the Trinity Parkway study area are characterized by varying degrees of cohesion. The FHWA defines community cohesion as patterns of behavior that individuals or groups of individuals hold in common. Residential subdivisions may develop a sense of community cohesion through social interaction or participation in neighborhood organizations. For instance, if a local church or school provides a location where residents of the neighborhood or community can assemble and associate with one another or a neighborhood association or neighborhood watch program is in place to serve the community and satisfy the residents' economic and social needs, then some sense of cohesion likely exists. Cohesion may also be based on a common characteristic of interest shared by the members of the community, such as religion, ethnicity, or income level (FHWA, 1996). **Section 3.1.3** describes the various neighborhood districts and neighborhoods where measurable impacts to community cohesion are likely to occur.

3.1.3 Neighborhoods

The study area includes many different neighborhoods and neighborhood districts which are shown on **Plate 3-7** at the end of this chapter. The neighborhood districts located within, or adjacent to, the study area include:

- Middle Stemmons/Brookhollow;
- Lower Stemmons;
- CBD/Deep Ellum;
- Cedars/Fair Park/East Dallas;
- South Dallas;
- Magna Vista/Cedar Crest;
- East Oak Cliff;
- North Oak Cliff;
- West Dallas – East of Hampton; and
- West Dallas – West of Hampton.

The majority of these neighborhood districts encompass all, or portions of, several distinct residential neighborhoods. Some districts also contain residential areas lacking distinct boundaries or identities.

Each potentially impacted neighborhood and/or district located within the study area is discussed briefly below. A summary of their demographic characteristics is presented in **Table 3-7**. The primary source of

demographic data was the 2000 U.S. Census because it is the most comprehensive, complete, and detailed data source currently available. Census block-group level statistics on housing characteristics, racial/ethnic composition, income level, and related information were obtained for each of the project area districts and neighborhoods that would be potentially affected by the Trinity Parkway. It should be noted that many of the districts and neighborhoods extend beyond project area boundaries. As a result, the block group-level census data represents only those portions of districts and/or neighborhoods that are most likely to be affected by the Trinity Parkway. Information for the City of Dallas is included for comparison purposes.

TABLE 3-7. NEIGHBORHOOD SOCIAL CHARACTERISTICS

Location	Households				Population			
	Percent Owner/ Renter Occupied	Median Value of Owner-Occupied Housing Units	Median Contract Rent[1]	Median Household Income[2]	Percent White	Percent Racial Minority[3]	Percent Ethnic Minority[4]	Percent Elderly[5]
Middle Stemmons/Brookhollow ND	61.2/38.8	$37,450	$426	$22,170	23.0	77.0	14.8	24.6
Residential area along Record Crossing	58.3/41.7	$38,600	$426	$29,132	13.1	86.9	13.9	19.9
-Trinity Industrial District -Bookhollow Industrial Park	64.0/36.0	$36,300	NA	$15,208	32.8	67.2	15.7	29.3
Lower Stemmons ND -Design District -Market/Technology Center	50.0/50.0	$85,000	NA	$48,750	54.3	45.7	18.2	0.8
Cedars/Fair Park/East Dallas ND	15.4/84.6	$75,025	$507	$30,084	30.3	69.7	36.8	6.9
South Dallas HOA	16.6/83.4	$87,950	$379	$27,937	17.5	82.5	13.1	11.8
The Cedars	17.3/82.7	$37,500	$435	$27,589	41.1	58.9	62.6	2.3
South Dallas ND	33.9/66.1	$29,225	$244	$12,344	6.4	93.6	11.1	13.0
South Dallas HOA	28.1/71.9	$30,950	$281	$13,463	4.9	95.1	9.2	16.4
Ideal	51.0/49.0	$36,250	$296	$13,036	2.1	97.9	4.4	17.7
Rochester Park	23.2/76.8	$33,133	$159	$10,241	9.5	90.5	13.6	8.3
West Dallas – West of Hampton ND -West Dallas HOA	54.6/45.4	$36,175	$311	$21,415	12.5	87.5	36.4	9.5
West Dallas – East of Hampton ND	55.6/44.4	$30,090	$346	$26,401	28.0	72.0	60.6	11.1
West Dallas HOA	56.7/43.3	$31,725	$337	$26,613	24.7	75.3	55.7	11.8
La Bajada	51.3/48.7	$23,550	$380	$25,555	41.3	58.7	80.0	8.2
North Oak Cliff ND	33.3/66.7	$94,958	$507	$28,120	42.8	57.2	66.1	4.2
Kessler Park	50.7/49.3	$96,900	$609	$40,598	54.4	45.6	62.2	7.4
Lake Cliff HOA	18.3/81.7	$93,571	$443	$20,322	35.5	64.5	79.0	2.2
East Oak Cliff ND	41.1/58.9	$24,925	$270	$16,858	10.8	89.2	22.1	13.2
Magna Vista/Cedar Crest ND	52.5/47.5	$35,600	$414	$22,598	14.9	85.1	34.3	14.9
Cadillac Heights	57.4/42.6	$33,300	$330	$21,917	27.5	72.5	79.6	7.8
City of Dallas	**43.2/56.8**	**$87,400**	**$551**	**$37,628**	**50.8**	**49.2**	**35.6**	**8.6**

Source: 2000 U.S. Census.

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively. **NA** = Not Available; **HOA** = Home owners association; **ND** = Neighborhood district

Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics.

1. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

2. Income figures are at the census block-group level. For neighborhoods/districts containing more than one block group, medians were averaged in proportion to the population, income, rental units, or owner-occupied housing units within each group.

3. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.

4. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.

5. 65-years of age or older.

Middle Stemmons/Brookhollow Neighborhood District. This district is located on the north section of the study area east of the Dallas Floodway. It is bounded to the west by the Dallas Floodway east levee and to the south by the Lower Stemmons neighborhood district. The remaining portion to the north and east extends beyond the study area limits. It is predominantly commercial/light-industrial in character. One single-family residential area is located adjacent to the east of the IH-35E/SH-183 interchanges in the vicinity of Record Crossing and the old Elm Fork river channel. Portions of the Trinity Industrial District and Brookhollow Industrial Park are included within this section of the larger district.

Approximately 61 percent of the residences in this district are owner-occupied, which is above the City of Dallas (43.2 percent) and is the highest percentage among project area districts and neighborhoods. The median value of homes ($37,450) is much lower than Dallas ($87,400). The median contract rent ($426) is also lower than Dallas ($551). This district also has a large concentration of racial minority residents (77 percent) in comparison to Dallas (49.2 percent). The residential area located east of IH-35E along Record Crossing has the largest concentration of racial minority residents (86.9 percent) within the district. There is also a much higher proportion of residents over the age of 65 (24.9 percent) compared to Dallas (8.6 percent) and is highest among all of the project area districts and neighborhoods.

Lower Stemmons Neighborhood District. This district is located on the east-central section of the study area between IH-35E and the Dallas Floodway. It is predominantly commercial/light-industrial in character. The Design District and Market/Technology Center are included within the larger district. These major business centers include a large concentration of market-support businesses (e.g., photography studios, design professionals; display designers, etc.) and market-related businesses (e.g., furniture dealers, antique dealers, interior decorators, etc.).

The percentage of owner-occupied housing in Lower Stemmons (50 percent) is slightly higher than the City of Dallas (43.2 percent). Median house values ($85,000) are similar to Dallas ($87,400). Median household income ($48,750) is above the median for Dallas ($37,628) and is the highest in the project area. No reportable median contract rent was available for the district. Lower Stemmons has a lower percentage of racial minorities (45.7 percent) and ethnic minorities (18.2 percent) than Dallas overall, and is among the lowest of all project area districts and neighborhoods. Lower Stemmons also has the lowest percentage of elderly residents (0.8 percent), which is substantially lower than the City of Dallas (8.6 percent).

Cedars/Fair Park/East Dallas Neighborhood District. This district is located in South Dallas on the southeast section of the study area adjacent to the south of the Dallas CBD. It is bounded to the west by the Dallas Floodway and to the east by MLK, Jr. Boulevard. The remaining areas to the east extend beyond the study area limits. It is predominantly urban residential in character with commercial/light-

industrial facilities along Industrial Boulevard, Lamar Street, and IH-45. The majority of residential properties are located between Lamar Street and IH-45. The Cedars neighborhood and a portion of the South Dallas Home Owners Association (HOA) are included within this section of the larger district.

Due to the prevalence of multi-family housing, the district has a high renter-occupied percentage (84.6 percent) – the highest of all the project area districts and neighborhoods. The owner-occupancy percentage of 15.4 percent is substantially lower than the City of Dallas rate (43.2 percent). Median house values are variable throughout the district. House values for the South Dallas HOA ($87,950) are much higher than The Cedars ($37,500). However, the South Dallas HOA has a lower median contract rent ($379) than The Cedars ($435). Median household incomes are among the highest in the project area, but are still below the City of Dallas ($37,628). The distribution of minority residents is also variable throughout the district. The South Dallas HOA has a higher concentration of racial minority residents (82.5 percent) compared to The Cedars (58.9 percent). In contrast, The Cedars has a much higher percentage of ethnic minority residents (62.6 percent) compared to the South Dallas HOA (13.1 percent). The South Dallas HOA also has a slightly higher percentage of elderly residents (11.8 percent) than the City of Dallas (8.6 percent). The percentage of elderly residents in The Cedars (2.3 percent) is among the lowest in the project area.

South Dallas Neighborhood District. This district is located in South Dallas on the southeast section of the study area. It is bounded to the west by MLK, Jr. Boulevard and to the south by Rochester Park. The remaining areas to the east extend beyond the study area limits. It is predominantly residential in character with commercial/light-industrial facilities along Lamar Street, IH-45, and near the US-175/SH-310 interchange. The majority of single-family homes are between Lamar Street and SH-310 and to the north and south of US-175. Portions of the South Dallas HOA, Rochester Park, and Ideal neighborhoods are included within this section of the larger district. The South Dallas HOA neighborhood encompasses the majority of the district. The Rochester Park neighborhood is located southeast of the US-175/SH-310 interchange and consists primarily of single-family homes. The Ideal neighborhood is located northeast of the US-175/SH-310 interchange and also consists primarily of single-family homes.

The Ideal neighborhood is considered more cohesive because of its higher percentage of owner-occupied housing (51.0 percent) when compared to the other district neighborhood areas (South Dallas HOA – 28.1 percent and Rochester Park – 23.2 percent) and the City of Dallas (43.2 percent). Ideal neighborhood house values ($36,250) and median contract rent ($296) are also higher than the other district neighborhoods. However, these amounts are well below the City of Dallas ($87,400 and $551, respectively). The median contract rent for Rochester Park ($159) is the lowest among all project area districts and neighborhoods. As a whole, the South Dallas Neighborhood District has the highest percentage of racial minority residents (93.6 percent) and the lowest percentage of ethnic minority

residents (11.1 percent) in the project area. The percentage of racial minority residents is nearly double the City of Dallas (49.2 percent). The percentage of ethnic minority residents is approximately one-third of the City of Dallas (35.6 percent). The percentage of elderly residents in the district is 13.0 percent, which is higher than the City of Dallas (8.6 percent). Of the district area neighborhoods, Ideal has the highest percentage of elderly residents (17.7 percent) and Rochester Park has the lowest (8.3 percent).

West Dallas – West of Hampton Neighborhood District. This district is located in West Dallas on the west section of the study area. It is bounded to the north by the Dallas Floodway and to the east by Hampton/Inwood Road. The remaining areas to the south and west extend beyond the study area limits. It is predominantly residential in character with retail/commercial and light-industrial facilities located along Westmoreland Road, Singleton Boulevard, and other major/minor arterials throughout the district. This district includes portions of the West Dallas HOA, a large neighborhood area located in both the East and West of Hampton neighborhood districts.

The percentage of owner-occupied housing (54.6 percent) is higher than the City of Dallas (43.2 percent). The median house value ($36,175), median household income ($21,415), and median contract rent ($311) are all well below the City of Dallas. The district has a much higher percentage of racial minority residents (87.5 percent) and a slightly higher percentage of ethnic minority residents (36.4 percent) compared to Dallas (49.2 percent and 35.6 percent, respectively). The percentage of residents over 65 (9.5 percent) is slightly above the City of Dallas (8.6 percent).

West Dallas – East of Hampton Neighborhood District. This district is located in West Dallas on the west section of the study area. It is bounded to the north by the Dallas Floodway; to the east by Beckley Avenue; and the west by Hampton/Inwood Road. The remaining portions to the south extend beyond the study area limits. It is predominantly residential in character with retail/commercial and light-industrial facilities located along Wycliff/Sylvan Avenue, Canada Drive, Singleton Boulevard, Commerce Street, and other major/minor arterials throughout the district. Portions of the West Dallas HOA and La Bajada neighborhoods are included within this section of the larger district. La Bajada is located on the east section of the district between Wycliff/Sylvan Avenue and Beckley Avenue. The Dallas West Mobile Home Park is located near the center of this neighborhood along Commerce Street.

The district's percentage of owner-occupied housing (55.6 percent) is higher than the City of Dallas (43.2 percent). Median house values ($30,090), median household income ($26,401), and median contract rent ($346) are well below the City of Dallas. The district has a high concentration of minority residents and is known for being racially balanced. The percentage of racial minority residents (72.0 percent) and ethnic minority residents (60.6 percent) are well above the City of Dallas. The La Bajada neighborhood has the highest percentage of ethnic minority residents (80.0 percent) within the project area. The

percentage of elderly residents ranges from 8.2 percent in La Bajada to 11.8 percent in the West Dallas HOA portion of the district.

North Oak Cliff Neighborhood District. This district is located in Oak Cliff on the west-central section of the study area. It is bounded to the north by IH-30 and the Dallas Floodway and to the east by IH-35E. The remaining portions to the south and west extend beyond the study area limits. It is predominantly residential in character with retail/commercial facilities along IH-35E, IH-30, Beckley Avenue, and other major/minor arterials throughout the district. Portions of the Lake Cliff HOA and Kessler Park neighborhoods are included within this section of the larger district. The Lake Cliff HOA is located between Beckley Avenue and IH-35E. Kessler Park is located between Beckley Avenue and IH-30.

North Oak Cliff is the most affluent district in the project area. The percentage of owner-occupied housing (55.6 percent) is higher than the City of Dallas (43.2 percent) and is among the highest in the project area. North Oak Cliff's median household income is $28,120. However, it is much more variable at the neighborhood level between Kessler Park ($40,598) and the Lake Cliff HOA ($20,322). Median house values (approximately $95,000) are higher than the City of Dallas and are the highest among the project area's districts and neighborhoods. Median contract rent prices range from $433 in the Lake Cliff HOA to $609 in Kessler Park. Rent prices in Kessler Park are higher than Dallas ($551) and are the highest in the project area. North Oak Cliff has a high percentage of both racial minority residents (57.2 percent) and ethnic minority residents (66.1 percent) compared to the City of Dallas and are known for its racially balanced makeup. The Lake Cliff HOA portion of the district has even higher percentages of minority residents (racial minority – 64.5 percent; ethnic minority – 79.0 percent). It also has among the smallest percentage of elderly residents (4.2 percent) in the project area.

East Oak Cliff Neighborhood District. This district is located in Oak Cliff on the southwest section of the study area. It is bounded to the north by the Dallas Floodway; to the east by MLK, Jr. Boulevard; and to the west by IH-35E. The remaining portions to the south extend beyond the study area limits. There is no identifiable neighborhood within this portion of the district. It is predominantly residential in character with retail/commercial and light-industrial facilities along IH-35E, Corinth Street, MLK, Jr. Boulevard, and other major/minor arterials throughout the district.

Approximately 41 percent of the homes in East Oak Cliff are owner-occupied. The district's median house value ($24,925), median household income ($16,858), and median contract rent ($270) are well below the City of Dallas. East Oak Cliff has a high percentage of racial minority residents (89.2 percent) and a relatively low percentage of ethnic minority residents (22.1 percent) compared to Dallas. The percentage of residents over 65 (13.2 percent) is slightly higher than Dallas (8.6 percent).

Magna Vista/Cedar Crest Neighborhood District. This district is located in South Dallas on the south section of the study area. It is bounded to the north by MLK, Jr. Boulevard and the Trinity River and to the east by IH-45. The remaining portions to the south and west extend beyond the study area limits. A portion of the Cadillac Heights neighborhoods is included within the larger district. It is predominantly residential in character with retail/commercial facilities along MLK, Jr. Boulevard and other major/minor arterials throughout the district. The Dallas CWWTP is located on the eastern section of the district.

The district's percentage of owner-occupied housing (52.5 percent) is higher than the City of Dallas (43.2 percent). More than 57 percent of the homes in Cadillac Heights are owner-occupied, which is among the highest in the project area. Median house values are $35,600 for the district and $33,300 for Cadillac Heights. Median household incomes are $22,598 for the district and $21,917 for Cadillac Heights. Rent prices range from $330 for Cadillac Heights to $414 for the district. These values are well below the City of Dallas. The district has a high percentage of racial minority residents (85.1 percent), which is among the highest in the project area. The percentage of ethnic minority residents (34.3 percent) is slightly lower than the City of Dallas (35.6 percent). The Cadillac Heights neighborhood has a high percentage of both racial minority residents (72.5 percent) and ethnic minority residents (79.6 percent) and is known for its racially balanced makeup. As a whole, the district has a slightly higher percentage of elderly residents (14.9 percent) compared to Dallas (8.6 percent). The percentage of residents over the age of 65 in Cadillac Heights (7.8 percent) is slightly below the City of Dallas percentage.

3.1.4 Schools, Community Services/Facilities, and Places of Worship

Public schools in the study area are administered by the DISD. Community services and facilities consist of police and fire facilities, public schools, community and recreation centers, and numerous places of worship. The schools, community services/facilities, and places of worship in the study area are summarized in **Table 3-8** and their locations are shown on **Plate 3-8**.

TABLE 3-8. SCHOOLS, PLACES OF WORSHIP, AND COMMUNITY SERVICES

Plate No.	Facility	Location
Police and Fire		
1	Lew Sterrett Justice Center	111 Commerce Street
2	Sheriff Dept. Jail Commanders Academy Training Div.	521 N. Industrial Avenue
3	Fire Station No. 1	1901 Irving Boulevard
4	Fire Station No. 47	7161 Envoy Court
5	Jack Evans Police Department	1400 S. Lamar Street
Schools		
6	DISD Storage and Maintenance Facility	3701 South Lamar
7	C.F. Carr Elementary School	1952 Bayside Street
8	Lorenzo DeZavala Elementary School	3214 Winnetka Avenue
9	Priscilla L. Tyler Elementary School	2333 Calypso Street
10	Yvonde A. Townview Magnet School	1201 E. 8th Street
11	H.S. Thompson Learning Center	5700 Bexar Street
12	Harllee N W Elementary School	1216 E. 8th Street
Community and Recreation Centers		
13	Joseph McMillan Community Center	Canada Drive at Ladd Street
14	West Dallas Community Center	2215 Canada Drive
15	Bataan Community Center	Bataan Street at Coronet Street
16	Eloise Lundy Recreation Center	1229 Sabine Street
17	Debra Lynn Woods Theater	Pear Street at Colonial Avenue
18	Southwest Key Program Youth Center	919 Dragon Street
19	Mattiemash Community Center	3710 N. Hampton Road
20	The Sarah Wilke Youth Center	1000 McBroom Street
Places of Worship		
21	Trinity Valley Church of God in Christ	2043 Canada Drive
22	Dallas Free 7th Day Adventist	Canada Drive at Ivanhoe Lane
23	Galilee Church of God in Christ	4004 Ivanhoe Lane
24	Canada Drive Christian Church	2035 Canada Drive
25	Macedonia Baptist Church	1967 Canada Drive
26	Canada Drive Church of God in Christ	1833 Canada Drive
27	Leath Street Baptist Church	1831 Canada Drive
28	Homeland Street Missionary Baptist Church	3636 Navarro Street
29	Lively Stones Outreach Ministry	Leath Street at Vilbig Road
30	Victory Mission Baptist Church	2313 Canada Drive
31	Inglesia Christiana Canaan	Winnetka Avenue at McBroom Street
32	La Inglesia Methodista Unida Nueva Esperanza	Winnetka Avenue at Toronto Street
33	Abundant Faith Church of God in Christ	3930 N. Hampton Road
34	Mt. Nebo Baptist Church	Bayside Street at Harston Street
35	House of Refuge Pentecostal Church	1823 Bayside Street
36	Sweet Home Baptist Church	3810 Vilbig Road
37	Kingdom Hall Jehovah's Witness	Vilbig Road at Bayside Street
38	Church of the Living God	1710 Bayside Street
39	Trinity River Mission	1018 Gallagher Street
40	New Mt. Gilead Baptist Church	115 Morgan Avenue
41	Shiloh Missionary Baptist Church	1114 Comal Street
42	Golden Gate Missionary Baptist Church	1101 Sabine Street
43	True Purpose Missionary Baptist Church	434 N. Moore Street
44	Christ's Willing Worker Baptist Church	2213 Lowery Street
45	New Hope Baptist Church	5002 S. Central Expressway
46	Harding Street Baptist Church	223 Harding Street
47	St. Paul Baptist Church	1600 Pear Street
48	Mosley Chapel CME Church	2246 Anderson Street
49	Faith Tabernacle Church of God in Christ	2308 Lowery Street
50	Church of the Living God	2414 Bethurum Avenue
51	South Dallas Baptist Church	2202 Hatcher Street
52	Iglesia Camino de Vida	Conroe and Nomas
53	Bethlehem Pentecostal Holiness Church	1826 Bickers Street
54	Community Care Fellowship Church	1915 Bayside Street
55	Holiness Church of God in Christ	2026 Calypso Street
Note: Plate ID numbers correspond to the locations shown on **Plate 3-8** at the end of **Chapter 3**.		

3.1.5 Utilities

Major components of an extensive urban utility infrastructure are situated throughout the study area. This includes major service lines for drinking water, storm water, natural gas, telephone, television, sanitary sewer, and electricity. Major utilities located in the study area are shown on **Plates 3-9** through **3-11**. A brief summary of these major utilities is provided in the following paragraphs.

Because of the location of the study corridor with respect to the Dallas CBD, industrial and retail areas, as well as residential locations, nearly all types of modern urban utilities have been identified. However, not all of these utilities are present at all locations. The major utilities that have been identified include:

- Storm Drainage Facilities/Pump Stations;
- Sanitary Sewers;
- Water Lines;
- Gas/Petroleum Pipelines;
- Electrical Transmission Lines/Substations;
- Telephone Cable;
- Fiber-Optic Cable; and
- Television Cable.

Drinking Water: Drinking water in the study area is provided by Dallas Water Utilities (DWU), which serves the City of Dallas and 21 additional towns and cities throughout the region. The DWU water system consists of five storage reservoirs, three water purification plants, 22 pump stations, 20 water storage tanks, and 4,560 miles of water distribution mains. DWU has 10 major water distribution mains, ranging from 20 inches in diameter to 66 inches, along with an extensive network of smaller distribution mains throughout the study area.

Sanitary Sewer: The sanitary sewer system in the study area is operated by the City of Dallas. The City has major wastewater treatment plants including the Southside Wastewater Treatment Plant and CWWTP. The Southside and CWWTP process and discharge approximately 90 million and 150 million gallons of wastewater effluent to the Trinity River per day, respectively. The city has six major sanitary interceptor sewer mains, ranging from 10 inches to 120 inches in diameter, along the corridor with an extensive network of smaller service lines located throughout the study area. The 120-inch West Bank interceptor line is located within the Dallas Floodway.

Cadiz Pump Station New Interceptor Sewer Line

The Cadiz pump station is located near the intersection of Industrial Boulevard and Cadiz Street. In the summer of 2000, the pump station experienced a power failure during a major weather event. As a result, several million gallons of untreated sewage was diverted to a bypass pipe that discharged into the old Trinity River sump and was subsequently pumped into the Trinity River. To prevent future discharges, a new sewer line is being designed to connect to the 120-inch West Bank Interceptor sewer line located

on the west side of the Trinity River channel. The new sewer line may cross under the east levee and river channel and would be constructed by tunnel boring. Once operational, the existing 60-inch interceptor line that parallels the west bank of the river channel may be abandoned in place.

Electricity: Electrical transmission line service in the study area is provided by Oncor. Oncor has nine major overhead transmission lines, ranging from 138 kilovolts (kV) to 345 kV in size, several electrical substations, and an extensive network of smaller underground and overhead service lines occur in the study area. Oncor is also in the process of evaluating the potential route location of a new 345 kV transmission line through the study area. The proposed West Levee - Norwood Project would route the new transmission line between the West Levee switching station (SW), located near the west levee south of Singleton Boulevard, to the Norwood switching station, located between Loop 12 and the Trinity River in Irving.

Natural Gas: Four major natural gas distribution mains, ranging from 16 inches to 30 inches in diameter, and an extensive network of smaller distribution lines are located throughout the study area.

Storm Water Drainage Facilities: Storm water drainage in the study area is provided by City of Dallas and maintained by the Streets and Sanitation Department. This department utilizes a large network of integrated drainage systems to provide drainage service throughout the city. The Dallas Floodway contains seven pump stations and five major pressure sewers to manage and distribute storm water runoff. Within the study area, storm water runoff is eventually discharged to the Trinity River through adjacent tributaries, open drainage channels, and/or by large pressure sewers. For areas on the landside of Dallas Floodway Levee system, storm water is collected in large storage sumps (old Trinity River meanders) and transported, via several pump stations, through the levees to outfall channels within the floodway. There are 13 major storage sumps and an extensive network of smaller drainage lines within the study area.

3.2 TRANSPORTATION SETTING

This section describes the existing transportation setting within the study area. This includes a description of the existing transportation infrastructure as well as important traffic generators, which affect both the local and regional transportation system. Additional details are presented in **Chapter 1 Purpose and Need for Action**.

3.2.1 Roads and Highways

The existing highway system within and adjacent to the study area includes seven major freeways and a network of arterial roads and local streets. The principal freeways within the study area are IH-35E and IH-30. Other important highway facilities include IH-45 (Julius Schepps Freeway), SH-183 (Airport Freeway), Spur 366 (Woodall Rodgers Freeway), US-175 (S.M. Wright Freeway/C.F. Hawn Freeway), SH-310 (Central Expressway), and the DNT. Major interchanges are located at IH-35E/SH-183, IH-35E/DNT, IH-35E/Spur 366, IH-35E/IH-30, and US-175/SH-310. As shown on **Plate 3-12**, this network of freeways and interchanges are a part of a system of highways that radiate from the freeway loop around downtown Dallas.

IH-35E is the major north-south corridor through the City of Dallas, connecting to densely populated suburban communities both north and south of the city. Major freeway interchanges associated with IH-35E occur at SH-183, the DNT, Spur 366, and IH-30. IH-35E provides direct north-south access to the Dallas CBD and other major population and employment centers located within and/or adjacent to the study area. These include the Stemmons Industrial District, the West End Historic District, and neighborhood communities in south and west Dallas.

IH-35E STEMMONS FREEWAY

In addition to serving the City of Dallas, IH-35E is also a nationally important Interstate highway. IH-35E merges with IH-35W both north and south of the DFW metropolitan area to form a continuous IH-35 corridor. It is the major north-south interstate linking Texas to other states in the central U.S. and beyond. Due to NAFTA, IH-35 also serves as a freight transportation corridor, linking the U.S. with Mexico and Canada. The ability of IH-35 to fulfill its hemispheric national and statewide function is vital to the economy of the DFW metropolitan area as well as the State of Texas.

The major east-west highway in the study area is IH-30. The only major freeway interchange with IH-30 in the study area occurs at IH-35E (Mixmaster). IH-30 provides direct east-west access to the Dallas CBD and other major population and employment centers located within and/or adjacent to the study area. IH-30 serves as a connecting link to the cities of Arlington, Grand Prairie, and Fort Worth to the west and neighborhoods and communities of east Dallas as well as other towns/cities east of the Dallas city limits.

IH-30 is also an important Interstate highway and is the major east-west facility linking the DFW metropolitan area to the eastern and western U.S. Similar to IH-35, IH-30 also acts as a freight corridor for NAFTA-related truck traffic and serves an important role in the local, statewide, and national economies.

3.2.2 Public Transportation

DART Light Rail

A major network of DART bus routes, light-rail transit (LRT) and commuter rail, and Amtrak rail lines serves the project study area. These are shown on **Plate 3-13**. DART provides bus, rail, on-call (shared-ride van service), paratransit (van service for the disabled), vanpool/carpool services, and manages the HOV system in the Dallas area. Like most U.S. transit systems, most of DART's service is oriented toward a downtown regional hub. Overall, approximately 88 percent of DART's bus riders, and 100 percent of DART's rail riders use routes that are oriented to downtown.

Currently, DART serves Dallas and 12 surrounding cities with more than 130 bus routes, 44 miles of LRT, 31 freeway miles of HOV lanes, and paratransit service for the mobility impaired. DART and the Fort Worth Transportation Authority (the T) jointly operate 35 miles of commuter rail transit (the Trinity Railway Express or TRE), linking downtown Dallas and Fort Worth with stops in the mid-cities and DFW International Airport.

In 2003, annual system-wide (bus, rail, HOV, paratransit, on-call, and vanpool/carpool services combined) ridership was 94.4 million passenger trips, an increase of 0.6 percent from 2002 (93.8 million). As of January 1, 2003, DART has completed the first 44 miles of its light-rail system and 35 miles of commuter rail. Ridership for the light-rail system was approximately 17.0 million in 2003 – up about 3.3 million passenger trips or 19.4 percent from 2002 (13.7 million).

Through 2014, the DART rail system is slated to more than double in size to 93 miles. Extensions now in development include the 17.5-mile northwest corridor serving downtown Dallas, American Airlines Center, Dallas Medical Market Center, Love Field Airport, and the cities of Farmers Branch and Carrolton. A 13-

mile branch will extend from the northwest corridor to north Irving's Las Colinas Urban Center and DFW International Airport. Another 10.2-mile extension will serve the southeast corridor connecting downtown Dallas, Deep Ellum, Fair Park, South Dallas, and Pleasant Grove.

Amtrak operates passenger rail service to the Dallas Union Station located in downtown Dallas. This service connects Dallas to other destinations nationwide. The *Texas Eagle* connects Dallas to points between San Antonio, Austin, and Fort Worth, Texas; St. Louis, Missouri; and Chicago, Illinois; providing twice a day service. In addition, Amtrak passengers may connect to the *Heartland Flyer* train in Fort Worth and the *Sunset Limited* train in San Antonio or Houston via bus service from Dallas.

In October 2000, the DOT announced the designation of a new high-speed passenger rail corridor, the "South-Central Corridor." This new corridor would have DFW as its hub and may serve destinations in Oklahoma, Arkansas, and Texas. This designation was made pursuant to § 1103(c) of TEA-21 and brings the total number to 10 of high-speed rail corridors in the U.S. The designations apply to corridor regions, not to specific routes, because in some cases there are two or more existing routes. The designations are intended to provide flexibility to each region before key stakeholders make planning and financing commitments.

3.2.3 Passenger Airports

The majority of airline passengers in the DFW metropolitan area use two primary airport facilities: Dallas Love Field and DFW International Airport. Combined, these airports provide service by eight international and 19 domestic airlines, including DFW-based American Airlines and Dallas Love Field-based Southwest Airlines. Due to their central location in the southern U.S., flight time to any city in the continental U.S. takes 4 hours or less. In addition, there are eight municipal and four private airports located in the DFW metropolitan area.

Love Field Airport

Owned and operated by the City of Dallas, Love Field Airport is a central hub for regional business and commuter travel. This airport is located approximately 5 miles northwest of downtown Dallas and approximately 2 miles from the IH-35E/SH-183 interchange at the north terminus of the study area. The majority of traffic traveling through the study area to and from Love Field use IH-35E. To access Love Field from IH-35E, motorists use either the DNT or Mockingbird Lane. In 2002, approximately 5.6 million passengers were handled at Love Field. The airport has approximately 32 operational gates and conducts an average of 658 aircraft operations each day. In addition, Love Field provides more than 24,000 jobs and has an annual economic impact in excess of $2.0 billion to the Dallas economy.

DFW International Airport

DFW International Airport is located approximately 11 miles west-northwest of downtown Dallas. Within the study area, the majority of traffic traveling to and from this airport use IH-35E, which connects to SH-183 at the north terminus of the study area. DFW is the world's third busiest airport, handling over 765,000 operations (takeoffs and landings) in 2002 and serving over 52 million passengers. Each day, DFW's seven runways handle an estimated 2,150 departures and arrivals with flights to approximately 160 destinations, including 36 international destinations. An eighth runway is planned for the near future, and three existing runways are being extended as DFW prepares for future growth and the use of new, larger transcontinental aircraft. Known as the "giant engine" that drives the north Texas economy, DFW International Airport contributes approximately $11.2 billion annually to this continually developing area. Businesses in the DFW area employ nearly 211,000 people because of jobs created directly or indirectly by the airport.

3.2.4 Movement of Freight

The movement of goods and products is extremely important to the economic vitality of the region. North central Texas has one of the most extensive surface and air transportation networks in the world, providing extensive trade opportunities for the more than 600 motor/trucking carriers and almost 90 freight forwarders that operate out of the DFW area. The following sections describe the methods used to transport freight through the study area.

3.2.4.1 Trucking

The primary roadway facilities for truck movements include major highways/freeways and major/minor arterial facilities throughout the study area. The transportation of hazardous materials is controlled by ordinances adopted by the City of Dallas. The City of Dallas Ordinance on the Transportation of Hazardous Materials specifically identifies the following "Prohibited Hazardous Material Areas":

- IH-30 from IH-35E to Oakland Avenue;
- IH-45 from Lamar Street to US-75 elevated bypass;
- US-75 elevated bypass from IH-45 to Bryan Street;
- Woodall Rodgers Freeway, all portions within the city limits; and
- Underground tunnel systems.

The regional movement of trucking is concentrated on IH-35 (IH-35E and IH-35W), IH-30, IH-45, and US-75. The IH-35 corridor was identified in ISTEA as Corridor 23, which designates IH-35 as a national high-priority trade route. Currently, the IH-35 corridor carries approximately 32 percent of all NAFTA-related

traffic in relation to other major trade corridors in the state. Referred to as the NAFTA "Superhighway," this major north-south route also serves both the Dallas and Fort Worth CBDs.

3.2.4.2 Freight Railroads

Four major active freight railroad corridors are located within the study area. Several railroad companies own or control these rights-of-way and others operate trains on these tracks, including UP Railroad Company, BNSF Railway Company, Dallas Garland and Northeastern Railroad, Inc. (DGNO), DART, and Amtrak. The following is a summary of these major/minor active freight rail corridors:

- DART owns the railroad right-of-way on the northwest portion of the study area between the IH-35E/SH-183 interchange and Commonwealth Drive. This railroad corridor travels east-west and is used by BNSF and UP for freight train operations and by DART for the TRE commuter train service. Switching movements occur at a rail yard located adjacent to the west of the study area.
- UP owns the railroad right-of-way on the central portion of the study area. This railroad bridge crosses the Trinity River between Continental Avenue and Commerce Street. This railroad corridor is used by DGNO and UP to operate freight trains and by Amtrak. A UP-owned spur track splits from the main railroad near the Dallas Floodway east levee. The spur runs parallel with the levee and was used to access former spur tracks within the Stemmons Industrial District. Currently, the spur is used by DGNO on a limited basis to serve one rail customer, Cargill.
- BNSF owns the railroad right-of-way on the southeast portion of the study area. This railroad bridge crosses the Trinity River between MLK and IH-45. This railroad corridor is used exclusively for freight transport by BNSF and UP. It merges with a UP-owned railroad right-of-way near the intersection of Lamar Street and MLK.
- UP also owns the railroad right-of-way on the southeast portion of the study area. This railroad corridor travels southeast-northwest and is used by UP, BNSF, DGNO, and Amtrak. Spur tracks along this corridor serve a limited number of rail customers, including Texas Industries (TXI), Big City Crushed Concrete, and Oxychem. Switching movements occur along a large rail yard between the old AT&SF Railroad corridor and IH-30 near downtown Dallas.

DART owns additional railroad right-of-way in the southeast portion of the study area. In the early 1990s, DART acquired the former AT&SF Railroad right-of-way located at the southern end of the Dallas Floodway to build an LRT facility. The old AT&SF Railroad has been abandoned, the tracks removed, and the bridge structure across the Trinity River left in place.

3.2.4.3 Air Cargo

Surface transportation in the study area is also influenced by freight rail and trucking movements to and from major air cargo facilities located in the DFW region. These major air cargo facilities include DFW International Airport, Dallas Love Field, and Alliance Airport, which provide air cargo service to many regional, national, and international destinations.

DFW International Airport is the focal point of one of the nation's largest intermodal hubs, connecting air, rail, and interstate highway systems. From this airport, shipping companies can link easily with rail, regional superhighways, and coastal water ports. DFW is one of the largest freight airports in the world, handling 739,041 tons of cargo (freight and mail) in 2002. The airport is also host to a 12,500-acre foreign trade zone and has plans to expand the airfreight capability even further. In addition, the airport is within 4 hours flight time, or 48 hours by truck, from 95 percent of the U.S. population as well as approximately halfway between Latin America and Asia. The Capital Development Program at DFW International plans to invest $2.6 billion into the airports infrastructure over a 5-year time frame. This investment will generate an additional $34 billion in economic impact on the DFW regional economy and another 77,000 new jobs over the next 15 years.

Dallas Love Field also maintains air cargo facilities and handles approximately 20,000 tons per year. Alliance Airport, located north of the City of Fort Worth, is the largest commercial/industrial airport in the nation, providing airfreight service for manufacturing, warehousing, and distribution firms throughout the region.

3.2.5 Non-Motorized Transportation: Pedestrian and Bicycle Use

Pedestrian circulation facilities in the study area are provided as a part of the roadway facility cross-section. Specific pedestrian circulation elements have not been developed by the City of Dallas. In 1992, the City of Dallas developed the Greater Dallas Bike Plan Map. The bicycle routes are on-street routes with no separate provision for bicycles. The following designated bike routes are located within the study area:

North-South Signed Bicycle Routes	East-West Signed Bicycle Routes
Route 23 on Westmoreland	Route 194 on Canada/Beckley
Route 29 on Hampton/Inwood	Route 192 on Bernal/Bickers
Route 37 on Sylvan/Wycliff	Route 190 on Commerce
Route 45 on Houston	Route 210 on Irving/Industrial
Route 45 on Jefferson	Route 170 on MLK

Several local agencies and organizations are in the process of developing an extensive network of bicycle/pedestrian trail facilities within and adjacent to the study area. These planned trails include biking for transportation as well as recreation (see **Section 3.3.2.3 Planned Parks and Recreational Areas**).

3.2.6 Regional Transportation Plans

As previously described in **Chapter 1 Purpose and Need for Action**, the MTP *Mobility 2025 – 2004 Update* identified the fiscally constrained long-term and short-term transportation strategies and actions planned through the year 2025. Multimodal improvements are considered, including highway, freight, transit, bicycle, and pedestrian facilities. The *2004-2006 Transportation Improvement Program for the Dallas-Fort Worth Metropolitan Area*, the TIP, is a staged, multi-year program of projects proposed for funding by federal, state, and local sources within the DFW metropolitan area. The TIP is developed by the NCTCOG in cooperation with local governments, TxDOT, NTTA, and local transportation authorities in accordance with the metropolitan planning requirements set forth in the *Statewide and Metropolitan Final Rule* (23 CFR 450, 49 CFR 613). The TIP was promulgated in the October 28, 1993, *Federal Register* as required by the ISTEA of 1991, which was reauthorized as the TEA-21. The *2004-2006 TIP* was prepared under ISTEA guidelines pending publication of revised planning guidelines consistent with TEA-21.

The projects included within the *2004-2006 TIP* were selected to implement improvements consistent with the *Mobility 2025 – 2004 Update*. Roadway improvement plans for the study area identified within the *2004-2006 TIP* may provide additional traffic-carrying capability to respond to the projected population and employment growth. Despite the existing transportation infrastructure and planned improvements, substantial traffic congestion is anticipated to occur in the study area between now and the year 2025.

The regional CMS was initiated as a federal requirement in the ISTEA of 1991. The CMS provides information on transportation system performance and considers strategies to provide the most efficient and effective use of existing and future transportation facilities. It also defines parameters for measuring the extent of congestion. The project-level CMS was implemented by the NCTCOG. To respond to federal requirements, there are two objectives to the project-level CMS analysis. The first is to evaluate and compare a congestion alternative to the “build” alternatives to determine whether or not the need for additional capacity can be met by management strategies. The second objective is to identify the congestion management strategies that would provide the most effective use of and support the operation of the selected alternative. Planned congestion management strategies in the project study area are listed in **Chapter 1 Purpose and Need for Action** (see **Table 1-9**).

The proposed action is consistent with the area's financially constrained MTP (*Mobility 2025 – 2004 Update*) and the *2004-2006 TIP.* The proposed improvement is included in the *2025 Mobility Plan – 2004 Update* found to conform by the USDOT (FHWA/FTA) on April 8, 2004. Additionally, the project comes from an operational CMS that meets all requirements of 23 CFR Parts 450 and 500.

3.2.7 Related Transportation Projects

Several transportation improvement projects, separate from this study, have been implemented, planned, or are currently being constructed in the study area. **Table 3-9** provides a summary of the key transportation projects in the study area.

TABLE 3-9. KEY TRANSPORTATION PROJECTS IN THE STUDY AREA

Project	Proposal	Status
TxDOT – Dallas District		
IH-30 at Trinity River	Bridge Reconstruction	Detailed Design
IH-30 (Canyon)	Reconstruction with HOV	Preliminary Design
IH-30 (Canyon)	Ramp Reversals/Auxiliary Lane Installation	Complete
IH-35E at Trinity River	Bridge Replacement	Preliminary Design
IH-35E (Mixmaster)	Reconstruction with HOV	Preliminary Design
IH-35E (Lower Stemmons)	Reconstruction with HOV	Preliminary Design
IH-35E – Southbound Frontage Road	Extension from Edison Street to Hi Line Drive	Complete
IH-35E – IH-30 to US-67 (South RLT)	Reversible (Interim) HOV Lane Installation	Complete
Corinth Street Viaduct	Bridge Couplet	Planning Phase
Houston Street Viaduct	Bridge Rehabilitation	Detailed Design Complete
Continental Avenue Viaduct	Bridge Rehabilitation with Potential Conversion to Pedestrian Only Use	Planning Phase
Hampton/Inwood Bridge	Bridge Replacement	Detailed Design
Woodall Rodgers Extension	New Bridge Crossing	Preliminary Design
City of Dallas and Dallas County		
Sylvan/Wycliff Bridge	Bridge Replacement	Preliminary Design
Beckley Avenue	Widen to Six Lanes	Preliminary Design
Commerce Street Viaduct	Bridge Maintenance	Complete
Source: NCTCOG, 2001a; TxDOT-Dallas District. **Note:** The status indicated is as of December 2003.		

As shown in **Table 3-9**, a substantial number of major and minor transportation projects are being planned and implemented throughout the Trinity Parkway study area. The following paragraphs provide a descriptive overview of the key transportation projects in the study area.

<u>Road and Bridge Projects</u>

Canyon/Mixmaster/Lower Stemmons Improvements

TxDOT has initiated the preliminary design and environmental assessment (EA) phase for the Canyon/Mixmaster/Lower Stemmons improvements (i.e., Project Pegasus). Improvements to the Canyon include frontage/collector-distributor road installation, installation of missing direct connections between

IH-30 and IH-35E, and removal of deficient left-hand entrance/exit ramps. The project includes the total reconstruction of the Canyon/Mixmaster interchange, Lower Stemmons segment (including the IH-35E/DNT connection), and the installation of a continuous HOV system through the Canyon. The estimated cost for reconstruction of the Canyon/Mixmaster/Lower Stemmons segments is $350 million. The TPC MTIS estimated cost for the HOV system component is $104 million. Construction of the Canyon/Lower Stemmons segments and HOV system is estimated to begin beyond 2005. Construction of the Mixmaster improvements is estimated to begin beyond 2010.

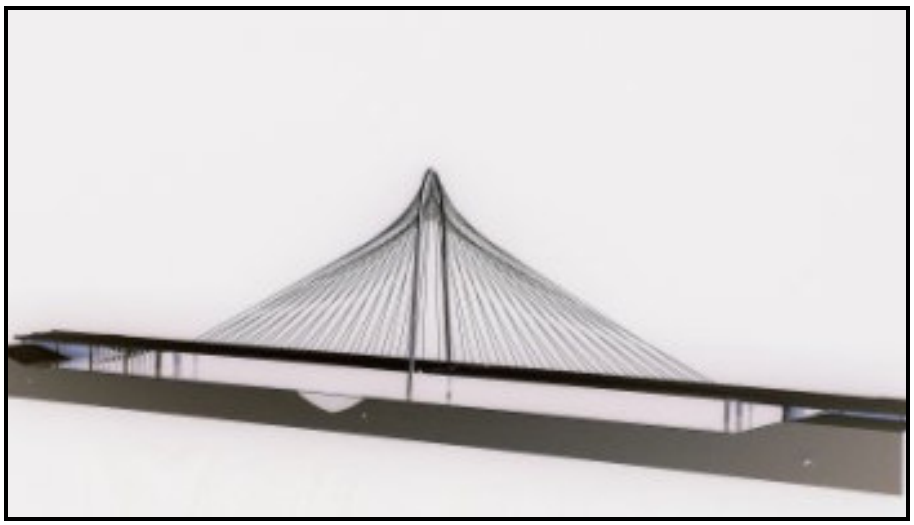
IH-35E HOV System Implementation

This project is currently under construction and consists of installing a reversible, barrier-separated (interim) HOV lane along the existing medians of US-67 and IH-35E (south R.L. Thornton Freeway) from US-67 to Woodall Rodgers Freeway. In addition to accessing the Stemmons Freeway corridor, it would also tie into the existing Houston Street and Jefferson Street Viaducts, allowing direct access to/from the Dallas CBD.

Woodall Rodgers Freeway Extension

TxDOT is currently processing the EA and the preliminary design schematic. A meeting with adjacent property owners was conducted in spring 2000. The City of Dallas and TxDOT have agreed to undertake a “signature” bridge design for this new bridge. The city has raised private funds for the design of the bridge.

PROPOSED WOODALL RODGERS SIGNATURE BRIDGE



IH-35E (Trinity River) Bridges

TxDOT would be initiating the preliminary design phase for the reconstruction of the existing IH-35E Bridges across the Trinity River. In addition to the mainlane structures, the project includes additional

collector-distributor bridges. In addition, the bridges are considered candidates for a “signature” bridge design concept. The current funding allocated for the main lane portion of this project (without “signature” bridges) is $16 million. Construction is estimated to begin beyond 2005.

IH-30 (Trinity River) Bridges

TxDOT is completing the detailed design phase for the reconstruction of the existing IH-30 bridges across the Trinity River. In addition to the main lane structures, the project includes additional collector-distributor bridges. In addition, the bridges are considered candidates for a “signature” bridge design concept. The current funding allocated for this project (without “signature bridges”) from Loop 12 to IH-35E is $111 million. Construction is estimated to begin beyond 2005.

Houston Street Viaduct

This transportation enhancement project involves the repair, rehabilitation, and subsequent preservation of the Houston Street Viaduct, which is listed on the NRHP. Construction is estimated to begin in 2004. Additional details concerning the Houston Street Viaduct are provided in **Section 3.3.1 Cultural Resources** and **Chapter 5 Preliminary Section 4(f) Evaluation.**

Corinth Street Viaduct

TxDOT is processing the preliminary design phase for this bridge couplet project. The existing bridge over the Trinity River is planned for added capacity from four to six lanes. The estimated construction cost is $16.9 million with construction estimated to begin beyond 2005. In addition, the Texas SHPO has determined the Corinth Street Viaduct eligible for the NRHP. Additional details concerning the Corinth Street Viaduct are provided in **Section 3.3.1 Cultural Resources** and **Chapter 5 Preliminary Section 4(f) Evaluation**.

Continental Avenue Viaduct

The Continental Avenue Viaduct is being evaluated in conjunction with the Woodall Rodgers Bridge extension. The bridge may be converted to “pedestrian only” facility once the Woodall Rodgers Extension project is complete. In addition, the Continental Street Viaduct has been determined eligible for the NRHP by the SHPO. More details concerning the Continental Street Viaduct are provided in **Section 3.3.1 Cultural Resources** and **Chapter 5 Preliminary Section 4(f) Evaluation**.

Sylvan/Wycliff Bridge

The Dallas County Public Works Department has completed the design phase for replacement of the Sylvan/Wycliff Bridge across the Trinity River. The proposed project would replace the existing at-grade crossing of the Trinity Floodway with an elevated six-lane bridge. Currently, this project is not funded and may require modification to accommodate connections with the proposed action, depending on the

preferred alternative identified. In addition, this new bridge may need to be shifted west approximately 100 feet to preserve the existing Sylvan Street Bridge, which could potentially be used as an at-grade crossing of the proposed Trinity Park access road system and to avoid impacts with the newly constructed Sylvan Avenue boat ramp on the Trinity River.

Hampton/Inwood Road Bridge

TxDOT is completing the detailed design phase for this bridge replacement project. The existing bridge over the Trinity River is to be replaced with a six-lane divided structure with the outside lanes designed to accommodate bicycle traffic. The estimated construction cost is $22 million with construction estimated to begin in 2004.

Trinity River Corridor MIP/BVP

As previously described in **Section 3.1.1.1**, the City of Dallas has proposed several transportation improvement projects, including the Trinity Parkway, as part of their *Trinity River Corridor MIP/BVP*. The portion of the plan located within the Trinity Parkway study area is shown graphically on **Plate 3-4**. A summary of the plan's proposed transportation improvements is provided in the following paragraphs.

Transportation

The urban design study from the *BVP* has introduced a concept for transportation improvements referred to as the "Balanced Transportation Concept." This concept has four integrated components. All would be necessary to meet the plan's objectives:

1. The Trinity Parkway (proposed action);
2. Industrial Boulevard, which would serve as a collector/distributor and simplify the Trinity Parkway's role in providing access to downtown Dallas;
3. An Oak Cliff levee-top road which could serves as a collector/distributor and simplify the Trinity Parkway's role in providing access to downtown Dallas; and
4. Vehicular and pedestrian access to the planned park and lakes.

The plan identifies two primary objectives for the Trinity Parkway:

1. To serve as a permanent reliever route, a part of a remedy for the heavy traffic flows along the Lower Stemmons, Mixmaster, and Canyon (i.e., Project Pegasus); and
2. To fulfill the goal of providing access and visibility for the proposed Trinity River park with a context-sensitive design.

The “stakeholders” in this balanced transportation concept – the City of Dallas, TxDOT, NTTA, NCTCOG, and the Trinity River Urban Design team – have agreed that the Trinity Parkway component of the concept should be evaluated in the Trinity Parkway DEIS. The Trinity Parkway component of this balanced concept is called the “Modified-Combined” alternative (Alternative 3B) and was added as another EIS build alternative (see **Chapter 2 Alternatives Considered**).

Major components of the transportation activities are listed below. The proposed Trinity Parkway is the only roadway component that is being evaluated in the Trinity Parkway DEIS. The other initiatives are not NTTA projects, but may be implemented by others.

Proposed Trinity Parkway

- Length of Parkway from SH-183 to US-175 is approximately 9.0 miles.
- 55 mph is the posted speed limit.
- 60 mph is the design speed.
- Number of lanes:
  - Six lanes northwest of Continental Avenue
  - Four lanes southeast of Continental Avenue. Expandable to six lanes for the full length prior to 2025 if sufficient traffic volumes warrant expansion and in consultation with the City of Dallas, NCTCOG, and TxDOT.
  - 12 feet is the lane width (with FHWA approval).
  - Trucks restricted by ordinance, high tolls, or other measures.
  - Vertical Clearances: reduced from highway standards (with FHWA approval).
  - Trinity Parkway is a tolled facility.

Industrial Boulevard

- Number of lanes: currently six lanes; proposed eight lanes with some additional turning lanes.
- Speed limit is 35 mph.
- Enhanced landscape and street trees.

South Lamar

- Number of lanes: currently four lanes; proposed six lanes with some additional turning lanes.
- Speed limit is 35 mph.
- Enhanced landscape and street trees.

Downtown Levee-Top Road

- Support development on properties near the levee on the downtown side.
- Number of lanes: two travel lanes with on-street parallel parking.

- Speed limit is 30 mph.
- Lane widths is 10 feet vehicular lanes (with 11 feet outside lanes where used for parking and bicycling).

Oak Cliff Levee-Top Road

- Length of Oak Cliff Levee-top Road is 1.8 miles from Beckley to IH 35.
- Number of lanes: 4 travel lanes with off-peak, on-street parallel parking.

S.M. Wright Freeway

- Downgrade to surface boulevard status.
- May become a city street.
- Enhanced landscape and street trees.

Public Transit

- DART service at Union Station, Convention Center, Cedars West and Moore Park.
- TRE at Union Station.
- Bus connections: Westmoreland, Hampton, Sylvan, and Irving Boulevard routes.
- Bus routes cross Continental, Commerce, Houston, and Jefferson viaducts.

Trail Projects

The TxDOT – Dallas District (in cooperation with others) has several planned, programmed, and funded trails and bicycle routes (i.e., regional veloweb) within the Trinity Parkway study area. This system of trails and bicycle routes is described in the project planning documents: *The Trinity River Corridor MIP* and the *Dallas County Trail Plan* (Dallas County Commissioners Court, 1997). These and other planned bicycle/recreational trails are further described in **Section 3.3.2.3 Planned Parks and Recreational Areas**.

Related Major Investment Studies

DART Northwest Corridor MIS. DART completed the Northwest Corridor MIS in February 2000. The Locally Preferred Investment Strategy (LPIS) adopted by DART consists of LRT on the UP Railroad alignment to Carrollton and light-rail along the University of Dallas/Texas Stadium (UD/TX Stadium) option through the City of Irving and on to the DFW Airport. An 18-mile LRT is planned from downtown Dallas through Farmers Branch to Carrollton. A 14-mile segment would branch from the Northwest Highway/Webbs Chapel area, past Texas Stadium, to the University of Dallas and Las Colinas in Irving. The recommended LPIS identified 18 potential station locations, which consist of 11 new stations along

the UP alignment and seven along the UD/TX Stadium alignment. DART estimates the $1.4 billion line with 18 stations may carry more than 25,000 riders per day. Planners estimate service could begin in Carrollton and Farmers Branch by 2010 and Irving by 2011. An extension from SH-161 could reach the north end of DFW Airport by 2014.

The highway/HOV element includes a two-lane reversible HOV facility on a portion of IH-35E and a one- or two-lane reversible HOV on SH-114. Also recommended was one additional general-purpose highway lane in each direction on portions of IH-35E and SH-114. The TSM/CMS element includes a freeway bottleneck removal component (nearly 50 projects), intersection improvement projects, and TDM programs. DART published the FEIS for this project in October 2003.

DART Southeast Corridor MIS. DART completed the Southeast Corridor MIS in May 2000. The LPIS adopted by DART consists of LRT, bus route enhancements, TMA programs, and roadway improvements. The main component, an LRT line, was approved from the CBD to Buckner Boulevard. The alignment is approximately 10.2 miles long with eight proposed stations. The estimated capital cost is $450 million. DART estimates the LRT line could be operational by the year 2009. The daily ridership in the year 2025 is expected to be 19,500 riders. DART published the FEIS for this project in October 2003.

TxDOT SH-183/West Fork Corridor MIS. The SH-183/West Fork Corridor MIS (2000a), managed by the TXDOT Dallas District as the lead agency, was published in May 2000. The MIS was performed to develop a locally preferred plan of action to solve existing and future transportation needs along the SH-183 corridor. One element of the recommended plan of action of the MIS was reconstruction of the SH-183 with widening from six to eight general-purpose main lanes and a management HOV system. The proposed improvements extend from SH-360 on the west to IH-35E on the east. The proposed project has completed the schematic design and the EA received a FONSI in February 2004.

IH-35E/US-67 (The Southern Gateway). In October 2001, the TxDOT – Dallas District initiated an MIS/EA to address transportation deficiencies along IH-35E/US-67 (i.e., The Southern Gateway). The project limits extend from the beginning of South R.L. Thornton Freeway (IH-35E) south of the Dallas CBD to IH-20 and along US-67 from IH-35E to FM-1382 in southern Dallas County. Preliminary design schematics have been completed and the corresponding environmental documentation is scheduled for completion by summer 2004.

3.3 CULTURAL RESOURCES AND PARKLANDS

This section describes cultural resources (historic and archeological) and parkland areas in the study area and the legal and regulatory requirements that apply to these resources.

3.3.1 Cultural Resources

An assessment was conducted to identify cultural resources within each alternative's established Area of Potential Effect (APE), as set by the THC. Research centered upon the identification of prehistoric and historic archaeological sites and historic architectural resources (buildings, structures, objects, and districts). The detailed identification and evaluation reports: *The Trinity River Parkway Archival and Archaeological Evaluation Report* (Skinner, 2003), *Cultural Resource Review for the Environmental Impact Statement Areas of Potential Effect of the Trinity River Parkway, Dallas, Texas* (Norman Alston Architects, 2000), and the *Historic Resource Survey of Building Displacements for the Trinity River Parkway, Dallas, Texas* (Norman Alston Architects, 2001) are on file.

3.3.1.1 Regulatory Context

Historic resources are regulated under § 4(f) of the DOT Act and under § 106 of the NHPA [16 USC 470(f)]. **Chapter 5 Preliminary Section 4(f) Evaluation** provides an analysis of impacts to historic resources in compliance with § 4(f).

Under 36 CFR § 800.1 of the Advisory Council on Historic Preservation (ACHP) regulations pertaining to the protection of historic properties, § 106 of the NHPA requires a federal agency with jurisdiction over a federal undertaking, or one that is federally assisted or federally licensed, to take into account the effect the undertaking will have on sites, buildings, structures, or objects that are listed in or determined eligible for inclusion in the NRHP. The § 106 process, as defined in 36 CFR § 800.4, requires the federal agency to identify and evaluate the significance of historic properties that may be affected by the proposed undertaking, in consultation with the SHPO and in following with the Secretary of the Interior's Guidelines and Standards for NRHP Evaluation.

Historic properties include archaeological sites or structures that are 50 years of age or older, or would be, prior to the completion of the proposed action. If the agency head and the SHPO agree that a property potentially affected by the undertaking is NRHP eligible, then they shall apply the *Criteria of Adverse Affects* found in 36 CFR § 800.5 to such a property. If an adverse effect is determined, then the federal agency and the SHPO shall seek ways to either avoid the property or minimize the impacts to it,

to the fullest extent possible. The following broadly defined criteria as described in 36 CFR § 60.4 are used to evaluate properties 50 years of age or older for eligibility in the NRHP.

National Register Criteria for Evaluation

The quality of significance in American history, architecture, archeology, engineering, and culture is important. Such importance is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. Such criteria include:

- That are associated with events that have made a significant contribution to the broad patterns of our history; or
- That are associated with the lives of persons significant in our past; or
- That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- That has yielded, or may be likely to yield, information important in prehistory or history.

Historic resources are also protected by other legislation and regulations including 36 CFR Part 800: *Protection of Historic Properties*; § 4(f) of the DOT Act (23 CFR § 771.135 and 49 USC § 303), Archaeological Land Historic Data Preservation Act; Texas Parks and Wildlife Code (Chapter 26, § 26.001 to § 26.004); Antiquities Code of Texas (Title 9, Chapter 191); and the City of Dallas Development Code (Chapter 51).

Section 4(f) and Section 106

Section 4(f) applies only to programs and projects undertaken by the DOT and only to publicly owned public parks, recreation areas, wildlife refuges, and historic sites on or eligible for the NRHP. For protected historic sites, § 4(f) is triggered by the "use" or occupancy of a historic site by a proposed project. There is also a situation, though rare, in which a project does not actually "take" or occupy a historic site, but due to proximity impacts to the historic site, is determined by the FHWA to substantially impair the qualities that made the historic site eligible for the NRHP. This would be a "constructive use."

Section 106 is a different requirement, which applies to any federal agency and is concerned about the direct and indirect effects of an action on historic properties. Section 106 evaluates "effects" on a historic site, while § 4(f) protects a historic site from "use" by a project. Therefore, even though there may be an "adverse effect" under § 106 because of the effects upon the site, the provisions of § 4(f) are not automatically triggered because the project would not result in an "actual use" or occupancy of land from the historic site. If there is not an "actual use," the analysis regarding whether § 4(f) provisions are

triggered needs to evaluate whether there is a "constructive use." A constructive use is determined by the FHWA to occur "when the transportation project does not incorporate land from a § 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under § 4(f) are substantially impaired. Substantial impairment occurs only when the protected activities, features, or attributes of the resource are substantially diminished" [23 CFR § 771.135(p)(2)].

Historic sites are listed on or eligible for the NRHP for their architectural significance and/or their associations with broad historical patterns. The features and attributes that qualify them for the NRHP are not typically affected by proximity impacts because those features and attributes remain in place after project implementation. This is in contrast to publicly owned parks, recreation areas, and wildlife refuges, which more typically have "activities" that could be substantially impaired by proximity impacts.

3.3.1.2 Historical Context

The City of Dallas has a long and interesting history that has developed due to the vast expanses of land available to farmers, real estate speculators, and developers, as well as its location at the "Three Forks" of the Trinity River. The area was first visited by the Spanish as early as 1542 and was visited by other European explorers and trappers in the 17th, 18th, and early 19th centuries. Mexico governed Texas from the early 1820s to the mid-1830s. Texas declared independence from Mexico in 1836. Soon thereafter, settlers who were primarily from the southern U.S. began to come to Texas.

In 1839, settler John Neely Bryan followed the faint Indian trail from Arkansas to the "Three Forks" area of the Trinity River. Seeking fortune from speculative land sales, Bryan chose the area because of the confluence of the rivers' forks, a natural rock ford for crossing the river, and the intersection of two major Indian traces. He envisioned a town on a river with a navigable waterway giving access to the sea. Bryan laid out the 10-block town site now known as Dallas and began selling lots to settlers. He also established Bryan's Ferry to help the settlers and immigrants cross the river during high water events.

The construction of the National Central Road in 1844 created an overland connection from St. Louis to San Antonio that followed the old Indian Trail through Dallas. This positioned Dallas as an important landmark for settlers and immigrants. That same year, J.P. Dumas surveyed the town of Dallas in a one-half square mile pattern of blocks and lots to the east of the Trinity River, which further defined the town. In 1849, local efforts were begun to use the Trinity River for navigation and as a transportation channel to the sea. The first steamboat, *Job Boat No. 1*, arrived in Dallas on May 5, 1868 from Galveston. The boat sank on its second voyage to Dallas. However, it so enthused the citizens of Dallas that they built their

own, the *Sallie Haynes*, and launched it on December 17, 1868. The boat sank about 40 miles down river a short time after.

The "iron horse" was beginning to make its way across the landscape of Texas in the late 1840s. The Galveston and Red River Railroad was incorporated in 1848 and efforts were underway to bring the railroad to Dallas. It would eventually be the first railroad to come to Dallas, but it would take another 24 years. The Galveston and Red River Railroad name was changed in 1856 to The Houston and Texas Central Railway.

In 1855, Alexander Cockrell and the Dallas Bridge and Causeway Company built Dallas' first permanent wooden bridge across the Trinity River, thereby further linking Dallas and Hoard's Ridge. The bridge was located approximately at the same site as the location of the current-day Commerce Street Viaduct. In 1856, Dallas was officially incorporated and the population had grown to 350.

HOUSTON STREET VIADUCT ENTERING DALLAS (CIRCA 1920)

By the 1860s and 1870s, Dallas was no longer a peaceful antebellum settlement, but rather had become a booming western frontier town. In 1872, an iron bridge replaced the wooden bridge across the Trinity, and the Houston and Texas Central Railway finally reached Dallas, establishing a direct connection to the sea. Dallas had become a sprawling railhead village and market for buffalo hides with a population of less than 3,000. In 1882, the County of Dallas purchased the iron bridge over the Trinity River for $42,000, and it became the first free bridge across the Trinity.

In 1884, Dallas' most famous architect, James E. Flanders, opened the first residential development west of the Trinity River, the Flanders Heights addition. It was situated near the current intersection of Sylvan Avenue and IH-30, but proved unsuccessful. Three years later, in 1887, Thomas Marsalis developed Oak Cliff as a residential suburb. It was reportedly named for the forested "cliffs" on the western edge of Trinity River bottoms. To connect this development with Dallas, Marsalis developed "The First Elevated Railway in the South," a railroad transit service over the Trinity River to connect Oak Cliff and Dallas. Oak Cliff was organized as a separate township in 1891 and was considered a part of greater Dallas by 1903, and the Winnetka Heights subdivision was platted in 1908 by Miller-Stemmons. Winnetka Heights was

the last major subdivision platted in Oak Cliff. The Winnetka Heights subdivision is now a National Register Historic District.

The Cedars, one of the most exclusive and fashionable residential sections in the state, was established just south of the CBD in the early 1880s. The Colonial Hill subdivision, a NRHP Historic District, was established shortly after the City of Dallas expanded its city limits in 1890. By the decade between 1890 and 1900, the fashionable Cedars area had begun to turn to industrial development because the land was closer to the railroads and less prone to flooding.

In an effort to promote Dallas, The Trinity River Navigation and Improvement Company, incorporated in 1871, had the Steamboat *Dallas* (the second to bear the name of the city) built in Galveston in 1892. On March 8, 1893, the company purchased the steam paddle wheeler *H.A. Harvey, Jr.* Once in Dallas, the boats' route ran from the Commerce Street tie-up 13 miles downstream to a dam. The public's interest in navigating the Trinity continued well into the 20th century. There were congressional committees and appropriations toward the navigation of the Trinity in 1902 and 1904, and locks and dams were built downstream between 1905 and 1921. One of the last efforts was the formation of the Trinity River Canal Association in 1930, later named the Trinity Improvement Association. Another survey of the river was financed by a Public Works Administration (PWA) grant. A report was made to Congress in 1940, but nothing came of it. Little has been done toward the Trinity River navigation effort since that time.

Things changed forever for Dallas in 1908. The Great Flood of 1908 left 4,000 people homeless, and the entire city was left without water, telephones and telegraph, and power, and all rail services were cancelled due to damaged bridges and tracks. The Trinity River Bridge was swept away, severing Dallas from Oak Cliff for over a week, and property damage was in the millions of dollars. Soon thereafter, George Kessler, a well-known city planner from Kansas City and native of Dallas, was hired by the Dallas City Plan and Improvement League to initiate a comprehensive plan that would include a way to vanquish the flooding of the Trinity River. The Kessler Plan, completed in 1911, was a massive scope of work in which he suggested that the river channel be straightened and that levees are built for flood protection. Elements of this plan are still being considered to this day, including a provision for a town lake and city harbor.

To reestablish the connection between Dallas and Oak Cliff, the Houston Street Viaduct was designed by Hedrick and Cochrane of Kansas City. Construction on the bridge was started on October 24, 1910, and it was completed on February 22, 1912 at a cost of $675,000. The bridge is listed on the NRHP. Its later sister Bridges, the Corinth, Commerce, Continental, and Cadiz (now, northbound IH-35E) were constructed during a 3-year period from 1929 to 1931 with the intent to relieve congestion on the Houston

Street Viaduct. The Southern Pacific, Santa Fe, and MKT Railroad Bridges that spanned the Trinity River were rebuilt after the 1908 flood, and they are also eligible for listing on the NRHP.

Dallas survived another devastating flood in 1913, which was not as destructive as the 1908 flood. However, the need for the Kessler Plan was all the more evident after the 1913 flood, and Dallas finally saw many of the recommendations of George Kessler come to fruition 13 years later. The city and county of Dallas Levee Improvement District approved the Ulrickson Bond Issue on July 26, 1926. Improvements for the Trinity River included $6,500,000 in bonds for constructing levees and straightening and moving the river channel; $3,339,500 for the construction of viaducts and other improvements; $5,000,000 by railroads and utilities in the district; and $3,500,000 by the City of Dallas bonds. On December 15, 1927, the City of Dallas voters approved the $23,900,000 Ulrickson Bond Issue, and on April 3, 1928, Dallas County voters approved the bond issue. The realization of these improvements came between 1928 and 1933, and the improvements remain an important factor in Dallas' success.

Another benefit of the Ulrickson Bond Issue was the construction of the Cadiz and Corinth Street Viaducts and the reclamation of the marshy bottomlands of the Trinity. The Cadiz Street Viaduct (now IH-35E northbound) was completed in 1932, and the Corinth Street Viaduct was completed in 1933. In 1933, the city-county improvement program reclaimed nearly 10,000 acres of bottomland for industrial uses.

The years of the Great Depression, between the approval of the Ulrickson Bond Issue and the beginning of World War II, were not as devastating to the Dallas economy as perhaps to the rest of the country. Between 1933 and 1940, Industrial Boulevard was built in the reclaimed valley to the east of the newly completed levees of the Trinity River. The location of Industrial Boulevard and the existence of hundreds of businesses that are so vital to Dallas' economy would not have been possible without the passage of the Ulrickson Bond Issue in the 1920s and the implementation of that portion of the Kessler Plan in the 1930s. The reclamation of that land made it possible to develop the industrial area that has held a major stronghold in the Dallas economy for seven decades. Land that was virtually unusable prior to the construction of the levees is now one of the most important manufacturing and distribution centers in the country and will likely be a vital part of the Dallas economy for decades to come.

To meet the growing needs of Dallas, Harland Bartholemew, a nationally recognized planner, was hired in 1943 to develop a new master plan for Dallas. The result was a $40 million bond package being developed to meet the plan's proposals. However, Dallas developed faster than the plan could be implemented. The end of World War II and the post-war boom that followed outdated the plan.

In the 1950s, Oak Cliff's prosperity reached its peak, and the post-war housing boom spawned multiple large housing developments and thousands of new businesses through the city. To meet the urban

sprawl, a freeway system was designed and built during the mid-1950s. In 1952, Central Expressway (US-75) was built to the south near the old Colonial Hill Subdivision and to the north in 1954-56 along the old Houston and Texas Central Railway right-of-way. The Dallas freeway system was greatly expanded with the additions of the DFW Turnpike (IH-30 west of the Trinity River) and IH-35E (US-77 and IH-35E) in 1957. The addition of these freeways secured the future of industrial developments like the Brookhollow Industrial District for the remainder of the 20th century and well into the 21st century. The building of R.L. Thornton Freeway (IH-30 east of the Trinity River) began in 1959. This controversial freeway was badly needed, but its construction was responsible for dividing many of the city's older neighborhoods and destroying many of Dallas' historic homes and buildings that remained from the late 19th and early 20th centuries. The 1960s through the 1980s also saw many of Dallas' historic commercial buildings fall to the wrecking ball in favor of the construction of skyscrapers and new commercial developments.

3.3.1.3 Survey Methodology

In accordance with 36 CFR § 800, a cultural resource-scoping meeting was held in Dallas on September 8, 1999. Participants included representatives from FHWA, NTTA, TxDOT-Environmental Affairs Division, THC, USACE, and City of Dallas. The participants were taken on a bus tour of the study area focused on the various alternative alignments. In consultation with SHPO and TxDOT reviewers, APEs pursuant to 36 CFR § 800.4(a) were established for the six alternative alignments under consideration. The APEs are described as follows:

APE for Prehistoric and Historic Archaeological Resources

- The APE is limited to 100 feet on either side of the Trinity River levee in those areas where Alternatives 3A, 3B, 4, and 5 are proposed to be on the inside or the outside of the levees.
- The APE is limited to the areas of proposed ground disturbance in all other parts of the Trinity Parkway project. This includes Alternatives 2A and 2B and the north and south ends of the project where all alternatives have common termini.

APE for Architectural and Neighborhood Resources

After a January 6, 2000 meeting at the office of the THC, field surveys of the proposed alignments for the six build alternatives were performed by professionals who met the Secretary of the Interior's *Professional Qualifications Standards* (36 CFR Part 61). A second field survey, which included members of the THC, TxDOT, City of Dallas Landmark Commission, and consultant architects, was conducted on January 17, 2001. This survey further evaluated structures along or within each alternative right-of-way and placed each structure within categories of low, medium, and high architectural/historic significance.

At this point in the § 106 process, listed and eligible archaeological and historic sites within each APE have been identified through archival information and available state records. Areas of potential for buried archaeological resources within each APE have been identified. Structures more than 40 years old within each APE have been identified and the number of these structures directly impacted (within the proposed right-of-way) by each alternative alignment has been determined. Each directly impacted structure has been photographed, mapped, described, and categorized (Norman Alston Architects, 2001).

3.3.1.4 Archaeological Resources

Due to the location of the APEs in heavily built-over areas with residential, commercial, and industrial properties and in areas disturbed by levees or in areas of low archaeological probability as defined by the THC (see **Appendix B**, THC letter dated February 28, 1996) a field reconnaissance of the APEs for archaeological resources was not done. As directed by the SHPO, field surveys for archaeological resources would be performed for the preferred alternative.

Archaeological resource data for the study area were compiled to provide a listing of known archaeological sites and to evaluate the archaeological potential within the APEs of the six build alternatives. Known sites are categorized as:

- Listed on the NRHP;
- Eligible for listing on the NRHP;
- Not eligible for listing on the NRHP; and
- Those with unknown NRHP potential.

The four known archaeological sites identified near the archaeological APE are listed below and shown on **Plate 3-14**:

- 41DL220 – recorded in 1981, this site was a historic (probably early 1900s) limestone-lined well and an associated packed clay floor. No artifacts were found at the site. Attempts to relocate the site in 1998 failed, as it was likely destroyed during construction of a transmission line. It has been recommended to be ineligible for inclusion in the NRHP.
- 41DL320 – recorded in 1990, this site was an old City of Dallas dump with two areas dated to the 1930s and one area dated to the 1900s. The dump has been looted by bottle collectors and may be eligible of inclusion in the NRHP.
- 41DL370 – recorded in 1996, this site was a brick-lined well and associated trash accumulation that has been dated to after the 1940s. The site was destroyed during the Phase I widening of

the Trinity River Floodway and would not have been considered eligible for inclusion in the NRHP.

- 41DL371 – recorded in 1996, this site was a trash dump exposed in the side slope of the Phase I widening of the Trinity River. Trash included oyster shells, cut animal bones, and thick earthenware along with drink and medicine bottle fragments. Most of the dated artifacts indicate the use of the dump was in the early 1900s. This site may be eligible for inclusion in the NRHP.

While the above listed archaeological sites are located within the study area, none is located within the archaeological APEs of the alternative alignments.

- Archaeological sites *listed* on NRHP – none identified within APE.
- Archaeological sites *eligible* for listing on NRHP – none identified within APE.
- Archaeological sites *ineligible* for NRHP listing – none identified within APE.
- Archaeological sites of *unknown* NRHP Potential – none identified within the APE.

Areas of High Probability for Archaeological Resources

Within the study area, the Trinity River has been relocated and channelized within the existing Dallas Floodway levees. Remnant meanders of the old river channel are located east of the east levee near Irving, Lamar, and Industrial Boulevards. The most likely location for buried archaeological sites is along the old meanders of the Trinity River from just west of Hampton/Inwood Road to east of the AT&SF Railroad Bridge. No archaeological surveys have been conducted in these areas and no attempt has been made to explore the river meanders in this part of the Trinity River floodplain for buried prehistoric or historic sites. However, surveys and deep testing downstream in the DFE project area including the areas of the CWWTP, as well as upstream along the Elm Fork and West Fork of the Trinity River, have shown the presence of shallow and deeply buried prehistoric deposits in floodplain sediments. Additionally, all of the alternative alignments cut across the first terrace of the Trinity River and thus have a potential for encountering archaeological deposits in terrace sediments.

Areas of Low Probability for Archaeological Resources

Archaeological resources have been shown to be absent within the levees along those sections that form the basis of the four river alternative alignments (Alternatives 3A, 3B, 4, and 5). Subsurface investigations inside and just outside these alignment APEs have been conducted in conjunction with construction of the DART Railroad crossing of the river, and no evidence of historic archaeological resources was encountered. Similar results were encountered in the corridor of the West Bank Interceptor (sewer line) project and in the second phase of the widening of the Trinity River channel. Two historic sites were found in the first phase of the channel modification project; one was a dump tentatively dated about 1900 and the other was a well dated after 1940. No prehistoric archaeological sites have

been recorded inside the levees within the APE area from west of Hampton/Inwood Road to east of the AT&SF Railroad Bridge. This is an area that in the past was designated as having a "high" potential for containing prehistoric cultural resources, but which has been concluded was too broadly defined. The THC has provided the opinion that the area has little potential for containing preserved prehistoric archaeological deposits (Skinner, 2003).

Areas of high and low archaeological potential are shown on **Plate 3-14**. In summary, archaeological resources are not anticipated within the build alternative APEs except possibly in those areas where the alternatives cross the now-abandoned and formerly meandering channel of the Trinity River, where alternatives cross a tributary intersecting with the old channel, or where alternatives cut across the first terrace of the Trinity River at the north and south ends of the project (Skinner, 2003).

3.3.1.5 Historic Resources

This section describes architectural resources (e.g., buildings, structures, objects, and districts) within the APEs that are listed in or eligible for listing in the NRHP. Additionally, the more than 40-year-old potentially historic properties that may be displaced by a build alternative(s) were identified, photographed, mapped, and submitted to the THC for eligibility determination. The THC determined six of these buildings were eligible for listing on the NRHP (see **Table 3-10**).

Table 3-10 is a listing of the known architectural resources and the more than 40-year-old resources that were determined to be on or eligible for the NRHP. **Plate 3-14** shows the location of these resources.

TABLE 3-10. HISTORIC AND POTENTIAL HISTORIC PROPERTIES

Plate ID No.	Historic Resources	Building/ Resource Type	Construction Date	Status*
1	Houston Street Viaduct	Bridge	ca. 1910-1912	1
2	Colonial Hill Historic District	Residential Area	ca. 1910-1940	1
3	UPRR (Southern Pacific) Bridge	Railroad Bridge	---	2
4	Corinth Street Viaduct	Bridge	1929-1931	2
5	AT&SF Bridge	Railroad Bridge	ca. 1890-1910	2
6	MKT RR Trinity River Bridge	Railroad Bridge	ca. 1890-1910	2
7	Continental Street Viaduct	Bridge	1929-1931	2
8	Commerce Street Viaduct	Bridge	1929-1931	2
12	1715 Market Center – Pettigrew Associates	Commercial Building	1954	3
13	1202 North Industrial – ACF Corp.	Commercial Building	1947	3
14	1000 South Industrial – Sportatorium * (demolished)	Commercial Building	1950	4
15	1212 South Industrial – Oak Cliff Box Co.	Commercial Building	1948	3
16	3701 South Lamar – DISD	Storage and Maintenance Facility	1920	3
17	2255 Irving Boulevard – City and County Levee Operations	Pump Station B	1925	3

Source: Norman Alston Architects, 2000.
Notes: Plate ID Numbers correspond to the locations shown on **Plate 3-14**. **ca.** = circa (i.e., approximately).
Status*: **1** = listed on the NRHP; **2** = eligible for listing on the NRHP; **3 =** buildings determined by THC to be eligible for listing on the NRHP and that are located within the proposed right-of-way of a build alternative(s); **4** = building has been demolished and removed by others since the THC determination of eligibility.

Properties Listed in the NRHP

- The Houston Street Viaduct extends across the Trinity River and is one of the longest viaducts ever built with reinforced concrete arches. The viaduct, completed in 1912, was built to re-establish the connection between the Dallas CBD and Oak Cliff after the disastrous 1908 flood. The viaduct plus embankments is 6,562 feet in total length, with spans totaling 5,840 feet and a width of 56 feet. The viaduct spans the river and floodplain with 80-foot-wide arches and a 100-foot center steel span. The viaduct was listed on the Texas Historic Engineering Site Inventory in 1975 and in the NRHP in 1984. At the time it was constructed, the Houston Street Viaduct was the longest reinforced-concrete bridge in the world. The Houston Street Viaduct continues to serve as a major traffic artery. Newer bridges nearby spanning the river are higher, but none has the solidity or visual prominence of the Houston Street Viaduct. The northern downtown sections of the bridge begin at Union Terminal and continue over a network of railroad tracks, IH-30, and Reunion Arena. The context of the southern half of the bridge remains little changed, crossing the floodplain into an early and intact section of the Oak Cliff suburb.

- Principally, the American Foursquare bungalows and cottages of the late 1910s, 1920s, and 1930s characterize the Colonial Hill Historic District. This long, narrow district is flanked by two major freeways: Central Expressway (US-75) on the northeast, and IH-45 and South Lamar on the west and southwest and incorporated approximately thirteen blocks north to south. The district contains 489 buildings. Of these, 353 (approximately 72 percent) are contributing properties (pre-1945 buildings that are essentially unaltered or have reversible alterations that have not drastically changed the character of the building). The district is a premier example of Dallas' streetcar suburbs along an original streetcar route. Contextually, the district relates to the influence of the streetcar on the development of suburban lands in South Dallas; therefore, the district is nominated under NRHP Criterion A in the area of Community Planning and Development as one of Dallas' largest intact and most illustrative examples of the classic streetcar suburban pattern. The district is also nominated under NRHP Criterion C in the area of architecture on the basis of its large grouping of intact historic domestic architecture, consisting primarily of one-story frame bungalows and two-story frame houses. The Colonial Hill Historic District, with its good collection of early 20th-century buildings and readily apparent traffic patterns, is a vivid architectural and cultural reminder of Dallas' early suburban streetcar development.

Properties Determined Eligible for Listing in the NRHP

The following resources have been determined *eligible* for listing on the NRHP under Criterion C in the area of engineering. All retain a high degree of integrity.

- The UPRR (Southern Pacific) Trinity River Bridge is significant as a good example of a Warren through-truss Bridge.
- The Corinth Street Viaduct is one of five reinforced-concrete bridges spanning the Trinity River built between 1910 and 1935. The bridge was designed and constructed in 1935 by F.D. Hughes and Jean H. Knox.
- The AT&SF Railroad Trestle pre-dates the construction of the flood-control levees and is significant as a good example of a Pratt through-truss dating from the period of 1890-1910. This steel truss and wooden trestle railroad bridge is a free span over the Trinity River which features approaches supported by wood piers and earthen embankments at each end. The central span across the river is supported on stone piers. It was determined eligible for inclusion in the NRHP in 1990.
- The MKT Railroad Trinity River Bridge is a good example of a Parker through-truss bridge commonly used by railroads at the turn of the century (circa 1900).
- The Continental Street Viaduct is one of five reinforced-concrete bridges spanning the Trinity River and was constructed in 1930.
- The Commerce Street Viaduct is one of five reinforced-concrete bridges spanning the Trinity River and was designed and constructed in 1915 by F.D. Hughes and Jean H. Knox.

3.3.2 Parklands and Recreational Areas

This section identifies the public parks and recreation areas (existing and planned) within the study area. Included is a description of the regulatory requirements applicable to § 4(f) of the DOT Act and § 6(f) of the LWCF Act.

3.3.2.1 Regulatory Requirements

Section 4(f) of the DOT Act of 1966 (Title 49, U.S.C., § 1653(f) as amended and codified in 49 USC, § 303 in 1983), states that…

> The Secretary [of Transportation] may approve a transportation program or project requiring use of publicly-owned land of a public park, recreation area, or wildlife/waterfowl refuge, or land of a historic site of National, State, or local significance (as determined by the officials having jurisdiction over the park recreation area, refuge, or site) only if there is no prudent and feasible alternative to such use, and the project includes all planning to minimize harm…

"Use" of § 4(f) land is usually considered to be acquisition of part or all of the property, although substantial access, visual, noise, ecological intrusion, or other proximity impact may constitute a "constructive use" if they are of such magnitude to substantially impair the § 4(f) functions, activities, or qualities of the site.

Additionally, Texas Parks and Wildlife Code, Title 3, Chapter 26 contains similar language concerning the taking of park and recreational lands. TPWD restricts the use or taking of any public land designated and used as a park (recreation area, scientific area, wildlife refuge, or historic site) unless the department, agency, political subdivision, county, or municipality determines that there is no feasible and prudent alternative and that the project/program includes all reasonable planning to minimize harm to the land.

Section 6(f) of the LWCF Act requires that any outdoor recreational facilities acquired with Department of Interior (DOI) financial assistance under the Act, as allocated by the TPWD, may not be converted to non-recreational use unless approval is granted by the director of the National Park Service (NPS).

3.3.2.2 Existing Parks and Recreational Areas

Existing parks/recreational areas were identified based on coordination with the City of Dallas Park and Recreation Department (PARD), Dallas Housing Authority (DHA), and property ownership research (as necessary). Copies of correspondence from the City of Dallas PARD are provided in **Appendix A-1**. The locations of existing parks/recreational areas in the study area are shown on **Plate 3-15**. **Table 3-11** presents an inventory of important features for these areas. There are a number of other public and privately owned open space lands in the study area, but these do not meet the definition of § 4(f) or § 6(f) properties.

TABLE 3-11. EXISTING PARKS AND RECREATIONAL AREAS

Plate ID	Name	Location	Property Owner	Acres	Function/Usage	§4(f)	§6(f)
1	Sleepy Hollow Park	1200 Sleepy Hollow Lane	PARD	0.62	Neighborhood park with picnic, swimming pool, playground, and multi-use court facilities.	Yes	No
2	Pegasus Park	3000 Pegasus Park Drive	PARD	7.41	Urban open space park with no recreational facilities.	Yes	No
3	Trinity River Greenbelt Park (Identified as "Trinity Park" within the limits of the Dallas Floodway)	From Northwest Highway to AT&SF Rail-road Bridge	PARD	3,652	Urban open space park with 177 water acres and two soccer fields. Majority extends beyond study area boundaries. The Dallas Floodway encompasses approximately 2000 acres of this park (Trinity Park). A special feature is Crow Lake located adjacent to the south of Sylvan Avenue. The lake area includes sculptures, a volleyball court, and a 0.66-mile walking trail.	No	No
4	Nash/Davis Park	3700 N. Hampton	PARD	11.91	Community park with a community recreation center. Includes picnic, swimming pool, tennis, sandlot ball field, softball field, playground, and multi-use court facilities. The park is shared with Carr Elementary School. Extends beyond study area boundaries.	Yes	No
5	Bickers Park	1400 Bickers	DHA	2.89	Neighborhood park with softball field, playground, and multi-use court facilities.	Yes	No
6	Shaw Park	3600 Ladd Street	PARD	0.11	Neighborhood park with no recreational facilities.	Yes	No
7	Benito Juarez Park	3352 N. Winnetka	PARD	6.10	Neighborhood park with soccer field and picnic facilities. Extends beyond study area boundaries.	Yes	No
8	Hattie R. Moore Park	3212 N. Winnetka	PARD	3.66	Community park with a community recreation center. Includes picnic, tennis, play- fields, playground, and multi-use court facilities. Park shared with DeZavala Elementary School.	Yes	No
9	Pueblo Park	3226 Bataan Street	PARD	0.55	Neighborhood park with picnic, playground, and multi-use court facilities.	Yes	No
10	Oak Cliff Founders Park	1300 North Zang	PARD	16.11	Urban open space park with 0.25-mile hike/bike trail. Extends beyond study area boundaries.	Yes	No
11	Eloise Lundy Park	1200-1229 Sabine	PARD	3.38	Community park with a community recreation center. Includes picnic, swimming pool, tennis, softball field, playground, and multi-use court facilities.	Yes	No
12	Moore Park	1900 E. Eighth Street	PARD	24.46	Community park with picnic, tennis, baseball and sandlot ball field, playground, swimming pool, and multi-use field and court facilities.	Yes	No
13	Rochester Park	3000 Rochester	PARD	983.28	Regional park with natural areas and trails. Includes playground, picnic, softball, football, soccer, and multi-use court facilities. Special features include a lake and fishing piers. Majority extends beyond study area boundaries.	Yes	Yes
14	Forest Park	2906 Parnell	PARD	2.40	Neighborhood park with picnic, swimming pool, playground, and multi-use court facilities.	Yes	No

Sources: City of Dallas PARD 1997, 1999.
Notes: Plate ID Numbers correspond to the locations shown on **Plate 3-15**.
PARD = Park and Recreation Department (City of Dallas)
DHA = Dallas Housing Authority

3.3.2.3 Planned Parks and Recreational Areas

The Dallas Floodway (Trinity Park) and proposed Great Trinity Forest Park as well as other portions of the study area are major focal points for the planned development of multiple large-scale recreational/open-space projects. The majority of these planning efforts have been coordinated and conducted by local, state, and federal agencies, as well as community volunteers and organizations for many years. Additional details are presented in **Sections 3.1.1.1 Local Land Use Plans/Policies** and **3.1.1.4**

Potential Joint Development Projects. For the purpose of this section, only planning and programming efforts for areas within, or adjacent to, the project study area are discussed.

1959 Parks and Open Spaces Plan

This plan was published in 1959 and has served as the basic guide to the Dallas PARD ever since. The plan followed a long line of previous park plans, which include the Kessler Plan (1910), Urlickson Plan (1927), Woodruff Plans (1934), Hare and Hare Plans (1942), and Bartholomew, Hare, and Hare in 1944. Included in the various plans were proposals for a large park along the Trinity River in Dallas. The *Parks and Open Spaces Plan* of 1959 consolidated and expanded the previous proposals in light of the growing population and recreational needs of Dallas.

1969 Coordinated Plan for Open Space Development of the Trinity River System

This plan (also known as the "Springer Plan") was published in 1969 by the Dallas Park Board. The plan presented concepts for recreational and open space development of the Dallas Floodway and adjacent floodplain areas. The developments proposed were in general conformance with the 1959 *Parks and Open Spaces Plan*. These included a proposed Trinity Park and open space system and "Town Lake" concept for the Dallas Floodway. Proposed recreational and related uses included golf, a model and motor area, athletics, tennis, two lake pools or "Town Lakes," a marina, and a system of trails.

As described in **Chapter 1 Purpose and Need for Action**, two major non-recreational uses were included in the Springer Plan for the Dallas Floodway. One was the proposed Trinity River Freeway, which was projected along the east levee in the vicinity of the Continental Avenue Viaduct, upstream to the Elm Fork, and then along the West Fork. The second important use of the floodway was a navigation channel.

1991 Dallas County Open Space Plan

This plan was prepared to review and update the 1980 *Dallas County Open Space Plan*, which was the first official open space planning effort completed to evaluate and preserve the remaining landscape features in Dallas County. It is a comprehensive plan, consisting of both short-term, early implementation elements and long-term, broad-ranging actions which the county may consider and phase-in over time. Dallas County has acquired land for open space preservation since 1977 through a series of funding mechanisms, including bond elections, state and federal grants, and private contributions. The long-term implementation of this open space plan proposes the additional acquisition of 60,000 to 65,000 acres of land for an approximate total of 95,000 to 100,000 acres of open space, which represents 16 to 17 percent of the Dallas County landscape. This plan includes the following key components within and/or adjacent to the study area:

- **Trinity River Floodway/Greenbelt Park (Trinity Park).** This existing open space is the largest green space in central Dallas and encompasses a major portion of the study area. The plan proposes various types of potential recreational improvements, such as lakes, trails, and various recreational amenities. Also recommended are tree plantings, wetland enhancement areas, as well as active/passive recreational facilities. The plan indicates its nominal status as a greenbelt park and the existence of Trammell Crow Lake (Crow Lake) could be significantly augmented through the introduction of new landscape features consistent with flood and drainage management requirements of the USACE and City of Dallas. The plan suggests these improvements would significantly enhance the value of the floodway corridor as a central feature for the elements of the city and county open space systems that radiate from it.

- **Old Trinity River Meanders.** The area is located in the northeast portion of the study area roughly between IH-35E and Irving Boulevard. Currently, the old river meanders serve as a network of flood control storage sumps. Their banks are bordered by warehouse and industrial facilities common to the area. The plan indicates the county's open space system as a whole, in particular downtown Dallas, could benefit from the salvaging and rehabilitation of the old channel as a river and corridor landscape. The Old Trinity Meanders would also serve as a connecting greenbelt between the Trinity River Greenbelt Park (Trinity Park), downtown Dallas, and other existing/planned parks and recreational areas within the study area and beyond. In addition, a habitat restoration component is being evaluated by the City of Dallas/USACE for this area.

- **West Dallas River Meanders Conservation Area.** This area is located in west Dallas in the northwest portion of the study area. This proposed conservation area is planned for lands adjacent to the old river meanders of the West Fork. The plan suggests these areas be replanted with floodplain trees, re-landscaped, and refitted with trails and natural water features compatible with the flood management functions of its drainage system. The intent is for the meanders and their adjacent re-naturalized lands to play a key role in the revitalization of the West Dallas neighborhood. The meanders conservation area would also serve as a central node in the planned trail systems by linking to other parks and trail systems through Dallas.

The USACE is currently designing an ecosystem restoration project for West Dallas River Meanders Conservation Area (i.e., Old Trinity River Channel Wildlife Restoration Project) (see **Section 3.5.7 Flood Plains and Flood Control Features**). This project may restore riparian and wetland vegetation along remnants of the West Fork channel. It would restore approximately 18.5 acres of wetlands and 82.9 acres of riparian forest. In addition, the USACE is designing a trail component compatible with planned trail systems described throughout this section of the DEIS.

As currently proposed, this project would restore riparian and wetland vegetation along remnants of the West Fork channel adjacent to the existing Dallas Floodway. These areas along with interconnected small, excavated areas serve as the interior drainage system for the floodway. The specific objective of the restoration project is to reestablish the bottomland hardwood, riparian forest, and emergent wetlands that originally existed in the project area. This would be accomplished through modification of the Pavaho (formerly Bickers Street) sump; construction of a water surface elevation control structure at the Westmoreland Road crossing; restoration of the lower Shadrack Creek channel by construction of an overbank wetland; planting of trees and shrubs along the old West Fork channel that are conducive to enhancing wildlife values; and regeneration of the littoral zone along the developed and modified wetlands to provide additional wildlife and fisheries values. The project would restore approximately 18.5 acres of wetlands and 82.9 acres of riparian forest.

The project is currently under design by the USACE with an anticipated design completion date of 2005 at an estimated construction cost of $2 million.

- **Cedar Creek Greenbelt**. This area is located along Cedar Creek in the southeast portion of the study area**.** The plan suggests that Cedar Creek could serve as the spine of a greenbelt linking Fivemile Creek (located outside of the study area) and the proposed Great Trinity Forest Park. The plan encourages completion of the greenbelt because the Dallas Zoo is on Cedar Creek, which would potentially aid visitation to the zoo and enhance its setting.

- **Trinity River State Park**. In 1983, the 68th Texas State Legislature approved authorization for the Trinity River State Park, but did not establish a funding source for its acquisition. The park's boundaries were defined as a 200-foot wide corridor of land on either side of the Trinity River from the AT&SF Railroad Bridge extending southward to IH-20. The 200-foot corridor was measured from the existing bank of the river. The enabling act also incorporated 1,400 acres of land on the east side of the river extending from Rochester Park south to an area adjacent to Jim Miller Road in south Dallas. As defined by the legislature, the park would have included approximately 1,500 acres of land.

The Trinity River State Park was established under the jurisdiction of the TPWD as defined in Title 3, Chapter 22, Subchapter S, § 22.251 of the Texas Parks and Wildlife Code. This legislation includes provisions granting the TPWD the authority to acquire by purchase, gift, lease, or condemnation of land for the park, including mineral interests in that land. The TPWD may also expend funds for the operation and maintenance of the Trinity River State Park. In addition, the legislation included certain provisions for the City of Dallas. According to Subchapter S, § 22.254 *Powers of City of Dallas*, the following provisions are indicated:

(a) Nothing in this Act shall preclude or prohibit the City of Dallas from initiating, developing, completing, extending, or maintaining any project, as described in Subsection (b) of this section, whether the project may be located within, or adjacent to the boundaries of the Trinity River State Park.

(b) For purposes of this section, the City of Dallas by ordinance or resolution of the governing body may approve and authorize any or all of the following:

(1) The development of a lake to be located within the floodplain of the Trinity River within the City of Dallas;
(2) The extension of Trinity River flood controls which shall include but not be limited to construction of drainage channels, swales, levees, and associated flood control appurtenances in the Trinity River floodplain which may be constructed and maintained within the boundaries of Trinity River State Park;
(3) The extension of Simpson Stuart Road at the point where it may cross the floodplain of the river; and
(4) The construction of swales in or adjacent to the natural channel of the Trinity River as necessary to provide offset capacity for full utilization of the McCommas Bluff Reclamation landfill.

(c) If the City of Dallas approves a project, as authorized by this section, the department shall grant the City of Dallas access to land within Trinity River State Park and whatever permissions are necessary in order to attain the purpose of the project.

In 1989, the Legislature once again addressed the park, authorizing the TPWD to set aside initial funding for land acquisition. However, progress on the park was slowed until concepts for the USACE's DFE project were resolved. Progress on the DFE led to the decision by TPWD in 1995 to prepare a master concept plan for the park. During this planning process, it was determined that the scope of the planning should not be limited to the narrow 200-foot wide definition of the park. Instead, the decision was made to look at a much broader area and then focus on how the area's many resources and assets could best be combined with the original concept of preserving the forest and the Trinity River. As a result, the proposed Great Trinity Forest Park was established as the successor of the Trinity River State Park. Details concerning the planning efforts involved for the Great Trinity Forest Park are discussed in the following paragraphs.

Moore Park Master Plan

Moore Park is located downstream of the Dallas Floodway at Cedar Creek and Eighth Street. The City of Dallas Park Board approved the Moore Park Master Plan on August 2, 2001. This park was also identified in the *Trinity River Corridor MIP* as a proposed neighborhood gateway leading into the Dallas Floodway park areas.

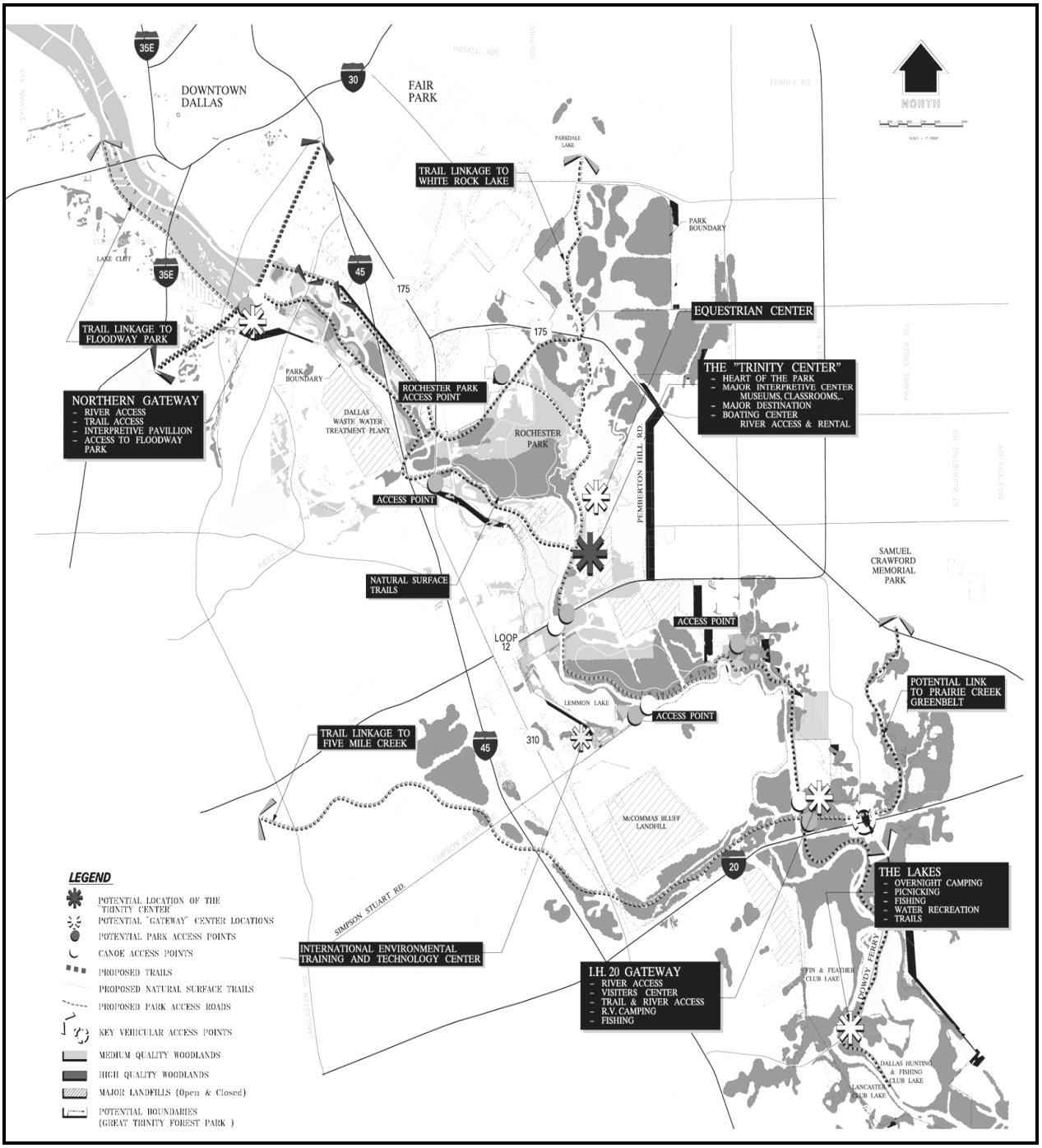
Great Trinity Forest Master Plan

In 1996, TPWD commissioned the design for major recreational development and preservation of over 6,000 acres of land extending from south of the Corinth Street Viaduct to IH-20 near the southern limits of the City of Dallas. This master planning effort was built upon many previous studies and plans for the Trinity River corridor. These include planning efforts by the TRCCC, NCTCOG, City of Dallas, Dallas County, and the USACE. It is designed to work within the context of these plans, such as the USACE's proposed "chain of wetlands," which would improve flood control, and the Trinity Parkway (proposed action), which would improve access along the upper end of the corridor. The plan includes a program of uses grouped into six broad categories:

1. Land management activities (e.g., reclamation, reforestation, and preservation);
2. Passive recreation activities (e.g., bird watching, picnicking, camping, and fishing);
3. Education activities (e.g., children's day camps, historic/cultural exhibits, and interpretive centers);
4. Active recreation (e.g., canoeing/kayaking, hiking/biking, and horseback riding);
5. Economic development activities (e.g., concessions, equestrian/canoe rentals, and recreational vehicle camping); and
6. Special events (e.g., festivals, outdoor art exhibits, and community gatherings).

The Great Trinity Forest Park is intended to be an "umbrella" designation, which would encompass both existing parks and other new areas with significant preservation of recreation assets. These areas would be grouped together if they contained either portions of the Great Trinity Forest or if they bounded the river south of the Dallas Floodway. In other words, they would be treated as "parks within a park." Two existing parks within the study area would be included under the "umbrella" of the Great Trinity Forest Park. These are Moore Park located adjacent to the southern boundary of the Dallas Floodway, and Rochester Park located along the Trinity River and adjacent to IH-45 in the southern portion of the study area (see **Figure 3-1**).

FIGURE 3-1. GREAT TRINITY FOREST MASTER PLAN



Source: TPWD, 1997.

The first phase of the Master Plan involves acquisition of lands not owned by the City of Dallas. In addition, the DFE project by the USACE must acquire 1,179 acres of land within the Great Trinity Forest as a requirement for mitigation. In 1998, the City of Dallas purchased 208 acres of land near IH-20 and the Trinity River as part of the initial effort to begin land acquisitions. As of January 2004, approximately 220 acres have been acquired for environmental mitigation and hydraulic conveyance for the DFE.

Trinity River Corridor MIP/BVP

The City of Dallas' *MIP*/*BVP* identifies several park and recreational developments, many of which are located within the Trinity Parkway study area. These are shown graphically on **Plate 3-4** at the end of this chapter. Portions of this plan are also considered potential joint developments projects along with the Trinity Parkway (see **Section 3.1.1.4**). The following points provide a summary of the planned park and recreation improvements identified as part of the city's *MIP*/*BVP*:

- Parks and Recreation – Dallas has the opportunity to create what could become the largest urban park in the nation. A Trinity Central Park within the Dallas Floodway will combine scattered recreational facilities into one system, totaling thousands of acres. Regional open space including the West Fork, the Elm Fork, the Great Trinity Forest and trail systems such as the Katy, Buckeye, and Santa Fe Trails will all be anchored and enhanced. The park area within the floodway would total approximately 2,000 acres and, with the Great Trinity Forest and Elm Fork areas, becomes a park of over 6,000 acres. Major components of the parks and recreation activities may include:

  Lakes and Water Features
  - Two off-channel stepped lakes totaling 150 acres adjacent to downtown with an additional 25 acres of wetland along lake edge.
  - A downstream bi-channel system will be called "braided" river channel: totaling 60 acres with an additional 45 acres of wetlands.
  - An off-channel lake in west Dallas totaling 80 acres with an additional 65 acres of wetlands.
  - Lake recreation, boat active and passive including canoeing, sailing, rowing, and fishing.
  - Protected with berms that provide 2-year flood protection.
  - Between-lakes waterfalls, pedestrian overlooks, and wildlife viewing areas.
  - Lakeside hard-edge promenade at downtown and soft edge riparian habitat elsewhere.

  Playing Fields
  - 160 acres of playing field including soccer and softballs fields. Fields are accessed from an internal park road system.
  - Irrigation for CWWTP.

Event/Concession Spaces

- 12-acre amphitheater of sloped turf and stage structure with utilities.
- Two concession pads for seasonal or permanent use.
- One floating restaurant pad at Upper Trinity Lake (potential if concession interest).
- One recreational building near playing fields.

Boat Launches

- Car-top boat launches at Westmoreland and Corinth Street.
- Trailer-boat access at Sylvan and at Urban Lake for larger boats.

Vehicular Access Points

- 5 miles of internal park roads running the length of the park. Access points to park road at Canada Drive, Westmoreland, Hampton, Sylvan, Continental, Commerce, Reunion, Houston, and Corinth Streets.
- 6-7 acres of parking areas within floodway for park users.

Trails and Paths

- 4,500 foot long promenade at downtown.
- 9 miles of trails with a variety of surfaces.
- 3 miles of equestrian miles within the floodway (surface to be determined).
- 5,000 feet of wetlands boardwalks for nature viewing and access.

Pedestrian Access Points

- One 600 foot-long pedestrian plaza overlooking the lakes and park at Reunion.
- Widened pedestrian connections at other locations along the downtown levees.
- Continuous pedestrian access of parkland Oak Cliff Levee-top road with on-street parking.
- 20 new pedestrian/bicycle access points including eight over the Trinity Parkway.
- Four vertical connector stairs/ramps added to historic viaducts at Continental, Commerce, Houston, and Corinth Street.

Open Space Connections

- On-street trail connections to Turtle Creek Katy Trail and Bernal Trail.
- MLK bike route from Trinity to Fair Park and proposed veloway.
- Equestrian/pedestrian trail to Trinity Interpretive Center/Equestrian Center.
- On-street connection to Oak Cliff Founders Park.

The *MIP/BVP* includes provisions for implementing various components of the *Great Trinity Forest Master Plan*, which were funded as part of the city's 1998 bond program. These include:

- Great Trinity Forest land acquisition;
- Trinity Interpretive Center;
- Equestrian Center; and
- Trinity Forest Trails.

Dallas Floodway Extension EIS

The USACE included preparation of a recreation master plan as part of the DFE FEIS project. This plan is designed to meet the existing needs for passive and non-structured recreational activities within the TPWD Region 4 service area and to address state and regional shortfalls in facilities for walking, hiking, cycling, and jogging as identified in the 1990 Texas Outdoor Recreation Plan (TORP) prepared by the TPWD.

Facilities proposed within the DFE study area would provide public access, protect sensitive environmental resources, and promote safe use of the area. The plan creates linkages between existing recreational and public open space areas, both existing and necessary for the DFE project. The plan is consistent with the locally adopted recommendations for long-range development of the Great Trinity Forest Park within the DFE project area. The USACE adopted many of the recommendations of the Great Trinity Forest Master Plan, including land acquisition, construction of trails and canoe launches, and implementation of an interpretive center in the forest (USACE, 1999b). The City of Dallas in cooperation with the USACE has purchased several additional tracts of land within the Trinity River floodplain for habitat mitigation and park uses.

Trinity Trails System

The Trinity Trails concept is the result of extensive planning efforts conducted by various local, state, and federal agencies since 1991. Since 1996, the Trinity Trails Advisory Committee (TTAC) has been working toward development of this project. The Trinity Trails System is consistent with the recommendations of other significant trail plans, including the *Dallas County Trail Plan*, NCTCOG's MTP (*Mobility 2025 – 2004 Update*), the TPWD's *Great Trinity Forest Master Plan*, and the City of Dallas' *Trinity River Corridor MIP/BVP*. The Trinity Trails plan provides recommended routes and policies to guide trail design and implementation.

The purpose of the Trinity Trails System is to establish a corridor that would be a continuous strip of land, which can accommodate hike/bike, equestrian, and/or nature trails and serve as the primary link for recreational opportunities within a "world-class" Trinity River Greenway. Trails within the corridor spine,

and connecting spurs, would provide alternate transportation routes to parks, schools, shopping areas, and work.

This planned system of trails radiates from the confluence of the West Fork, Elm Fork, and Main Stem of the Trinity River. The 125-mile northward spine, referred to as Dalhoma, is planned to extend along the Elm Fork to Lakes Lewisville and Ray Roberts, then along major highway and rail corridors to Lake Texoma at the Oklahoma border. The 50-mile southeastern spine initially extends along the Trinity to the Dallas/Ellis County line, but could eventually reach the Gulf of Mexico. The 75-mile western spine extends along the West Fork to Lakes Benbrook and Eagle Mountain, and may eventually extend farther west (NCTCOG, 1998).

Dallas County Trail Plan

LOCAL HIKE AND BIKE TRAIL

In 1996, Dallas County began this initiative for a large-scale, countywide recreation trails network that would link to the Trinity Trails System. The plan proposes a logical network of over 480 miles of potential non-motorized, environmentally friendly thoroughfares for pedestrian/bicycle use and enjoyment. Trails in Dallas County that intersect the Trinity Trails System may be along waterways, railways, utility corridors, or roadways. Over 335 miles of the total network are hard-surface trails with over 145-miles proposed as soft-surface trails, creating connections countywide. The Dallas County Commissioner's Court adopted this plan on March 18, 1997.

The *Dallas County Trail Plan* includes an extensive network of trails within the Trinity River corridor, with 3.5 miles of trails designed for environmentally sensitive areas, 7 miles of soft-surface trails, and 26 miles of hard-surface trails with pedestrian bridges across the river. The bicycle and pedestrian facilities proposed are part of the plan and include segments of the Great Trinity Trail, Bernal Trail, Fair Park Trail, Trestle Trail, and the Katy Trail (see **Table 3-12**). This component is proposed to include approximately 45 miles of off-road trails and 20 miles of on-road facilities (Dallas County Commissioners Court, 1997).

Regional Veloweb

A “veloweb” is an interconnected network of off-street, hard-surface trails designed to provide safe, efficient mobility opportunities to high-speed bicycle commuters. The purpose of a veloweb is to provide interregional routes, which favor bicycle travel to encourage increased use of the bicycle for utilitarian trip purposes.

The regional veloweb was developed and recommended by the NCTCOG as part of the bicycle/pedestrian component of the *Mobility 2025 – 2004 Update*. The proposed bicycle/pedestrian facilities within the study area were incorporated into the *Mobility 2025 – 2004 Update* based on recommendations included in the TxDOT TPC MTIS. Planned veloweb trails within the study area include the Great Trinity Trail, the Trestle Trail, and the Katy Trail.

Table 3-12 provides a summary of the proposed trails within the study area that may potentially be affected by the Trinity Parkway alternatives.

TABLE 3-12. PROPOSED TRAILS WITHIN THE STUDY AREA

Proposed Trail	Description	Type/Function	Trails Linked	Comments
Trinity Park Trail	Follows south side of river in floodway to the Great Trinity Forest. Extends beyond study area boundaries.	Hike and Multi-Use	Links to trail system in floodway and Great Trinity Forest.	Hard surface, off street.
Bernal/Canada Drive Trail	From existing Bernal Trail along old West Fork meanders in Oak Cliff to Dallas Floodway. Extends beyond study area boundaries.	Hike and Bike	Links with Cockrell Hill Trail and with trail system in floodway.	Hard surface, off street.
Old Trinity Trail	Follows old river channel meanders near and across IH-35 E and Industrial. Extends beyond study area boundaries.	Hike and Bike	Cockrell Hill, Turtle Creek, and Katy Trails (outside of study corridor).	-Hard surface, off street. -Friends of Old Trinity Trail, a local non-profit organization, has been active in helping establish phase 1 of this trail.
Coombs Creek Trail	Originates from Oak Cliff and merges with Great Trinity Trail near Houston and Jefferson Viaducts. Terminates at Trestle Trail junction. Extends beyond study area boundaries.	Hike and Bike	Links with trail system in floodway.	Hard surface, off street.
Continental Avenue Pedestrian Bridge	Conversion of existing bridge from vehicular use to pedestrian use only.	Pedestrian with bicycle access at north and south ends.	Links with trail system in floodway.	-Hard surface, off street. -Provides access to proposed central community park and to large civic lake area.
Trestle Tail	Follows the DART ROW east of the Trinity then crosses the river on the Old AT&SF Railroad Bridge into Oak Cliff. Extends beyond study area boundaries.	Hike and Bike	Links with trail systems in floodway and Great Trinity Forest.	-Hard surface, off street. -Part of Veloweb. -Projected to be region's second most highly used commuter trail.
Great Trinity Trail	Follows along floodway from confluence to the Great Trinity Forest. Extends beyond study area boundaries.	Includes a network of trails/access points in the floodway for numerous user groups – walkers, bicyclists, skaters, equestrians, and canoeists.	Links with trail systems in floodway and Great Trinity Forest. Also, Cockrell Hill, Coombs Creek, Katy, Trestle, and Bernal/Canada Drive Trails.	-Hard surface, off street. -Part of Veloweb.
Katy Trail (south extension)	Follows Houston Street south to Oak Cliff across the Houston Street Viaduct. Extends beyond study area boundaries.	Hike and Bike	Links with trail system in floodway.	-Hard surface, off street. -Part of Veloweb. -Projected to be region's most highly used commuter trail.
Cockrell Hill Trail	From south side of Trinity River near Hampton Road through West Dallas to Cockrell Hill community. Extends beyond study area boundaries.	Hike and Bike	Links with trail system in floodway.	Hard surface, off street.
Trinity River	Follows river channel. Extends beyond study area boundaries.	Water trail for canoes/kayaks	Links with Elm/West Forks, and other water bodies outside of study corridor.	Proposed canoe access sites at Sylvan, Corinth, and IH-45.

TABLE 3-12. PROPOSED TRAILS WITHIN THE STUDY AREA

Proposed Trail	Description	Type/Function	Trails Linked	Comments
Dallas Floodway - Soft-Surface Trails	Located in areas with little tree cover on the west or south side of the river away from pedestrian areas.	Equestrian and Bike	Links with trail system in floodway and Great Trinity Forest.	Proposed 30-horse equestrian center in floodway near Houston/ Jefferson Viaducts.
Great Trinity Forest - Soft-Surface Trails	Located in DFE area along river and proposed chain-of wetlands. Extends beyond study area boundaries.	Equestrian, Nature, and Bike	Links with trail system in floodway and Great Trinity Forest.	Proposed 50-horse equestrian center near Loop 12.
Dallas Floodway – Levee Top Trails				
Stemmons Trail	From Westmoreland to Commerce (east levee)	Pedestrian	Links to proposed levee top promenades and trail system in floodway.	Hard surface, off street.
West Dallas Trail	From Westmoreland to Commerce (west levee)	Pedestrian	Links to proposed levee top promenades and trail system in floodway.	Hard surface, off street.
Cedars Trail	From IH-35E to Corinth (east levee)	Pedestrian	Links to proposed levee top promenades and trail system in floodway.	Hard surface, off street.
Bottoms to Corinth	From IH-35E to Corinth (west levee)	Pedestrian	Links to proposed levee top promenades and trail system in floodway.	Hard surface, off street.

Sources: City of Dallas, 1999b; Dallas County Commissioners Court, 1997.
Note: Proposed trails include proposed, endorsed, and sponsored trails.

It should be noted that no official easements or right-of-way have been established for any of the proposed trails within the study area. These planned trail projects are being coordinated with the proposed action and would not proceed until a preferred alternative for the Trinity Parkway has been identified.

Trinity River Boat Ramps, Access Roads, and Parking Areas

The City of Dallas has obtained grant funding from the TPWD for the design and construction of two boat ramps and associated access roads and parking areas. One of the boat ramps has been constructed and is located within the Dallas Floodway just downstream of Sylvan Avenue adjacent to Crow Lake. A second boat ramp will be located under the Loop 12 Trinity River Bridge in South Dallas. The design of the boat ramp is complete and construction is anticipated in 2004.

Development of a system of parks, recreational areas, and linear trails along the Trinity River is an integral portion of the NCTCOG's COMMON VISION work program. NCTCOG has identified the Trinity River Corridor as a "unique regional resource." The value of this resource is increased because of its location within the growing DFW metropolitan area. The NCTCOG is pursuing a Trinity Greenbelt of major parks linked by a regional trail system. It is the intent of the NCTCOG to implement a "world class" Trinity Greenbelt strategy.

2002 A Renaissance Plan for Dallas Parks and Recreation in the 21st Century

This plan was published in August 2002 by the Dallas PARD. The overall purpose of the plan is to develop an "innovative, interactive, creative, environmentally sensitive, and state-of-the-art" long-range development plan for the PARD over the next 10 to 20 years. The plan includes a Capital Implementation Plan organized according to the six park maintenance districts across the city. These Park District Action Plans present proposed capital improvements for each park based upon the top ten facility needs identified in a citizen survey. Proposed capital improvements for existing parks and recreational areas in the study area include a variety of recreational improvements. These include playgrounds, hike/bike/walk trails, outdoor swimming pools, sport facilities (e.g., soccer, basketball, and baseball), picnic facilities, recreation centers, senior facilities, and facilities for the disabled (PARD, 2002).

3.4 NATURAL RESOURCES

This section provides a description of the ecological resources located within the project study area. It includes baseline vegetation communities, associated wildlife, including special status plant and animal species, wetlands, and waters of the U.S.

3.4.1 Regulatory Setting

Natural resources within the project area were evaluated in accordance with the provisions of state and federal environmental statutes and regulations. These include § 404 of the Clean Water Act (CWA), § 10 of the Rivers and Harbors Act of 1899, State Water Quality Certification Program [completed by Texas Commission of Environmental Quality (TCEQ)] for § 404 permits under authority of § 401 of the CWA), EO 11990 (Protection of Wetlands), EO 13112 (Invasive Species), the Endangered Species Act (ESA) of 1973, and the Migratory Bird Treaty Act of 1918.

<u>EO 13112 – Invasive Species</u>

Executive Order 13112, dated February 3, 1999, directs federal agencies to expand and coordinate their efforts to combat the introduction and spread of "invasive species" (i.e., plants and animals not native to the U.S.). Non-native flora and fauna can cause significant changes to ecosystems, upset the ecological balance, and cause harm to our nation's agricultural and recreational sectors. Transportation systems can facilitate the spread of plant and animal species outside their natural range, both domestically and internationally. Those species that are likely to harm the environment, human health, or economy are of particular concern. The FHWA has implemented guidance concerning EO 13112 effective November 18, 1999 (FHWA, 1999).

Compliance with EO 13112 means that Federal-aid and Federal Lands Highway Program funds cannot be used for construction, revegetation, or landscaping activities that purposely include the use of known invasive plant species. Until the National Invasive Species Council defines an approved national list of invasive plants, known invasive plants are defined as those on the official noxious weed list of the state in which the activity occurs.

In Texas, the Texas Department of Agriculture (TDA) defines and regulates prohibited and restricted noxious weed seeds in accordance with Texas Agricultural Code, Chapter § 61.008 (Texas Seed Law). The TDA defines noxious weed seeds as seeds bulblets or tubers of certain species designated by the Texas Seed Law Regulations and considered highly objectionable and difficult to eradicate. Noxious weed seeds are divided into two classes, prohibited and restricted, defined as follows:

(a) Prohibited noxious weeds are the seeds or bulblets of weeds that reproduce by seed and/or spread by underground roots, stems, and other reproductive parts, and which, when established, are highly destructive and difficult to control by ordinary good cultural practices.
(b) Restricted noxious weed seeds are the seeds of such weeds that are objectionable in fields, lawns, and gardens, but can be controlled by good cultural practices.

In the State of Texas, it is unlawful to sell, offer for sale, or expose for sale any agricultural or vegetable seed for planting purposes containing noxious weed seed in excess of the limitations as defined in Texas Administrative Code (TAC) Title 4, Part 1, Chapter 9, Subchapter E, Rule § 9.9 (effective September 6, 1996). TDA Regulatory Programs Division, Seed Quality Branch, regulates the Texas Seed Law. The Texas Seed Law requires truth in labeling of agricultural and vegetable seed marketed in Texas. To enforce this law, TDA administers seed testing, trueness-to-variety grow outs, inspection fees, and vegetable seed licenses.

3.4.2 Regional and Local Setting

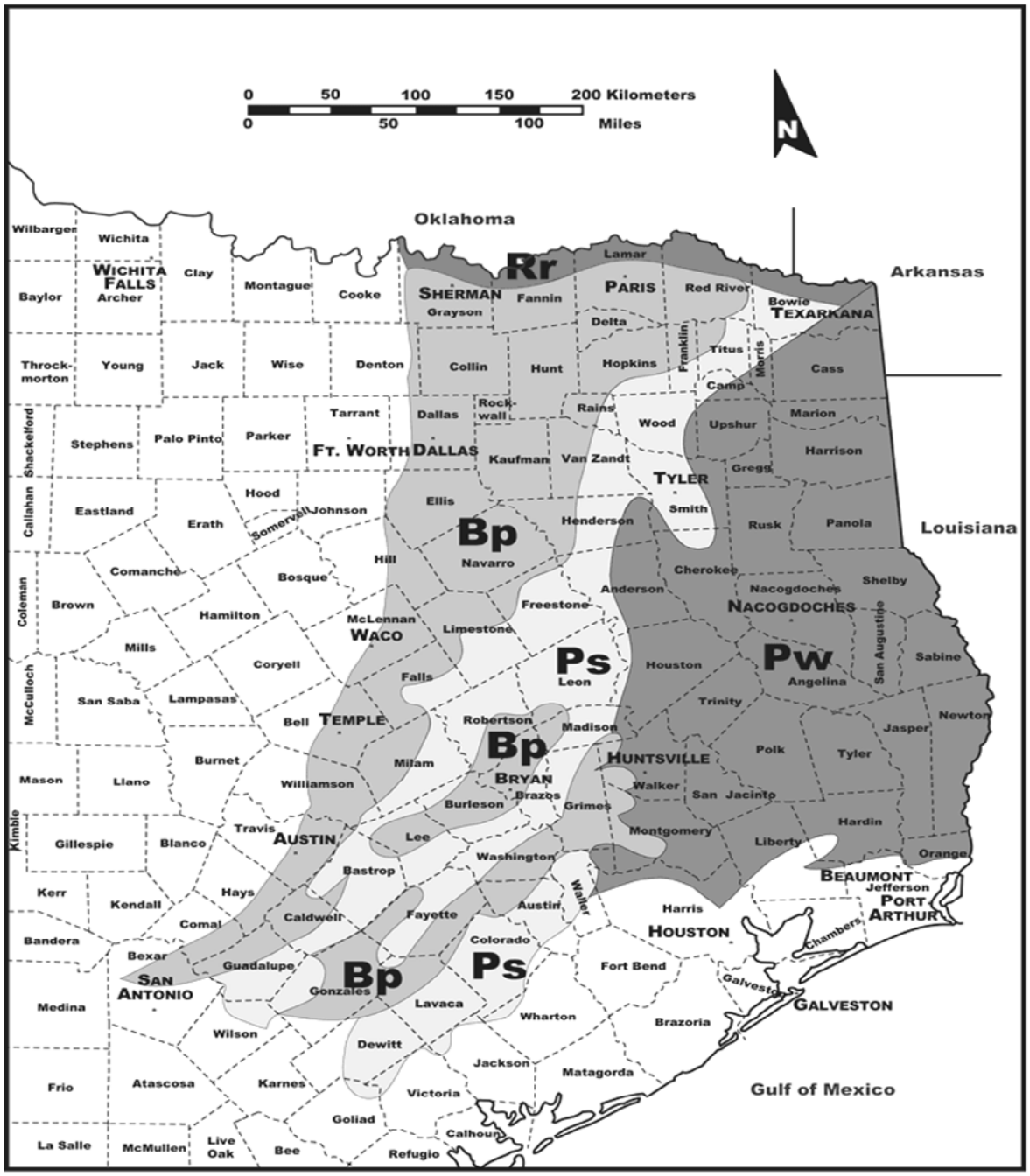
TYPICAL UPLAND GRASSLAND

Regional Setting

The Trinity Parkway study area is situated within the Blackland Prairie ecoregion of Texas (see **Figure 3-2**). Surface topography is generally level to gently rolling. Soils consist of black, alkaline, organic clays overlying Cretaceous limestone. The native vegetation of the Blackland Prairies consists of little bluestem (*Schizachyrium scoparium* var. *frequens*), big bluestem (*Andropogon gerardii*), yellow Indian grass

(*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), hairy grama (*Bouteloua hirsuta*), sideoats grama (*Bouteloua curtipendula*), tall dropseed (*Sporobolus asper* var. *asper*), silver bluestem (*Bothriochloa saccharoides*), and Texas wintergrass (*Stipa leucotricha*). Less than one-half of 1 percent of the Blackland Prairies is believed to remain in a relatively undisturbed state, and the majority of the remnants are relatively small and isolated.

FIGURE 3-2. ECOREGIONS OF EAST TEXAS



Source: Diggs, Lipscomb, and O'Kennon, 1999.

Bottomlands within the region are characterized by a variety of woody and herbaceous vegetation. Areas within bottomland floodplains usually contain higher-quality mast-producing trees such as pecan (*Carya illinoensis*), bur oak (*Quercus macrocarpa*), red oak (*Quercus shumardii*), American elm (*Ulmus Americana*), and mulberry (*Morus rubra*) with little understory vegetation. Disturbed areas within the floodplain have a greater preponderance of green ash (*Fraxinus pennsylvanica*), hackberry (*Celtis laevigata*), cedar elm (*Ulmus crassifolia*), cottonwood (*Populus deltoides*), and black willow (*Salix nigra*). These areas often have less tree canopy cover, thus permitting a greater abundance of invading forbs and grasses such as ragweed (*Ambrosia* sp.) and Johnsongrass (*Sorghum halepense*).

Local Setting

According to the TPWD publication *The Vegetation Types of Texas*, the study area is located primarily in the urban physiognomic region. A small portion of the Water Oak-Elm-Hackberry Forest vegetation type is located at the far southern terminus of the study area. Commonly associated plants of this vegetation type include cedar elm (*Ulmus crassifolia*), American elm (*Ulmus americana*), willow oak (*Quercus phellos*), southern red oak (*Quercus falcata*), white oak (*Quercus alba*), black willow (*Salix nigra*), cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), pecan (*Carya illinoensis*), bois d'arc (*Maclura pomifera*), flowering dogwood (*Cornus florida*), dewberry (*Rubus trivialis*), coralberry (*Symphoricarpos orbiculatus*), dallisgrass (*Paspalum dilatatum*), switchgrass (*Panicum virgatum*), rescuegrass (*Bromus unioloides*), bermudagrass (*Cynodon dactylon*), eastern gamagrass (*Tripsacum dactyloides*), Virginia wildrye (*Elymus virginicus*), Johnsongrass (*Sorghum halepense*), giant ragweed (*Ambrosia trifida*), and Leavenworth eryngo (*Eryngium leavenworthii*) (TPWD, 1984).

Unusual vegetation features include unmaintained vegetation, trees, or shrubs along a fence line adjacent to a field, riparian vegetation, trees that are unusually larger than other trees in the area, and unusual stands or islands of vegetation. Special habitat features include bottomland hardwoods, caves, cliffs and bluffs, native prairies, ponds, seeps or springs, snags or groups of snags, water bodies, and existing bridges with known or easily observed bird or bat colonies (TxDOT/TPWD MOA, 1998). A description of existing land use within the study area is provided in **Section 3.1.1**.

The upland areas along the Trinity River floodplain have been developed for residential or industrial use, and most of the lower floodplain areas are confined within the Dallas Floodway. Urbanization, flood control channels, levees, reservoirs, and wastewater discharge have reduced the physical and chemical characteristics of the habitat and waters, which in turn has reduced the diversity and abundance of aquatic and wildlife resources within the study area. Some improvement in water quality has been noted in recent years; however, the Trinity River in this area is still largely dominated by wastewater discharge, which strongly influences the biotic community within the river [U.S. Fish and Wildlife Service (USFWS),

1997]. As the upland and tributary woodland habitat are diminished by urbanization, the remaining river channel, wetlands, open water areas, and forested bottomlands become an increasingly valuable and necessary resource for wildlife.

3.4.3 Vegetation within the Study Area

Predominant terrestrial habitat types within the study area include floodplain grasslands, riparian bottomland forest, and urban landscape communities. Of the total area within the study area, urban landscape habitats comprise 67 percent (4,144 acres), of the study area. Floodplain grassland habitats comprise approximately 23 percent (1,420 acres), and bottomland riparian forest makes up approximately 4 percent (273 acres) of the study area. The remaining 6 percent is composed of aquatic habitats, which are described in **Section 3.4.6 Wetlands and Waters of the United States**. A list of common plant species identified in the study area is provided in **Table 3-13**.

TABLE 3-13. COMMON PLANT SPECIES IN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
American Elm	*Ulmus americana*
Bermuda Grass	*Cynodon dactylon*
Black Willow	*Salix nigra*
Box Elder	*Acer negundo*
Brown-Eyed Susan	*Rudbeckia hirta*
Bur Oak	*Quercus macrocarpa*
Cedar Elm	*Ulmus crassifolia*
Cottonwood	*Populus deltoides*
Goldenrod	*Solidago* sp.
Hackberry	*Celtis laevigata*
Johnsongrass	*Sorghum halepense*
Mulberry	*Broussonetia papyrifera*
Pecan	*Carya illinoensis*
Poison Ivy	*Toxicodendron radicans*
Ragweed	*Ambrosia* sp.
Red Oak	*Quercus shrumardii*
Swamp Privet	*Forestiera acuminata*
Vinemesquite	*Panicum obtusum*
Virginia Wildrye	*Elymus virginicus*
Source: Tull and Miller, 1991.	

Floodplain Grasslands

The majority of lands within the Dallas Floodway are composed of this habitat type, consisting of upland grasses, scattered wetland depressions, with trees common along portions of the river channel and scattered throughout the floodway. The City of Dallas conducts semi-annual mowing within the floodway to maintain this grassland prairie community for flood control purposes. This prevents the gradual

succession of this community into a bottomland hardwood forest. Grass species typically found in the upland areas include Johnson grass, Bermuda grass, and vine grass. This prairie habitat also supports a variety of flowering species such as brown-eyed Susan, ragweed, and goldenrod. Because this area is continuously disturbed from mowing as part of regular floodway maintenance, it is not considered to be a sensitive habitat for plant or wildlife species.

Riparian Bottomland Forests

Within the study area, the riparian bottomland forest begins at the downstream portion of the Dallas Floodway south of the AT&SF Railroad Bridge (see **Plate 3-16**). This forested area consists of mixed secondary/mature growth composed predominantly of secondary growth tree species, such as hackberry, American elm, and cedar elm, ranging from 6 to 8 inches in diameter at breast height (DBH). Mature pecan, red oak, mulberry, and bur oak are scattered throughout this forested area. Several large cottonwood and black willow with a DBH between 24 and 36 inches may be found along the river. Ragweed, Virginia wildrye, poison ivy, swamp privet, and box elder saplings are common components of the understory vegetation.

TRINITY RIVER CHANNEL - DOWNSTREAM OF THE DALLAS FLOODWAY

Urban Landscape

Urban landscaped areas are located beyond the levees and out of the floodplain and include the landside slopes of the levees. These areas are characterized by the presence of buildings, roads, artificial surfaces, and their associated landscapes. Vegetation is usually restricted to landscaped business parks or residential areas, and native plant species are usually excluded from these areas due to manicured landscapes or human disturbance. Landscaped vegetation is not considered to be sensitive habitat for plant or wildlife species.

3.4.4 Wildlife Resources within the Study Area

Historically, Dallas County contained a diversity of habitats that supported a wide variety of wildlife. The wildlife habitat of Dallas County has been altered drastically in the last 150 years, thus eliminating much of the original wildlife community. The prairie was converted to cultivated fields and has been further

modified by urbanization, and the forests were cut for building materials and cleared for agriculture. Riparian vegetation has been cleared; however, riparian corridors are still used by waterfowl, shorebirds, and mammals such as beaver and nutria (USACE, 2000). Predator control, indiscriminate hunting, use of pesticides, and various forms of air, water, and land pollution have been responsible for modified distribution of fish and wildlife populations throughout the area. Dallas County wildlife is subject to reduction or elimination by habitat destruction through removal, physical alteration, and/or pollution. The surviving fish and wildlife live in a modified natural habitat within the immediate influence of an encroaching urban complex (USACE, 1999).

The USFWS publication *Urban Development and Fish and Wildlife Habitat of the Dallas/Fort Worth Metroplex* provides an assessment of fish and wildlife resources of the Dallas area (Johnston, 1989). The major wildlife habitats can be subdivided between aquatic and terrestrial resources. In addition to open water, aquatic habitats include vegetated shallows and mudflats. Aquatic habitats support 66 species of fish within the DFW metropolitan area. Terrestrial habitats include both wetlands and uplands, which support 291 species of birds, 36 species of mammals, 68 species of reptiles, and 25 species of amphibians. **Tables 3-14** through **3-17** identify common wildlife species that may be located within the study area.

TABLE 3-14. COMMON FISH SPECIES IN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Alligator Gar	*Lepisosteus spatula*
Longnose Gar	*Lepisosteus osseus*
Bowfin	*Amia calva*
Smallmouth Buffalo	*Ictiobus bubalus*
Carp	*Cyprinus carpio*
Channel Catfish	*Ictalurus punctatus*
Blue Catfish	*Ictalurus furcatus*
Flathead Catfish	*Ictalurus olivaris*
Yellow Bullhead	*Ictalurus natalis*
Black Bullhead	*Ictalurus melas*
Green Sunfish	*Lepomis cyanellus*
Redear Sunfish	*Lepomis microlophus*
Bluegill	*Lepomis macrochirus*
Longear Sunfish	*Lepomis megalotis*
Freshwater Drum	*Aplodinotus grunniens*
Warmouth	*Chaenobryttus gulosus*
Largemouth Bass	*Micropterus salmoides*
Source: McCune, 1971.	

TABLE 3-15. COMMON AMPHIBIAN AND REPTILE SPECIES IN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Broad-Headed Skink	*Eumeces laticeps*
Bullfrog	*Rana catesbiana*
Chorus Frog	*Pseudacris triseriata*
Cottonmouth	*Agkistrodon piscivorus*
Cricket Frog	*Acris crepitans*
Eastern Hognose Snake	*Heterodon platyrhinos*
Green Anole	*Anolis carolinensis*
Ground Skink	*Leiolopisma laterale*
Lesser Siren	*Siren intermedia*
Narrow-Mouthed Toad	*Gastrophryne olicavea*
Pig Frog	*Rana grylio*
Ringneck Snake	*Diadophis punctatus arnyi*
Southern Copperhead	*Agkistrodon contortrix*
Southern Leopard Frog	*Rana pipiens*
Texas Rat Snake	*Elaphe obsolete lindheimeri*
Water Snake	*Natrix* sp.
Western Mud Snake	*Farancia abacura*
Source: Conant, 1975.	

TABLE 3-16. COMMON MAMMAL SPECIES IN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME
Armadillo	*Dasypus novemcinctus*
Beaver	*Castor candensis*
Bobcat	*Lynx rufus*
Hispid Cotton Rat	*Sigmodon hispidus*
White-Footed Mouse	*Peromyscus leucopus*
Hispid Pocket Mouse	*Peromyscus penicillatus*
Coyote	*Canis latrans*
Eastern Fox Squirrel	*Sciurus niger*
Eastern Wood Rat	*Neotoma floridana*
Feral Hog	*Sus scrofa*
Gray Fox	*Urocyon cinereoargenteus*
Nutria	*Myocastor coypus*
Opossum	*Didelphis marsupialis*
Rabbit	*Sylvilagus aquaticus*
Cottontail Swamp Rabbit	*Sylvilagus floridanus*
Raccoon	*Procyon lotor*
River Otter	*Lutra canadensis*
Short-Tailed Shrew	*Blarina brevicauda*
Striped Skunk	*Spilogale putorius*
White-Tailed Deer	*Odocoileus virginianus*
Source: Burt and Grossenheider, 1976.	

TABLE 3-17. COMMON BIRD SPECIES IN THE STUDY AREA

COMMON NAME	SCIENTIFIC NAME		COMMON NAME	SCIENTIFIC NAME
Waterfowl	**Order Anseriformes**		**Woodpecker**	**Order Piciformes**
Blue-Winged Teal	*Anas discor*		Common Flicker	*Colaptes auratus*
Green-Winged Teal	*Anas crecca*		Red-Bellied Woodpecker	*Melanerpes carolinus*
Mallard	*Anas platyrhynchos*		Yellow-Bellied Sapsucker	*Sphyrapicus varius*
Gadwall	*Anas strepera*		Downy Woodpecker	*Picoides pubescens*
Northern Pintail	*Anas acuta*			
Northern Shoveler	*Anas clypeata*		**Perching Birds**	**Order Passeriformes**
Wood Duck	*Aix sponsa*		Scissor-Tailed Flycatcher	*Tyrannus forficatus*
			Western Kingbird	*Tyrannus verticalis*
Vultures, Falcons, and Hawks	**Order Falconiformes**		Eastern Kingbird	*Tyrannus tyrannus*
Turkey Vulture	*Cathartes aura*		Blue Jay	*Cyanocitta cristata*
Northern Harrier	*Circus cyaneus*		American Crow	*Corvus brachyrhynchos*
Red-Tailed Hawk	*Buteo jamaicensis*		Carolina Chickadee	*Parus carolinensis*
American Kestrel	*Falco sparverius*		Northern Mockingbird	*Mimus polyglottos*
			American Robin	*Turdus migratorus*
Herons and Egrets	**Order Ciconiiformes**		Eastern Bluebird	*Sialia sialis*
Cattle Egret	*Bubulcus ibis*		Ruby Crowned Kinglet	*Regulus satrapa*
Snowy Egret	*Egretta thula*		Logger-Head Shrike	*Lanius ludovicianus*
Great Blue Heron	*Ardea herodias*		European Starling	*Sturnus vulgaris*
Little Blue Heron	*Egretta rufescens*		White-Eyed Vireo	*Vireo griseus*
Yellow-Crowned Night Heron	*Nycticorax violaceus*		Red-Eyed Vireo	*Vireo olivaceus*
			Black and White Warbler	*Mniotilta varia*
Shorebirds and Gulls	**Order Charadriiformes**		Yellow-Rumped Warbler	*Dendroica coronata*
Killdeer	*Charadrius vociferus*		House Sparrow	*Passer domesticus*
Lesser Yellowlegs	*Tringa flavipes*		Western Meadowlark	*Sturnella neglecta*
Ring-Billed Gull	*Larus delawarensis*		Red-Winged Blackbird	*Agelaius phoeniceus*
			Common Grackle	*Quiscalus mexicanus*
Pigeons and Doves	**Order Columbiformes**		Brown Headed Cowbird	*Molothrus aeneus*
Mourning Dove	*Zenaida macroura*		Northern Cardinal	*Cardinalis cardinalis*
Rock Dove (Pigeon)	*Columba livia*		White-Throated Sparrow	*Zonotrichia albicollis*
Source: Pulich, 1990.				

3.4.5 Threatened and Endangered Species

The purpose of this section is to provide a brief summary of the listing and monitoring procedures employed by the federal and state governments, to provide a list of threatened and endangered species potentially occurring in the project study area and to provide brief ecological descriptions of these sensitive resources.

3.4.5.1 Listing and Monitoring Process

Federal (USFWS) – The USFWS has legislative authority to list and monitor the status of species whose populations are considered imperiled. This federal legislative authority for the protection of threatened and endangered species issues from the ESA of 1973, and its subsequent amendments. Regulations supporting this Act are codified and regularly updated in 50 CFR Sections 17.11 and 17.12.

The federal process stratifies potential candidates based upon the species' biological vulnerability. The vulnerability decision is based upon many factors affecting the species within its range and is always linked to the best scientific data available to the USFWS at the time. Species listed as threatened or endangered by the USFWS are provided full protection. This protection includes a prohibition of indirect take such as destruction of critical habitat. Additionally, species that have been proposed for listing (including publication in the *Federal Register*) as threatened or endangered are granted limited protection under the act until a decision is reached. The ESA and accompanying regulations provide the necessary authority and incentive for the individual states to establish their own regulatory vehicle for the management and protection of threatened and endangered species.

State (TPWD) – Endangered species legislation passed in Texas in 1973 (amended in 1981, 1985, and 1987) and subsequent 1975 and 1981 revisions to the Texas Parks and Wildlife Code established a state regulatory vehicle for the management and protection of threatened and endangered species. Chapters 67 and 68 (the 1975 revisions) of the code authorize the TPWD to formulate lists of threatened and endangered fish and wildlife species and to regulate the taking or possession of the species. A 1981 revision and 1985 amendment to the code provide authority for the TPWD to designate plant species as threatened or endangered and to prohibit commercial collection or sale of these species without permits.

Under this statutory authority, the TPWD regulates the taking, possession, transport, export, processing, selling or offering for sale, or shipping of threatened or endangered species of fish, wildlife, and plants. Neither specific criteria for the listing of plant and animal species, nor protection from indirect take (i.e., destruction of habitat or unfavorable management practices) are found in either one of the above-mentioned statutes or regulations. Functionally, the TPWD oversees endangered resources through the Wildlife Division.

3.4.5.2 List of Threatened and Endangered Species

The list of threatened and/or endangered species potentially occurring in the Trinity Parkway study area has been compiled from the above-mentioned federal and state regulations, and supplementary information from the Wildlife Diversity Program in the Wildlife Division of the TPWD. **Table 3-18** presents a list of the threatened and/or endangered species for Dallas County along with their current regulatory status.

TABLE 3-18. THREATENED AND ENDANGERED SPECIES IN DALLAS COUNTY, TEXAS

Common Name	Scientific Name	Status	
		USFWS	TPWD
Black-Capped Vireo (bird)	*Vireo atricapillus*	E	E
Interior Least Tern (bird)	*Sterna antillarum athalassos*	E	E
Whooping Crane (bird)	*Grus americana*	E	E
Golden Cheek Warbler (bird)	*Dendroica chrysoparia*	E	E
Piping Plover (bird)	*Charadrius melodus*	T	T
Arctic Peregrine Falcon (bird)	*Falco peregrinus tundrius*	NL	T
Bald Eagle (bird)	*Haliaeetus leucocephalus*	T (PDL)	T
Wood Stork (bird)	*Mycteria americana*	NL	T
Texas Horned Lizard (reptile)	*Phrynosoma cornutum*	NL	T
Timber Rattlesnake (reptile)	*Crotalus horridus*	NL	T

Source: USFWS, 2003; TPWD, 2002c.
Notes:
USFWS Status
E = Endangered (in danger of extinction throughout all or a significant portion of its range)
T = Threatened (likely to become endangered within the foreseeable future)
PT = Proposed for listing as threatened and under consideration by the Secretary of the Interior
T (PDL) = Threatened (Proposed for Delisting)
NL = Not Listed
TPWD Status
E = Listed as endangered in the State of Texas
T = Listed as threatened in the State of Texas
NL = Not Listed

3.4.5.3 Occurrences and Ecological Requirements of Protected or Otherwise Sensitive Species

Migratory Avian Species

Protected or otherwise sensitive birds of potential occurrence within the study area consist largely of migratory species. These include the bald eagle (*Haliaeetus leucocephalus*), whooping crane (*Grus americana*), interior least tern (*Sterna antillarum athalassos*), and wood stork (*Mycteria americana*). These species utilize the area primarily as a travel corridor, where various habitats are used for resting and feeding stops. Some of the more important migratory habitats within the Trinity Parkway study area include riparian zones, grasslands, wetlands, and upland woods/brush. The status [(Federal) (State)], ecological requirements, and known localities of each species potentially occurring in the study area are presented below.

Bald Eagle (T-PDL)(T). Historically, the bald eagle was found throughout North America, Canada, and northern Mexico. It is primarily a fish-eating species, which seeks wooded seacoasts, estuaries, major rivers, and large lakes, including impounded reservoirs, for preferred nesting and wintering habitat. Loss of riparian habitat on major rivers, pesticide-induced reproductive failures, lead poisoning from lead shot ingested prey, and other human disturbances are the primary threats to the species. The nesting range of the bald eagle in Texas extends along the Gulf Coast from Nueces to Jefferson County inland to Robertson County, and along the Red River. The wintering range in Texas is scattered throughout the northeast quarter of the state and most of the Panhandle. Based on the nesting range to the south, the

bald eagle may use the area during migration, but their potential occurrence and use of the study area is considered incidental.

Whooping Crane (E)(E). Historically, the whooping crane occurred throughout most of North America. It was almost extirpated during the 20th century due to habitat destruction and human disturbances. Whooping crane populations increased from a low of 18 in 1938-1939 to approximately 300 in 1990. The remaining cranes breed in the wetlands of Wood Buffalo National Park, Northwest Territory, Canada, and winter in the coastal wetlands of the Aransas National Wildlife Refuge in Aransas, Calhoun, and Refugio Counties, Texas. Dallas County lies within the migratory route used by these rare birds. However, their potential use of the project area should be considered incidental relative to the large area considered as part of their migration corridor.

Interior Least Tern (E)(E). The interior least tern is a colonial nesting species adapted to sand and gravel deposition features associated with inland lacustrine and riverine habitats. Active nesting colonies may be found in the Texas Panhandle on the Red and Canadian River systems and in south Texas along the Rio Grande River.

Several pair of nesting interior least terns has been documented utilizing the City of Dallas Southside Wastewater Treatment Plant as a nesting area for the past several years. The plant is located about 15 miles south of the study area. No nesting is known to occur in the vicinity of the study area. The potential occurrence and use of the study area is considered incidental.

Black-Capped Vireo (E)(E). The preferred habitat of the black-capped vireo consists of scattered oaks, eastern red cedar, and Ashe juniper interspersed with dense clumps of bushes and open areas of bare ground, rocks, and a sparse vegetative cover of grasses and forbs. This type of habitat is most prevalent in the escarpment area of southwest Dallas County, which is not present within the study area.

Wood Stork (NL)(T). The preferred habitat of the wood stork consists of low-lying wetland areas that may be seasonably flooded and/or drying. Wood storks feed not by sight but by touch “tacto-location” in shallow and often muddy water full of plants. Fish cannot be seen in those conditions. Walking slowly forward, the stork sweeps its submerged bill from side to side. Touching prey, mostly small fish, the bill snaps shut. Only seasonally drying wetlands (mostly in drying ponds) concentrate enough fish to provide the 440 pounds a pair of these big birds requires in a breeding season. When natural wetland cycles are upset by human water management wood storks fail to nest successfully.

Other Species

Other sensitive species of potential occurrence in the study area include two reptiles: the Texas horned lizard (*Phrynosoma cornutum*) and the timber rattlesnake (*Crotalus horridus*). These reptiles are state-listed as threatened. The Texas horned lizard was a common resident of north central Texas, inhabiting xeric grassland habitats, but has recently experienced serious declines throughout many portions of the state. The timber rattlesnake usually prefers dense thickets, but can also be found in open, upland pine and deciduous woods and the second-growth pastures of unused farmland. Their decline has been attributed to impacts to their primary prey items (mainly native ants), the loss of habitat, and the cumulative effects of pesticides in urban and agricultural areas. Although none was observed during field observations, they may occur sporadically in the Trinity Parkway study area.

3.4.6 Wetlands and Waters of the United States

Wetlands are usually defined in terms of their physical, chemical, and biological characteristics such as hydrologic regime, soil type, and plant species composition. For example, in classifying wetlands for mapping, inventory, and other purposes, Cowardin et al. (1979) defined wetlands as "…lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water…" that are characterized by the presence of hydrophytic vegetation, hydric soils, and surface water during the growing season.

Waters of the U.S. [§ 328.3(2) of the CWA] are those waters used in interstate or foreign commerce, subject to ebb and flow of tide, and all interstate waters including interstate wetlands. Jurisdictional waters of the U.S. are further defined as all other waters such as navigable waterways, interstate lakes, rivers, streams, intermittent streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds or impoundments of waters, tributaries of waters, and territorial seas, that are not considered "isolated."

Section 404 of the CWA (PL 95-217) authorizes the Secretary of the Army, acting through the USACE, to issue permits for the discharge of dredged or fill material into waters of the U.S., including wetlands. For the purposes of § 404, the USACE and EPA define wetlands as "…areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR § 328.3 and 40 CFR § 230.3).

Wetland Functions and Values

Wetlands are especially valued by many members of society because of their location on the landscape, the variety of functions they perform, and uniqueness of their plant and animal communities. Individual landowners and members of the general public also value wetlands for their open space and aesthetic qualities, as locations of important historic and archeological sites, and as locations for conveying floodwaters.

The primary function of wetlands relates to their physical, chemical, and biological attributes. Examples of functions include flood flow alteration, wildlife habitat, and groundwater discharge. The term values may be used to describe those functions that are generally regarded as beneficial to society. Recreation and uniqueness are examples of values. All or part of society may not value some wetland functions. For example, nutrient removal and transformation may not be considered a value if that function leads to algal blooms and noxious odors. **Table 3-19** provides a summary of typical wetland functions and values.

TABLE 3-19. TYPICAL WETLAND FUNCTIONS AND VALUES

Functions Related to Hydrologic Process	Value
Short-Term Storage of Surface Water: the temporary storage of surface water for short periods.	On-Site: Replenish soil moisture, import/export materials, conduit for organisms. Off-Site: Reduce downstream peak discharge and volume, and help maintain and improve water quality.
Long-Term Storage of Surface Water: the temporary storage of surface water for long periods.	On-Site: Provide habitat and maintain physical and bio-geochemical processes. Off-Site: Reduce dissolved and particulate loading and help maintain and improve surface water quality.
Storage of Subsurface Water: the storage of subsurface water.	On-Site: Maintain biogeochemical processes. Off-Site: Recharge surficial aquifers and maintain base flow and seasonal flow in streams.
Moderation of Groundwater Flow or Discharge: the moderation of groundwater flow or groundwater discharge.	On-Site: Maintain biogeochemical processes. Off-Site: Recharge surficial aquifers and maintain base flow and seasonal flow in streams.
Dissipation of Energy: the reduction of energy in moving water at the land/water interface.	On-Site: Contributes to nutrient capital of ecosystem. Off-Site: Reduced downstream particulate loading helps maintain or improve surface water quality.
Functions Related to Biogeochemical Processes	**Value**
Cycling of Nutrients: the conversion of elements from one form to another through abiotic and biotic processes.	On-Site: Contributes to nutrient capital of ecosystem. Off-Site: Reduced downstream particulate loading helps maintain or improve surface water quality.
Removal of Elements and Compounds: the removal of nutrients, contaminants, and other elements and compounds on a short-term or long-term basis through burial, incorporation into biomass, or biochemical reactions.	On-Site: Contributes to nutrient capital of ecosystem. Contaminants are removed, or rendered innocuous. Off-Site: Reduced downstream particulate loading helps maintain or improve surface water quality.
Retention of Particulates: the retention of organic and inorganic particulates on a short-term or long-term basis through physical processes.	On-Site: Contributes to nutrient capital of ecosystem. Off-Site: Reduced downstream particulate loading helps maintain or improve surface water quality.
Export of Organic Carbon: the export of dissolved or particulate organic carbon.	On-Site: Enhances decomposition and mobilization of metals. Off-Site: Supports aquatic food webs and downstream biogeochemical processes.
Functions Related to Habitat	**Value**
Maintenance of Plant and Animal Species: the maintenance of plant and animal community that is characteristic with respect to species composition, abundance, and age structure.	On-Site: Maintain habitat for plants and animals (e.g., endangered species and critical habitats), forest and agricultural products, and aesthetic, recreational, and educational opportunities. Off-Site: Maintain corridors between habitat islands and landscape/regional biodiversity.
Source: USACE, 1995.	

Study Area Wetland Delineation

In April 1994, a wetland delineation was prepared and § 404 Individual Permit application for the Dallas Floodway Channel Modification Project (Project No. 199300146). This delineation was field verified from March through May 1999. Before this field investigation, aerial photographs, soil survey maps, and USFWS National Wetlands Inventory (NWI) maps were reviewed. Due to the large amount of available information, field verification consisted of the USACE routine determination method, as described in the *1987 Wetland Delineation Manual*. For an area to be considered a wetland, hydric soils, hydrophytic vegetation, and wetland hydrology must be present.

Most of the wetland areas were located in depressions or drainages between 396 and 400 feet above mean sea level on either side of the Trinity River channel (see **Plate 3-16**). A few isolated water bodies were delineated as open water instead of wetlands based on their depths and lack of emergent vegetation. These water bodies were considered jurisdictional waters of the U.S. The Trinity River is considered a navigable waterway under the Rivers and Harbors Act of 1899 (see **Section 3.5.8**), and is therefore considered jurisdictional. Drainage sumps located along the perimeter of the floodway were considered jurisdictional, based on their association with the Trinity River channel.

Wetlands and waters of the U.S. in the study area are shown on **Plate 3-16**. Multiple field investigations of the study area were conducted during 1998, 1999, 2001, and 2003. Potential wetlands were delineated on current year 2000 digital topographic engineering maps with a 2-foot contour interval. Wetlands were delineated in accordance with the USACE *1987 Wetland Delineation Manual* based on the presence of hydrophytic vegetation, wetland hydrology, and hydric soils. A preliminary jurisdictional determination was submitted to the USACE on March 2000 and the project was assigned USACE project number 2000308. A field survey was conducted with the USACE in April 2002. The USACE is currently verifying the wetland delineation. Further coordination with the USACE would occur as required.

Predominant aquatic habitat types within the study area include wetland, river channel, drainage sump, and open water habitats. Together, they comprise 6 percent (432 acres) of the total study area. Characteristics of wetland (214 acres), river channel (151 acres), drainage sump (61 acres), and open water (6 acres) habitats are summarized in the following paragraphs.

DALLAS FLOODWAY LOOKING SOUTH TOWARD CORINTH STREET VIADUCT

Wetlands in the Study Area

Wetlands within the floodway portion of the study area consist primarily of shallow depressions that seasonally flood and then dry out, becoming exposed mud flats during summer months. These areas contain a variety of emergent plant species such as water primrose (*Ludwigia peploides*), smartweed (*Polygonum* sp.), umbrella sedge (*Cyperus* sp.), flat sedge (*Carex* sp.), spikerush (*Eleocharis* sp.), and curly dock (*Rumex crispus*). These depressions attract a variety of waterfowl species when inundated and are popular foraging areas for shorebirds and wading birds as the depressions dry up and the mud flats become exposed.

Downstream of the floodway, several isolated depressions varying in depth and size are intermixed with the elm-hackberry forest as described above. Plant species are similar to those in the elm-hackberry forest but are dominated by the more water-tolerant species such as green ash (*Fraxinus pennsylvanica*), swamp privet (*Forestiera acuminata*), buttonbush (*Cephalanthus occidentalis*), and black willow (*Salix nigra*).

Trinity River Channel

The jurisdictional limits of the Trinity River extend to the ordinary high-water mark of the channel, which may be defined as the line on the bank established by fluctuations of water and indicated by physical characteristics such as a clear natural line on the bank, shelving, destruction of terrestrial vegetation, presence of debris, or other appropriate means that consider the characteristics of the area. The ordinary high-water mark of the Trinity River may vary between 100 and 200 feet throughout the floodway. Associated with the river channel is a very narrow riparian corridor that consists mostly of cottonwood (*Populus deltoides*), black willow, American elm (*Ulmus americana*), hackberry (*Celtis laevigata*), and green ash.

Downstream of the floodway, the Trinity River retains its natural characteristics and may have an ordinary high-water mark between 100 and 150 feet. Vegetation along this portion of the river is similar to the species listed above; however, the width of the riparian corridor is notably wider (1,500 to 2,000 feet). Cedar Creek is also jurisdictional and enters the Trinity River between the AT&SF Railroad Bridge and MLK. Coombs Creek, another tributary of the Trinity River, enters the western portion of the study area

just south of IH-30. Coombs Creek is a perennial stream and drains into the Dallas Floodway through the west levee by a pressure sewer and outfall channel. These riparian corridors may serve as migration corridors for wildlife present within the study area.

Former river meanders of the old Trinity River channel are also located within portions of the study area. These meanders have been traversed and surrounded by development and are predominantly open channels with scattered tree growth. These segments of the old river channel are not regulated under § 10, but are still considered jurisdictional under § 404.

Open Water Habitats

Open water habitats were classified on the basis of depth of inundation and lack of rooted emergent or woody vegetation. These habitats are substantially deeper than the wetland depressions and are ponded throughout most of the year. Trammel Crow Lake, located within the Dallas Floodway near Sylvan Avenue, is a particularly hard-edged open water area and contains minimal emergent vegetation. Emergent vegetation in the few ponds east of the MKT Railroad Bridge usually consists of isolated patches of cattail (*Typha latifolia*) along the immediate shoreline. In some of the shallower areas, pondweed (*Potamogeton* sp.) and spikerush (*Eleocharis* sp.) are common.

Drainage Sumps

Several steep-sloped drainage sumps collect local storm water runoff, which eventually drains into the floodway and empties directly into the Trinity River (see **Section 3.5.7.2**). The sumps originate on the upland side of the levees and are often bordered by residential, commercial, or industrial development. The sumps vary in depth and are usually deep and steep-sloped, which limits the vegetative diversity. Cattails are the most dominant species and often form a continuous stand around the sumps.

Drainage is conveyed through the floodway to the Trinity River by several pump stations located along each levee. Storm water is directed through steep-sloped channels aligned perpendicular to the levee and the river channel. As flood levels recede, these channels usually drain entirely with the exception of a few isolated pools. Black willow and cottonwood saplings represent the majority of the vegetative species that have become established on the steep side slopes. Isolated pools that remain after flood waters recede may provide foraging opportunities for a variety of heron or egret species (see **Table 3-17**).

3.4.7 Wild and Scenic Rivers

The National Wild and Scenic Rivers System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, or recreational features in a free-flowing condition for the enjoyment of present and future generations. According to the National Wild and Scenic River Systems, a 191.2-mile

stretch of the Rio Grande River from the Chihuahua-Coahuila border in Mexico to the Terrell-Val Verde County line is the only river segment in the State of Texas protected under the Wild and Scenic Rivers Act (USFWS, 1990).

3.4.8 Prime and Unique Farmland

Coordination with the National Resource Conservation Service (NRCS) determined the project area, which is located in the urbanized area of the City of Dallas, does not meet the definition of farmland as defined in 7 CFR 658. Therefore, the provisions of the Farmland Protection Policy Act (FPPA) of 1984 do not apply to this project.

3.5 PHYSICAL ENVIRONMENT SETTING

This section provides a description of the physical environment within and around the study area. Topics include geography, topography, climatology, geology, soil types, hydrology, and water quality.

3.5.1 Geography and Topography

The DFW metropolitan area is located in north central Texas, approximately 250 miles north of the Gulf of Mexico. It is near the headwaters of the Trinity River, which lies in the upper margins of the Gulf Coastal Plain. The rolling hills in the area range from approximately 500 to 800 feet in elevation above mean sea level (msl).

The City of Dallas is located in Dallas County and serves as the county seat. Dallas is 35 miles east of Fort Worth and 245 miles north-northwest of Houston. Dallas is the second largest city in Texas and is the largest inland city in the U.S. without direct transportation access by a navigable water body. **Table 3-20** presents a summary of geographic data for the City of Dallas.

TABLE 3-20. SUMMARY OF GEOGRAPHIC DATA - DALLAS, TEXAS

Geographic Latitude	32°51' North
Geographic Longitude	96°51' West
Total Area	378.4 square miles
Lake Area	45.0 square miles
Average Elevation (above msl)	479 feet
Lowest Point (above msl)	382 feet
Highest Point (above msl)	750 feet
Source: City of Dallas, 1994. **msl** = mean sea level	

3.5.2 Climatology

The DFW metropolitan area is located in a region of temperate mean climatological conditions, experiencing occasional extremes of temperature and precipitation of relatively short duration. According to the National Oceanic and Atmospheric Administration (NOAA) at Fort Worth, Texas, the 30-year average rainfall amount is 33.7 inches per year. The extreme annual rainfall data since 1887 is a maximum of 53.5 inches in 1991 and a minimum of 17.9 inches in 1921. The mean relative humidity is 65 percent, with an average annual temperature of 65.8°F. The average first freeze date is November 13, while the average last freeze date is March 23.

Generally, the major storms experienced in the study area are produced by heavy rainfall from frontal-type storms, which occur during the spring and summer months. However, heavy rainfall totals can also be produced by intense localized thunderstorms. These thunderstorms may occur at any time during the year, but are more common in spring and summer months. **Table 3-21** presents a summary of climate statistics for the DFW area.

TABLE 3-21. CLIMATE STATISTICS FOR DFW, TEXAS

PRECIPITATION	
Average Annual (1887-1996)	33.7 inches
Maximum Annual (1991)	53.5 inches
Minimum Annual (1921)	17.9 inches
Maximum 24-Hour Total (September 1932)	9.6 inches
TEMPERATURE	
Average Daily	65.8°F
Daily Maximum (June 1980)	115°F
Daily Minimum (December 1989)	-1°F
RELATIVE HUMIDITY	
Average A.M.	82 percent
Average P.M.	56 percent
Source: NOAA, 2001. **Note**: Climate statistics are based on 109 years of recorded data.	

The highest temperatures of summer are associated with fair skies, westerly winds, and low humidity levels. Characteristically, summer heat waves are broken into 3- to 5-day periods by thunderstorm activity. There are only a few nights each summer when the low temperature exceeds 80°F. Summer daytime temperatures frequently exceed 100°F. Average high and low temperatures range from 37°F in January to 98°F in August (NOAA, 2001).

The prevailing winds for the DFW area are from the south, except during portions of winter months. During this time, occasional high-pressure polar air masses, locally known as “blue northers,” invade from the north, resulting in cool/cold north winds. **Table 3-22** presents average wind speed/calm data for the DFW area.

TABLE 3-22. AVERAGE WIND SPEED/CALM DATA FOR DFW, TEXAS

WIND DATA	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVERAGE
Wind Speed (mph)	11.0	11.7	12.7	12.4	11.1	10.6	9.8	8.9	9.3	9.7	10.7	10.8	10.7
Percent Calm Winds	3.6	2.9	3.0	4.5	4.6	4.0	3.0	8.3	7.5	5.9	4.0	4.5	4.6

Source: NOAA, 1999. **mph** = miles per hour
Note: Average wind speeds are based on 45 years of data. Calm wind percentages are based on data from 1984 through 1992.

Table 3-22 indicates the average monthly wind speeds in the DFW area range from 8.9 mph in August to 12.7 mph in March. The average annual wind speed is 10.7 mph. The percentage of calm winds ranged from 2.9 percent in February to 8.3 percent in August. During any given year, calm winds occur approximately 4.6 percent of the time.

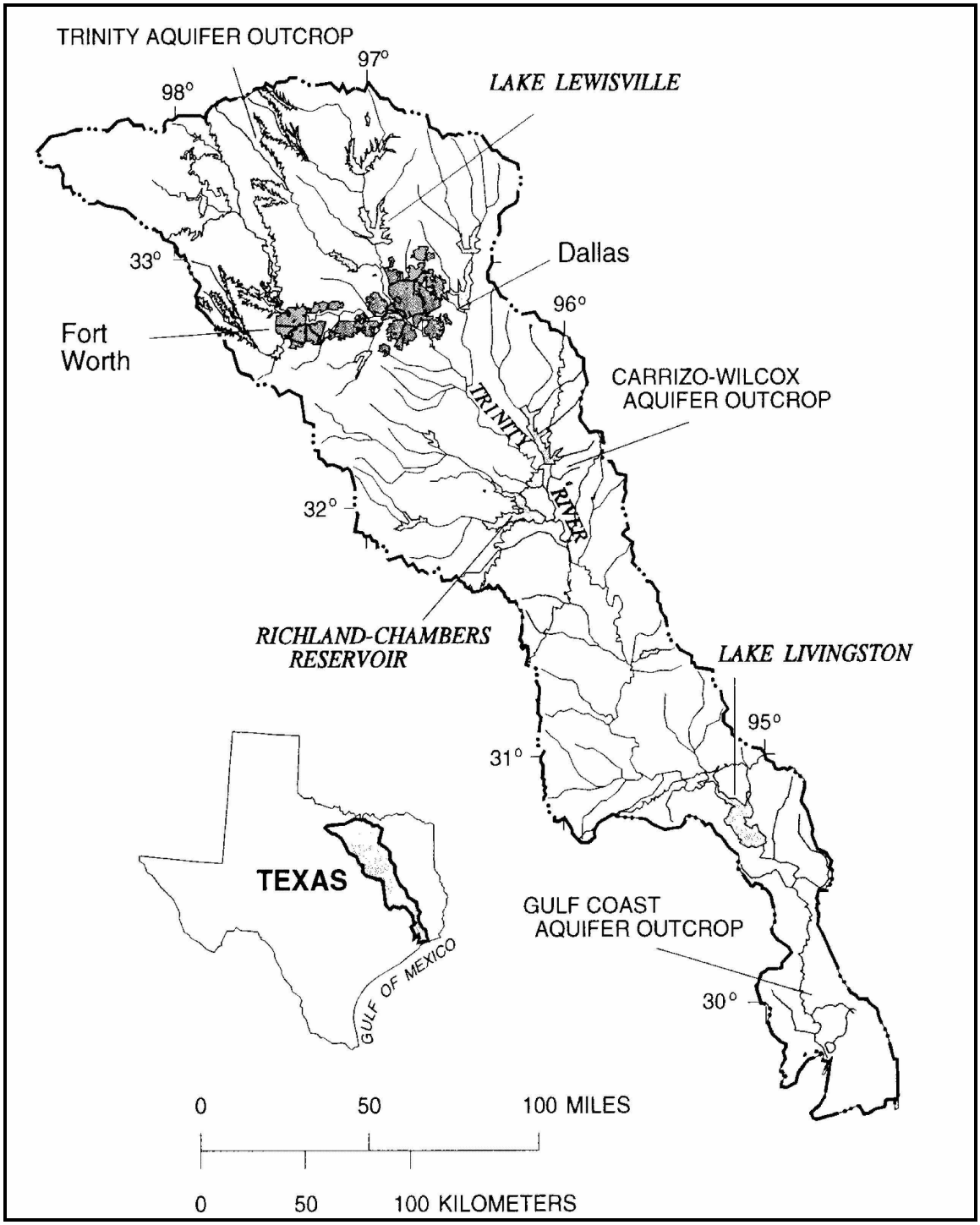
3.5.3 Geology and Soils

This subsection describes the physiographic setting, geology, mineral resources, and soil types within the study area.

3.5.3.1 Physiographic Setting

The Trinity River Basin (or watershed) drains approximately 18,000 square miles from just south of the Oklahoma border in north central Texas to Galveston Bay on the Gulf of Mexico in southeast Texas (see **Figure 3-3**). Altitudes range from 1,500 feet above msl in the upper extreme reaches of the basin to sea level at the mouth in Trinity Bay near Houston. The gradient of the river decreases from almost 4 feet per mile to approximately 0.8 feet per mile toward the south. The basin is situated within two physiographic provinces, the Central Lowland province in the headwaters, with rock outcrops indicative of the Pennsylvanian and Permian age, and the Coastal Plain province, which includes varying outcrops throughout the basin. In the extreme upper basin, moderately rugged eastward-facing escarpments and stream valleys with narrow and steep-sided floodplains are indicative of a newly forming erosion cycle. The topography changes to primarily flat to gently rolling in the mid-basin prairies and Cross Timbers regions, becomes gently rolling to hilly through the east Texas timber belt, and then gradually levels out to very flat treeless areas (in uplands) in the Coastal Prairie.

FIGURE 3-3. TRINITY RIVER BASIN



The Trinity Parkway study area is located within the northernmost section of the Gulf Coastal Plain, which is characterized as flat to gently dipping unconsolidated terrace and floodplain deposits. All physiographic features within this area were formed during the Cenozoic Era and are of sedimentary origin. The exposed bedrock is composed of near shore and shoreline marine sediments deposited at the edge of the Gulf Coast Embayment by a shallow Cretaceous sea that existed approximately 100 million years ago. These Cretaceous sediments were deposited unconformably on top of the older Pennsylvanian and Permian sediments and were subsequently covered by Tertiary and Quaternary sediments of marine and continental origin. These formations dip gently to the southeast at a rate steeper than the land surface, producing a banded outcrop pattern with progressively younger formations outcropping in the downstream direction. The rate of dip and thickness of the individual formations increases in a gulfward direction.

3.5.3.2 Geology

The geologic setting within the study area is mainly characterized with fluvial terrace deposits and alluvial deposits of Quaternary age. These deposits occupy the floodplain area of the Trinity River and consist of gravel, sand, silt, and clay. The underlying bedrock consists of the lower and middle members of the Austin Chalk Formation, a chalky limestone with thin bentonitic beds scattered in the lower part. Within the study area, the Austin Chalk Formation has an estimated thickness of a few meters to 200 feet and gently dips to the southeast.

The Quaternary sediments range in age from 3 million years to the present. These sediments, composed of unconsolidated sand, gravel, silt, and clay are found in and above the river and creek floodplains. A typical floodplain alluvial sequence would consist of silt or clay underlain by sand with a basal gravel layer. The highest terraces located at the outer edge represent the oldest remnant floodplain.

The differing geologic units within the study area have distinct mineral properties and stability characteristics; therefore, the study area's suitability for urban development is varied. In general, limestone and calcareous cemented alluvial gravels exhibit strong stability, while clays show very weak stabilities. However, these very general characterizations are subject to variability. For instance, if a layer of limestone is underlain by clay, then the stability of the limestone is jeopardized by the weakness and plasticity of the clay. The most favorable substrate for urban development is the Austin Chalk. These soft limestones generally have very high foundation strength and form stable slopes.

Mineral Resources

Mineral resources in the study area are limited to near-surface deposits of sand and gravel that are used in construction aggregate. Historically, extensive areas of sand and gravel extraction have occurred

along the floodplain/terrace complexes of the Trinity River, as well as some of the smaller features in the study area. Such deposits provide a potential source for road-base fill and other construction uses. Another potential rock/mineral resource along the corridor includes the Austin Chalk, which is quarried elsewhere in north central Texas as an ingredient in the manufacture of Portland cement. No active quarrying activities for these mineral resources occur within the study area.

3.5.3.3 Soils

This subsection describes the soil types found in the study area according to their functions in the ecosystem and their utility or limitations associated with the construction of the proposed tollway facility. Also listed are the dominant soil associations and the extent of other soils found in the study area.

General Soil Attributes

Soils are a major component in ecological systems. Various physical, chemical, and biological processes filter water that percolates through soil. These include aeration, microbial digestion, ion exchange, and the uptake of nutrients by plants. Through these actions, low-quality runoff may be upgraded as it passes through the soil zone. The thick, clayey soil types are especially active in terms of their chemical activity. Because of this activity, the soil zone functions as an environmental buffer in which the quality of runoff, from a roadway for example, may be upgraded.

Aside from the ecological values of these soils, there are also engineering constraints. These constraints are related to the weak, plastic properties displayed by both soil and substrate across much of the terrain in the corridor. The engineering properties of soil, which must be considered in designing a highway, include compressive strength, shrink-swell potential, slope stability, permeability, excavation potential, and corrosion potential. Clayey soils all have low compressive strength, low slope stability, low permeability, high shrink-swell potential, and high corrosion potential.

Soil Map Units

According to the *Soil Survey of Dallas County, Texas* (USDA, 1980), two major soil map units are located within the majority of the study area and include the Trinity-Frio and the Silawa-Silstid-Bastsil (see **Plate 3-17**). The Trinity-Frio unit comprises approximately 19 percent of the Dallas County and the majority of the study area, while the Silawa-Silstid-Bastsil unit comprises approximately 4 percent of the county and the portion of the study area between the Trinity River and the US-175/SH-310 interchange (southern terminus).

The soils within the Trinity River Basin are composed of the Trinity-Frio map unit. The Trinity-Frio unit consists of deep, nearly level, clayey soils found in floodplains. Trinity-Frio soils are moderately alkaline,

somewhat poorly drained- and well-drained soils that have slopes of 0 to 1 percent. Trinity soils make up approximately 56 percent of the unit and are somewhat poorly drained soils located on broad bottomlands along the Trinity River and its larger tributaries. Frio soils make up approximately 19 percent of the unit and are well-drained soils located on broad bottomlands along the larger streams. Minor soils make up the remaining 25 percent of the unit and consist of Arents soils in areas where sand and gravel have been removed and Gowen, Ovan, and Seagoville soils on floodplains. The soils in this map unit are used mainly as cropland and pasture, but many small areas are strip mined for sand and gravel. The flood hazard, clayey texture, very slow to moderately slow permeability of the soils, and the very high shrink-swell potential of the Trinity soils are the main limitations to urban and recreation uses with the Trinity-Frio unit.

The Silawa-Silstid-Bastsil map unit consists of deep, nearly level to sloping, loamy and sandy soils found on stream terraces. Silawa-Silstid-Bastsil soils are slightly acidic to medium acidic, well-drained soils that have slopes of 0 to 8 percent. Silawa soils make up approximately 40 percent of this unit and are gently sloping to sloping soils on ridges and side slopes of uplands. Silstid soils make up approximately 28 percent of this unit and are nearly level to gently sloping soils on uplands. Bastsil soils make up approximately 11 percent of this unit and are nearly level to gently sloping soils on high terraces. Minor soils make up the remaining 21 percent and consist of Arents soils in small areas where soil has been removed in excavating for sand and gravel; Altoga, Lewisville, and Sunev soils in sloping areas near streams; the nearly level Axtell and Rader soils on high terraces; Dutek soils on low ridges; and the sandy Eufaula soils on low ridges near floodplains. The soils in the Silawa-Silstid-Bastsil map unit are used mainly as pasture and for urban uses and have no major limitations to use as cropland or to urban uses. A summary of the individual soil types located in the study area is presented in **Table 3-23**.

TABLE 3-23. SOIL TYPES IN THE STUDY AREA

Soil Type	Soil Characteristics	Soil Potentials and Limitations
Arents, loamy, gently undulating (1 to 5 percent slopes)	Areas mined for gravel and sand are lower than surrounding landscape. No uniform layers, but some layers of sandy clay loam. These soils have a moderate permeability.	These soils have a low potential for urban development. Limitations include the hazard of flooding and corrosivity to steel.
Arents, loamy, hilly (10 to 30 percent slopes)	Discarded overburden of mining operations left mounds and ridges in gravel pits. The soil is moderately alkaline, light yellowish brown gravelly sandy clay loam to a depth of 80 inches. Permeability is moderate, and available water capacity is medium.	This soil has a very low potential for urban development. Limitations include the hazard of flooding and corrosivity to steel.
Axtell-Urban land complex (1 to 5 percent slopes)	Deep, gently sloping, moderately well drained, upland soils. Surface layer is slightly acidic, dark grayish brown fine sandy loam about 4 inches thick. Permeability is very slow, and the available water capacity is high.	This soil has a medium potential for urban uses. Limitations include a high shrink-swell potential, low strength, corrosivity, and the hazard of erosion, which is moderate.
Bastsil-Urban land complex (0 to 2 percent slopes)	Nearly level to gently sloping soils and Urban land, well drained. Permeability is moderate and available water capacity is high. The surface layer is medium acidic, brown fine sandy loam about 8 inches thick.	This soil has a high potential for urban use. Limitations include corrosivity and low strength of soil. The hazard of erosion is moderate.
Eddy-Urban land complex (4 to 8 percent slopes)	Gently sloping to sloping, shallow and very shallow, well drained soils and Urban land. Permeability is moderately slow, and available water capacity is very low. Surface layer is moderately alkaline, grayish brown clay loam 4 inches thick.	This soil has a medium potential for urban use. Limitations include shallowness to rock, corrosivity, and the severe hazard of erosion.
Frio-Urban land complex	Deep, nearly level, well-drained soils and Urban land on floodplains of small streams. Permeability is moderately slow and available water capacity is high. Surface layer is moderately alkaline, dark grayish brown silty clay 7 inches thick.	This soil has a low potential for urban use due to the flooding hazard. Limitations include low strength and corrosivity of soil. Hazard of erosion is slight.
Lewisville-Urban land complex (0 to 4 percent slopes)	Deep, nearly level, and gently sloping soils and Urban land well drained. Permeability is moderate and available water capacity is high. Surface layer is moderately alkaline, dark grayish brown silty clay 17 inches thick.	This soil has a medium potential for urban use. Limitations include high shrink-sell potential, corrosivity, and low strength of soil. Hazard of erosion is moderate.
Pits and Dumps	Limestone or shale removal areas. Areas are 8 to 75 feet below original surface.	Water stands in low parts. A few areas have been smoothed for use as building sites.
Silawa-Urban land complex (2 to 6 percent slopes)	Deep, gently sloping and sloping soil and Urban land, well drained. Permeability is moderate and available water capacity is medium. Surface layer is slightly acidic, grayish brown fine sandy loam 6 inches thick.	This soil has a high potential for urban use. Limitations include the moderate erosion hazard, corrosivity, and low strength of soil.
Silstid-Urban land complex (0 to 6 percent slopes)	Nearly level, gently sloping, and sloping soils and Urban land. Permeability is moderate and available water capacity is low. Surface layer is dark grayish brown, neutral loam 5 inches thick.	This soil has a high potential for urban uses. Limitations include the corrosivity of the soil. Wind erosion is a severe hazard on a bare surface.
Trinity clay, frequently flooded	Deep, nearly level, somewhat poorly drained, located on floodplains. Permeability is very slow, available water capacity is high. Surface layer is moderately alkaline, dark gray clay 7 inches thick.	This soil has a very low potential for urban and recreational use. Limitations include frequent flooding and wetness, corrosivity, very high shrink-swell potential, and clayey texture, also walls of excavations tend to cave or slough. Hazard of erosion is slight.
Trinity-Urban land complex	Deep, nearly level soils and Urban land, somewhat poorly drained. Permeability is very slow and available water capacity is high. Surface layer is moderately alkaline, very dark gray clay 30 inches thick.	These soils have a very low potential for urban and recreational use. Limitations include flooding, very high shrink-swell potential, corrosivity, low strength, and wetness of soil. Also walls of excavations tend to cave or slough. Hazard of erosion is slight.
Urban land	Extensively built-up areas with 75 percent or more of the surface covered with buildings and pavement.	Residential areas make up 10 percent.

Source: USDA, 1980.
Note: This soil survey does not address the wind and water erosion potentials for the identified soil types.

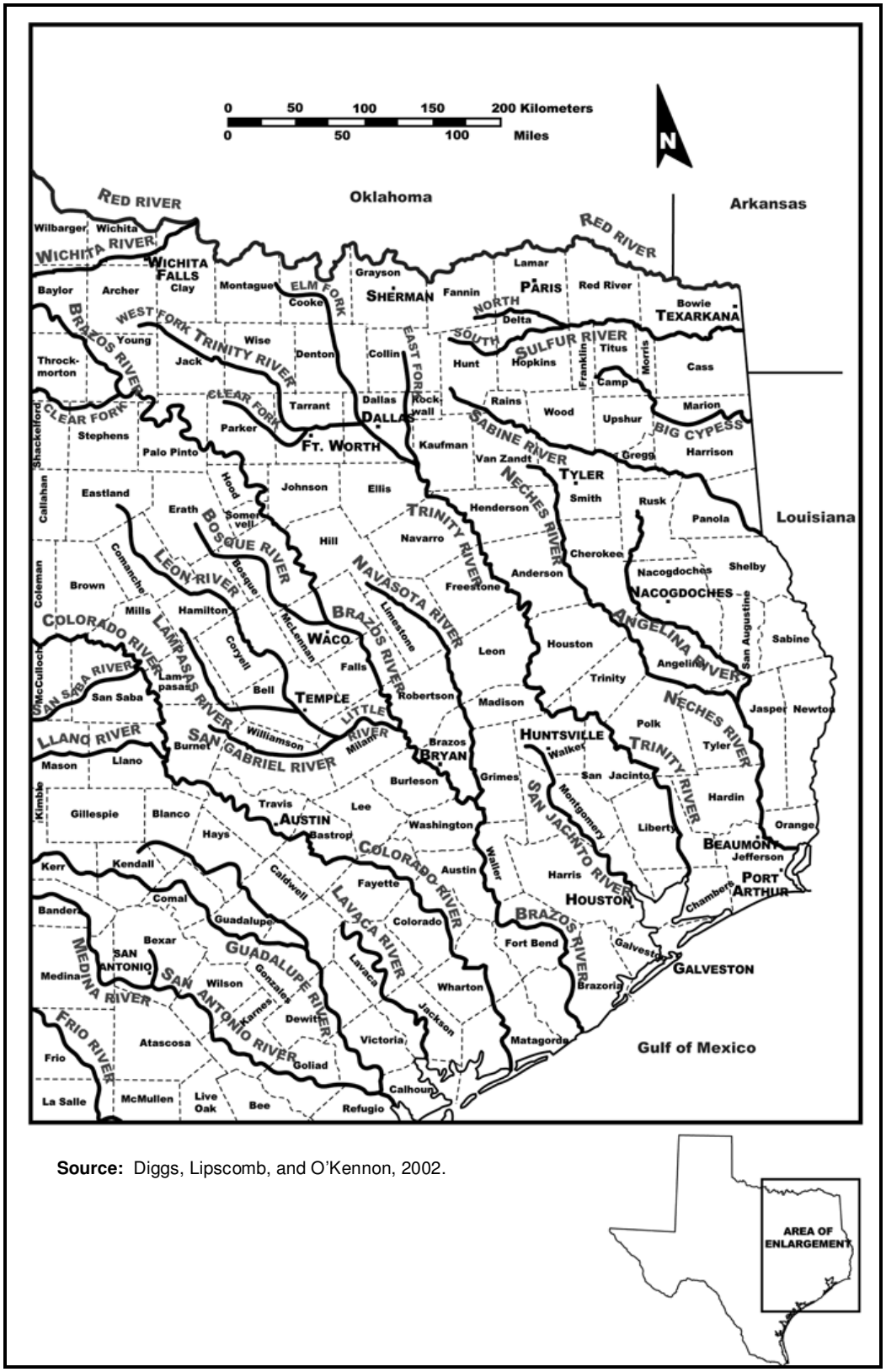
3.5.4 Hydrology and Water Quality

This section describes the existing hydrology and water quality characteristics in the study area. Subsections include descriptions of existing surface water and groundwater characteristics, floodplains and flood control features, and navigation characteristics.

3.5.4.1 Surface Water

The Trinity Parkway study area is located within one of the state's major watersheds – the Trinity (see **Section 3.5.3.1**). The Trinity River watershed drains approximately 18,000 square miles from just south of the Oklahoma border in north central Texas to Galveston Bay on the Gulf of Mexico in southeast Texas. It is over 300 miles long from north to south and 100 miles wide at its widest point. River elevations range from over 1,000 feet in the headwaters to 550 feet in the DFW area to sea level at the mouth. The river, with its meanders, is about 500 miles long from the mouth to Dallas. **Figure 3-4** shows the location of the Trinity River in relation to other major rivers of east Texas.

FIGURE 3-4. MAJOR RIVERS OF EAST TEXAS



Source: Diggs, Lipscomb, and O'Kennon, 2002.

As shown in **Figure 3-4**, the upper Trinity River begins with four tributaries, the Clear Fork, West Fork, Elm Fork, and East Fork. The headwaters of these four branches are located north, west, and southeast of the cities of Dallas and Fort Worth, and converge in or near the DFW metropolitan area. The main stream begins with the junction of the Elm and West Forks at Dallas.

The majority of surface water bodies in the study area have been substantially modified from their natural conditions. These changes began in the late 1920s when the City of Dallas began a major effort to control flooding of the Trinity River in and around the downtown area. The most substantial change involved the diversion of the Trinity River (old river channel) to its current location within the Dallas Floodway. Within the study area, the old river channel along with other major tributaries provide additional flood control through a network of storage sumps located on the landside of the Dallas Floodway levees. Details concerning the network of flood control features in the study area are provided in **Section 3.5.7 Floodplains and Flood Control Features**. **Table 3-24** provides a summary of the major surface water bodies in the study area. Their locations are shown on **Plate 3-18**.

TABLE 3-24. MAJOR SURFACE WATER BODIES IN THE STUDY AREA

Name	Description
Trinity River Mainstem (Dallas Floodway)	Primary surface water feature in the study area. Consists of a man-made channel situated between flood control levees from Westmoreland Road to the AT&SF Railroad Bridge. Intersects with the natural river channel at AT&SF Railroad Bridge and continues north-south through remaining portion of study area.
Elm Fork of the Trinity River (Old River Channel)	Enters the northern portion of the study area near IH-35E/SH-183 interchange. The majority of the "Old River Channel" is used for flood control, serving as a network of drainage storage sumps. Drainage from the sumps is discharged into the Dallas Floodway by pressure sewers and pump stations.
West Fork of the Trinity River (Old West Fork River Channel)	Enters the northwest portion of the study area near Westmoreland Road. The Dallas Floodway bisects the Old West Fork. The eastern section intersects with the Elm Fork near Hampton Road. The majority is used for flood control storage sumps on both sides of the Dallas Floodway. Drainage from the sumps is discharged into the Dallas Floodway by pressure sewers and pump stations.
Cedar Creek	This tributary enters the southwest portion of the study area near Corinth Street. Cedar Creek is a third-order, perennial stream and drains into the Trinity River just south of the AT&SF Railroad Bridge.
Coombs Creek	This tributary of the Trinity River enters the western portion of the study area just south of IH-30. Coombs Creek is a first-order, perennial stream and drains into the Dallas Floodway through the west levee by a pressure sewer and outfall channel.
Crow Lake	This small man-made lake is situated within the Dallas Floodway just east of Wycliff/Sylvan Avenue. Its primary use is for recreation.
Sources: USGS, 1981; FEMA, 2001a-f.	

3.5.4.2 Groundwater

The primary source of groundwater for the Upper Trinity River Basin (including the study area) is supplied by the Lower Cretaceous Trinity Group; a major aquifer composed of (in descending order) the Paluxy, Glen Rose, and Twin Mountains Formations. The Trinity Group aquifer ranges in thickness from 100 to 1,200 feet with yields ranging from 50 to 1,900 gallons/minute. The water quality of the Trinity Group is acceptable for most municipal and industrial purposes and ranges from fresh to slightly saline with salinity increasing with depth. This aquifer has been overdeveloped in the DFW metropolitan area and, therefore, the water table is

low, dropping as much as 1,200 feet below the surface. Currently, water supplied to the area comes from surface water reservoirs and other river systems generally located north and east of the City of Dallas.

Data concerning the movement of groundwater in the Trinity Group indicates that it moves generally in an easterly direction, approximately at right angles to the strike of the beds. Local variations in the direction of movement result from cones of depression that have been caused by pumping, especially in Dallas and Tarrant Counties. The rate of groundwater movement in the Trinity Group is on the order of a few feet to a few tens of feet per year.

The Woodbine aquifer (a minor aquifer) also produces water in the upper part of the Trinity River Basin near the study area. This Upper Cretaceous aquifer consists of fine-grained sand and sandstone interbedded with clay. Lignite and sandy clay layers occur in the upper part of the aquifer with 50 percent commonly consisting of sand. Maximum thickness is approximately 600 feet. Usable water is produced to a maximum depth of approximately 2,000 feet. However, the quality of water produced is relatively poor, exceeding 1,500 parts per million (ppm) dissolved solids in some areas.

Groundwater in floodplain terraces and deposits is in hydraulic connection with the Trinity River, its major tributaries, and larger local lakes. The primary source of this near-surface groundwater is rainwater infiltration on the surface of the alluvial terrace and floodplain deposits. Most water accumulating in floodplain deposits is discharged into surface water bodies, evaporated, or transpired. Relatively shallow or “perched” groundwater conditions can occur locally within the study area, especially in inactive creek channels present above the limestone bedrock. Several inactive creek beds are known to exist near and within the study area.

3.5.5 Water Quality

The Trinity Parkway study area is located in the NCTCOG-designated “Trinity Mainstem Watershed.” This watershed contains 397,555 acres and includes 24 incorporated cities situated fully or partially within this watershed. Approximately 42 percent of the watershed (166,973 acres) is classified as urban, while 55 percent may be classified as rural. Urbanization has a variety of impacts on water quality. Urban storm water runoff carries pollutants from many sources and activities – automobiles, oil and grease on roads, atmospheric deposition, processing and salvaging facilities, wastewater effluent, chemical spills, pet wastes, industrial plants, construction site erosion, and the disposal of chemicals used in homes and offices.

Urban rivers inherit some problems from upstream, notably sediment, nutrients, and pesticides from non-point sources. However, cities add a variety of pollutants to rivers and other water bodies, including:

- *Bacteria*. Urban runoff often contains high levels of harmful bacteria and viral strains, including fecal streptococcus and fecal coliform from human and animal wastes. When these levels exceed public health standards, drinking water may be unsafe, contact recreation may be restricted, and the taking of fish may be banned.
- *Oil and Grease*. Oil, grease, and other petroleum-based substances contain hydrocarbons, some of which are harmful to sensitive animal species and aquatic life. Hydrocarbons degrade fisheries habitats and lower dissolved oxygen by limiting the interaction of water and air.
- *Heavy Metals*. Heavy metals – including lead, copper, cadmium, zinc, mercury, and chromium – can be toxic to aquatic life and contaminate drinking water supplies. Most metals found in urban runoff come from corroding, decaying surfaces, including roofing materials, downspouts, galvanized pipes, metal plating, paint, catalytic converters, brake linings, and bridges and other structures.
- *Toxic Substances*. Toxic substances, which are found in household substances, such as paint and cleaning materials, and industrial chemicals can seriously impair water quality.
- *Trash and Debris*. Trash and debris from street litter and careless disposal washes into water bodies both over land and through the storm drain system, collecting at impasses in streams and lakes, and disturbing water flow.

Water quality is measured in terms of chemical and physical qualities such as temperature, dissolved oxygen, suspended solids, and levels of nitrogen compounds and metals. Dissolved oxygen is the key to survival of aquatic life. When organic material and other chemicals are present in wastewater, they contribute to bacteria growth, which consumes oxygen, lowering oxygen levels and consequently reducing the ability of fish and other aquatic life to survive.

The Trinity Mainstem Watershed has one TCEQ classified State Stream Segment: *Upper Trinity River 0805*. This segment extends 100 miles from a point immediately upstream of the confluence of the Cedar Creek Reservoir discharge canal to a point immediately upstream of the confluence of the Elm Fork. Designated uses include high aquatic life and contact recreation. The Trinity River Authority (TRA) describes this segment as an effluent-dominated stream. Since most of the natural flow in the river is rainfall, the volume of water from rainfall varies substantially during the year. During dry periods, most of the water in the river is treated effluent discharged from area wastewater treatment plants.

There are 18 TCEQ permitted wastewater discharge facilities within the Trinity Mainstem Watershed with a total discharge of 524.57 MGD. This includes five public domestic dischargers (524.09 MGD), one private domestic discharger (0.0007 MGD), and 12 industrial dischargers (0.465 MGD). Included in the public domestic wastewater discharger category are the joint system Dallas Central and Southside wastewater treatment plants and the TRA Ten Mile Creek and Red Oak Creek wastewater treatment

plants. The Dallas CWWTP is located near the southern portion of the study area just south of the Dallas Floodway.

Segment 0805 is listed in the TCEQ Draft 2002 303(d) List as being “Category 5a and 5c,” indicating the water body does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants. This is because bacteria levels have exceeded the criterion established to assure the safety of contact recreation, though non-contact recreation could be supported. The consumption of fish is threatened due to elevated PCBs in fish tissue. As a result, these activities are not supported through the upper 19 miles of the segment, which includes the study area. An aquatic life closure was issued by the TDH in 1990 due to the presence of elevated levels of the organochlorine insecticide “chlordane” in fish tissue. This means fishing is allowed, but not the taking of fish for human consumption. Long-term human exposure to chlordane can lead to cancer of the liver and harmful effects on the nervous system and liver.

Table 3-25 provides a summary of the TCEQ Draft 2002 § 303(d) data for Segment 0805. For comparison purposes, the table includes data for stream segments located immediately upstream of Segment 0805. This information is important because drainage from these segments flow into Segment 0805 and, thereby, influences water quality conditions in the study area.

TABLE 3-25. SUMMARY OF DRAFT 2002 TEXAS 303(D) WATER QUALITY DATA

Segment Number	Segment Name and Location	Area	Parameter	Category [1]	Rank [2]
0805	*Upper Trinity River* Located in study area – from a point immediately upstream of the confluence of the Cedar Creek Reservoir discharge canal in Henderson/Navarro County to a point immediately upstream of the confluence of the Elm Fork Trinity River in Dallas County (100 miles).	11 mile reach near S. Loop 12	PCBs in fish tissue	5a	H
		11 mile reach near S. Loop 12	Bacteria	5c	D
		25 mile reach near SH 34	Bacteria	5c	D
		Remainder of segment	Bacteria	5c	D
		Upper 8 miles	PCBs in fish tissue	5a	H
		Upper 8 miles	Bacteria	5c	D
0841	*Lower West Fork Trinity River* Located immediately upstream of study area – from the confluence of the Elm Fork Trinity River to a point immediately upstream of the confluence of Village Creek in Tarrant County (27 miles).	Lower 14 miles of segment	PCBs in fish tissue	5a	H
		Lower 14 miles of segment	Bacteria	5c	D
		Upper 13 miles of segment	PCBs in fish tissue	5a	H
		Upper 13 miles of segment	Bacteria	5c	D
0822 [3]	*Elm Fork Trinity River below Lewisville Lake* Located immediately upstream of study area – from the confluence with the West Fork Trinity River to Lewisville Lake Dam in Denton County (30 miles)	NA	NA	NA	NA

Source: TCEQ, 2002.

Notes:

1. Category 5a – A TMDL is underway, scheduled, or will be scheduled. Category 5c – Additional data and information will be collected before a TMDL is scheduled.
2. Water bodies in Category 5 have been prioritized by TCEQ. For Category 5a, a rank of High (H), Medium (M), or Low (L) is given for the urgency to initiate a TMDL. Rankings are based on the current understanding of the causes of the non-support of the water quality standards and the sources of pollution, the importance of the resource, the severity of the impact, and the likelihood of TMDL success. For water bodies in Category 5c, a ranking of "D" has been assigned to indicate that additional data and information will be collected before a TMDL is scheduled. TCEQ will develop a separate prioritized schedule for standards review and the collection of additional data and information. These activities will be conducted at the same time that TMDLs are being developed for the parameters in Category 5a. However, TCEQ will not schedule a TMDL at this time for Category 5c water bodies.
3. Segment 0822 is not included in the Draft 2002 Texas 303(d) List. Available data indicate that there are no water quality concerns.

TMDL = Total Maximum Daily Load – a quantitative plan that determines the amount of a particular pollutant that a water body can receive and still meet its applicable water quality standards. **NA** = Not Applicable

According to the Texas Water Quality Inventory, the Segment 0805 summary states the contact recreation use is not supported due to elevated fecal coliform densities (TCEQ, 2000a). The "aquatic life closure" issued by the TDH was based on a 1989 TPWD publication stating that fish collected from locations along the Trinity River, extending from Fort Worth to the mid-Trinity above Lake Livingston, during 1987 and 1988 contained chlordane at levels that were of concern to public health. Chlordane and other organochlorine insecticides have entered aquatic systems as a result of direct application to a water body, drift from aerial spraying, urban and agricultural runoff, spills, industrial and municipal wastewater discharges, and erosion of contaminated soils. Chlordane contamination in segments of the Trinity River appears to have originated from urban areas, as the watershed for these segments is highly urbanized.

Although chlordane was detected in fish tissue from the entire length of the surveyed area, the most contaminated fish were collected from sites in the immediate vicinity of the DFW metropolitan area. The use of chlordane was banned in early 1988, but before this time it was widely used to control termites and other insects. Chlordane degrades very slowly in the environment and may be detected in the environment many years after application. Recent sediment and fish tissue data indicate the chlordane concentrations are decreasing through natural attenuation, thus removing a substantial source of bio-available contamination (TCEQ, 2000b).

3.5.6 Baseline Surface Water Quality

This section provides a summary of the TCEQ baseline surface water quality for Segment 0805. These data were obtained from the TCEQ's Surface Water Quality Monitoring Program, which monitors and inventories state water quality and submits the water quality data to the EPA in accordance with § 305(b) of the CWA. The Texas Surface Water Quality Standards (TSWQS), which apply to all surface water features in the state, are promulgated in 30 TAC 307. These standards are approved by the EPA in accordance with § 303(c) of the CWA and are updated every 3 years to accommodate new developments and/or updated information. The TCEQ inventory includes an assessment of the extent to which the state's waters provide for healthy aquatic communities, recreation in and on the water, and safe public water supplies.

In order to monitor water quality and compliance with the TSWQS, the TCEQ divides the state's larger surface water features into defined (classified) segments and assesses them according to the criteria specified in the TSWQS. Smaller features, although not designated as segments, are likewise monitored, but sufficient data are not available to develop more conventional criteria. **Table 3-26** provides a summary of the most recent field measurements and water chemistry for Segment 0805. **Table 3-27** provides a summary of the most recent data regarding toxic substances detected in water for Segment 0805.

TABLE 3-26. SUMMARY OF FIELD MEASUREMENTS AND WATER CHEMISTRY FOR TRINITY RIVER SEGMENT 0805

Parameter	Standards Criteria	Screening Levels	Minimum Value Detected	Maximum Value Detected	Mean Value Detected	Percent of Values Outside Criteria or Screening Levels
Water Temperature (ºF)	95.0º	---	46.2º	92.3º	70.7º	0.0
Dissolved Oxygen	5.0	---	4.7	11.6	7.8	0.8
pH (SU)	6.5 - 9.0	---	6.8	8.2	7.6	0.0
Chloride	175.0	---	10.0	201.0	48.5	1.0
Sulfate	175.0	---	24.0	126.0	66.7	0.0
Total Dissolved Solids	850.0	---	207.4	555.1	369.7	0.0
Ammonia	---	1.0	0.02	0.76	0.107	0.0
Nitrite + Nitrate	---	1.0	0.6	11.8	5.7	92.5
Orthophosphorus	---	0.10	0.1	3.7	1.2	97.7
Total Phosphorus	---	0.20	0.05	9.06	1.7	94.6
Chlorophyll A (ppb)	---	30.0	1.0	23.5	7.0	0.0
Fecal Coliform (No./100 ml)	400.0	---	10.0	8,900.0	722.9	38.0

Source: TNRCC, 1996 (most recent available).
Notes: All values are represented in parts per million, unless noted otherwise.
ºF = Degrees Fahrenheit
pH = [p(otential of) H(ydrogen)] – a measure of the acidity or alkalinity of a solution; SU = standard units.
ppb = parts per billion
No./100 ml = Number per 100 milliliters

Table 3-26 shows that elevated levels of dissolved oxygen, chloride, and fecal coliform bacteria have exceeded the standards criteria and nitrate plus nitrite nitrogen, orthophosphorus, and total phosphorus has exceeded screening levels throughout the segment.

TABLE 3-27. SUMMARY OF TOXIC SUBSTANCES IN WATER FOR TRINITY RIVER SEGMENT 0805

Parameter	Acute Criteria	Chronic Criteria	Minimum Value Detected	Maximum Value Detected	Mean Value Detected	Percent of Values Exceeding Acute Criteria	Mean Exceeds Chronic Criteria
Arsenic	360.0	190.0	0.5	2.5	1.3	NA	No
Cadmium	26.204	0.951	0.48	0.48	0.48	NA	No
Chromium	1446.468	172.411	1.0	4.5	3.2	0.0	No
Copper	15.547	10.551	0.5	6.0	2.8	0.0	No
Lead	61.456	2.395	0.5	1.2	0.7	NA	No
Nickel	1174.027	130.477	5.0	50.0	20.0	0.0	No
Silver	0.920	None	0.3	8.0	2.9	NA	NA
Zinc	96.696	87.582	61.0	610.0	252.7	33.3	Yes
Selenium	20.0	5.0	3.2	3.2	3.2	0.0	No
Mercury	2.4	1.3	0.5	0.5	0.5	0.0	No
Aluminum	991.0	None	4.0	10.0	7.0	0.0	NA

Source: TNRCC, 1996 (most recent available).
Notes: All values are represented in parts per billion, unless noted otherwise.
NA = Not applicable.

Table 3-27 shows zinc as the only toxic substance that has exceeded the acute or chronic criteria established for the segment. In addition, elevated levels of mercury, zinc, and chlordane have been observed in sediment. Domestic wastewater discharges and urban runoff are referenced as the main sources of contaminants.

The TCEQ classifies Segment 0805 as "water quality limited" due to historical TSWQS violations and requires advanced waste treatment practices for permitted facilities along the entire segment. Implementation of advanced waste treatment by major dischargers has resulted in improved water quality, but certain concerns remain. The contact recreation use is not supported through the entire segment due to elevated fecal coliform bacteria levels. The TCEQ is addressing Segment 0805 through Total Maximum Daily Loading (TMDL) development, targeted monitoring, special water quality studies, and source water protection efforts.

In November 1998, TDH analyzed 30 samples of finfish from three sites along the Trinity River in the vicinity of the DFW metropolitan area. These samples were analyzed for metals, pesticides, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). The pollutants detected in fish collected from the DFW metropolitan area were chlordane, DDE, and dieldrin. The PCB Alaclor 1260 was also detected in 13 of 30 samples. The conclusions and public health implications from the TDH study indicated "the levels of PCBs encountered in samples of fish from [the] Trinity River pose a public health hazard because long-term ingestion of as little as 0.2 meals of fish per week could have an adverse non-cancerous impact on human health. This conclusion is based on adverse immunological effects observed in animals chronically exposed to PCBs."

In summary, the Trinity in all respects is an urban river. The amount of water it receives is controlled by the discharge of effluent from sewage treatment plants, by the watershed runoff it receives from impervious areas during rainfall events, and by overflows from the series of man-made reservoirs, which surround it. In general, the major influences on water quality in the Trinity River in the vicinity of the study area arise from the highly urbanized DFW metropolitan area.

3.5.7 Floodplains and Flood Control Features

3.5.7.1 Floodplains

Protection of floodplains and floodways is required by EO 11988, *Floodplain Management*; USDOT Order 5650.2, *Floodplain Management and Protection*; FHPM 6-7-3-2, *Location and Hydraulic Design of Encroachments on Floodplains*; and 23 CFR 650 Subpart A. At the local level, floodplain regulations are contained in Sections 51A-5.101 through 5.106 of the City of Dallas Development Code.

A floodplain is defined as lowland bordering a stream or river that is usually dry, but is subject to flooding. A base floodplain, as defined by the FHWA Federal-Aid Policy Guide (23 CFR 650A) is an area having a 1 percent chance of flooding in any given year (a 100-year storm event). These base floodplains are determined by FEMA and shown on Flood Insurance Rate Maps (FIRMs). The floodway of a stream is defined as the stream channel, plus any adjacent floodplain areas, that must be kept free of encroachment so that the base flood can be carried out without any substantial increases in flood elevations. Maximum federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced.

As described in 23 CFR 650A, floodplains provide natural and beneficial values serving areas for fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural flood moderation, water quality maintenance, and groundwater recharge. The intent of these regulations is to prevent or minimize highway encroachments within floodplains, where practicable, and to avoid supporting land use development where it is incompatible with floodplains.

The FEMA administers the National Flood Insurance Program (NFIP), of which the City of Dallas and Dallas County are participating members. In accordance with 23 CFR 650A, the design studies required by Subpart A "apply to all encroachments and to all actions which affect base floodplains." Therefore, in order to determine the extent of floodplains and floodways in the corridor, FIRMs published by FEMA were assessed. The extent of floodplains (FEMA Zone AE and X) in the study area is shown graphically on **Plate 3-19**. **Table 3-28** summarizes the FEMA designated base flood zones (Zone AE) for specific areas within the study area.

TABLE 3-28. BASE FLOOD ZONES LOCATED IN THE STUDY AREA

Flood Zone and Location	Flood Zone Descriptions and Boundaries
Trinity River and Dallas Floodway	*Zone AE:* The base flood elevation ranges from approximately 416 feet on the south part of the study area east of the Corinth Street Viaduct to 422 feet on the north part of the study area west of the Hampton Street Bridge.
Record Crossing Sump	*Zone AE:* The sump base flood elevation is approximately 404 feet. The Record Crossing Sump drains to the Hampton-Oak Lawn Sump.
Hampton-Oak Lawn Sump	*Zone AE:* The sump base flood elevation is approximately 405 feet.
Pumping Plant A Sump	*Zone AE:* The sump base flood elevation is approximately 393 feet.
Westmoreland-Hampton Sump and Pumping Plant B Sump	*Zone AE:* The sump base flood elevation is approximately 407 feet.
Pavaho Sump	*Zone AE:* The sump base flood elevation is approximately 409 feet.
Pumping Plant C Sump	*Zone AE:* The sump base flood elevation is approximately 404 feet.
Corinth Street Sump	*Zone AE:* The sump base flood elevation is approximately 400 feet.
Source: FEMA, 2001a-f. **Note:** Zone AE – Special flood hazard areas inundated by the 100-year flood.	

Historical Flood Data

DALLAS COUNTY COURTHOUSE DURING 1908 FLOOD

Major floods at Dallas originate from precipitation occurring in a drainage area of 6,106 square miles upstream from the city. At present, USACE reservoirs regulate runoff from a total of 3,016 square miles of this area. Reservoirs owned by others also affect, to a limited degree, the flows at Dallas from an additional 2,274 square miles leaving a completely uncontrolled drainage area of 816 square miles, much of which is urbanized area.

The Trinity River frequently exceeds its channel capacity and floods its banks. A number of major floods have been recorded in the study area prior to and since 1900. The USGS maintains a stream gage on the Commerce Street Viaduct where continuous steam flow measurements for the Trinity River are taken. These records have been kept since 1903. **Table 3-29** summarizes significant flood events and the peak discharge recorded for each year.

TABLE 3-29. SIGNIFICANT FLOOD EVENTS AT DALLAS

Year	Peak Discharge (cfs)
1908	184,000
1922	69,600
1941	77,000
1942	111,000
1945	52,900
1949	82,500
1957	75,300
1966	42,100
1969	67,000
1981	37,400
1989	58,700
1990	82,300
1991	62,200
Source: USACE, 1999. **cfs** = cubic feet per second	

3.5.7.2 Flood Control Features

The primary flood control feature in the study area is the Dallas Floodway, which protects areas along both sides of the floodway levees. The floodway has several adjacent storage sumps, which were created from the drainage basins bisected from construction of the floodway (e.g., West Fork and Elm

Fork). These sumps represent a wide variety of storage capacities, drainage area, and land use. There are 10 sump areas in the floodway system with six having pumping stations that consist of both high- and low-rate pumps. The pumps start operating when sump water levels reach pre-programmed values. In some instances, the sumps are drained in part by gravity sluices. These pump stations and pressure sewers drain most of the interior areas on the landside of the levees. As storm water flows toward the levee system, the pump stations and pressure sewers drain storm water to the Trinity River.

Storm water is intercepted and temporarily stored by the sumps before eventual release to the river by a gravity sluice, pumping over the levees, or gravity flow through the sump system until it reaches the river. Although the flow of storm water through the sump system is regulated solely by flood control requirements, the sumps may function as sedimentation basins that potentially provide purification of storm water. **Table 3-30** provides a description of the major flood control features in the study area. These are shown graphically on **Plate 3-20**.

TABLE 3-30. MAJOR FLOOD CONTROL FEATURES IN THE STUDY AREA

Name and Location	Description
Old Elm Fork River Channel, Record Crossing Sump (1E), and Hampton-Oak Lawn Sump (2E and 3E)	Intersects the study area south of the IH-35E/SH-183 interchange. Flows west to east into the Record Crossing sump and eventually empties into the Hampton-Oak Lawn sump north of the east levee. This drainage meanders through the Brookhollow Industrial area. It serves as sump storage for the Hampton Road Pump Station.
Cedar Springs Branch, Pumping Station B, and Sump 2E	Intersects the study area north of Oak Lawn. Flows south under IH-35E to join the Hampton-Oak Lawn sump. Flows reach Trinity River via Pumping Station B.
Turtle Creek, Turtle Creek Pressure Sewer, Pumping Station B, and Sumps 2E and 3E	Intersects the study area near the intersection of IH-35E/DNT. Flows west before entering Hampton-Oak Lawn sump north of Industrial Boulevard and south of IH-35E. Flows reach Trinity River via the Turtle Creek Pressure Sewer and Pumping Station B. The pressure sewer diverts runoff into the floodway that would otherwise have to be pumped. A gated outlet prevents river flows from entering protected areas behind the east levee at higher river stages.
Woodall Rodgers Pressure Sewer	Intersects the study area south of Continental Avenue and north of Woodall Rodgers Freeway. The pressure sewer enters through the east levee just north of Woodall Rodgers Freeway before discharging to Trinity River.
Dallas Branch Pressure Sewer	Intersects the study area via 12-foot circular conduit. Flows southwest to Trinity River diverting runoff to the Dallas Floodway. The pressure sewer enters through the east levee just above the UP Railroad Bridge.
Pumping Station A and Pumping Plant A Sump (4E ,5E, 6E, and 7E)	The sump parallels east levee and is located west of Industrial Boulevard. Flows to intake structure for Pumping Station A located between Houston and Jefferson Streets.
Bellevue Pressure Sewer	Intersects the study area south of the IH-35E Bridge and north of the Corinth Street Viaduct. The pressure sewer takes flows from areas north of the MKT railroad switchyard and Industrial Boulevard south through the east levee.
Old West Fork River Channel	Intersects the study area south of Industrial Boulevard flows west to east joining the Old Elm Fork River Channel to begin the Dallas Floodway. The old channel meanders in areas south of the west levee to form sump storage for the Westmoreland-Hampton sump.
Pumping Station D and Westmoreland-Hampton Sump (1W)	The sump parallels the west levee and is located south of the west levee between Westmoreland Avenue and Hampton Road. Flows to intake structure for Pumping Station D located just west of Hampton Road.
Pavaho Pumping Station and Pavaho Sump (2W and 3W)	The sump parallels west levee and is located south of the Sylvan Street Bridge. Flows to intake structure at Pavaho Pump Station.
Coombs Creek Pressure Sewer and New Coombs Creek Pressure Sewer	Coombs Creek pressure intersects the study area south of IH-30 as a 6-foot diameter storm sewer. The old pressure sewer takes flows from IH-30, Kidd Springs diversion sewer, and Coombs Creek to the west levee. The new Coombs Creek pressure sewer intersects the study area south of IH-30 as an 18.5-foot semi-elliptical conduit. The outfall is located about 300-feet south of the old pressure sewer outfall and about 800 feet south of IH-30.
Lake Cliff Pressure Sewer	Intersects the study area just north of the Houston Street Viaduct as a 6-foot by 8-foot conduit. Flows from the Lake Cliff area drain north and through the west levee above Houston Street.
Pumping Station C and Pumping Station C Sump (4W and 5W)	The sump parallels the west levee from north of the Houston Street Viaduct extending south to R.L. Thornton Freeway. Flows to intake structure at Pumping Station C.
Corinth Street Sump (6W)	The sump parallels the west levee north of Corinth Street and drains to sump for Pumping Station C. Storm sewer pipe carries Corinth Street sump water to an outfall north of IH-35E.
Sources: USGS, 1981; FEMA 2001a-f.	

Trinity River Desiltation Project

This project involves desilting (or removing excess sediment) from the existing Trinity River channel from just downstream of the AT&SF Railroad Bridge to approximately 1,500 feet upstream of the Westmoreland Road. The design criteria specifies that the existing channel bottom be excavated to produce a width of 70 feet and the channel side slopes be excavated to a 6:1 slope, with a gentler

benched slope on alternating sides of the river. This project has been permitted through the USACE § 404 permit program (USACE Permit No. 199300146).

The first phase of the project occurred in 1997 at a cost of $4.5 million and extended from the AT&SF Railroad Bridge to 2,300 feet upstream of the Corinth Street Viaduct. Phase two of the project was completed in 2000 at a cost of $3.8 million and extended to the Houston Street Viaduct. The primary purpose of the project was to restore the original flood conveyance capacity of the river channel and improve interior drainage within the existing levees.

The silt removed from the channel bottom was deposited in borrow pits located within the Dallas Floodway. The excavated clay from the silt disposal areas was used to strengthen and raise the existing floodway levees to their original design grade. The levees have been raised approximately 2 feet and the riverside of the levee has been flattened to an approximate 4:1 slope. This levee work has occurred from the downstream end of the floodway to the vicinity of IH-30. All of the riparian vegetation from the AT&SF Railroad Bridge to the Houston Street Viaduct (primarily black willow) has been removed from the channel banks as the result of this construction project. The remainder of the permitted project is not currently funded and is on-hold pending future development of the Dallas Floodway (see **Section 3.1.1.1**).

USACE – Old Trinity River Channel Wildlife Restoration Dallas, Texas

The USACE is currently designing an ecosystem restoration project for West Dallas River Meanders Conservation Area. This project includes flood control improvements along remnants of the West Fork channel. This would be accomplished through modification of the Pavaho (formerly Bickers Street) sump; construction of a water surface elevation control structure at the Westmoreland Road crossing; and restoration of the lower Shadrack Creek channel by construction of an overbank wetland. In addition, the USACE is designing a trail component compatible with planned trail systems in the study area. Additional details are provided in **Section 3.3.2.3 Planned Parks and Recreation Areas**.

3.5.7.3 History of Flood Control Measures

Consideration of flood control in the study area began in earnest after the record flood of May 25, 1908. This flood event caused the death of 11 persons and extensively damaged the Dallas CBD and other industrial areas. The flood dramatized the need for protective planning and construction, which have continued to the present. The following paragraphs provide a historical overview concerning the extensive flood control measures implemented by the City of Dallas within the study area.

Dallas Floodway

The Dallas Floodway was constructed through the creation of the Dallas City and County Levee Improvement District in 1926. Construction of the floodway improvements occurred from 1928 through 1932. These improvements consist of parallel levees, approximately 2,000 feet apart, located near the center of the Trinity River floodplain from a point upstream of the AT&SF Railroad to the confluence of the West Fork and Elm Fork. From the confluence, the left bank or east levee extends upstream along the Elm Fork approximately 4 miles to IH-35E. The right bank or west levee extends upstream on the West Fork about 2 miles. The levee system also includes a portion of an original agricultural levee, the northwest levee, which was constructed by the Dallas County Levee Improvement District Number 5. The northwest levee is located on the right bank of the Elm Fork from Grauwyler Road to upstream of SH-183. Cities bordering the Elm Fork, such as Carrollton, Irving, and Farmers Branch also have constructed levees along the river.

The present river channels were excavated as part of the project and portions of the old river channels are contained within the reclaimed areas. The USACE completed additional improvements to the floodway in 1960, which included strengthening of the levees, clearing of the floodway on the West Fork and Elm Fork, increasing the existing pump and sump capacities at pumping stations A, B, C, and D, and construction of pressure sewers, additional pumping stations, diversions, and gravity outlets to improve the interior drainage. The Dallas Floodway original design discharge, the SPF produced by a design storm centered on the uncontrolled area of the West Fork, is 226,000 cfs with 4 feet of freeboard at the floodway levees.

The downstream end of the Dallas Floodway levees is located at the abandoned AT&SF Railroad Bridge. The east levee has a terminal section extending perpendicular to the river along the AT&SF Railroad tracks and directly beneath the newly constructed DART LRT Bridge to high ground. A portion of this extension of the east levee is an earthen embankment with a design crest elevation of 452.2 feet, while the remainder is a concrete floodwall up to 7 feet in height extending to the high ground limit. The concrete floodwall portion of the levee has a design crest elevation of 423 feet and includes two integral stop-log closure sections. One of these stop-log structures provides passage for a dual-track SP Railroad line. The other stop-log structure formerly served the same purpose, but the tracks have been removed as part of the construction of the DART LRT Bridge.

A topographic survey compiled from aerial photographs taken in 1991 indicated that several portions of the east and west levee crests have degraded below the design grade. The City of Dallas has restored the east levee design grade at the AT&SF Railroad with work completed during 1996. The city initiated additional work within the Dallas Floodway in late 1998 to address other levee crest deficiencies upstream (see **Section 3.5.7.2**).

Several USACE projects, undertaken from 1939 to the present, have reinforced the levees and improved the floodway. The Dallas Flood Control District was formed in 1945 to operate and maintain the floodway project. The project has reclaimed 10,500 acres of floodplain, most of which is now highly developed industrial property. On several occasions, federal, state, and municipal agencies have proposed the use of floodway land for navigation, recreation, and transportation.

Upstream of the DFW area, the Trinity River is influenced by over 2,500 minor flow-retarding structures and 10 major reservoirs. The USACE has constructed six of these – Lake Ray Roberts and Lewisville Lake on the Elm Fork; Grapevine Lake on the Elm Fork's tributary, Denton Creek; Lake Lavon on the East Fork; Benbrook Lake on the Clear Fork; and Joe Pool Lake on Mountain Creek, a tributary of the Trinity.

Final Programmatic EIS – Upper Trinity River Basin

As previously described in **Chapter 1 Purpose and Need for Action**, the FPEIS was completed in June 2000 and a ROD was signed in September 2000. The FPEIS includes an examination of past actions of the USACE and other entities within the study area. It defines the baseline conditions within the basin and examines reasonably foreseeable actions of the USACE and of others (including the proposed action) that may affect water and related land resources. During the course of the *Upper Trinity River Feasibility Study*, approximately 90 preliminary projects addressing flood damage reduction, ecosystem restoration, and recreation were initially identified for further study within the PEIS study area. Of these, three USACE projects that currently have local sponsorship are considered to be reasonably foreseeable. These are the Johnson Creek project in the City of Arlington, and the Dallas Floodway and Stemmons North Industrial projects in Dallas.

At this time, the USACE study of the Stemmons North Industrial area is suspended while the City of Dallas is conducting feasibility level studies. The USACE continues to study the Dallas Floodway with the City of Dallas as the local sponsor (see below). All of the above referenced projects (with exception of the City of Dallas's feasibility study of the Stemmons North Industrial area) and their alternatives were evaluated in the PEIS in a cumulative manner using all available data, assuming the authorized DFE project to be in place prior to any other project (USACE, 2000). The following paragraphs provide a descriptive overview of the ongoing USACE Dallas Floodway EIS project.

Upper Trinity River Feasibility Study – Dallas Floodway EIS

The USACE continues its Upper Trinity River Feasibility Study for the Dallas Floodway along the Trinity River in Dallas, Texas. Feasibility studies for the Dallas Floodway began in June 1996. This Dallas Floodway EIS is an ongoing supplement report "tiered" (40 CFR §1502.20) from the PEIS. The potential exists for a multi-objective project entirely within the existing Dallas Floodway. The floodway extends

along the Trinity River upstream from the AT&SF Railroad Bridge (Trinity River mile 497.37) to the confluence of the West and Elm Forks at Trinity River mile 505.50. The PEIS describes the potential project components that were under study with the Dallas Floodway EIS at the time of release of the FPEIS in June 2000. The following Dallas Floodway alternatives were described in the FPEIS.

No Action

The "No Action" or "Future without Project" is an alternative plan, which would assume no USACE activities within the Dallas Floodway study area. This alternative considers the effects of the DFE project, which includes the Lamar Street and Cadillac Heights Levees, and the Chain of Wetlands measures as part of the baseline conditions.

Flood Damage Reduction Plan

This alternative for the Dallas Floodway seeks to maximize the flood damage reduction outputs. It would consist of raising the existing floodway east and west levees to a crest height of 2 feet above the SPF water surface elevation (assuming the DFE project is in place). The levee raise would involve placement of impervious fill up to the design crest height and the addition of fill on the riverside of the levees to a 4:1 slope. These actions would result in an increased levee height of approximately 2.5 feet near the Houston Street Viaduct. No additional fill would be placed on the city side of the levees. The design would include removal of the existing road base material at the crest of the existing levees prior to the placement of the impervious fill. An additional 18 inches of road base material would be placed on top of the impervious fill to accommodate vehicular traffic for maintenance and inspections.

The proposed crest width of the levees would be 20 feet. Excavated fill for the levees would be obtained from the floodplain near the toe of the structure. Levee fill would be excavated from the floodplain from a broad, shallow cut to minimize disruption of the uniformity of the floodplain. These borrow areas would be designed with an average width of 300 feet and have an average depth of 2.5 feet. The improvements to the floodway east levee would extend approximately 58,400 linear feet and would include about 1,468,400 cubic yards of embankment. These improvements would extend upstream the full length of the existing levees.

No excavation of fill material would occur beneath any of the existing bridges. Floodwall-type structures would be constructed underneath and in between the bridge beams to provide the needed protection at the bridges. All of the existing bridges over the levees provide adequate levee design crest height with the exception of the floodway west levee crossing at the Houston Street Viaduct.

Environmental Quality Plan

This alternative was designed primarily to improve the environmental character of the study area. This Environmental Quality (EQ) alternative would provide benefits to fish and wildlife habitat, water quality, and aesthetic values while minimizing adverse impacts to existing cultural resources and flood damage reduction benefits. The EQ alternative for the Dallas Floodway would consist of excavating a new meandering low flow channel between the existing levees establishing forested areas and additional wetlands and raising the levees to provide a flood damage risk comparable to the "Future Without Project" alternative condition.

The meandering channel would be designed to mimic the original natural Trinity River channel with respect to sinuosity, side slope, and capacity. The meandering channel alignment would diverge from the existing channel alignment upstream of the DART Railroad Bridge at the downstream end and from the existing channel near the confluence of the Elm Fork and West Fork at the upstream end. The preliminary design for the meandering channel would have a variable bank slope and bottom width, but would have an average side slope of 3:1 and an average bottom width of 70 feet. Raised overbank areas, reminiscent of natural sediment depositional zones, would be incorporated as part of the construction to allow for the establishment of trees and shrubs normally found in riparian areas that have habitat quality.

The existing channel would be filled with excavation from the meandering channel up to an elevation of approximately 2 to 4 feet below the existing top of bank, except for the bridge crossing, where the existing channel would be retained. Portions of the old channel would be only partially filled and the old banks would be further graded to provide gradual slopes that would lead to the development of shallow wetlands. Additional segments of the original channel would be left unfilled to provide sources of permanent water at several locations within the overbank areas. Woody vegetation, including predominantly cottonwood and willow trees, which has reestablished adjacent to the constructed channel over the last couple of decades, would remain.

The new meandering channel would traverse the entire available floodplain width between the levees at several locations, but would utilize the existing channel crossing at existing bridges. This would reduce costs by preventing the need to modify existing bridges to accommodate different channel crossings. The length of the meandering channel would be longer than the existing channel by approximately 8,500 feet. The average bottom slope of the meandering channel would be approximately 0.025 percent. The meandering channel would have a rock outer bank and streambed protection at the bendways.

The rock bank protection would be designed to prevent channel migration due to streambank erosion and provide grade control. Placement of rock in the channel and at key areas along the channel curves would

promote areas of turbulence in the river flow that would improve aeration and simulate natural riffle and pools found in the Upper Trinity River. The rock outer bank protection would extend from the toe of the slope approximately halfway up the bank slope or approximately 15 feet in height. The upstream and downstream limits of the rock slope protection would extend from the upstream curvature of the bendway to approximately 200 feet downstream of the bendway. The rock bed protection would be strategically placed to form riffles and pools and extend across the entire channel bottom from the downstream limit of the rock slope protection to approximately 500 feet upstream.

Trees would be planted along the top of the bank of the meandering channel on one side at the minimum width of 100 feet. This riparian corridor is intended to ultimately provide overstory shading for the river and would be planted alternately on either side of the channel only on the out bends of the meandering channel. Other tree planting zones would be established in random locations within the floodplain between the toes of the levees to establish forested areas from 1 to 5 acres in size. The perimeters of all forested areas would be accurately marked with posts or by other means in order to define mowing and non-mowing zones within the floodway. Forested areas of the floodplain would be maintained free of dense undergrowth, and a minimum tree spacing of 15 feet to 20 feet would be required to facilitate periodic mowing of underbrush and collection of floating debris. The remaining areas of the floodplain between the levees and the levee slopes would continue to be mowed to control vegetation growth to design levels.

Existing depressions in the floodplain would be preserved or enhanced to provide seasonal wetland functions and to support wetland vegetation. No structures to provide water management of individual wetland sites are proposed. Wetland sites would also be periodically mowed to control woody vegetation, but mowing would not necessarily be required on the same frequency as the grassland areas of the floodplain.

Locally Preferred Plan

The City of Dallas' LPP is under development and includes portions of the *Trinity River Corridor MIP/BVP*. The plan incorporates floodway off-channel lakes; the proposed Trinity Parkway (proposed action); a levee raise for the existing Dallas Floodway; channel meandering (in concept with the USACE's EQ plan described above); modification of the AT&SF Railroad Bridge to improve hydraulic conveyance; and trail and access development along the length of the Dallas Floodway.

The USACE anticipates completion of the Dallas Floodway EIS in the winter of 2005. This EIS will contain detailed descriptions of the direct and indirect impacts for each of the alternatives considered for the Dallas Floodway. Included will be a determination of the potential federal (USACE) cost sharing

participation for the various components of each alternative. Additional details are provided in **Section 3.1.1.4 Potential Joint Development Projects**.

Dallas Floodway Extension

As previously described in **Chapter 1 Purpose and Need for Action**, the DFE is a flood control project proposed by the USACE with the City of Dallas as the local sponsor. Originally authorized in 1965 under the Rivers and Harbors Act of 1965 (PL 89-298), the DFE project was modified by the Water Resources Development Act of 1999 (PL 106-053) to include environmental restoration and recreation as project purposes. **Plate 3-5** shows the major features of the DFE Recommended Plan.

The DFE project area is located along the main stem of the Trinity River from the end of the existing Dallas Floodway Levees downstream to IH-20 including the lower end of White Rock Creek. The DFE project has authorized purposes of flood damage reduction, ecosystem restoration, recreation, and environmental mitigation. Features of the project include a "chain of wetlands," a realignment of the river channel at the IH-45 Bridge, construction of a levee in the Lamar Street area, the construction of a levee near the Cadillac Heights subdivision, recreation features, and environmental mitigation. Recreation amenities would be compatible with the regional recreation master plan and would include linear hike/bike trails, equestrian trails, nature trails, and pavilions (see **3.3.2.3 Planned Parks and Recreational Areas**).

The original plan, which included channels and levees along the river and some tributaries, was never built due to lack of funding and local support. Due to the flood events in 1989 and 1990, the City of Dallas requested that the USACE reevaluate the recommendations of the plan and assess structural as well as non-structural alternatives.

On August 28, 1996, the Dallas City Council approved the "chain of wetlands" concept. On March 26, 1997, protective levees for the Lamar and Cadillac Heights neighborhoods were also approved by the City Council as the LPP for the DFE project. The City of Dallas plans to use the voter-approved $24.7 million in General Obligation Bonds for its share of the $127 million project.

The LPP, developed jointly by the City of Dallas and USACE, consists of a 170-acre "Chain of Wetlands" extending from Cedar Creek to Loop 12 (a distance of approximately 4 miles), a provision for 1,179 acres of land for environmental mitigation, and the construction of protective levees along Lamar Street and Cadillac Heights. These levees would link the existing Dallas Floodway levees from the CBD to the Rochester Park levee on the east, and would extend a levee from Cedar Creek to the CWWTP on the west. This would increase the level of protection for the CBD from the present 300-year flood event to the 800-year SPF and improve protection of Rochester Park from the present 110-year event to the SPF. The protection for the Lamar Street and Cadillac Heights areas would also be the SPF.

Construction of the Cadillac Heights and Lamar Street levees at the SPF level would: provide protection to 2,500 structures within the DFE project area, increase flood protection for over 10,000 structures within the existing Dallas area, preserve 7,863 jobs in the Lamar Street area, and increase flood protection for the CWWTP to the 500-year flood event. The project would also realign the Trinity River channel at IH-45 to protect the bridge structure, which is a designated National Defense Highway. Excavated material from the wetlands may be utilized for construction of the levees, potentially for the construction of the Trinity Parkway (proposed action), and to increase the height of the existing Rochester Park levee for a distance of approximately 1,000 feet. The project would provide environmental restoration/mitigation for levee and, depending on the alternative selected, Trinity Parkway construction. The plan would also provide for recreational facilities and trail linkages between the proposed Great Trinity Forest Park, the Dallas Floodway (Trinity Park), neighborhoods, and high-density employment areas.

The USACE finalized the *General Re-Evaluation Report and Integrated Environmental Impact Statement* in February 1999, and the ROD was signed on December 1, 1999. Currently, the project is in engineering design and real estate acquisition phases, which are scheduled for completion beyond 2005. Construction of the "Chain of Wetlands" and the Lamar Street and Cadillac Heights levees is anticipated to be completed by the end of 2008.

As previously described in the **Executive Summary** of this DEIS (see **Section S-7**), a lawsuit was filed in U.S. District Court by various opponents to the Trinity River Project in May 2000. This suit seeks an injunction against the USACE to stop the DFE project. In April 2002, the court ruled the FEIS needed further supplementation to address the cumulative impacts of other similar, reasonably foreseeable future projects in the same geographic area as the DFE, including the Trinity Parkway (proposed action). The court further ordered that construction of the DFE be stopped until the USACE complied with the court's order. In response, the USACE prepared a SFEIS to address the court's order. A NOA for the SFEIS was published in the FR on May 9, 2003.

In May 2004, the court issued a "Final Judgment" and ordered the plaintiffs' claims in the case "Dismissed with Prejudice" (i.e., the case is dismissed for good reason and the plaintiffs are barred from bringing an action on the same claims). In addition, the court ordered the April 2002 preliminary injunction "Dissolved," and concluded the defendants had complied with the terms of the injunction. This project is further described in **Section 3.1.1.4 Potential Joint Development Projects**.

Trinity River Corridor MIP/BVP

As previously described in **Section 3.1.1.1 Local Land Use Plans/Policies**, the city's *MIP/BVP* includes various flood control measures as part of the plan. A portion of these planned flood control improvements are considered potential joint development projects along with the Trinity Parkway (see **Section 3.1.1.4**

Potential Joint Development Projects). These flood protection features are a continuation of several on-going projects. The major components of the flood protection plan include:

- Construct Lamar Levee extension (3.1 miles) to SPF protection;
- Remove 417 acres of low-lying lands (mostly occupied by industrial uses) from the 100-year floodplain;
- Construct Cadillac Heights levee extension (2.2 miles) to SPF protection level;
- Remove 205 acres of low lying lands (mostly composed of residential uses) from the 100-year floodplain; and
- Realignment of river channel at IH-45.
- Raise the existing CWWTP levee – Improves flood projection from current 140-year flood protection to 500-year flood projection.
- Raise the existing Rochester Park Levee – Improves flood projection from current 110-year flood protection to the SPF protection level.
- Chain of Wetlands replaces approximately 230 acres of bottomland hardwoods with wetlands. Year round water supply for wetlands if provided by the CWWTP.
- Elm Fork Flood Protection Project – The Elm Fork of the Trinity River converges with the main stem of the Trinity River at the western end of the Dallas Floodway.
- Existing Dallas Floodway – The proposed combination of roadways, lakes, and river meandering within the Dallas Floodway has been designed to maintain the current flow characteristics of the floodway. The excavation necessary to recreate meanders in the Trinity River, combined with excavation for several lakes is approximately the same (4.6 million cubic yards) as the quantity of soil needed to raise the parkway and the levees. The balance of cut and fill reduces the cost of exporting or importing soil into the corridor. This general balance also ensures that the flow characteristics of the floodway are maintained.
- Dallas Floodway Levee Modifications – This includes:
    - Increase levee height to provide up to an additional 2 feet of freeboard above the SPF elevation.
    - Riverside slopes of levees will be reduced in steepness from current slopes of 3:1 (horizontal to vertical) to 4:1. Reduced slopes will reduce risks from potential slope failures during flood events.
- Trinity Parkway Impacts on Flood Conveyance:
    - Amount of soil needed to build parkway 3.1 million cubic yards.
    - Amount of soil needed to increase levee freeboard by 2 feet: 1.5 million cubic yards.
    - Amount of soil available from lake excavations and river modification: 4.6 million cubic yards.
- Environmental Restoration and Management – Proper reconstruction of the Dallas Floodway will protect the investments in the Great Trinity Forest. Several hundred acres of new wetlands at the

pumped storm water outfalls and additional screening of storm water will provide additional water quality improvements, storm water cleaning and removal of floating trash and sediment. The habitat created by new wetlands in the floodway will expand the ecosystem of the Great Trinity Forest and reconnect it to the West and Elm Forks. Inclusion of two off-channel lakes will create additional diversity for natural habitat and recreational choices within the floodway, potentially including fishing and other outdoor activities.

- Major components of the Environmental Restoration and Management activities include:
  - Reestablish meanders or sinuosity to the Trinity River within the Dallas Floodway.
  - Proposed storm water wetlands:

    Area of proposed sump-fed wetlands
    - Pavaho: 70 acres.
    - Baker: 50 acres.
    - Hampton: 50 acres.
    - Delta: 50 acres.

      Total: 220 acres.

    Proposed headwater wetlands
    - Size of proposed headwater wetlands: 70 acres.
    - Quantity of CWWTP water to move through the headwater wetland: 5 million gallons/day.
    - Total quantity of CWWTP water to be used to supply lakes: 50 million gallons/day.
- Proposed Habitat for Wildlife:
  - Total acres within the Dallas Floodway: approximately 2,000 acres.
  - Amount of proposed wetlands within Dallas Floodway: 495 acres.
  - Amount of open water for aquatic species and bird sanctuary: 205 acres.

3.5.8 Navigation

The USCG has designated the Trinity River as a navigable waterway in accordance with 33 CFR 2.05-25, *Navigable Waters of the United States*. Although the Trinity is officially designated a navigable waterway this portion of the river has not been developed or used for that purpose.

Navigation on the Trinity (known as the Trinity River Project) was authorized pursuant to the Rivers and Harbors Act of 1965 (PL 89-298). The Trinity River Project included the construction of a multi-purpose channel along the river from the Houston Ship Channel to the City of Fort Worth. This project would have provided a 12-foot by 200-foot navigation channel with 20 locks and dams. Currently, the multi-purpose channel is officially inactive and the USACE has no plans to develop a navigation channel. Coordination with the USCG is on-going (see **Appendix A-1**).

3.6 AIR QUALITY

Air quality is a regional concern with numerous contributing factors. Sources of air pollution are divided into five categories: (1) area, (2) point, (3) on-road mobile, (4) off-road mobile, and (5) biogenic. The following provides a summary of these air pollution sources.

1. *Area* sources are defined as commercial, small-scale industrial, and residential sources too numerous and too small to identify individually (e.g., printing, house paints, industrial coatings, degreasing solvents, leaking underground storage tanks, vehicle refueling, fossil fuel combustion at residences and businesses, outdoor burning, structural fires, etc.).
2. *Point* sources are defined as industrial, commercial, or institutional plants/operations responsible for generating higher levels of VOCs, nitrogen oxides (NO_x), and/or carbon monoxide (CO).
3. *On-road mobile* sources consist of automobiles, trucks, motorcycles, and other internal combustion engine powered vehicles traveling on roadways.
4. *Off-road mobile* sources are considered as aircraft, marine vessels, recreational boats, trains, construction equipment, lawn mowers, etc.
5. *Biogenic* sources are essentially all types of plant life in the biosphere including forests, crops, grass, and other types of vegetation.

The remainder of this section describes the existing project area air quality and identifies the primary sources of air pollution, especially transportation-related sources. Included is a discussion of how air quality can be influenced by local meteorology and topographic conditions. The legal and regulatory requirements which apply to air quality are also discussed.

3.6.1 Regulatory Context

The CAAA of 1990 requires the EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA has established NAAQS for six principal pollutants, which are called “criteria” pollutants. These criteria pollutants and their primary and secondary NAAQS are presented in **Table 3-31**.

TABLE 3-31. NATIONAL AMBIENT AIR QUALITY STANDARDS

POLLUTANT	PRIMARY[1]	SECONDARY[2]
Carbon Monoxide (CO)		
8-Hour Average	9 ppm (10 mg/m^3)	No Secondary Standard
1-Hour Average	35 ppm (40 mg/m^3)	No Secondary Standard
Nitrogen Dioxide (NO_2)		
Annual Arithmetic Mean	0.053 ppm (100 µg/m^3)	Same as Primary Standard
Ozone (O_3)		
1-Hour Average[3]	0.12 ppm (235 µg/m^3)	Same as Primary Standard
8-Hour Average[4]	0.08 ppm (157 µg/m^3)	Same as Primary Standard
Lead (Pb)		
Quarterly Average	1.5 µg/m^3	Same as Primary Standard
Particulate Matter ($PM_{2.5}$)		
Annual Arithmetic Mean	15 µg/m^3	Same as Primary Standard
24-Hour Average	65 µg/m^3	Same as Primary Standard
Particulate Matter (PM_{10})		
Annual Arithmetic Mean	50 µg/m^3	Same as Primary Standard
24-Hour Average	150 µg/m^3	Same as Primary Standard
Sulfur Dioxide (SO_2)		
Annual Arithmetic Mean	0.030 ppm (80 µg/m^3)	No Secondary Standard
24-Hour Average	0.14 ppm (365 µg/m^3)	No Secondary Standard
3-Hour Average	No Primary Standard	0.50 ppm (1,300 µg/m^3)

Source: EPA, 2002.
Notes: Annual standards are never to be exceeded. Short-term standards are not to be exceeded more than once per year unless noted.

1. Primary standards set to protect public health, including "sensitive" populations such as asthmatics, children, and the elderly.
2. Secondary standards set to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.
3. Not to be exceeded on more than 3 days in a 3-year period. The 1-hour ozone standard only applies to areas that were designated non-attainment when the 8-hour ozone standard was adopted in July 1997.
4. Concentration-based form, 3-year average of the annual fourth highest daily 8-hour maximum ozone concentration.

ppm = parts per million (by volume)
mg/m^3 = milligrams per cubic meter of air
µg/m^3 = micrograms per cubic meter of air
PM_{10} = particles <10 microns in size
$PM_{2.5}$ = particles <2.5 microns in size

In July 1997, the EPA adopted revised ozone and particulate matter standards, which are also presented in **Table 3-31**. The EPA is phasing out and replacing the 1-hour primary ozone standard with a new 8-hour standard to protect against longer exposure periods. The new 8-hour ozone standard is 0.08 ppm.

3.6.2 Existing Project Area Air Quality

The amount of pollution emitted into the atmosphere from year to year is the net effect of several factors, including shifts in economic and industrial activity, technology, fuel use, traffic, and other activities. **Table 3-32** indicates the amount (in tons) of criteria air pollutant emissions (all sources) for Dallas County from 1986 through 1996 (most recent available).

TABLE 3-32. TONS OF CRITERIA AIR POLLUTANT EMISSIONS

Year	SO_2	NO_x	VOC	CO	PM_{10}
1986	35,797	161,084	192,389	920,492	444,101
1987	40,480	151,733	181,950	863,350	422,808
1988	32,658	150,784	178,110	817,250	420,664
1989	30,988	156,958	163,886	745,923	423,624
1990	11,094	116,365	121,301	658,217	107,054
1991	10,368	115,416	126,832	646,263	121,145
1992	10,079	116,385	124,812	631,172	132,227
1993	10,424	111,783	122,859	603,172	135,286
1994	9,837	124,520	135,815	710,862	157,910
1995	9,857	129,031	128,439	597,767	134,031
1996	9,765	120,199	124,624	606,101	145,374

Source: EPA, 2001.
Note: Data on lead emissions are not available at the county level. Data reflect the most recent information available from the EPA for Dallas County, Texas.

Table 3-32 shows a substantial decrease in criteria air pollutant emissions occurred in Dallas County from 1986 through 1996. The most notable decrease in emissions occurred from 1990 through 1996. The remainder of this discussion will focus on transportation-related pollutants or on-road mobile sources, since the proposed action is a planned toll road facility. On-road mobile sources contribute approximately 29 percent of VOC, 53 percent of NOx, and 55 percent of CO in the DFW region (NCTCOG, *Mobility 2025 Update*).

Transportation-Related Pollutants

The burning of fossil-based fuels in internal combustion engines can create a serious air pollution problem for highway-oriented urban areas. Transportation activities are considered a major source of CO, NOx, and VOC. Ozone has also been identified as a transportation-related pollutant; however, O_3 differs from other pollutants because it is not emitted directly to the atmosphere. It is produced by chemical reactions among VOC, NOx, and intense sunlight. Ozone is a regional problem in that the contribution of the pollutant emissions from a single transportation facility cannot be determined. This is because of the complexity of the chemical reactions and the time between the emission of pollutants and the formation of O_3. The lag time for the formation of O_3 can be up to several hours (EPA, 1974).

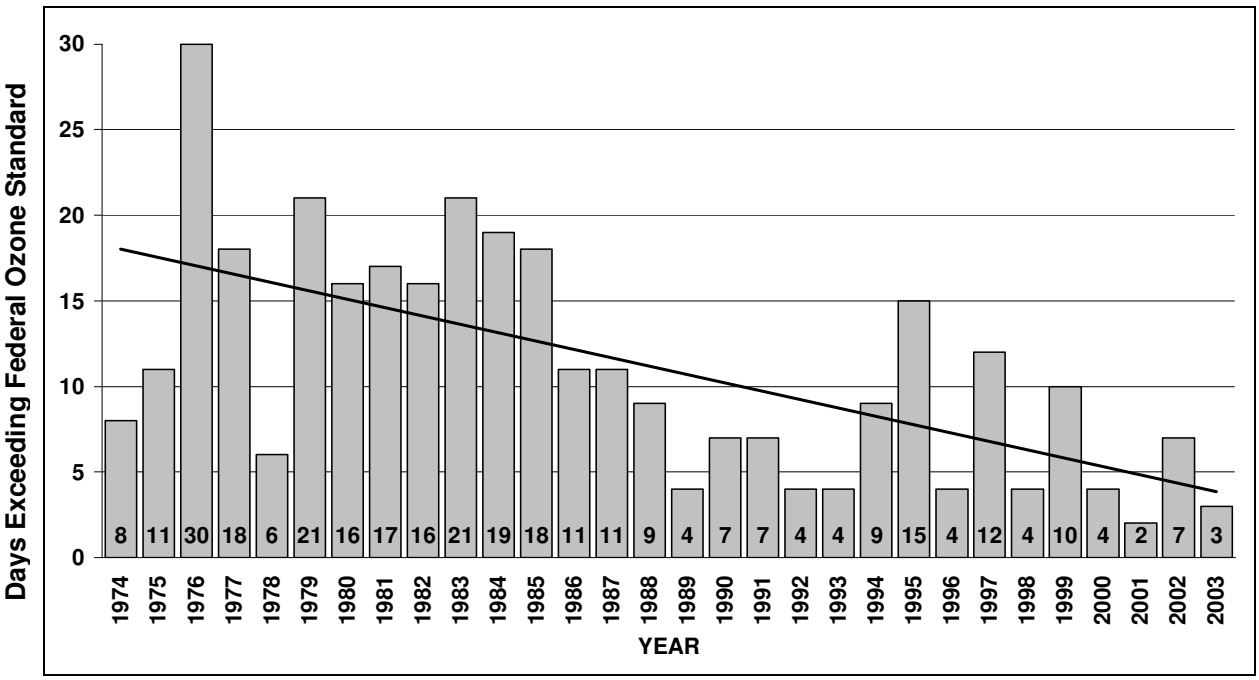
The predominant pollutant associated with motor vehicles is CO. As previously mentioned, approximately 55 percent of the DFW regions CO come from on-road mobile sources. CO is produced when carbon in fuel is not burned completely. CO is a relatively stable and site-specific pollutant, with elevated concentrations generally located in areas with heavy traffic congestion. It is odorless and colorless and can cause adverse health effects in high concentrations.

DFW Attainment Status

The Trinity Parkway study area is located in the Metropolitan DFW Intrastate Air Quality Control Region (AQCR) 215, which consists of 19 counties located in north central Texas. AQCR 215 is designated by the EPA as “better than national standards” for SO_2; “unclassifiable/attainment” for CO; “unclassifiable” for

$PM_{10;}$ and "cannot be classified or better than national standards" for NO_2 (40 CFR § 81.344). However, the EPA has designated the counties of Collin, Dallas, Denton, and Tarrant in a non-attainment category for O_3. The "non-attainment" classification indicates violations of the NAAQS for O_3 have been recorded at regional air monitoring sites. **Figure 3-5** illustrates the number of days the federal O_3 standard has been exceeded in the DFW area from 1974 through 2003.

FIGURE 3-5. DFW OZONE HISTORY



Source: NCTCOG, 2003a.

Note: Line on graph indicates the statistical trend for the period 1974 through 2003.

Figure 3-5 shows the number of times the O_3 level exceeded the federal standards within the DFW area. Days exceeding federal O_3 standard levels have decreased substantially during the past decade. Despite these improvements, however, the DFW region remains a non-attainment area and must be brought into compliance (attainment) for the O_3 standard as required by the CAAA.

Dallas County (along with Collin, Denton, and Tarrant counties) has been designated in non-attainment of the 1-hour O_3 standard by EPA. The proposed improvement is included in the *2025 Mobility Plan – 2004 Update* found to conform by USDOT (FHWA/FTA) on April 8, 2004. In addition, Dallas County (along with Collin, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties) was designated non-attainment for the 8-hour O_3 standard by EPA, effective June 15, 2004. A demonstration of transportation conformity for added capacity projects to the 8-hour O_3 standard is not required until the end of the 1-year grace period (June 15, 2005).

Ground level O_3 is considered a severe irritant. High concentrations of O_3 can damage lung tissue, aggravate respiratory disease, and make people more susceptible to respiratory infections. Children are especially vulnerable to the harmful effects of O_3, as are adults with existing respiratory problems. Even otherwise healthy individuals may experience health problems from breathing O_3-polluted air. Elevated O_3 levels can also affect plant growth and cause damage to crops and forests (EPA, 1997).

The TCEQ regulates emissions of pollutants that contribute to the formation of O_3. In May 2000, the TCEQ began a year-round program designed to help protect DFW residents by providing prompt health alerts when O_3 levels pose potential health concerns. This Air Pollution Watch/Warning Program is used to forecast and issue notices to public health authorities, local officials, schools, day care centers, and interested individuals every time ground level O_3 in DFW reaches levels determined by the EPA to have potential health risks.

3.6.3 Local Meteorology and Topography

Once pollutants are emitted into the atmosphere, the prevailing weather conditions determine their dispersion. Atmospheric stability controls the dispersion of pollutants near a source. This factor is especially important to the assessment of primary pollutant impacts. Stability is affected by thermal and mechanical turbulence of the atmosphere and wind velocity of the layer of air closest to the ground. When the atmosphere is unstable, usually during daytime, dispersion of airborne particulates increases. DFW meteorological data provided by the TCEQ indicate that on an annual basis unstable conditions occur approximately 18.2 percent of the time, neutral conditions approximately 52.4 percent of the time, and stable conditions approximately 29.4 percent of the time. Therefore, it can be assumed that relatively good vertical dispersion occurs about 70.6 percent of the time in the DFW area.

Another meteorological element that influences dispersion is the mixing height. The mixing height is the height above the ground through which relatively vigorous vertical mixing occurs. The mixing layer dilutes pollutants released in it. Annual average mixing heights over the DFW area range from approximately 1,640 feet in the morning to approximately 4,920 feet in the afternoon. Therefore, based on stability and mixing height characteristics, atmospheric dispersion in the study area and vicinity can be considered quite well.

Ozone problems tend to occur during the summer months because, in addition to being dependent upon emissions of NOx and VOCs, O_3 formation is enhanced by summer meteorological conditions. During summer months, the sun is higher on the horizon, which increases the temperature and ultraviolet radiation available to the chemical reactions that form O_3. The higher temperatures increase biogenic

activity as well as evaporation of VOCs. In addition, lighter winds allow O_3 and the pollutants that form it to accumulate.

CO concentrations generally follow the temporal and spatial distributions of vehicular traffic and are also influenced by meteorological factors, such as wind speed and atmospheric stability. Concentrations of CO are the greatest during periods of moderate to heavy vehicular use and when stable atmospheric conditions (which limit the atmosphere's ability to disperse pollutants) and calm winds can trap CO emissions near the surface. These conditions occur most often during the late fall and early winter (see **Table 3-21**).

The level to rolling terrain of the DFW metropolitan area allows air masses to move easily over the region. Generally, the terrain would not trap pollutants and may allow for their dispersion. As a result, long-term air pollution episodes resulting from stagnant air masses are relatively uncommon. The study area varies from relatively undeveloped open space to dense commercial and residential development with few high-rise buildings to restrict wind movement. The primary physical feature in the study area is the Dallas Floodway. The floodway is primarily level, open space with bridge crossings and scattered trees. In comparison to the surrounding land use, the lack of major obstructions (i.e., houses, buildings, and dense vegetation) within the floodway allows wind movement to occur much easier through the area.

3.6.4 Requirements for Conformity

Under the 1990 CAAA conformity requirement, transportation activities cannot be federally funded or approved if they involve a regionally significant roadway unless they are consistent with state air quality goals. This means conformity with 40 CFR 51 and 93 (i.e., conformity rule) must be demonstrated as part of the project approval process. To meet conformity, the proposed project must meet the following provisions:

- Must not cause or contribute to any of the new violations of the NAAQS;
- Must not increase the frequency or severity of existing NAAQS violations; or
- Must not delay timely attainment of the NAAQS.

The FHWA, in accordance with federal air quality standards, has set forth a policy to examine potential air quality impacts of proposed transportation projects in order to ensure the preservation and enhancement of air quality. As part of this DEIS, a micro-scale traffic air quality analysis (TAQA) was conducted for the proposed action. The results of this analysis are presented in **Chapter 4 Environmental Consequences.**

3.7 EXISTING NOISE ENVIRONMENT

This section provides a brief overview of noise characteristics, describes the existing land use in the study area, describes the methodology for determining the existing noise levels in the study area, and identifies the major sources contributing to those noise levels.

3.7.1 Introduction

Sound travels through the air as waves of air pressure fluctuations. In general, sound waves travel away from the source as an expanding spherical surface. Thus, the energy contained in a sound wave is spread over an increasing area as it travels away from the source, resulting in a decrease in loudness at greater distances from the source. Sound is commonly measured in decibels (dB). Because the human ear is most sensitive to frequencies in the middle and upper audible range, these frequencies are given greater weight than others in averaging sound contributions from audible sources. Sound level values adjusted in this manner are designated as "A-weighted." Sound levels measured in dB and A-weighted are denoted "dBA." **Table 3-33** provides a listing of sound levels related to common indoor/outdoor sources.

TABLE 3-33. COMMON SOUND AND NOISE LEVELS

OUTDOOR	dBA	INDOOR
Pneumatic hammer	100	Subway train
Gas lawn mower at 3.2 feet		
	90	Food blender at 3.2 feet
Downtown (large city)	80	Garbage disposal at 3.2 feet
		Shouting at 3.2 feet
Lawn mower at 98.4 feet	70	Vacuum cleaner at 9.8 feet
Commercial area		Normal speech at 3.2 feet
Air conditioning unit	60	Clothes dryer at 3.2 feet
Babbling brook		Large business office
Quiet urban (daytime)	50	Dishwasher (next room)
Quite urban (nighttime)	40	Library

Source: TxDOT, 1996.

The term "loudness" is used to describe the manner in which humans perceive the intensity of sound. The human ear is a far better detector of relative (comparative) differences in sound levels than absolute levels. **Table 3-34** summarizes the relationship between changes in sound levels and the perceived loudness.

TABLE 3-34. SOUND LEVEL CHANGE VS. LOUDNESS

Sound Level Change	Relative Loudness
1 dBA	No perceptible change
3 dBA	Barely perceptible change
5 dBA	Readily perceptible change
10 dBA	Perceived to be twice as loud
Source: TxDOT, 1996.	

Highway-related noise is dependent on traffic volumes, vehicle types, speed, roadway geometry, and distance from the roadway to a receiver. Noise from highway traffic is generated primarily from a vehicle's tires, engine, and exhaust. The majority of highway noise created by cars and light trucks is generated by the sound of tires on pavement. Medium- and heavy-duty trucks produce tire noise along with engine and exhaust noise. Because highway traffic noise levels are never constant due to the changing number, type, and speed of vehicles, a single value is used to represent the average or equivalent sound level. The FHWA uses a peak 1-hour noise measurement; that is, the hour with the highest noise level. This is described in terms of the Leq. Leq is the equivalent steady-state sound level, which in a stated period of time (i.e., 1-hour) would contain the same acoustical energy as a time-varying sound level during the same period.

3.7.2 Land Use in the Study Area

As described in **Section 3.1.1 Existing Land Use in the Study Area**, the Trinity Parkway study area is located in a heavily developed urban area adjacent to the west of downtown Dallas. Major freeways, high-volume arterial roadways, railroads, and other transportation facilities are as described in **Section 3.2 Transportation Setting**.

3.7.3 Existing Noise Levels

Pursuant to § 23 CFR 772 *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, analysis of the project area noise levels must include a comparison of the existing levels to those predicted to occur at some point in the future as a result of the implementation of the proposed action. A detailed description of the noise analysis is included in the *Traffic Noise Analysis* report on file.

The key findings of the existing noise conditions are summarized as follows:

- Noise levels at receivers near and adjacent to existing high-volume arterial roadways and highways, such as Hampton Road, Continental Avenue, Jefferson Street, Houston Street, IH-35E, IH-30, and US-175 ranged from 64 to 77 dBA.

- Noise levels at front row receivers along Irving/Industrial Boulevard and Lamar Street ranged from 60 to 69 dBA.
- Noise levels at front row receivers along smaller roadways such as Canada Drive ranged from 60 to 66 dBA.
- The quietest interior residential neighborhood noise level (away from dominant road noise sources) was 47 dBA.
- Noise levels within the Dallas Floodway ranged from a high of 69 dBA near the IH-30 bridge crossing to a low of 42 dBA within the floodway away from any crossing roadway noise.

Other sources of noise contributing to the existing noise levels in the study area are commercial and industrial facilities, primarily along Irving/Industrial Boulevard and Lamar Street, passenger/freight trains, and aircraft using Dallas Love Field. The major contributors, however, are the existing highways and high-volume arterial roadways within the study area. The results of the noise modeling analysis conducted for the proposed action is presented in **Chapter 4 Environmental Consequences**.

3.8 VISUAL AND AESTHETIC CONDITIONS

The NEPA regulations identify aesthetics as one of the components of the environment to be considered in evaluating the effects of a road project. In addition, § 136 of the Federal-Aid Highway Act of 1970 (PL 91-605) requires consideration of aesthetic values in the highway planning process. The aesthetic attribute can be used to describe an element of the environment that is apprehended through the senses: sight, taste, smell, hearing, and touch. Although aesthetic perceptions generally require the consideration of all of the senses simultaneously, visual perception is perhaps the most predominant. Visual resources are defined by the FHWA as those physical features that constitute the visible landscape. The activities that affect aesthetics create changes in the existing visual characteristics of the environment based on an individual's perception.

Generally, any action or activity that can alter the distinguishable characteristics or quality of the perceived environment can be considered as having an effect on aesthetics. Visual perception and preference are strongly influenced by spatial properties (wide-open vistas, woodlands, or park-like, manicured settings), content (human-influenced or natural), previous experiences, and professional training. Spatial properties also include design concepts such as configuration (scale and arrangement) and references (landmarks and symbolic importance). Visual aesthetics may be altered by actions involving construction, transportation, and other activities that create landscape and scenic vista modifications. Views toward, as well as those from, the facility are affected by landscape modifications.

3.8.1 Viewer Groups

Viewer group characteristics determine how a visual quality is evaluated. Viewers are categorized into groups based on activities, lifestyle, and/or purpose for being within the study area. Viewer groups within the study area can be classified into the two general groups: (1) those with a view of the roadway and (2) those with a view from the roadway. Each of these two general groups can be split into several sub-groups of viewers that have varying types and durations of views of the roadway or surrounding landscape. These groups typically include:

Groups with a view from the road	***Groups with a view of the road***
Local traffic	Residents
Regional traffic	Recreational
Commuter traffic	Commercial/Industrial

3.8.2 Project Study Area

A detailed description of the existing land use characteristics of the Trinity Parkway study area is provided in **Section 3.1.1 Existing Land Use in the Study Area**. The existing aesthetic attributes of the study area can be characterized as a substantially developed urban area interspersed with natural and man-made features, vegetation, open space, and views. Development consists primarily of commercial/industrial facilities, residential neighborhoods (see **Section 3.1.3 Neighborhoods**), parks and open space (see **Section 3.3.2 Parklands and Recreational Areas**), transportation corridors (see **Section 3.2 Transportation Setting**), and public utilities (see **Section 3.1.5 Utilities**).

The vegetation, level topography, and existing development within the study area limit long-range distant views, except at road crossings over the open landscape of the Trinity River floodplain. Virtually the only topographical relief within the study area is that associated with the flood control levees, which parallel the Trinity River within the Dallas Floodway.

3.8.3 Existing Landscape Units and Visual Image Typologies

Land use categories provide a convenient and logical method for segregating the study area into smaller, more manageable areas for visual considerations. The Trinity Parkway study area has several unique visual typologies (the term “typology” refers to the study of types, as in a systematic classification). The following four major land use types were applied to describe the existing visual setting in the study area:

1. commercial/industrial areas;
2. residential areas;
3. roadway/transportation uses; and
4. parks and open space areas.

Table 3-35 provides a summary of the land use typologies established for the study area.

TABLE 3-35. SUMMARY OF LAND USE TYPOLOGIES

Land Use/Typology	Description
Commercial/Industrial and Retail	Includes that portion of the study area adjacent to Irving/Industrial Boulevard and South Lamar.
Adjacent Neighborhoods and Residential	Includes that portion of the study area to the west of the floodplain and the southeast tip of the study area.
Transportation Corridors	This pertains only to the transportation corridors that traverse the Trinity River floodplain. This would include the MLK overpass, the DART Rail Bridge, the Commerce Street and Continental Street Bridges, the Corinth Viaduct, the Houston and Jefferson Street Viaducts, the Hampton/Inwood Bridge and the IH-30 and IH-35E flyovers.
Parkland/Open Space Areas	Includes areas within the boundaries of the east and west Trinity Levees. This area begins at the convergence of SH-183 and IH-35E and extends past the MLK overpass.

The existing landscapes can be described by visual quality, character, and unity, which form the visual baseline condition for the study area. The following methodology was used to assess the existing visual resources in a study area:

- Description of the character of the surrounding area;
- Description of the existing visual quality;
- Concern of viewer groups for visual quality; and
- Goals or objectives for protecting and enhancing visual resources (FHWA, 1988).

Overall, the Irving/Industrial Boulevard and Lamar Street corridor receives low ratings for visual character, quality, and unity. Development along the corridor predates citywide landscaping and sign regulations enacted in the 1970s. Consequently, these land use tools were not effective in shaping a positive visual character of the study area. Finally, many of the existing utilities along the corridor are situated above ground. These utility lines, including utility poles, transmission towers, and overhead traffic lights, add to the visual clutter.

View looking north-northwest toward the Irving/ Industrial/Market Center Boulevard intersection from approximately 1300 Industrial Boulevard.

The landscape within the Dallas Floodway has a moderate to good visual quality rating. This parkland is lacking any significant topographic and vegetative variation. Park and recreation facilities containing a wider variety of niches, microclimates, and vegetation types are generally considered of a higher quality and value. This rating relates to the variety of experiences provided to the user by the park as well as the park's value as ecological habitat. In addition, areas of the park directly adjacent to certain overhead bridges or transportation corridors have a decreased visual quality. This would include the expanse of parkland directly adjacent to the Jefferson/Houston Viaducts. Should one compare the quality of the parkland to other parks in the state or across the county, the rating may not be as high. However, parkland in an area as highly urbanized as the study area is unique. When considered in relation to the surrounding land use, the park provides a necessary visual diversion from the urban environment of the Dallas CBD. In addition, the park's role as a buffer for the neighborhoods that lie to the west of the floodplain facilitates the transition from an urban environment to a less intense land use. Therefore, the park's value as an open space and visual amenity should be rated accordingly.

View looking along the top of the Dallas Floodway east levee toward the Commerce Street Viaduct.

3.8.4 Existing Visual Character, Quality, and Unity for Landscape Units

Subcategories called landscape units were developed to assist in the visual assessment. The purpose of these units is to provide clarity, facilitate classification, and project area descriptions. The Trinity Parkway study area delineated several geographic areas, or districts, according to a shared land use, age of the existing structures, and business typology. **Table 3-36** contains a brief description of landscape units.

TABLE 3-36. SUMMARY OF LANDSCAPE UNITS

Commercial/Industrial	Description	Land Use
Brookhollow Industrial Park	East of IH-35E.	Industrial Office Multi-Unit-3.
Trinity Industrial District	South of the IH-35E/SH-183 interchange. The roadway is Irving Boulevard; the Industrial District is south of the road surface.	Industrial/Research, Industrial/Manufacturing, Community Service, and Multi Unit – 3.
Market/Technology Center	From Irving Boulevard just north of the Irving/Industrial Boulevard merge, past IH-35E to the split between Irving Boulevard and Harry Hines. Bounded by Amelia and Motor Streets to the north and Oak Lawn Avenue to the south.	Industrial/Research, Multi Unit – 3, Community Service, and Industrial/Manufacturing.
Design District	Boundaries include Oak Lawn Avenue to the north, IH-35E to the east, the floodplain to the west, and the SP-366/Industrial Boulevard intersection to the south.	Industrial/Research, Industrial/Manufacturing, and Multi Unit – 3.
CBD	Boundaries include US-75 to the east, IH-30 to the south, IH-35E to the west, and SP-366 to the north.	Industrial/Manufacturing and Community Service.
Southern Lamar Boulevard	South of the existing Industrial Boulevard and extending past IH-45 to join with US-175.	Commercial/Retail, Duplex, Multi-Family, Commercial Service, and Residential – 5.
Residential	**Description**	**Land Use**
West Dallas HOA (Muncie and Los Altos)	Boundaries include the levee to the north, IH-30 to the south, Loop 12 on the west, and Sylvan Avenue on the east.	Industrial/Research, Industrial/Manufacturing, Community Retail, Commercial Service, Multi-Family, and Residential – 5.
La Bajada (also includes La L'Aceate)	Sylvan Avenue on the west, IH-30 to the south, the levee to the north, and Beckley Avenue to the east.	Industrial/Manufacturing, Industrial/Research, Community Retail, and Residential – 5.
Lake Cliff HOA	IH-35E to the east, SH-180 to the south, Beckley Avenue to the west, and Dealey to the north.	Residential 7.5 and Community Retail.
Kessler Park	Canada Drive to the north, IH-30 to the south, Beckley Avenue to the west, and Colorado Boulevard the east.	Industrial/Manufacturing, Commercial, Office, Residential 7.5, and Multi-Family 2.
South Dallas HOA(s)	Lamar Street east along Starks Street crossing SH-310 to US-175 to Bexar Street.	Residential – 5, Community Retail, and Multifamily 2.
Cadillac Heights	Surrounded by MLK to the northwest, the Union Pacific Rail Road on the east, and Southerland Boulevard to the southeast.	Industrial/Manufacturing, Townhouses, Single Family Residential – 5, and Townhouse District.
Magna Vista-Cedar Crest	Contained by Morrell Avenue to the north, Corinth Street to the west, Illinois Avenue to the south, and Kiest Boulevard to the west.	Multi-Family – 2(A), Residential – 5, Townhouse District (3), Residential – 7.5, Community Retail, Neighborhood Service, Multifamily – 2, Industrial Research, Commercial Service, and Townhouse.
Park/Open Space	**Description**	**Land Use**
Trinity River Greenbelt Park	Includes the land interior of the levees. Has been divided into three major typologies.	Floodplain and Parkland.
Meadows	This section of parkland is found in the interior park spaces directly adjacent to the Houston/Jefferson Viaducts.	Floodplain and Parkland.
Secondary Succession	Parkland containing both understory and canopy vegetation located between the Continental and Commerce Street Bridges. Canopy vegetation is interspersed throughout the floodplain and specifically concentrated adjacent to the existing river channel.	Floodplain and Parkland.
Climax Dominant Species	These areas are located due south of the existing DART light rail overpass. This heavily wooded acreage extends south past the MLK overpass.	Floodplain and Parkland.

TABLE 3-36. SUMMARY OF LANDSCAPE UNITS

Major Transportation Corridors	Description	Land Use
IH-45	IH-45 connects with US-75 and connects Dallas with Houston in the south. For the purposes of this study, the section of IH-45 under consideration begins at the northern edge of the Trinity River and extends north past Lamar Street through the South Dallas HOA and terminates at MLK.	Transportation.
SH-310	SH-310 includes the roadway section north of the Southern Pacific Railroad north to its merge with US-175.	Transportation.
US-175	Also referred to as C.F. Hawn Freeway, US-175 is the southernmost major transportation corridor affected by the proposed action. The portion of US-175 that falls within the study area includes the area to the west of the SP Railroad to its merge with SH-310 and continues north to the connection with IH-45 to the north.	Transportation.
MLK overpass	The southern most bridge and the southern boundary of the study area.	Transportation.
DART overpass	The DART light rail overpass is due north of the MLK overpass.	Transportation.
Corinth Street Viaduct	Corinth Street Viaduct is north of the DART overpass.	Transportation.
IH-35E	IH-35E overpass connects both sides of the Trinity River. Redesigned by TxDOT.	Transportation.
Houston/Jefferson Street	The Houston/Jefferson Street Viaducts are two separate bridges that join on either side of the Trinity River. The existing structures were not constructed simultaneously, a fact that is evident in their design and look.	Transportation.
IH-30	IH-30 is located north of the Houston/Jefferson Street Viaducts. The TxDOT is currently redesigning the bridge.	Transportation.
Commerce Street	The Commerce Street Bridge is a potential historic bridge that spans the Trinity River.	Transportation.
Continental Avenue	The Continental Bridge shares a similar design and profile to both the Commerce Street and Houston Street Bridges and is a potential historic bridge.	Transportation.
Sylvan Road	Sylvan Road is the only "at-grade" crossing through the Trinity Corridor. The road terminates at an elevated bridge structure on either side of the floodplain.	Transportation.
Hampton/Inwood Road	The Hampton/Inwood Bridge is the northernmost bridge in the study area.	Transportation.

3.8.5 Visual Rating for Landscape Units

A visual rating for the landscape units indentified and discussed in **Table 3-36** was developed. A visual impact rating for each landscape unit was assigned an existing visual quality value. There are seven visual quality values:

1 = very low;

2 = low;

3 = moderately low;

4 = moderate;

5 = moderately high;

6 = high; and

7 = very high.

By using a scoring system from 1 to 7, an averge existing visual quality rating was developed and assigned for each landscape unit. **Table 3-37** identifies the land use, provides brief descriptions, and indicates the assigned visual rating. No landscape units received either the lowest or highest values. Only two landscape units, (1) climax dominant species and (2) the Houston Street Viaduct, received the next to the highest rating of 6. Six of the landscape units received the next ot the lowest value of 2. These were the Dallas CBD, southern Lamar Street, and various residential neighborhoods including Lake Cliff HOA, Rochester Park/Colonial Hill Historic District, South Dallas/Queen City HOA, Magna Vista/Cedar Crest, and Cadillac Heights. All other landscape units received moderate values of 3, 4, or 5.

TABLE 3-37. VISUAL RATING FOR LANDSCAPE UNITS

Land Use	Description	Visual Rating
Commercial/Industrial		
Brookhollow Industrial Park	• Industrial and Commercial businesses located near the roadway.	3
Trinity Industrial District	• Industrial and commercial business located adjacent to the roadway. • Limited number of businesses compliant with landscaping and sign ordinances. • Truck rental and sales create visual clutter throughout the district.	3
Market/Technology Center	• Contains the highest concentration of landscape ordinance compliant sites. • "Strip" type businesses that have historic value. • Poor condition of older structures. • Infrastructure is aged and in need of updating.	3
Design District	• Eclectic mix of old and new development. • Historically significant structures that may be prime for redevelopment.	3
CBD	• Spectacular views of the Dallas CBD. • Intersection for IH-35E and IH-30. • Fast food and convenience stores surround the corridor.	2
Southern Lamar Street	• Disintegrating industrial corridor. • Vacant and dilapidated industrial businesses.	2
Residential		
West Dallas HOA (Muncie and Los Altos)	• High-density residential land use. • Consistency in building type. • Variety of exterior sheathing materials. • Poor infrastructure.	3
La Bajada (also includes La L'Aceate)	• High-density residential. • Low-quality infrastructure.	3
Lake Cliff HOA	• Higher percentage of multifamily, industrial, and commercial land uses than other residential districts. • Housing types are less consistent. • Quality and condition of residences is lower than the West Dallas and La Bajada subdivisions.	2
Kessler Park	• Low residential densities. • Mature canopy vegetation adds unity and character to the neighborhood. • Higher quality of housing. • Topographic variation adds visual interest.	5
Rochester Park/Colonial Hill Historic/South Dallas/Queen City HOA(s)	• Low-quality housing. • High percentage of commercial businesses. • Businesses are not in compliance with landscaping ordinances.	2
Cadillac Heights	• High concentration of industrial/manufacturing. • High residential density. • Low-quality infrastructure.	2
Magna Vista/Cedar Crest	• Mixture of high- and low-density residential. • Higher proportion of commercial service and community retail. • Poor infrastructure.	2

TABLE 3-37. VISUAL RATING FOR LANDSCAPE UNITS

Land Use	Description	Visual Rating
Park/Open Space		
Trinity River Greenbelt Park	• Lake. • Walk/Jog Trail. • Parking Area. • View of CBD Dallas/Oak Cliff. • Flat, Horizontal expanse of unimproved grasses.	5
Meadows	• Flat, horizontal expanse of unimproved turf grasses, sedges, herbaceous perennials, annuals and isolated woody persistents. • Land use exterior to the floodplain is visible from within the corridor. This includes large buildings, transmission towers, and utility poles. • The horizon line is outside the boundaries of the floodplain and causes the land exterior to the floodplain to become a part of the park experience.	4
Secondary Succession	• Isolated patches or remnants of riparian bottomland hardwood forest, located adjacent to the existing river channel. • Trees create a visual barrier, which works to direct the viewer's eye inward, creating a focal point on the meadow of greenery that lies between the observer and the tree line.	5
Climax Dominant Species	• Climax dominant woodland species indigenous to the Trinity floodplain. • The dense trees and understory shorten the view and create a series of intimate, personal spaces. The trees serve as a visual buffer, blocking the views of land uses exterior to the floodplain.	6
Major Transportation Corridors		
IH-45	• Continuous steel girder bridge. • Constructed in the late 1960s to early 1970s. • Substructure is a series of exposed steel "I" beams supported by grouped piers. There are 36 spans. • Northbound and southbound bridges have three lanes of high-speed Interstate traffic.	4
SH-310	• Principal arterial for the City of Dallas. • Four-lane divided "at-grade" highway. • Standard TxDOT specifications used through the roadway.	4
US-175	• At-grade alignment through South Dallas HOA. • Principal arterial for the City of Dallas. • Four-lane undivided roadway.	3
MLK	• Principal arterial for the City of Dallas. • Four-lane divided roadway. • Bridge goes through the area known as the Great Trinity Forest.	5
MKT Railroad Bridge	• Constructed in the late 1920s. • Steel plate girder with 32 spans. • 200-foot steel truss over the Trinity. • Historic significance.	4
DART overpass	• Constructed in the 1990s. • Main spans over the Trinity River are continuous welded steel plate girder bridges, clothed in a concrete fascia. • Three-foot galvanized handrail.	5
Corinth Street Viaduct	• Potential for historic status. • The bridge is in need of repair. • Principal arterial for the City of Dallas. • Four-lane undivided roadway; 35 mph design speed. • Simple, elegant design.	5
IH-35E	• Two distinct structures with dissimilar construction styles. • Northbound lanes were constructed in the 1920s as the Cadiz Street Bridge. • Bridge for the southbound lanes is a steel plate girder bridge.	3
Jefferson Street Viaduct	• Original construction in 1975 as a steel plate girder bridge with concrete deck. • Four lanes of northbound traffic. • Deck is approximately 30 feet above the floodplain floor.	3

TABLE 3-37. VISUAL RATING FOR LANDSCAPE UNITS

Land Use	Description	Visual Rating
Houston Street Viaduct	• Designated as a historic structure. • Constructed in the early 1900s. • 51 individual concrete arches with steel girders. • ASCE National Civil Engineering Landmark. • Four undivided lanes of southbound traffic.	6
IH-30	• Continuous plate girder bridge spanning over 2,200 feet. • Deck is 32 feet over the floodplain floor.	4
Commerce Street Bridge	• 1929 construction as a part of the Kessler Development Plan. • Contemporaneous development with the Continental and Cadiz Street Bridges.	5
Continental Avenue Bridge	• Constructed as a part of the triad of "C" bridges. • Concrete span bridge with a haunched-cantilever steel girder. • Principal arterial for the City of Dallas.	5
Sylvan Road	• Only "at-grade" crossing of the Trinity River. • Two-lane undivided roadway. • No barriers, paved shoulders, or landscape improvements throughout its length. • Bridges at the east and west levees are continuous steel plate girder bridges.	3
Hampton/Inwood Road	• Principal arterial for the City of Dallas. • Four lanes, undivided. • Galvanized metal railing over flush concrete curbs. • Continuous steel plate girder bridge with an exposed steel "I" beam substructure. • Constructed in 1951.	4

3.9 HAZARDOUS/REGULATED MATERIALS

A search of publicly available records to identify potential hazardous waste/material sites was conducted for each of the six build alternatives. The search focused on hazardous waste/material sites located within 500 feet either side of the proposed alternative alignments. The following list of EPA and TCEQ databases were reviewed for this study.

EPA Regulatory Databases

Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database – CERCLIS is the official repository for site and non-site specific Superfund data in support of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and contains information on hazardous waste site assessment and remediation from 1983 to the present.

National Priority List (NPL) – The NPL is a priority subset of the CERCLIS list and is a list of priority sites that the U.S. EPA has determined to pose a threat to human health and/or the environment and where remedial action is required.

Resource Conservation and Recovery Information System (RCRIS) Treatment, Storage or Disposal (TSD) Database – RCRIS, under the Resource Conservation and Recovery Act (RCRA), provides

information concerning facilities that generate, transport, treat, store, and/or dispose of hazardous waste as federally defined. The RCRIS TSD is a subset of the RCRIS list, which tracks facilities that treat, store, and/or dispose of hazardous waste.

RCRIS Generators Database – The RCRIS generators database tracks facilities that generate or transport hazardous waste. A conditionally exempt small quantity generator (SQG) is a facility that produces less than 220.5 pounds of hazardous waste per month; a SQG produces at least 220.5 pounds per month, but less than 2,204.7 pounds of hazardous waste per month; and a large quantity generator (LQG) produce more than 2,204.7 pounds of hazardous waste per month.

RCRIS Corrective Action (CORRACTS) Database – The RCRIS CORRACTS database lists RCRIS sites that currently or has had corrective action in the past.

RCRA Administrative Action Tracking System Database (RAATS) – The RAATS database tracks facilities that have had administrative enforcement and civil actions issued by the EPA pertaining to major RCRA violators.

State of Texas Regulatory Databases

Texas State Superfund List – The Texas State Superfund database is a list of sites that the State of Texas has identified for investigation or remediation.

Solid Waste Facilities/Landfills (SWF/LF) Database – The TCEQ requires municipalities and counties to report known active and inactive landfills. The SWF/LF database is a listing of solid-waste facilities, transfer stations, and processing stations registered and tracked by the TCEQ Solid Waste Division.

Registered Storage Tank (RST) Database – The RST database is a list of facilities with permitted underground storage tanks (USTs) and/or aboveground storage tanks (ASTs).

Leaking Underground Storage Tank (LUST) Database – The LUST database is a list of facilities with known underground storage tank releases.

Voluntary Clean-Up Program (VCP) Database – The VCP database is a list of sites participating in the TCEQ VCP, which was established to provide administrative, technical, and legal incentives to encourage the clean up of contaminated sites.

Innocent Owner/Operator Program (IOP) Database – The IOP database is a list of sites contaminated as a result of a release or migration of contaminants from an off-site source or sources, and where the facility owner and/or operator did not cause or contribute to the source or sources of contamination.

Closed Landfill Inventory (CLI) – The CLI database is a list of permitted as well as closed, abandoned, and unauthorized landfill sites.

3.9.1 Assessment of Contamination Potential

Identified hazardous waste/material sites located within the proposed right-of-way or within 500 feet either side of the proposed alignments that were considered to have a high probability for contamination are shown on **Plate 3-21**. Examples of these sites include landfills, active Superfund sites, RCRA sites with reported violations, and reported LUST sites that have not attained closure status. **Table 3-38** provides a summary of database information pertaining to these sites and/or facilities.

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
1	RCRIS-SQG LUST RST IOP VCP	-EPA No. TXD007331788 -LUST No. 94610 -IOP No. 291 -VCP No. 975	Flint Ink Corporation 3120 Halifax Street	Former ink manufacturing facility. Facility received into the VCP in 1999 to address ink/solvents affected soils and groundwater. VCP Phase – Investigation. Facility entered the IOP in 2002. IOP Site – 1.9 acres. Documented VOCs affected soils and groundwater. IOP Certificate of Completion issued February 2003. Facility has violations concerning RCRA generator requirements. One UST removed from the ground, two USTs abandoned in place. LUST Status[1] – Site Assessment. LUST Priority[2] – Assessment incomplete, no apparent threats or impacts to receptors.	No
2	RCRIS-SQG LUST RST	-EPA No. TXD086273554 -LUST No. 103984	Hylift, Inc. 2928 Irving Boulevard	Violation of the Texas Solid Waste Rule recorded for the facility. Two USTs removed from the ground. LUST Status – Final concurrence issued, case closed.	Yes
3	RCRIS-SQG	-EPA No. TXD981914310	The Printing Place, Inc. 3160 Commonwealth Drive	Violations of the Texas Solid Waste Rule.	No

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
4	LUST RST	LUST No. 112718	Bright Truck Leasing 3020 Irving Boulevard	Two USTs removed from the ground. LUST Status – Monitoring. LUST Priority – Impacted groundwater within 500 feet – 0.25 mile to surface water used by human, endangered species.	Yes
5	LUST RST	LUST No. 113975	Aladdin Car Wash 1449 Inwood Road	Four USTs removed from the ground, one 12,000-gallon gasoline UST in use. LUST Status – Site Assessment. LUST Priority – Impacted groundwater within 500 feet - 0.25 mile to surface water used by human, endangered species.	Yes
6	LUST RST	LUST No. 112519	Lewis Transfer and Storage (Bradford Co./Former Central Transfer) 3060 Irving Boulevard	One UST removed from the ground. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
7	RCRIS-SQG CERCLIS	EPA Nos. TXR000019042 and TX0000605431	Motor Works/Dallas Battery, Inc. 2743-5 Irving Boulevard	Former retail store that rebuilt and distributed lead-acid batteries, vacated in 1991, currently occupied by an automotive engine parts repair shop. Non-NPL status – Preliminary Assessment start needed. Several violations of the Texas Solid Waste Rule and RCRA generator requirements.	Yes
8	IOP LUST RST	IOP Nos. 244 and 329 LUST No. 115329	Pioneer Concrete of Texas/Hanson Aggregate Central 2151 Irving Boulevard	Former concrete plant. VOCs affected soils and groundwater documented at the site. IOP Certificates of Completion issued in January 2002 and February 2003. Two USTs removed from the ground. LUST Status – Preassessment/release determination. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
9	LUST RST	LUST No. 112797	Industrial Texaco 1636 N. Market Center Boulevard	Five USTs removed from the ground. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No
10	LUST	LUST No. 112189	Jack's Drive-In 1601 Market Center Boulevard	LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
11	LUST RST	LUST No. 114848	Montgomery Truck Service 2011 Levee Street	Two USTs removed from the ground. LUST Status – Site assessment. LUST Priority – No groundwater impact, no apparent threats or impacts to receptors.	No
12	LUST RST	LUST No. 114546	Hargrove Electric Co. 1522 Market Center Boulevard	One UST permanently filled in-place. LUST Status – Pre-assessment/release determination. LUST Priority – Assessment incomplete, no apparent threats or impacts to receptors.	Yes

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
13	LUST RST	LUST No. 98126	Consolidated Freightways 101 Turtle Creek Boulevard	Three USTs removed from the ground. LUST Status – Final concurrence pending documentation of well plugging. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No
14	RCRIS-SQG	EPA No. TXD050136290	Manders Premier, Inc. 327 Cole Street	Printing ink manufacturing facility. Violations of RCRA generator requirements and the Texas Solid Waste Rule.	No
15	RCRIS-LQG	EPA No. TXD980810279	Lone Star Wire, Inc. 1310 Dragon Street	Steel wire and related products manufacturing facility. Violation of the Texas Solid Waste Rule recorded for the facility.	No
16	RCRIS-SQG	EPA No. TXD026267591	Manhattan Laundry and Dry Clean 1345 E. Levee Street	Inactive facility. No violations listed.	No
17	LUST RST	LUST No. 110529	Auto Detail and Service 1101 N. Industrial Boulevard	Three USTs removed from the ground, one UST in use. LUST Status – Pre-assessment/release determination. LUST Priority – Assessment incomplete, no apparent threats or impacts to receptors.	Yes
18	LUST RST	LUST No. 101987	Payless Convenience Store 1000 N. Industrial Boulevard	Three USTs removed from the ground. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
19	IOP	IOP No. 125	3 Vaughan Company 918 Dragon Street	Distribution warehouse. VOCs and metals affected soils and groundwater identified at the site. IOP Certificate of Completion issued February 2000.	No
20	RCRIS-SQG	EPA No. TXD000836460	TU Electric Payne Street Service Center (Dallas Power and Light Materials Reclaim) 100 Payne Street	Violation concerning RCRA generator requirements.	Yes
21	RCRIS-SQG LUST RST	-EPA No. TXD006438626 -LUST No. 102415	Greyhound Lines, Inc. 315 Continental Avenue	Violation of the Texas Solid Waste Rule recorded for the facility. Eight USTs removed from the ground. Three USTs in use. LUST Status – Final concurrence issued, case closed.	No
22	RCRIS-SQG	EPA No. TXD050836170	AUM, Inc./Silver Services - Recycler 324 Singleton Boulevard	Violations of the Texas Solid Waste Rule.	No
23	LUST RST	LUST No. 113012	Star Grocery (GLOCO [Good Luck Oil Co.] #40) 353 Singleton Boulevard	One 4,000-gallon and two 8,000-gallon gasoline USTs in use. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
24	RCRIS-SQG	EPA No. TXD007322530	Oak Cliff Plating Co. 2330 N. Beckley Avenue	Inactive facility. Former electroplating, polishing, anodizing, and coloring facility. Violations concerning RCRA generator requirements.	Yes
25	LUST RST	LUST No. 106272	Jacks Service Station 322 Cadiz Street	Five USTs removed from the ground. LUST Status – Corrective action plan. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No
26	LUST RST	LUST No. 108033	Instant Whip 210-214 Oregon Avenue	One UST removed from the ground. LUST Status – Final concurrence pending documentation of well plugging. LUST Priority – No groundwater impact, no apparent threats or impacts to receptors.	No
27	LUST RST	LUST No. 101719	Whitlock Corp. (Mystic Oil) 401 Corinth Street	Three USTs removed from the ground. LUST Status – Final concurrence pending documentation of well plugging. LUST Priority – No groundwater impact, no apparent threats or impacts to receptors.	No
28	LUST RST	LUST No. 101691	Kwik Stop (Diamond Shamrock) 418 Corinth Street	Three gasoline USTs in use. LUST Status – Corrective action plan. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
29	LUST RST	LUST No. 97465	Chevron/Texaco/Gulf/Metro Cost Plus 201 Corinth Street	Four USTs removed from the ground. Two 10,000-gallon gasoline USTs in use. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
30	RCRIS-LQG LUST RST VCP	-EPA No. TXD026213769 -LUST No. 95395 -VCP No. 999	Buckley Oil and Chemical 1809 Rock Island Street	Chemical storage/distribution facility. Application to enter the VCP submitted in 1999. Media affected and contaminant categories not reported. VCP Phase – Withdrawal. Hazardous wastes included spent halogenated degreasing solvents and spent non-halogenated solvents. Several violations recorded concerning RCRA generator requirements and the Texas Solid Waste Rule. One UST removed from the ground, one UST permanently filled in-place. LUST Status – Monitoring. LUST Priority – Groundwater other than 1B, site characterization incomplete.	No

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
31	VCP	VCP No. 402	Atlas Scrap Iron and Metal Company 2209 S. Industrial Boulevard	Scrap metal yard. VCP Site – 1.9 acres Soils impacted by metals, total petroleum hydrocarbons, and volatile organic compounds. Excavation/removal of affected media and a surface cap were implemented to satisfy Risk Reduction Standard No. 3 requirements. Conditional certificate of completion issued in 1999.	Yes
32	RCRIS-SQG RST	EPA No. TXD000836494	Faubion Associates, Inc. (Dresser Industries Guiberson Division) 1000 Forest Avenue	SIC Code – 2541, Wood partitions and fixtures manufacturing. Registered wastes included ignitable wastes (e.g., lacquer thinner) and spent non-halogenated solvents. Violations concerning RCRA generator requirements and the Texas Solid Waste Rule. Three USTs removed from the ground.	Yes
33	RCRIS-SQG RCRIS-TSD RAATS RST LUST	-EPA No. TXD071376404 -LUST No. 92660	Praxair, Inc. (Union Carbide Corp./Linde Gases of the South/Airgas Southwest) 1001 Forest Avenue	Industrial gases manufacturing facility. Violations concerning RCRA generator requirements and the Texas Solid Waste Rule. Three USTs removed from the ground. LUST Status – Final concurrence issued, case closed.	Yes
34	RCRIS-LQG LUST RST	-EPA No. TXD096813969 -LPST No. 104774	Brockway Standard Southwestern Steel Plant 3301 S. Lamar Street	Metal barrels, drums, and pails manufacturing facility. Reported hazardous wastes generated on-site included tetrachloroethylene and ignitable hazardous wastes. Violations concerning RCRA generator requirements and the Texas Solid Waste Rule. Six USTs removed from the ground. LUST Status – Final concurrence issued, case closed.	Yes
35	RCRIS-SQG LUST RST	-EPA No. TXD007327166 -LUST No. 104373	Proctor and Gamble Manufacturing Co. (Dallas Public Schools Transportation Dept. facility) 1301 McDonald/3701 S. Lamar Street	Shortening/cooking oils manufacturing facility. Violations of the Texas Solid Waste Rule. LUST Status – Final concurrence issued, case closed. Land filling and elevated concentrations of metals, total petroleum hydrocarbons, and acids documented at the site.	Yes

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
36	LUST RST RCRIS-SQG VCP	-LUST No. 109854 -EPA No. TXD000609578 -VCP No. 227	Beall Concrete (Tri-Gas Corporation/Chemetron Corp.) 3301 S. National Street	Tri-Gas described as a welding supply operations facility. Chemetron described as an industrial gases manufacturing facility. Two acetone USTs in use. LUST Status – Pre-assessment/release determination. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors. VCP Site – 2.28 acres. Soils/groundwater affected by lime and acetylene condensate. VCP Phase – Remediation. Remedy type – excavation/natural attenuation. VCP applicant attempting to meet Risk Reduction Standard No. 2 requirements.	Yes
37	RCRIS-LQG	EPA No. TXD078383056	Occidental Chemical Corporation Dallas Plant (Diamond Shamrock Corp. Dallas Silicate/Oxychem) 1100 Lenway Street	Industrial inorganic chemicals manufacturing facility - produces sodium silicate. Preliminary assessment and site inspection conducted by the EPA in 1979. Inactive landfill identified at the facility. Landfill in operation from 1941 to 1971 – contains alkaline product waste, floor sweepings, empty caustic containers, asbestos piping, and empty paint thinner cans.	Yes
38	RCRIS-LQG RST	EPA No. TXD007347875	Okons Iron and Metal Co. (Trinity Recycling) 4801 S. Lamar Street	Elevated lead concentrations identified in soil and groundwater at the site.	Yes
39	CLI	TCEQ #34259	Herman Gibbons 5003 S. Lamar Street	Closed landfill site (11.4 acres). Closed 1994. Facility accepted household trash, construction/demolition debris, tires, and brush. Final cover has been applied.	Yes
40	LUST RST	LUST No. 114954	Vacant Station 5006 S. Lamar Street	Four USTs removed from the ground. LUST Status – Pre-assessment/release determination. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	Yes
41	LUST RST	LUST No. 97460	Bordens/Meadow Gold Dairy 5327 S. Lamar Street	Five USTs removed from the ground. LUST Status – Monitoring. LUST Priority – Groundwater impacted, non-public/non-domestic water supply well within 0.25 mile.	Yes

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
42	RCRIS-SQG VCP IOP RST	-EPA No. TXR000012641 -VCP No. 230 -IOP No. 1	Brookhollow Warehouse (RS Used Oil Svcs., Inc. and Kroger Distribution Warehouse) 3191 Commonwealth Drive	Facility received into the VCP in 1996 to address chlorinated solvents, metals, and total petroleum hydrocarbons affected soils and groundwater. Facility was transferred from the VCP to the IOP in 1997. IOP Site – 7.2 acres. IOP Certificate of Completion issued in June 1998. Facility has violations of the Texas Solid Waste Rule. One UST removed from the ground.	No
43	SWF/LF	Permit No. 128	City of Highland Park 1261 Conveyor Lane	Sanitary landfill, daily cover required. Grandfather site (in operation prior to 1974). Permit Status – closed site permit issued (final cover complete).	Yes
44	LUST RST	LUST No. 113014	Exxon No. RAS 6-0921 (abandoned gas station) 1639 Market Center Boulevard	Four USTs removed from the ground. LUST Status – Monitoring. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No
45	Not Registered	Not Registered	Artistic Furniture Craftsmen 1820 Irving Boulevard	UST system vent pipe and fill port observed at the site. Potential USTs abandoned in place.	Yes
46	Not Registered	Not Registered	Abandoned Gas Station 1129 N. Industrial Boulevard	Three UST system vent pipes and two former dispenser islands observed at the site. Potential USTs abandoned in place.	Yes
47	RCRIS-TSD CORRACTS RCRIS-SQG LUST RST	-EPA No. TXD982813156 -LUST No. 113336	Allied Radiator Service (Vacant Lot/Dealy Ltd.) 2006 N. Beckley Avenue	Violations concerning RCRA TSD and generator requirements. Three USTs removed from the ground. LUST Status – Site assessment. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No
48	CLI	Unknown	Unnamed Landfill E. Side of Trinity River, S. of MLK	Site closed during 1930s. Origin and use of site unknown.	Yes
49	Not Registered	Not Registered	Former Wrecking Company 4901 S. Lamar Street	UST vent pipe observed at the site. Potential USTs abandoned in place.	Yes
50	Not Registered	Not Registered	Forest Avenue Landfill North of MLK on east side of Trinity River	Inactive municipal solid waste landfill. Closed ca. 1900.	Yes

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
51	NPL CERCLIS RCRIS-SQG/TSD CORRACTS	EPA No. TXD079348397	Murmur Corporation Site (Murph Metals, Inc./RSR Corporation) 2727 Westmoreland Road	NPL site encompasses 13.6 square miles and consists of areas of contaminated soil located in West Dallas, south of the Dallas Floodway West Levee. A lead smelting facility, in operation from the 1930s until 1984, was located near the center of the NPL site at Westmoreland Road and Singleton Boulevard. Soil sampling identified contamination in areas around the smelter where fallout occurred and where battery chips/slag were used as fill in yards/driveways. In 1995, the site was added to the NPL. The site is divided into five operable units (OUs) consisting of residential areas (OU-1), a Dallas Housing Authority (DHA) public housing area (OU-2), slag piles/landfills (OU-3), the former smelter facility (OU-4), and a battery wrecking facility (OU-5). Removal actions have been performed in OU-1 for soil/debris containing contaminant concentrations in excess of cleanup levels. The EPA conducted removal, treatment, and disposal activities for waste/debris at OUs 4 and 5. In 1994-1995, the DHA conducted removal actions under EPA supervision at OU-2. Records of Decision have been issued for OU-1 and OU-2, which are the only operable units that extend into the study area. OU-1 and OU-2 have been proposed for de-listing from the NPL. Investigation and remediation activities are on-going for OU-3, OU-4, and OU-5, which are all located outside of the study area.	Yes
52	VCP IOP	VCP No. 455 IOP No. 167	Dover Elevator 7017-7021 Carpenter Freeway	VCP site described as inactive concrete vaults (oil/water sumps). Facility received into the VCP in 1997. TPH and VOCs affected soils/groundwater documented at the VCP site. VCP Certificate of completion issued 2002. VCP site satisfied Risk Reduction Standard No. 3 requirements. Remedy Type for VCP site – Excavation/removal to off-site landfill. IOP site described as a retail business. Facility received into the IOP in 2000 due to VOCs affected groundwater. IOP Phase – Investigation.	Yes
53	RCRIS-LQG LUST RST	EPA No. TXD981054828 LUST No. 108633	DSI Transports, Inc./Red Ball Shop 3151 Halifax Street/15600 John F. Kennedy Boulevard	Facility described as a motor freight transport terminal and truck maintenance facility. Violations of the Texas Solid Waste Rule recorded for the facility. LUST Status – Final concurrence issued, case closed. LUST Priority – Groundwater impacted, no apparent threats or impacts to receptors.	No

TABLE 3-38. POTENTIAL HAZARDOUS WASTE/MATERIAL SITES

Plate ID Number	Regulatory Database	Regulatory Reference	Facility Name/ Address	Summary	Adjacent or Within Right-of-Way (Yes/No)
54	RST LUST	LUST No. 102035	Gascard/Conway Southern Express 3130 Halifax Street/5020 Calvert Street	Five USTs removed from the ground. Two 30,000-gallon diesel USTs in use. LUST Status – Final concurrence pending documentation of well plugging. LUST Priority – No groundwater impact, no apparent threats or impacts to receptors.	No

Sources: EPA and TCEQ regulatory databases, 2003; USACE, 1999.
Notes: Plate ID Numbers correspond to the locations shown on **Plate 3-21**.
1. LUST Status indicates the phase of the site within the TCEQ's risk-based corrective action process as of the date of the database information.
2. LUST Priority indicates the scenario that is determined to be relevant to the site based on release investigation activities and field observations as of the date of the database information.

In October 1999, a geotechnical and environmental investigation was conducted as part of the Trinity River Corridor MIP for the City of Dallas. The purpose of this study was to determine soil characteristics within the Dallas Floodway. In addition, the study included a review of previous environmental investigations (prepared by others) also conducted within the floodway. The project limits extended from the Hampton/Inwood Bridge to just southeast of the Corinth Street Viaduct. The investigation included the collection of 26 soil samples from 13 soil borings completed within the project limits. The soil samples were submitted for laboratory analysis of pesticides, herbicides, SVOCs, VOCs, and total RCRA metals (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver). The study concluded that soils within the floodway did not appear to contain hazardous levels of contaminants (Terra-Mar, Inc., 1999).

[END OF CHAPTER 3 EXCEPT FOR PLATES]

Chapter 4

Environmental Consequences

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

This chapter describes the anticipated impacts (beneficial and/or adverse) to existing social, economic, and environmental resources for each of the alternatives considered, including the No-Build Alternative. Resources identified in **Chapter 3 Affected Environment** for which no impacts are anticipated are not included in this chapter (i.e., Wild and Scenic Rivers, Prime and Unique Farmland, etc.). This chapter addresses only those environmental elements which would be affected by the proposed action. In some cases, recommendations to minimize or mitigate impacts to resources are presented along with the discussion of impacts. Details concerning the recommended mitigation measures for the proposed action are described in **Chapter 7 Mitigation Measures and Commitments**.

4.1 LAND USE IMPACTS

Section 3.1 documented the Trinity Parkway study area's historical and current land use patterns and identified specific land uses (both existing and proposed) that may be potentially affected by the proposed action. It also described local government plans and policies that may influence which alternative is identified as the preferred alternative for the Trinity Parkway or have some bearing on possible impacts or mitigation measures. All of the build alternatives would change land use within the right-of-way of the proposed action. Direct land use impacts would be related to the relocation of residential and business structures and the loss of developable land within the right-of-way.

The following subsections address several factors that were used to assess potential land use impacts for each alternative, including compatibility with local land use plans and policies, direct conversion of land use, regional land use impacts, and toll road effects.

4.1.1 Compatibility with Local Plans and Policies

4.1.1.1 No-Build Alternative

The No-Build Alternative would be incompatible with the plans and policies of the City of Dallas, Dallas County, and NCTCOG. These agencies generally support the construction of the Trinity Parkway and have formally stated their support for the project (see **Section 4.1.1.2**). If the Trinity Parkway is not constructed, these agencies may have to modify their land use and/or transportation plans to discourage development within the study area, provide other means of mobility, or both.

4.1.1.2 Build Alternatives

Table 4-1 indicates the compatibility of the Trinity Parkway build alternatives with local plans and policies. In most cases, compatibility is determined by preferences stated in the jurisdiction's respective adopted resolutions. The table indicates whether or not a build alternative is compatible with an adopted resolution or court order.

TABLE 4-1. COMPATIBILITY WITH LOCAL PLANS AND POLICIES

Local Plans and Policies	Trinity Parkway Build Alternatives					
	2A	2B	3A	3B	4	5
City of Dallas Resolution, *The Dallas Plan*, December 14, 1994.	No	No	Yes	---	Yes	Yes
City of Dallas Resolution, TRCCC Report *Trinity Parkway Corridor,* May 10, 1995.	No	No	No	---	Yes	No
City of Dallas Resolution, *Trinity Parkway Corridor MTIS*, September 10, 1997.	No	No	No	---	Yes	No
Dallas County Commissioners Court (by Court Order), *Trinity Parkway Corridor MTIS*, September 30, 1997.	No	No	No	---	Yes	No
DART Resolution, *Trinity Parkway Corridor MTIS*, October 28, 1997.	No	No	No	---	Yes	No
NCTCOG Resolution, *Trinity Parkway Corridor MTIS*, March 12, 1998.	No	No	No	---	Yes	No
City of Dallas Resolution, *Trinity River Corridor Master Implementation Plan*, August 1999.	No	No	No	---	Yes	No
City of Dallas Resolution, directed the NTTA to evaluate the proposed "urban design" parkway (Alternative 3B), a major component of the BVP, as part of the Trinity Parkway DEIS, October 8, 2003.	No	No	No	Yes	No	No

Sources: TxDOT, 1998a and City of Dallas.
Notes: No = Not compatible with adopted resolution or court order; **Yes** = Compatible; **---** = This build alternative (Alternative 3B) was developed after the date of the specified resolution or court order.

Regardless of which alternative is identified as the preferred alternative, the City of Dallas has a variety of ordinances, plans, and regulations at their disposal to manage growth within its jurisdiction. As previously discussed in **Chapter 3 Affected Environment**, zoning and subdivision ordinances and other requirements can be applied to ensure the orderly growth of its communities. However, the application of such controls occurs within a political process.

4.1.2 Direct Land Use Impacts

4.1.2.1 No-Build Alternative

Under the No-Build Alternative, current land use patterns within the study area would probably remain the same. However, several major land use plans are proposed for flood control and recreational development within the Dallas Floodway and DFE portions of the study area. These land use plans are described in **Chapter 3 Affected Environment** of this DEIS.

4.1.2.2 Build Alternatives

All build alternatives would change land use within the right-of-way proposed for the Trinity Parkway. The build alternatives directly result in the conversion of approximately 252 acres (Alternative 2A) to 495 acres (Alternative 4) of land from current uses to right-of-way, depending on which alternative is identified as the preferred alternative. Direct land use impacts would be related to the displacement and relocation of residential, business, and publicly owned properties (see **Section 4.5 Relocation and Displacement Impacts**) and the loss of developable land within the right-of-way. **Table 4-2** provides a summary of the estimated right-of-way required from the various types of land use within the study area.

TABLE 4-2. SUMMARY OF LAND USE IMPACTS

Land Use Type	Trinity Parkway Build Alternatives					
	2A	2B	3A	3B	4	5
Privately Owned						
Residential	2.0	1.7	2.3	2.3	3.3	4.9
Commercial/Industrial	112.1	202.6	90.8	97.0	93.0	105.2
Private Railroad ROW	6.7	8.6	10.0	14.0	10.7	11.9
Subtotal	**120.8**	**212.9**	**103.1**	**113.3**	**107.0**	**122.0**
Publicly Owned						
Dallas Floodway	---	---	170.6	152.4	204.5	14.0
Existing Levee ROW	3.3	1.9	74.9	78.3	131.5	197.1
DART ROW	1.6	1.9	2.9	4.1	2.9	2.2
Highland Park Landfill	---	---	4.0	6.6	2.6	3.2
Lew Sterrett Justice Center	0.7	0.7	---	---	---	0.7
DISD Maintenance Facility	4.0	8.9	2.0	2.0	2.0	2.0
Existing Roadway ROW	121.7	116.0	35.6	36.8	44.7	52.4
Subtotal	**131.3**	**129.4**	**290.0**	**280.2**	**388.2**	**271.6**
Total	**252.1**	**342.3**	**393.1**	**393.5**	**495.2**	**393.6**
Non-Taxable Property						
Dallas Floodway, ROW, etc.	131.3	129.4	290.0	280.2	388.2	271.6

Notes: All quantities shown in acres. Calculated areas are estimates only.
ROW = right-of-way; --- = no impact.

All of the proposed build alternatives would result in long-term changes in land use within the study area. Additional land use changes may occur due to restriction of access across the proposed facility. In some areas, additional investment in infrastructure (e.g., access/service roads and utilities) would be required to ensure continuation of service (refer to **Chapter 2 Alternatives Considered** for a detailed description of each build alternative).

During construction, short-term impacts to land uses adjacent to an alternative, especially in developed areas, would occur due to the movement of workers and materials through the area and construction activities. Construction noise and dust, as well as temporary disruption of traffic flow on local roads, may also temporarily affect residents and businesses in the vicinity of the project. If compatible with adjacent land use, construction activities may occur at night to minimize the effects on daytime traffic on existing facilities or where construction schedules are deemed important. Coordination between the City of Dallas, NTTA, TxDOT, and landowners regarding construction scheduling and access to the construction

site and right-of-way should minimize any such temporary disruptions. Additional details are presented in **Section 4.20 Temporary Effects During Construction**.

4.1.3 Indirect Land Use Impacts

4.1.3.1 No-Build Alternative

As the DFW metropolitan area grows by as much as 47 percent over the next 25 years, increased residential, commercial, and other developments would generate additional vehicle trips within the Trinity Parkway study area. Without the Trinity Parkway, the transportation system would be less able to accommodate additional trips, resulting in increased traffic congestion, travel delays, and the need for additional roadways, widening of existing highways and arterial roadways, and other congestion-reduction improvements. Such transportation improvements would be in addition to those currently proposed within the study area (see **Chapter 2 Alternatives Considered** for information concerning planned improvements to existing roadways, TSM/TDM, public transportation, and LRT/commuter rail).

The absence of the Trinity Parkway transportation facility would also have a limiting effect on growth within the study area as residential and commercial developers choose to locate their projects in areas with superior transportation infrastructure. This would leave the character of most of the study area relatively unchanged while current trends in urban development would likely continue in other portions of the region, such as northern Dallas County and portions of Collin, Denton, and Tarrant Counties.

4.1.3.2 Build Alternatives

Construction of the Trinity Parkway may indirectly affect land use within the study area, resulting in long-term land use changes to the landscape. Like most new highways, construction of the Trinity Parkway could enhance land development opportunities, helping to create attractive opportunities for the location of land uses that thrive on drive-by exposure or access to major transportation routes. However, the Trinity Parkway is by no means the only factor contributing to growth (i.e., population and employment) within the corridor, as land development depends on several other factors being present. There must be a market demand for new development, favorable local and regional economic conditions, adequate utilities, and supportive local land development regulations and policies.

Many of these ingredients are present within the Trinity Parkway study area. The substantial development that has occurred for many years in the urban residential and commercial/light industrial areas would indicate the presence of favorable market conditions. Local land development plans and policies, such as the City of Dallas' MIP/BVP (see **Section 3.1.1.1**) provide public support for growth and

redevelopment within the Trinity Parkway study area and beyond. The construction of the Trinity Parkway may indirectly encourage a more diverse assemblage of land uses to occur in the area (e.g., multi-family, commercial, mixed-use, and industrial). These new land uses are likely to be concentrated in areas where the Trinity Parkway would intersect existing or planned major roadways and along access/service roads, where provided.

By indirectly encouraging land development activity, the Trinity Parkway build alternatives could be a contributing factor in triggering secondary social, economic, and environmental impacts. Secondary development induced by the facility could encourage new urban development (i.e., redevelopment or infill development) in some portions of the study area. As previously described, however, this would depend on other factors also being present (i.e., market demand, favorable local and regional economic conditions, adequate utilities, and supportive local land development regulations and policies). In some areas, new land development and/or redevelopment has and will continue to occur regardless of whether or when the Trinity Parkway is built.

The adverse impacts of development can be at least partially mitigated by the existing land use and development controls of the City of Dallas throughout the study area. As mentioned above, the City of Dallas has adopted comprehensive plans and/or passed official resolutions that recognize and support the construction of the Trinity Parkway. The Trinity Parkway may also influence future capital improvement plans, as well as land use planning goals (i.e., beyond those currently planned or proposed). Most of these plans share a common desire to create a balance between community/economic growth and preservation and protection of existing natural resources (see **Section 3.1.1.1**).

Secondary impacts could also potentially include the loss of access to land across the controlled access facility, localized pressure for business development in the vicinity of interchanges, the disruption of the physical fabric of neighborhoods; impacts to areas of scenic attraction and recreational value, and urban growth. These impacts are further discussed in the appropriate sections of this document and are further summarized in **Section 4.24.1 Secondary Impacts**.

Toll Road Effects

As a proposed toll facility, the Trinity Parkway may require additional right-of-way to accommodate toll plazas and other ancillary toll facilities (see **Plates 2-1** through **2-6** at the end of **Chapter 2 Alternatives Considered** for proposed toll plaza locations). The amount of additional right-of-way, if any, is subject to design. Additional amounts of developed or undeveloped land uses may be converted to Trinity Parkway right-of-way. The FEIS would provide a better estimate of whether and how much additional right-of-way

is required at such locations and provide more specific information about the direct land use impacts occurring from the Trinity Parkway as a toll facility.

Construction of the Trinity Parkway as a toll road would have only a minor influence on its ability to affect land development. Access/service roads are provided for the purpose of restoring access. Limiting the extent of access/service roads may indirectly limit the amount of adjacent land development along the Trinity Parkway. Even so, there would be numerous other potential land development opportunities along the toll road, such as interchanges along cross streets. For this reason, the toll road designation is not expected by itself to either appreciably diminish or augment induced land development.

4.2 POTENTIAL JOINT DEVELOPMENT ACTIONS

This section describes the anticipated beneficial and adverse effects associated with construction of the Trinity Parkway together with other proposed agency actions identified in **Section 3.1.1.4** as potential joint development actions. The proposed Dallas Floodway improvements and USACE DFE project provide the greatest opportunities for joint development with the Trinity Parkway.

4.2.1 Introduction

Section 3.1.1.4 provided a description of other planned projects in the study area considered potential joint development projects along with the Trinity Parkway. The potential joint development with these projects involves integrating transportation infrastructure and non-highway uses into coordinated multi-use actions that complement one another. Since these types of projects are usually developed independently, it requires considerable coordination to achieve mutual goals. Highway projects can be integrated with the development of bikeways, parks, and other public or private undertakings and may fit better into the overall fabric of the community than if they were developed separately.

Joint development of these projects through a collaboration and partnership of a number of federal, state, and local agencies would further accentuate and enhance the investments of the parties through an aggregation of the investments' individual benefits. Combined and joint development of these projects provide cost efficiencies, important flood control benefits, and promote the corridor as more than just a transportation link, but a vital part of regional tourism and local recreational resources.

Potential elements of these joint development actions include:

- Development of an agency consortium to devise and carry out the plan;
- Flood protection benefits provided by new levee construction, structural reinforcement of existing levees, and the excavation of borrow areas for increased floodwater storage and hydraulic conveyance capacity;
- Accelerated lake construction coordinated with levee and roadway embankment requirements;
- Landscaping and beautification including the consideration of native and contextual habitat enhancements at key areas, such as the major floodplain crossings;
- Wildlife and wetland preservation and mitigation plans, including special considerations for ecosystem restoration and wildlife passage across the corridor such as at major floodplain areas or other highly traveled areas; and
- A coordinated plan for economic development to showcase the City of Dallas – its history and natural resources – at established points of interest, including tourist/visitor centers, public gathering areas, and other recreational amenities associated with lakes, trails, and parks.

Specific joint development projects include:

City of Dallas MIP/BVP – Joint and coordinated construction items consist of the following:

- Floodway levee raise (2 feet above the SPF) and levee strengthening (flatten riverside of levees to a 4:1 slope).
- Floodway lake development – this item involves the creation of lakes to improve flood conveyance and recreational benefits.
- Removal of abandoned AT&SF Railroad Bridge – this item includes total or partial removal of the wooden support piers and earthen embankment. Partial removal would involve preservation of the existing steel truss bridge span over the Trinity River. Benefits include improved flood conveyance and potential re-use of the bridge span for a hike/bike trail.
- Ecosystem restoration – this item involves the creation of a meandering river channel upstream and between the two proposed lakes. Included would be supplemental tree plantings along the channel banks and wetland construction.
- Recreational amenities – this item consists primarily of hike/bike trail improvements.

USACE DFE Project – Joint and coordinated construction items consist of the following:

- Lamar Levee – this item involves the construction of a new levee to the SPF plus 2 feet, which would provide flood protection benefits to the south Lamar Street area near the US-175/SH-310

interchange. A portion of the levee could be used for a roadway embankment from the downstream end of the Dallas Floodway to the MLK Bridge.

- Lamar Levee sump storage – this item includes the excavation of designated areas to produce borrow material for levee construction. The excavated areas would serve to enhance flood protection in the south Lamar Street area by providing interior floodwater storage. Coordination with the USACE would be required to ensure the proposed Trinity Parkway avoids impacting the storage sump locations.
- Recreational amenities – this item consists primarily of constructing hike/bike trails to adjacent neighborhoods and/or paralleling the Trinity River.

More detailed descriptions of the MIP/BVP and DFE projects are provided throughout **Chapter 3 Affected Environment** of this DEIS.

4.2.2 No-Build Alternative

The No-Build Alternative would offer very limited, if any, joint development opportunities within the Trinity Parkway study area. Under this alternative, the FHWA/TxDOT/NTTA would not continue to participate in cooperative planning for the Dallas Floodway, DFE, and adjacent areas (i.e., future Great Trinity Forest Park). The City of Dallas' plans for parks and recreational areas within the study area would not be affected by this alternative. The No-Build Alternative would not prohibit the City of Dallas' planned development of parkland within the Dallas Floodway or other areas; therefore, no impact would occur and no mitigation would be required.

While it would have the least impact on the environment, the No-Build alternative would contribute to increased traffic congestion as well as both human and air quality impacts. Traffic volume and congestion would continue to increase on the existing roadway network, possibly contributing to traffic congestion to and from parks and recreational areas, as well as potentially unsafe bicycle and pedestrian use of trail systems.

4.2.3 Build Alternatives

Transportation impacts associated with the Trinity Parkway build alternatives are described in **Section 4.4 Transportation Impacts**. As previously described in **Chapter 1 Purpose and Need for Action**, if a build alternative is identified that is located <u>outside</u> of the Dallas Floodway (Alternative 2A and 2B), the USACE and City of Dallas would publish a stand-alone EIS that would address the lakes, flood control, environmental restoration, and recreational improvements proposed in the floodway. Accordingly, the FHWA/TxDOT/NTTA would proceed with finalization of the Trinity Parkway EIS independent of the proposals by the USACE and City of Dallas, and would thereafter proceed on an independent course of

action. Since neither Alternatives 2A nor 2B would be involved in direct association with features in the floodway, it is likely there would be no participation by FHWA/TxDOT/NTTA in these potential joint development actions. There would be no primary USACE involvement with the Trinity Parkway other than the processing of regulatory permits.

In addition, the City of Dallas may not finalize its Dallas Floodway BVP until the Trinity Parkway preferred alternative has been identified. As a result, the USACE has indicated that none of the aforementioned plans has been sufficiently developed to know whether or not there would be a flood damage reduction or ecosystem restoration purpose in which the USACE could participate. Assuming there would be a federal (USACE) interest (monetary or otherwise) in either of those projects, the USACE could then be a potential project participant (see **Section 4.2.7 Next Step in the Process**).

Based on the above information, Trinity Parkway Alternatives 3A, 3B, 4, and 5 are considered the likely candidate alternatives for potential joint development with the DFE and BVP. Therefore, in attempting to identify and evaluate the potential effects of joint development, only Alternatives 3A, 3B, 4, and 5 are considered in this analysis. One of the primary differences between the alternatives is that Alternatives 4 and 5 would restrict access to the floodway park from both levees where as Alternative 3A and 3B would have a greater barrier on the east levee and no barrier on the west levee.

The highway construction activities (earthen borrow areas) associated with these build alternatives could be coupled with levee and lake construction and wetland creation or re-creation. There is a desire on the part of the City of Dallas to enhance the visual character of the Dallas Floodway and DFE areas and provide more public recreational facilities. As such, these areas would be prime candidates for aesthetic and recreational enhancement projects possibly funded by transportation enhancement (TE) funds administered by the FHWA [§ 1201(a)(35) of TEA-21]. More details concerning eligible TE activities that could be implemented as part of the joint development actions are presented in **Chapter 7 Mitigation Measures and Commitments**.

4.2.4 USACE DFE Project

Details of the DFE project and its areas of impacts and benefits are contained in the FEIS dated February 1, 1999, and Final Supplement No. 1 to the FEIS, dated April 2003. The ROD for the project was signed on December 1, 1999. According to the ROD, compliance with all applicable environmental review and consultation requirements was accomplished through coordination of the *Final General Reevaluation Report and Integrated EIS* (USACE, 1999). In addition to satisfying the Fish and Wildlife Coordination Act, compliance with the CWA, including preparation of a § 404(b)(1) analysis, CAA, CERCLA, RCRA, Endangered Species Act (ESA), NHPA, § 9 [33 USC 401] and § 10 (33 USC 403) of the Rivers and

Harbors Act of 1899, EO 11988 (*Floodplain Management*), and EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*) was completed. An exception to obtaining the TCEQ State Water Quality Certificate is being pursued under § 404(r) of the CWA. In addition, a signed Programmatic Agreement with the ACHP, SHPO, and other parties was developed to address cultural resources.

The ROD specifies that all practicable measures to avoid or minimize environmental impacts were adopted and incorporated in the development of the project. This includes the acquisition and management of a minimum of 1,179 acres of terrestrial habitat, including 926 acres of bottomland hardwoods and reforestation of 253 acres of mixed grass-forblands. Included would be a program to monitor the success of the environmental mitigation and restoration features of the project, which may be adopted and jointly implemented by the City of Dallas and the USACE.

The FEIS indicates that planned recreation amenities of the DFE would be compatible with the regional recreation master plan, which includes hike/bike trails, equestrian tails, nature trails, and pavilions. The project would adversely impact approximately 162 acres of forested wetlands. Mitigation for adverse impacts resulting from construction of the levees, swales, and river channel realignment requires the acquisition, preservation, and management of 1,179 acres of Trinity corridor lands. Detailed design of the project is ongoing and construction is estimated to be completed in 2008.

4.2.5 City of Dallas MIP/BVP

As previously noted, the City of Dallas has not finalized its decision on the LPP for the Dallas Floodway, which is formulated from the list of measures and alternatives being considered as part of the *Trinity River Corridor MIP/BVP*. As previously described in **Chapter 3 Affected Environment**, the current version of the LPP includes common features adopted from the BVP, which includes the construction of off-channel lakes and wetlands, channel realignment, recreational features, and the Trinity Parkway (proposed action).

The primary differences between versions of the LPP involve which Trinity Parkway alternative (build or no-build) is identified as the preferred alternative. The draft MIP and current version of the LPP recommends Alternative 4 as the preferred option for the Trinity Parkway. However, some local agency officials and members of the public have stated a preference that Alternative 3B be identified as the preferred alternative for the Trinity Parkway.

The *Trinity River Corridor MIP/BVP* is closely related to the Trinity Parkway plan because lake excavation presents an optimum source of earth fill material for roadway embankments, which would be needed to

construct Alternatives 3A, 3B, and 4 and to a lesser extent Alternative 5. Furthermore, the lakes would serve to mitigate the effects of the roadway embankments on floodway conveyance. Thus, construction of either of these alternatives within the floodway would create efficiencies for the Trinity Parkway, floodway levee improvements, and the ultimate development of floodway lakes. Having such an available and close source of embankment material would benefit the Trinity Parkway and levee raise projects, while the two lakes could be fully excavated as part of the joint development project.

4.2.6 Potential Environmental Impacts of Joint Development

Joint development of all, or portions thereof, of these three projects (i.e., Trinity Parkway, DFE Lamar Levee, and MIP/BVP) would have the potential to affect (beneficial and/or adverse) the social, economic, and environmental conditions within the Trinity Parkway study area. However, their effects – individually or combined – would be mitigated through various public/agency review and mitigation processes. As previously described, the City of Dallas has not finalized their plans for the Dallas Floodway and surrounding areas. Additionally, the Trinity Parkway DEIS includes build alternatives located within and outside the Dallas Floodway with no preferred alternative identified. Therefore, it is not possible to fully determine the potential environmental impacts from joint development with other proposed floodway improvements at this time (see **Section 4.2.7 Next Step in the Process**).

It should be noted here that the impacts described below are generalized and would not be uniform throughout the study area. Impacts may be more pronounced or less pronounced depending on proximity to the proposed joint development projects. Potential impacts of the joint development actions are discussed in the following paragraphs.

Demographics. Impacts on population and ethnic composition would be minimal with the joint development projects. Development of the combined projects would likely attract more people to live in close proximity to these improvements.

Community Cohesion. With implementation of the joint development projects, the majority of existing neighborhood boundaries would be reinforced by the presence of the Trinity Parkway and levee improvements. The overall quality of life for residents is expected to be improved as access to the local/regional transportation system increases, the risk to human life and property from flooding is reduced, and the opportunity to enjoy enhanced recreational facilities becomes available.

Community Resources. Trail connections and recreational opportunities would be enhanced, benefits from increased flood control would occur, service access to residents and community facilities would be improved, and some vehicle access routes would be altered (but maintained).

Safety and Security. Improvements to the transportation system would improve safety. All of the build alternatives would provide an alternate north-south travel route that would benefit emergency services. Some emergency response routes may change, but access would be maintained and improved. In addition, the potential for loss of property and life during a 100-year flood event would be virtually eliminated outside the floodway levees.

Environmental Justice. Under federal requirements, neither minority nor low-income populations should receive disproportionately high or adverse impacts as a result of a project. The western and southernmost portion of the Trinity Parkway study area has the highest degree of potential impacts to identified environmental justice populations (see **Section 4.3.3**). These are unavoidable due to the need to connect the southern terminus of US-175 to all of the build alternatives (see **Chapter 1 Purpose and Need for Action**). While there are impacts to this area (e.g., most residential displacements occur in this area), many benefits would be received from the joint development actions, such as flood protection, transportation system improvements, and recreational benefits.

Land Use. The joint development actions would introduce facilities (i.e., transportation, flood control, and recreation) that are consistent with local land use plans and policies (see **Section 3.1.1.1**).

Relocation/Displacements. Any displacements would be acquired at fair market value. Relocation assistance would be provided in accordance with federal and state requirements. Some homes deemed structurally sound and consistent with neighborhood integrity may be relocated to nearby vacant parcels.

Utilities. Other than potential short-term interruptions in service, no adverse impacts (i.e., termination of service or long-term interruptions) to utilities are anticipated to occur from construction of the joint development actions. Each of the proposed projects would require that existing utility components be relocated and/or adjusted, to varying degrees. Schedules for any utility relocations/adjustments would be closely coordinated to avoid or minimize disruptions and inconvenience to customers.

Economic. Potential economic impacts include tax revenues and employment (see **Section 4.6** for the Trinity Parkway project). In the short-term, the joint development actions would slightly reduce annual property tax revenues. However, the long-term gains in tax revenues generated from increased tourists/visitors to new parks/recreational areas and potential economic development due to increased accessibility would offset any short-term losses. Property values may also increase due to increased flood protection and proximity to the Trinity Parkway. The joint development actions would also generate construction jobs for several years. Some jobs may relocate outside the area through business relocations, but potential economic development and community revitalization measures would create new jobs for area residents.

Pedestrians/Bicyclists. The joint development actions would provide positive, long-term benefits on the bicycle and pedestrian environment. Working, living, playing, and shopping would be promoted by new trails and connections to existing trails (see **Section 3.3.2.3**). Safety would be enhanced as pedestrians and bicyclists are separated from motor vehicle traffic.

Air Quality. Based on the traffic air quality analysis (TAQA) conducted for the Trinity Parkway, CO levels would not exceed the NAAQS at any of the worst-case locations studied (see **Section 4.14**). Long-term air quality benefits are anticipated due to increased mobility and reduced traffic congestion. Unavoidable short-term impacts caused by construction equipment and airborne dust would occur, but would be minimized and mitigated by incorporating best management practices (BMPs) in contract documents and adhering to them. For example, blowing dust from areas cleared or excavated would be minimized by routine application of water to these surfaces using a water sprinkler truck.

Noise. Noise impacts associated with the Trinity Parkway are described in **Section 4.15** of this DEIS. Short-term noise impacts would occur during the construction period for the joint development actions. Because of the sensitive nature of residential land use, these impacts would be more pronounced at residences in South Dallas near the southern terminus location (US-175/SH-310) and residential areas located along the west side of the Dallas Floodway (Alternatives 4 and 5).

Wetlands. Impacts to wetlands would occur as a result of the joint development actions. Compensatory mitigation for wetland impacts would be mitigated at acceptable replacement-to-loss ratios to ensure there would be minimal impact to the functions and values of wetlands in the area. Wetland mitigation banking may also be considered for compensation to impacted wetland resources. Implementation of both structural and non-structural BMPs would be considered to address construction and post-construction storm water management. The successful implementation of the mitigation would ensure that no net loss wetlands would result from the joint development actions. Additional information regarding mitigation of wetland impacts is provided in **Sections 4.8** and **7.4**.

Floodplains, Hydrology, and Hydraulics. With the joint development actions, the base floodplain would be modified to include portions of the Trinity Parkway, flood control improvements (i.e., levees and wetland creation), parks/recreational areas, and ecosystem restoration. Any development project or a combination thereof that result in modifications to the flood carrying capacity causes direct, indirect, and cumulative impacts to other locations within the base floodplain. Alternative 5 would not have major floodplain impacts, while Alternatives 3A, 3B, and 4 could have major impacts that could be balanced or minimized by carefully analyzed cut/fill and joint development efforts.

Floodplain and floodway impacts associated with the joint development actions would be avoided or minimized in accordance with all local, state, and federal laws and regulations, including 23 CFR 650 Subpart A *Location and Hydraulic Design of Encroachments on Floodplains* and EO 11988 *Floodplain Management.* Additional information regarding mitigation of floodplain impacts is provided in **Chapter 7 Mitigation Measures and Commitments**.

Threatened and Endangered Species. No threatened and endangered species are located within the study area and, therefore, no adverse impacts are anticipated under the joint development actions (see **Section 4.9**).

Water Quality. The joint development actions would have no long-term adverse impacts on the chemical or biological constituents in surface water or groundwater. This would be accomplished by adherence to the EPA's National Pollutant Discharge Elimination System (NPDES) and/or Texas Pollutant Discharge Elimination System (TPDES) permit requirements and all other applicable local, state, and federal laws and regulations (see **Section 7.2**). A Storm Water Pollution Prevention Plan (SW3P) is required for each construction project or site covered under NPDES/TPDES permit requirements. The EPA states that for more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort is encouraged for the different operators at a site to prepare and participate in a comprehensive SW3P. Both structural and non-structural BMPs would be considered to address post-construction storm water management for the joint development actions. During construction, short-term adverse impacts to water quality may occur, but would be mitigated through contract provisions requiring the use of BMPs to control erosion and sedimentation.

Water Body Modification and Wildlife. The joint development actions would provide long-term wildlife and aquatic habit improvements through an increased length of open stream, improved channel cross-section, wetland creation, ecosystem restoration techniques, a continuous landscaped greenbelt, and new lakes. During construction, unavoidable short-term disturbances to habitat and increases in turbidity and total suspended solids would be minimized through contractor adherence to BMPs.

Cultural Resources. The joint development actions would avoid and/or minimize adverse effects on any protected cultural resource. Following the identification of a preferred alternative for the Trinity Parkway, FHWA/TxDOT/NTTA would coordinate with the SHPO regarding additional investigations within the proposed right-of-way for the preferred alternative. The mitigation of cultural resources would be pursued, as necessary, in compliance with § 106 of the NHPA and Texas Antiquities Code (see **Section 7.6**).

A signed Programmatic Agreement with the ACHP, SHPO, and other parties was developed to address cultural resources associated with the DFE project. Any joint development impacts to cultural resources would be mitigated according to the provisions of the NHPA. If required, the § 106 parties involved with the joint development actions would complete a MOA. This MOA would be developed to describe the commitments made by the § 106 parties, either separately or collectively, to offset any potential adverse effects on cultural resources and agreed to by the MOA signatories. Therefore, the joint development actions would have no un-mitigated adverse impacts and may have beneficial impacts by identifying and preserving cultural resources.

Environmental Risk Sites. Construction of the joint development actions poses very little risk of hazardous waste contamination of the environment. Hazardous waste impacts associated with the joint development actions would be associated with currently operating sites and historical sites and facilities that have already impacted the environment or have the potential to impact the existing environment (see **Section 4.17**).

Avoiding hazardous waste sites would be a priority during the final design stage. Site assessments would be carried out to the degree necessary to determine the levels of contamination and, if necessary, to evaluate the options to remediate, along with the associated costs. Mitigation measures would include avoiding the sites, removing the contaminated media or building materials, and/or treating contamination on-site. All mitigation would be carried out in full compliance with EPA and TCEQ regulations.

The impacts from hazardous material use and handling during construction activities associated with the joint development actions pose a minimal risk. Adherence to the NPDES/TPDES permit requirements, including the implementation of a SW3P and BMPs would minimize the risk of contamination during construction activities. Additional information regarding the mitigation of hazardous waste sites and pollution prevention measures is provided in **Chapter 7**.

Visual. The combined elements of the joint development actions would blend together and complement the visual setting of the area in most locations. However, the construction of new levees and the Trinity Parkway would be elevated above grade and would be visible in the surrounding vicinity – thus, changing the existing visual character. A combination of landscaping (particularly within the floodway), architectural treatments, and surface finishes would minimize and mitigate impacts associated with the joint development actions. Additional information regarding visual impact mitigation techniques is provided in **Chapter 7**.

Topography, Geology, and Soils. The joint development actions would have some degree of impact to surface topography due to cut and fill slopes, embankment material, excavation, ditching, and/or

trenching. Construction of the joint development actions would disturb previously disturbed soils in the project area. None of the actions under consideration would be expected to have a substantial impact on the geological composition of the area.

Permits. Among those permits and compliances that may be necessary for the joint development actions are: § 404 of the CWA, § 401 Water Quality Certification (TCEQ), USCG Bridge Permit, FEMA CLOMR, Trinity River Corridor/City of Dallas Corridor Development Certificate (CDC) Permit, and NPDES/TPDES Permit. Other agreements or consents that may be necessary would involve railroad companies and utilities. Additional information regarding permitting and compliance requirements is provided in **Chapter 7**.

Construction. Short-term impacts associated with the joint development projects include traffic, air quality, soil erosion, water quality degradation, and noise. Appropriate mitigation would be provided for all identified impacts.

Secondary Impacts. Construction of the joint development actions would create some secondary impacts that result indirectly from the existence of new levees, the Trinity Parkway, and recreational developments. These secondary impacts are not a direct result of construction or operation, but can be expected to occur due to reasonably foreseeable related activities. Potential secondary impacts include:

- As access to study area land becomes more convenient, more areas would become practical and economically feasible for development and land use changes would occur;
- Runoff increases due to changes in land use and increased development on land surrounding the joint development actions;
- Increased sedimentation of wetlands and streams and decreased water quality due to future development of land adjacent to the joint development actions;
- Loss of wildlife habitat and decreased habitat value in areas of increased land development;
- Impact to cultural resource sites from development projects on private property that do not require cultural resource investigation because public funds or permits are not required;
- Increased use of parks and recreational areas due to more convenient access;
- Continuing changes in the aesthetic quality of urban areas as future development takes place;
- Stimulation of the local economy from the circulation of construction spending; improved access to employment opportunities, markets, goods, or services such as health and education; an increased work force related to construction; development stemming from the joint development actions; and an increase in visitors and tourism;
- Increases in population in local neighborhoods and communities, which may create more demand for local services;

- Need for additional utilities as population increases and land use changes;
- Changes in land use to other uses as more areas near the roadway become easily accessible and more attractive for development, which could also help with revitalization efforts in and around the Dallas CBD; and
- Changes in land use that promote livable, sustainable communities by placing priority on enhancing community character, neighborhood cohesion, social interaction, safety, economic prosperity, and general quality of life.

The joint development actions may contribute to secondary social, economic, and environmental impacts. These impacts have already resulted from development activity that has and continues to occur within the area. Development impacts – both beneficial and adverse – would continue to be felt within the area regardless of whether or when the joint development actions are constructed. Efforts to enhance beneficial aspects and minimize adverse effects of development are subject to the existing land use plans/policies and development controls of local jurisdictions. This includes adherence to various rules and regulations associated with comprehensive land use planning, zoning, subdivision regulations, site plan permitting, and building permitting.

4.2.7 Next Step in the Process

As previously described in **Chapter 1 Purpose and Need for Action**, the FHWA proposes to publish this DEIS for the Trinity Parkway as a decision making document regarding transportation improvements in the Trinity Parkway study area. FHWA recognizes there may be integration and coordination issues with foreseeable flood control and lake improvements proposed by the USACE and City of Dallas within the Dallas Floodway, which are further described throughout this DEIS. However, since the Trinity Parkway DEIS includes build alternatives located within and outside the Dallas Floodway, it is not possible to fully determine the degree of integration with other proposed floodway improvements at this time.

The FHWA intends to process the Trinity Parkway DEIS to a point that the locally preferred transportation solution can be determined. At the conclusion of this effort, the following actions can be expected to occur:

1. If a build alternative is identified within the Dallas Floodway, subsequent NEPA documentation, which would further address the lakes, flood control, environmental restoration, and recreational improvements proposed in the Dallas Floodway, would be developed.
2. If a build alternative is identified outside of the Dallas Floodway, FHWA/TxDOT/NTTA would proceed to finalization of the Trinity Parkway FEIS (i.e., an FEIS would be prepared) independent of the proposals by USACE and the City of Dallas in the Dallas Floodway.

3. If No-Build is identified as the preferred alternative, FHWA/TxDOT/NTTA would stop work on the Trinity Parkway DEIS and pertinent study materials would be forwarded to the City of Dallas. The proposals by the USACE and City of Dallas in the Dallas Floodway would not be directly affected by this alternative, and would be processed independently (refer to **Chapter 2 Alternatives Considered** for a complete description of the alternatives evaluated for the proposed action).

These specific development strategies (Options 1, 2, and 3) are further described in a letter to the FHWA prepared and signed by representatives of the NTTA, USACE, and City of Dallas, dated January 29, 2003 (see **Appendix A, Page A-47**). This letter affirms each respective agency's concordance in the proposed strategies for preparation of this DEIS. These strategies were adopted due to the potential complexity and interrelated nature of the "reasonable and foreseeable actions" being considered by these agencies. Once the DEIS comment period has been completed, the above strategies will be reevaluated. These potential joint development projects are fully described in **Chapter 3 Affected Environment**.

Either Option 1 or Option 2 (i.e., a Trinity Parkway build alternative is identified as the preferred alternative) would lead to the publication of a FEIS. Under Option 1, FHWA recognizes that if subsequent NEPA documentation raises substantial unforeseen issues, which affect the transportation analysis, there may need to be some revisions or reevaluation of the transportation sections of the EIS and it is conceivable, in such event, that the interim preferred alternative may need to change. Such a change would include public/agency involvement and be fully disclosed in the FEIS. Completion of the environmental review and impact documentation process, followed by a signed ROD by the FHWA, would permit the proposed action to proceed to the final design and construction phases.

If Alternatives 3A, 3B, 4, or 5 is identified as the locally-preferred alternative for the Trinity Parkway, subsequent NEPA documentaion would provide details concerning the identification of and rationale for selection of the preferred alternative. Once a locally-preferred alternative for the Trinity Parkway has been identified and the city's LPP is finalized, the USACE would determine if there would be a flood damage reduction or ecosystem restoration purpose in which the USACE could participate. This would be accomplished in accordance with NEPA, Engineer Regulation (ER) 200-2-2 (33 CFR 230), ER 1105-2-100 *Planning Guidance Notebook*, and other applicable laws, statutes, EOs, and regulations.

Assuming there would be a federal (USACE) interest (monetary or otherwise) in either of those purposes, then the USACE could be a potential project participant. In addition, the USACE could become an official Cooperating Agency for the EIS pursuant to the Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 CFR § 1501.6). The focus of the Cooperating Agency provisions is to emphasize agency cooperation early in the NEPA process and to integrate the requirements of NEPA and § 404 of the CWA.

As a Cooperating Agency, the USACE can provide its special expertise in wetlands, flood damage reduction, ecosystem restoration, and other mission areas as part of integrated interagency and multi-purpose planning to the FHWA. The USACE would maximize coordination with the FHWA (Lead Agency) along with other resource and cooperating agencies (i.e., EPA) to ensure development of subsequent NEPA documents are prepared in full compliance with NEPA and all other applicable local, state, and federal laws, statutes, EOs, and regulations.

The subsequent NEPA process would include extensive public involvement and a more detailed description of the anticipated social, economic, and environmental impacts associated with these joint development actions, including the USACE's DFE project. Included would be a detailed financial analysis specifying funding sources, estimated costs, cost sharing opportunities, and a project schedule. A preliminary financial analysis and evaluation, which includes the proposed joint development actions is presented in **Chapter 6 Financial Analysis and Evaluation** of this DEIS.

Subsequent NEPA documentation would be circulated for review to federal, state, and local agencies with jurisdiction by law or special expertise and made available to the public for comment. A minimum 45-day comment period is provided from the date the availability notice is published in the *Federal Register*. Agency and public comments must be received on or before the date specified for any subsequent NEPA documentation unless a time extension is granted. After the comment period is completed work may begin on the FEIS.

The FEIS would include the following:

- Identification of the recommended course of action (preferred alternative), and the basis for its recommendation;
- Basic content of any changes, updated information, or additional information as a result of agency and public review;
- Summary and disposition of substantive comments on social, economic, environmental, and engineering aspects resulting from the public hearing/public comment period and agency comments; and
- Resolution of environmental issues and documentation in compliance with applicable environmental laws and related requirements.

NEPA documents are full-disclosure documents that provide descriptions of the proposed action, the affected environment, alternatives considered, and an analysis of the expected beneficial and/or adverse environmental effects. After completion of the environmental review and impact documentation process,

and compliance with agency-specific regulatory policies and procedures, an appropriate signed ROD(s) in accordance with CEQ regulations (40 CFR § 1505.2) would be prepared. Once a ROD(s) has been executed, the proposed action may proceed to the final design and construction phases.

In summary, the Trinity Parkway project presents a unique opportunity for comprehensive, whole corridor joint development among the FHWA, TxDOT, NTTA, USACE, City of Dallas, other participating agencies, and the public. A multi-agency effort would be best with regard to support and implementation of possible endeavors. This would require the participating agencies to work closely together so the Trinity Parkway project affords an opportunity to make a new reliever route compatible with resource agencies' plans and visions.

4.3 SOCIAL IMPACTS

4.3.1 Impacts to Neighborhoods and Neighborhood Districts

4.3.1.1 No-Build Alternative

The Trinity Parkway would not be constructed under this alterative. Therefore, no impacts to neighborhood districts/neighborhoods would occur within the study area. However, the No-Build Alternative may have an impact to neighborhood districts/neighborhoods by the increase in traffic congestion that is expected to occur on local area roadways. As a result, this may result in a detriment to air quality, an increase in noise levels, and a decrease in public safety.

4.3.1.2 Build Alternatives

Several different types of adverse impacts to existing neighborhoods and neighborhood districts are anticipated as a result of the proposed action (see **Table 4-3**). These impacts include relocations/displacements (see **Section 4.5**), community cohesion (see **Section 4.3.2**), proximity effects, such as noise impacts (see **Section 4.15**), visual intrusion (see **Section 4.16**), or increased traffic on local arterials and residential collector streets (see **Section 4.4**). Additional impacts are also described **Section 4.3.3 Environmental Justice Considerations**. It must be noted here that the impacts reported are generalized and may not be uniform for all residences within the neighborhood or residential area. Impacts may be more pronounced or less pronounced depending on the proximity of each residence to a proposed alternative. In addition, noise levels are expected to rise in all neighborhoods that are adjacent, or in proximity, to one of the build alternatives, but only those sites where a noise impact has been identified are reported. For detailed information on what constitutes a noise impact, refer to **Section 4.15 Noise Impacts**.

TABLE 4-3. IMPACTS ON NEIGHBORHOODS AND NEIGHBORHOOD DISTRICTS

Neighborhood or Neighborhood District	Trinity Parkway Build Alternatives					
	2A	2B	3A	3B	4	5
Middle Stemmons/Brookhollow ND						
Residential area east of IH-35E/south of Record Crossing	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T
Trinity Industrial District	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
Brookhollow Industrial Park	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
Lower Stemmons ND						
Design District	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
Market/Technology Center	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
Cedars/Fair Park/East Dallas ND						
South Dallas HOA	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
The Cedars	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T	R, P, V, T
South Dallas ND						
South Dallas HOA	R, P, N, V, T	R, P, N, V, T	R, P, N, V, T	R, P, N, V, T	R, P, N, V, T	R, P, N, V, T
Ideal	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T
Rochester Park	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T	P, N, V, T
West Dallas – West of Hampton ND						
West Dallas HOA	---	---	---	---	P, N, V, T	P, N, V, T
West Dallas – East of Hampton ND						
West Dallas HOA	---	---	---	---	P, N, V, T	P, N, V, T
La Bajada	---	---	---	---	R, P, N, V, T	R, P, N, V, T
North Oak Cliff ND						
Kessler Park	---	---	---	---	P, T	P, V, T
Lake Cliff HOA	---	---	---	---	P, V, T	R, P, V, T,
East Oak Cliff ND	---	---	---		P, N, V, T	R, P, N, V, T

Key to Terms: **R** = relocation(s) anticipated at this location; **P** = proximity effects; **N** = noise impact to one or more residences in neighborhood; **V** = visual intrusion expected to one or more residents of neighborhood; **T** = increased traffic expected on local streets; **---** = no impacts anticipated for alternative.

Notes: Visual intrusion is generally considered to be either the introduction of the highway facility into an area where none existed previously, or the loss of privacy of residents now exposed to motorists traveling on the highway.
ND = Neighborhood District; **HOA** = Home Owners Association

As shown in **Table 4-3**, each of the build alternatives would have some degree of adverse impact on a number of existing neighborhoods or neighborhood districts. In some cases, impacts include the displacement and required relocation of one or more residence, business, or community facility in a neighborhood, and in others proximity is the only impact. In most cases, however, proximity results in multiple impacts including increased noise, visual intrusion, and increased traffic on local streets. The alternatives with the lowest degree of adverse impact to existing neighborhoods or neighborhood districts are Alternatives 2A, 2B, 3A, and 3B. The build alternatives with the highest degree of adverse impacts are Alternatives 4 and 5, with Alternative 5 having the highest degree of all of the build alternatives.

4.3.2 Impacts to Community Cohesion

As previously described in **Section 3.1.2.3**, communities within the Trinity Parkway study area are characterized by varying degrees of cohesion. Strong community cohesion is characterized by extensive interaction among neighbors and friends, participation in community activities and organizations, and involvement in local government and politics. Typically, cohesive communities have several generations of families, extended families, and strong informal (non-governmental) social support networks which can

provide for child care, emergency assistance, and spiritual guidance, among many other possibilities. Transportation and land use changes can have profound effects on community cohesion. People and relationships can be separated by barriers and greater distances, adversely affecting their ability to see and communicate with one another easily. Alternatively, transportation facilities can tie communities more closely together, making it easier for people to interact.

4.3.2.1 No-Build Alternative

If the Trinity Parkway were not built, the potential displacement of residences, businesses and their employees, and public facilities would not occur. If alternative solutions are not developed, and traffic continues to grow as projected, the adjacent communities would experience extensive congestion and a very low level of service. The long-term cohesion of the community at large, as well as the specific neighborhoods through which the congested roadways pass, may be affected by not building the proposed project. Future neighborhoods or neighborhood expansions would develop in accordance with local land use planning policies and zoning requirements.

4.3.2.2 Build Alternatives

The overall impact of the Trinity Parkway project can be expected to have some negative and positive impacts. The construction of a limited access toll facility may make it more difficult for some neighbors to interact because they would have to walk or drive longer distances to see one another. Displacements may cause some community members to move some distance from their present community (see **Section 4.5**). However, no communities would be divided to an extent that would prohibit access or make it extremely inconvenient for community members to continue present relationships.

Residents within the Trinity Parkway study area generally identify with communities (e.g., South Dallas and West Dallas) and neighborhoods, such as Rochester Park, Ideal, Oak Cliff, and La Bajada (see **Section 3.1.3**). The cores of these communities and neighborhoods would remain intact with only minor physical disruption, if any at all, depending on which alternative is identified as the preferred alternative. While some members of the project area communities and neighborhoods may have to travel slightly longer distances to their destinations, the long-term impact of such inconveniences on community cohesion would be minor. People and families which are displaced may move to places more distant from their present communities, but closer to another community. Therefore, the social impacts of the relatively modest number of residential displacements associated with the proposed action would most likely in the long run prove to be minor.

It should be noted that neighborhoods and communities located on both sides of the Dallas Floodway were developed independently of each other. Historically, these communities have been divided by the presence of the Trinity River. Neither of these communities depends on their counterpart for social interaction or access to a localized community facility, and although one or more of the proposed build alternatives is aligned between them, travel from one community to its counterpart would not be restricted. The Trinity Parkway build alternatives would not create a new physical barrier between these communities. However, based on their alignment locations, Alternatives 3A, 3B, 4, and 5 could be viewed as a re-enforcement of the existing physical barrier situated between them – the Dallas Floodway. The primary difference between the six build alternatives is that Alternatives 4 and 5 would have impacts to areas on both the east and west sides of the Dallas Floodway, while Alternatives 2A, 2B, 3A, and 3B would only have impacts to areas located on the east side of the Dallas Floodway.

Community cohesion in the project area may be strengthened in some ways by the Trinity Parkway. Travel times between communities would be reduced, facilitating more interaction among communities surrounding the Dallas CBD. Improved accessibility among communities can lead to a beneficial interchange of ideas and views, and make it possible for people to extend networks of friends, and for more distant relatives to see one another more often.

4.3.3 Environmental Justice Considerations

Overview of EO 12898 and FHWA Order 6640.23

Presidential EO 12898 (1994) requires that each federal agency "shall make achieving environmental justice (EJ) part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…" In a memorandum concerning EO 12898, the President states that federal agencies should collect and analyze information concerning a project's effects on minorities or low-income groups when required by the NEPA of 1969. If such investigations identify that minority or low-income groups experience disproportionate adverse effects, then avoidance or mitigation measures are to be taken.

The FHWA implements the requirements of EO 12898 through FHWA Order 6640.23 *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (1998). Guidance on how to implement EO 12898 and conduct an EJ analysis has also been issued by the President's Council on Environmental Quality (CEQ 1997a). EO 12898 and FHWA Order 6640.23 are primarily a reaffirmation of the principles of Title VI of the Civil Rights Act of 1964 (Title VI) and related statutes, the NEPA of 1969, 23 USC § 109(h), and other federal environmental laws emphasizing the incorporation of those provisions with the environmental and transportation decision making process.

FHWA Order 6640.23 applies the following definitions for minority and low-income populations, which are consistent with the definitions for EO 12898 that have been issued by the federal CEQ and EPA.

Low-Income means a household income at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines.

Minority means a person who is:

- Black (having origins from any of the black racial groups of Africa);
- Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
- Asian-American (having origins from any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); or
- American Indian and Alaskan Native (having origins from any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

Minority Population means any readily identifiable group of minority persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who will be similarly affected by a proposed FHWA program, policy, or activity.

Minority populations were identified based on the federal CEQ's guidance document *Environmental Justice: Guidance Under the National Environmental Policy Act* (CEQ, 1997a). Based on this guidance

> "Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis…"

Low-Income Population means any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed FHWA program, policy, or activity.

Unlike the CEQ guidance (1997a) on minority population, no EJ order or guidance document contains a quantitative definition of how many low-income individuals constitute a low-income population. In the

absence of guidance for this analysis, the measure used to identify low-income populations was the average median household income for the inclusive census tracts and/or block groups. As described above, the FHWA defines low-income as "a person whose household income level is at or below the Department of HHS poverty guidelines." In 2003 (most recent available), the HHS poverty guidelines for a family of four persons was $18,400.

4.3.3.1 No-Build Alternative

The No-Build Alternative does not present any issues regarding EO 12898.

4.3.3.2 Build Alternatives

The following sections comprise the elements of the EJ analysis:

1. Methodology and Approach: how the build alternatives were evaluated for compliance with EO 12898 and FHWA Order 6640.23;
2. Distribution of minority and low-income populations in the project area: the geographic distribution of minority and low-income populations in proximity to the build alternatives, with comparison to larger reference areas;
3. Disproportionate effects analysis: a determination of whether any of the build alternatives may have a disproportionate effect on minority and low-income populations;
4. Extent of adverse effects: for those alternatives affecting populations at issue, a comparison of extent and degree of adversity of potential effects;
5. Public involvement: a description of past and planned public involvement and community outreach activities for the proposed action;
6. Limited English proficiency considerations: the identification of residents in the project area with potential limited English proficiency (LEP);
7. Title VI of the Civil Rights Act of 1964: guidance for evaluating compliance with the EJ order derived by analogy from federal court decisions under Title VI of the Civil Rights Act;
8. Toll road considerations;
9. Mitigation and compensation options; and
10. Summary of environmental justice considerations.

1. Methodology and Approach

The proposed Trinity Parkway build alternatives were evaluated for compliance with EO 12898 and FHWA 6640.23. For this analysis, three evaluation measures were used:

- Identify whether minority or low-income populations exist in the project area. The terms “minority populations” and “low-income populations” were defined. Sources of data used included census data; anecdotal information from coordination with local officials; and public involvement;
- Determine whether the proposed project would have disproportionate effects on minority and/or low-income groups; and
- Identify impacts that would potentially affect any minority and low-income communities of concern and identify mitigation strategies for any identified adverse impacts.

2. Distribution of the Minority and Low-Income Populations within the Project Area

The primary source of demographic data was the 2000 U.S. Census because it is the most comprehensive, complete, and detailed data source currently available. The results of the analysis of minority and low-income conditions within the affected census tracts (see **Plate 3-6**) and reference areas (i.e., City of Dallas and project area) are shown in **Table 4-4**. It should be noted that some persons fall into more than one of these categories. As such, these percentages should not be combined to represent the area population, since doing so would result in duplication. For example, the columns for racial minority populations include all income levels; and low-income populations may be a racial minority, ethnic minority, or any mix of demographic characteristics.

Table 4-4 shows that for the City of Dallas the percentage of minorities ranged from 0.5 percent (American Indian/Alaskan Native) to 35.6 percent (Hispanic or Latino ethnic origin). The median household income for the City of Dallas was $37,628. Within the project area (17 inclusive census tracts), the percentage of minorities ranged from 0.5 percent (American Indian/Alaskan Native and Asian-American, respectively) to 48.5 percent (Black). Persons of Hispanic or Latino ethnic origin comprised 48.2 percent of the project area. The average median household income for the project area was $22,791.

TABLE 4-4. MINORITY AND LOW-INCOME CHARACTERISTICS

Reference Areas						
Census Geography[1]	Total Area Population	Racial Distribution			Percent Hispanic or Latino[2]	Median Household Income[3]
		Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American		
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628
Project Area[4]	60,251	48.5	0.5	0.5	48.2	$22,791
Project Area Census Tract Demographics						
20	7,271	11.2	1.1	0.2	**83.1**	$19,914
33	2,066	13.6	1.6	1.1	**59.5**	$35,375
34	1,460	**73.3**	0.2	0.4	12.9	$22,308
39.02	2,099	**86.4**	0.6	0.0	12.8	**$16,061**
40	1,496	**85.6**	0.1	0.0	12.2	**$15,817**
41	1,440	**74.5**	0.8	0.4	24.0	**$14,341**
42.01	5,449	5.1	0.6	0.6	**66.7**	$37,667
43	2,860	12.8	0.3	2.7	**74.7**	$27,262
86.03	1,687	**51.0**	0.4	0.6	47.1	$20,104
89	2,730	**84.1**	0.3	0.4	14.2	$23,594
100	9,614	42.2	0.9	0.3	17.7	$29,063
101.01	3,766	**60.5**	0.1	0.3	38.9	$19,500
101.02	3,460	4.1	0.9	0.1	**92.2**	$30,341
102	2,356	**76.4**	0.4	0.5	21.5	**$7,094**
105	2,378	**68.0**	0.0	0.0	31.8	$28,058
106.01	5,163	4.7	0.7	0.2	**91.6**	$30,144
115	4,956	**70.9**	0.1	0.2	29.6	**$10,800**

Source: 2000 U.S. Census.

Notes: Bolded areas show project area census tracts with a racial or ethnic minority population greater than 50 percent, or with a median household income at or below the U.S. Department of HHS 2003 poverty guidelines. The HHS 2003 poverty guideline for a family of four persons was $18,400.

1. Census tracts within and/or adjacent to the project area were used to represent the population potentially affected by the proposed action (see **Plate 3-6**).
2. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
3. 1999 median household income as reported in the 2000 Census (most recent available).
4. Average of project area census tracts for racial distribution, Hispanic or Latino ethnic origin, and median household income.

The bolded areas in **Table 4-4** show project area census tracts with minority population densities high enough (i.e., greater than 50 percent) to be considered minority populations based on the CEQ's guidance. Ten tracts (34, 39.02, 40, 41, 86.03, 89, 101.01, 102, 105, and 115) have a Black minority percentage greater than 50 percent and seven tracts (20, 33, 42.01, 43, 100, 101.02, and 106.01) have a lower percentage. In regards to ethnic minority concentrations, six tracts (20, 33, 42.01, 43, 101.02, and 106.01) have a Hispanic or Latino percentage greater than 50 percent and 11 tracts (34, 39.02, 40, 41, 86.03, 89, 100, 101.01, 102, 105, and 115) have a lower percentage. None of the tracts have an American Indian/Alaskan Native or Asian-American minority population greater than 50 percent.

Table 4-4 also shows five tracts (39.02, 40, 41, 102, and 115) with a median household income below the U.S. Department of HHS 2003 poverty guidelines ($18,400) and 12 tracts that are higher (20, 33, 34, 42.01, 43, 86.03, 89, 100, 101.01, 101.02, 102, and 106.01).

In summary, this demographic information would appear to be sufficient to raise an issue of environmental justice with respect to the proposed action, particularly when the population characteristics of several census tracts within the study area have minority populations greater than 50 percent and low-income populations with a median household income below the HHS 2003 poverty guidelines.

The findings presented in **Table 4-4** and described above provide an aggregate look at the environmental justice question as it relates to the Trinity Parkway project area as a whole. Several factors, related to both the requirements of EO 12898 and the nature of the data itself, require a more focused look at the issue. With respect to the census data, the size and configuration of many of these tracts may produce misleading results.

The proposed highway corridor covers approximately 9 miles in length (IH-35E/SH-183 to US-175/SH-310) through a variety of socioeconomic environments. In addition, many of the project area's census tracts have boundaries which extend, in some cases, several miles from the alignment location of one or more of the build alternatives. The total area encompassing the project area census tracts covers approximately 26 square miles. An analysis that merely aggregates the demographic conditions of the entire project area may tend to dilute or exaggerate potential disproportionate conditions within certain segments as well as mask more localized circumstances that could raise legitimate environmental justice concerns.

EPA's guidance document on incorporating environmental justice into NEPA states:

> "…the analysis should focus both on the overall affected area and population and on smaller areas and/or communities within the affected area… Environmental justice concerns may lead to more focused analyses, identifying significant effects that may otherwise have been diluted by examination of a larger population or area" (EPA, 1998).

For these reasons, the analysis focused on sub-areas, or neighborhoods/communities, within the affected corridor wherein potential impacts may appear to be more disproportionate. This was accomplished in the context of the next basic element of the environmental justice analysis, that of determining the potential for disproportionate effects.

3. Disproportionate Effects Analysis

FHWA order 6640.23 provides guidance on determining when a disproportionately high and adverse effect is likely and how to respond if such a finding is made. When determining whether a particular program, policy, or activity

> "…will have disproportionately high and adverse effects on minority and low-income populations, FHWA managers and staff should take into account mitigation and enhancement measures and potential offsetting benefits to the affected minority or low-income populations. Other factors that may be taken into account include design, comparative impacts, and the relevant number of similar existing system elements in non-minority and non low-income areas. FHWA managers and staff will ensure that the programs, policies, and activities that will have disproportionately high and adverse effects on minority populations or low-income populations will only be carried out if further mitigation measures or alternatives that would avoid or reduce the disproportionately high and adverse effects are not practicable. In determining whether a mitigation measure or an alternative is "practicable," the social, economic (including costs) and environmental effects of avoiding or mitigating the adverse effects will be taken into account…"

In accordance with Title VI, EO 12898, and FHWA Order 6640.23, data on the presence of and effects to minority and low-income populations were analyzed at the corridor level to ensure that the proposed action does not subject these populations to a "disproportionately high and adverse effect."

To complete the disproportionate effects analysis, 2000 Census block groups (see **Plate 3-6**) were used as the environmental justice analysis unit to establish the area of potential effect for each build alternative. The demographic characteristics of potentially affected block groups were compared against the City of Dallas demographic thresholds and the 2003 HHS poverty threshold to determine if the build alternatives could have a disproportionate effect on minority and/or low-income populations. The results of these calculations for each alternative are shown in **Tables 4-5** through **4-10**. The bolded areas of the tables indicate those areas where the block group percentages exceed the City of Dallas thresholds or have a median household income below the 2003 HHS poverty threshold ($18,400).

TABLE 4-5. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 2A – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
33/2	516	15.9	**2.9**	0.8	**62.6**	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	**$12,232**
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	1.0	2.2	18.2	$48,750
City of Dallas	**1,188,580**	**25.9**	**0.5**	**2.8**	**35.6**	**$37,628**

Source: 2000 U.S. Census.

Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

TABLE 4-6. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 2B – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
33/2	516	15.9	**2.9**	0.8	**62.6**	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	**$12,232**
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	1.0	2.2	18.2	$48,750
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628

Source: 2000 U.S. Census.

Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

TABLE 4-7. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 3A – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
33/2	516	15.9	**2.9**	0.8	**62.6**	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	**$12,232**
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	1.0	2.2	18.2	$48,750
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628

Source: 2000 U.S. Census.

Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

TABLE 4-8. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 3B – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
33/2	516	15.9	**2.9**	0.8	62.6	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	**$12,232**
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	1.0	2.2	18.2	$48,750
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628

Source: 2000 U.S. Census.

Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

TABLE 4-9. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 4 – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
20/1	305	12.8	0.3	1.0	**83.9**	$20,500
20/2	1,659	25.1	**1.3**	0.2	**64.4**	**$15,877**
33/2	516	15.9	**2.9**	0.8	**62.6**	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	**$12,232**
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
41/1	396	**76.5**	**1.3**	0.0	21.0	**$14,205**
43/1	776	13.8	0.3	**4.5**	**66.5**	$23,950
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	**1.0**	2.2	18.2	$48,750
101.01/1	698	**69.5**	0.1	0.3	29.4	$20,865
101.02/1	1,133	2.2	**0.8**	0.0	**93.5**	$27,159
102/1	2,033	**73.8**	0.4	0.4	24.0	**$6,925**
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628

Source: 2000 U.S. Census.

Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

TABLE 4-10. CENSUS BLOCK GROUPS AFFECTED BY ALTERNATIVE 5 – MINORITY AND LOW-INCOME CHARACTERISTICS

Census Tract/ Block Group	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
20/1	305	12.8	0.3	1.0	**83.9**	$20,500
20/2	1,659	25.1	**1.3**	0.2	**64.4**	$15,877
33/2	516	15.9	**2.9**	0.8	**62.6**	$27,589
34/2	693	**80.8**	0.1	0.0	16.7	$19,444
39.02/2	921	**92.6**	**0.9**	0.0	7.3	$12,232
39.02/3	693	**70.4**	0.4	0.0	28.0	$18,824
40/1	547	**82.1**	0.2	0.0	15.9	**$15,938**
40/2	949	**87.7**	0.0	0.0	10.0	**$15,781**
41/1	396	**76.5**	**1.3**	0.0	21.0	**$14,205**
43/1	776	13.8	0.3	**4.5**	**66.5**	$23,950
100/1	338	**55.0**	**0.9**	2.4	15.7	**$15,208**
100/2	1,021	**77.0**	0.1	0.6	13.9	$29,132
100/3	8,255	**37.4**	**1.0**	2.2	18.2	$48,750
101.01/1	698	**69.5**	0.1	0.3	29.4	$20,865
101.02/1	1,133	2.2	**0.8**	0.0	**93.5**	$27,159
102/1	2,033	**73.8**	0.4	0.4	24.0	**$6,925**
City of Dallas	1,188,580	25.9	0.5	2.8	35.6	$37,628

Source: 2000 U.S. Census.
Note: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

Tables 4-5 through **4-10** show there are several block groups related to each alternative which contain minority and low-income populations that exceed the corresponding City of Dallas thresholds or are below the 2003 HHS poverty threshold. This information is useful in understanding where these populations are located in proximity to each individual build alternative. The next step in the disproportionate effects analysis is to test each build alternative to determine if, in their entirety, they may have a potential disproportionate effect on minority or low-income populations.

Disproportionate Effects Test

The disproportionate effects test is a statistical method used to determine whether a project may potentially result in a disproportionate effect to minority or low-income populations (Shalkowski, 1999). However, the intent of this analysis is not to determine if the potential effects would be beneficial or adverse, but rather to determine if a disproportionately high percentage of minority or low-income persons

could be affected by the build alternatives. This methodology employs a comparative analysis measuring the potentially impacted populations for each alternative within the project area against overall City of Dallas demographic statistics.

The disproportionate effects test examines the affected block groups collectively as a whole for each individual build alternative. The results of this test will determine if any or all of the individual build alternatives may have a disproportionate effect on minority and/or low-income populations. The results for each individual build alternative are shown in **Table 4-11**. This table compares the total percentage of minority and low-income populations within the affected block groups of each alternative against the City of Dallas demographic thresholds and 2003 HHS poverty threshold computed for each EJ population category. The bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or are below the 2003 HHS poverty threshold.

TABLE 4-11. DISPROPORTIONATE EFFECTS TEST

Census Geography	Total Block Group Population	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Median Household Income
City of Dallas Thresholds (HHS Poverty Threshold)		**25.9**	**0.5**	**2.8**	**35.6**	**$37,628 ($18,400)**
Alternative 2A						
BG Totals	13,933	**66.5**	**0.7**	0.7	20.9	$22,544
Alternative 2B						
BG Totals	13,933	**66.5**	**0.7**	0.7	20.9	$22,544
Alternative 3A						
BG Totals	13,933	**66.5**	**0.7**	0.7	20.9	$22,544
Alternative 3B						
BG Totals	13,933	**66.5**	**0.7**	0.7	20.9	$22,544
Alternative 4						
BG Totals	20,933	**54.5**	**0.7**	0.8	**35.7**	$20,744
Alternative 5						
BG Totals	20,933	**54.5**	**0.7**	0.8	**35.7**	$20,744

Source: 2000 U.S. Census. **BG** = Block Group

Notes: Bolded areas indicate the total percentage of population affected by an alternative exceeds the City of Dallas thresholds or is below the 2003 HHS poverty threshold ($18,400).

As shown in **Table 4-11**, the results of the disproportionate effects test for "Asian-Americans" indicate that none of the build alternatives exceed the threshold for this population. Therefore, no further EJ analysis was conducted for this group because there would be no potential for disproportionate effects. **Table 4-11** also shows that the representative low-income populations of the alternatives have an average median household income ranging from $20,744 (Alternatives 4 and 5) to $22,544 (Alternatives 2A, 2B, 3A, and

3B), which is well below the City of Dallas ($37,628). However, because these representative low-income populations are above the 2003 HHS poverty guidelines, no further EJ analysis was conducted for this group because there would be no potential for disproportionate effects.

The bolded areas in **Table 4-11** show that each of the build alternatives have the potential to affect a percentage of the population that slightly exceeds the City of Dallas threshold for the "American Indian/Alaskan Native" category by two-tenths of a percent. **Table 4-11** also shows that Alternatives 4 and 5 have the potential to affect a percentage of the population that slightly exceeds the City of Dallas threshold for the "Hispanic or Latino" category by one-tenth of a percent. For both of these categories, such a small difference is statistically insignificant and, according to FHWA Order 6640.23, would not constitute an effect which is "appreciably more severe or greater in magnitude" than the effect to non-minority populations. As a result, no further EJ analysis was conducted for these groups because there would be no potential for disproportionate effects.

Statistically, each of the build alternatives has the potential for disproportionate effects on "Black" minority populations in several project area block groups. As shown in **Table 4-11**, the Black minority percentages of affected block groups range from 54.5 percent (Alternatives 4 and 5) to 66.5 percent (Alternatives 2A, 2B, 3A, and 3B). These percentages are well above the City of Dallas percentage (25.9 percent) and, therefore, can be considered "meaningfully greater" than the Black minority composition of the general population.

The census block groups with higher densities of Black minorities (as defined above) are located in neighborhood districts/neighborhoods on both sides of the Trinity River. When considered separately, Alternatives 2A, 2B, 3A, and 3B would have the least degree of potential disproportionate effects on Black minority populations. This is because each of these alternatives is located east of the Trinity River and each would affect the same identical block groups. Alternatives 4 and 5 would have the highest degree because a portion of these alignments (i.e., southbound main lanes) are located west of the Trinity River and, therefore, each would affect the same identical block groups on both the east and west sides of the project area. **Plate 4-22** at the end of this chapter shows the location of affected block groups of concern in relation to each build alternative.

The area affected by the build alternatives in census tract 100, block group 1 is a commercial/light-industrial area (Trinity Industrial District). There are no residential areas located near the alternative alignments within this block group. As a result, no further EJ analysis was conducted because no minority or low-income populations in this block group would be disproportionately affected by the build alternatives.

Table 4-12 provides block group-level statistics on minority composition, income level, and related information obtained for each of the project area neighborhoods that would be disproportionately affected by the build alternatives (see **Section 3.1.3 Neighborhoods** and **Plate 3-7** at the end of **Chapter 3** for the location of neighborhood districts/neighborhoods). These neighborhoods are the communities for which an impact analysis was conducted. The bolded areas of the table show the census block groups of concern within each identified neighborhood.

TABLE 4-12. DEMOGRAPHIC CHARACTERISTICS OF AFFECTED NEIGHBORHOODS/CENSUS BLOCK GROUPS OF CONCERN

Neighborhood/ Neighborhood District	Census Tract/ Block Group	Total Pop.	Percent Black	Percent American Indian/ Alaskan Native	Percent Asian-American	Percent Hispanic or Latino	Percent Elderly[1]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent[2]
Middle Stemmons/Brookhollow ND										
Residential area east of IH-35E/ south of Record Crossing	**100/2**	1,021	77.0	0.1	0.6	13.9	19.9	$29,132	$38,600	$426
Cedars/Fair Park/East Dallas ND										
South Dallas HOA	**34/2**	693	80.8	0.1	0.0	16.7	16.2	$19,444	$46,700	$367
South Dallas ND										
South Dallas HOA	**40/1**	547	82.1	0.2	0.0	15.9	18.3	$15,938	$35,600	$423
	40/2	949	87.7	0.0	0.0	10.0	17.5	$15,781	$26,300	$298
Ideal	**39.02/2**	921	92.6	0.9	0.0	7.3	13.1	$12,232	$30,400	$272
Rochester Park	**39.02/3**	693	70.4	0.4	0.0	28.0	11.1	$18,824	$22,100	$257
West Dallas – West of Hampton ND										
West Dallas HOA	**102/1**	2,033	73.8	0.4	0.4	24.0	5.2	$6,925	$37,500	$121
West Dallas – East of Hampton ND										
West Dallas HOA	**101.01/1**	698	69.5	0.1	0.3	29.4	10.3	$20,865	$26,400	$330
East Oak Cliff ND	**41/1**	396	76.5	1.3	0.0	21.0	22.9	$14,205	$24,400	$355

Source: 2000 U.S. Census.

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.

Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. 65-years of age or older.

2. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

ND = Neighborhood District

4. Extent of Adverse Effects

Table 4-57 (Comparison of DEIS Alternatives), presented later in this chapter, provides a summary of environmental impacts of the six build alternatives. The impacts with the greatest relevance to the EJ analysis are relocation/displacements (see **Section 4.5**), noise impacts (see **Section 4.15**), visual

intrusion (see **Section 4.16**), and transportation impacts (see **Section 4.4**). **Table 4-13** shows which build alternatives affect each neighborhood along with the types of impacts anticipated to occur.

TABLE 4-13. POTENTIAL IMPACTS TO AFFECTED BLACK MINORITY NEIGHBORHOODS

Neighborhood/ Neighborhood District	Inclusive Census Tracts/Block Groups	Affected by Alternatives	Types of Impacts
Middle Stemmons/Brookhollow ND			
Residential area east of IH-35E/south of Record Crossing	100/2	All	P, N, V, T
Cedars/Fair Park/East Dallas ND			
South Dallas HOA	34/2	2A, 2B	R, P, V, T
		3A, 3B, 4, 5	P, V, T
South Dallas ND			
South Dallas HOA	40/1, 40/2	All	R, P, N, V, T
Ideal	39.02/2	All	P, N, V, T
Rochester Park	39.02/3	All	P, N, V, T
West Dallas – West of Hampton ND			
West Dallas HOA	102/1	4, 5	P, N, V, T
West Dallas – East of Hampton ND			
West Dallas HOA	101.01/1	4, 5	P, N, V, T
East Oak Cliff ND	41/1	4	P, N, V, T
		5	R, P, N, V, T
Key to Terms: R = Relocation; **P** = Proximity; **N** = Noise; **V** = Visual; **T** = Traffic increase **Notes: ND** = Neighborhood District; **HOA** = Home Owners Association			

Detailed descriptions of the potential impacts are described throughout **Chapter 4 Environmental Consequences**. Based on the results of this analysis, the build alternatives would adversely affect the Black minority populations of the project area as described above. The primary impacts include:

- Acquisition of property;
- Residential and business relocations;
- Increase in traffic at new access road locations;
- Proximity impacts, such as noise and visual intrusion; and
- Construction impacts, such as noise and additional traffic.

As shown in **Table 4-13**, the alternatives with the least degree of adverse impacts to Black minority populations are Alternatives 3A and 3B. The alternatives with the highest degree are Alternatives 4 and 5, with Alternative 5 having the most adverse impacts of all the build alternatives.

5. Public Involvement

Extensive public involvement has been an integral part of the proposed action during the TPC MTIS/DEIS process. The purpose of the public involvement has been to establish and maintain communication with the public and various affected or interested parties. These public involvement activities included a formal DEIS scoping meeting and informal presentations to a wide range of organizations, agencies, and individuals (see **Chapter 10 Comments and Coordination** and **Appendix A2**). A few examples are:

- A formal public scoping meeting held in July 1999;
- A Community Advisory Work Group (CAWG);
- An Interagency Executive Team;
- A project office telephone number;
- Project newsletters;
- Media outreach; and
- Meetings with local institutions, civic groups, business associations, neighborhood groups, and other local organizations.

The Interagency Executive Team is comprised of representatives from local governments, resource agencies, and the project consultant team. The CAWG is comprised of members of the community to provide a broad-based representation of the community at-large. CAWG members have included representatives from project area neighborhoods/districts, the Dallas Black Chamber of Commerce, and Dallas Hispanic Chamber of Commerce (see **Appendix A**). During both the TPC MTIS and DEIS process, public meeting announcements were published in local newspapers, including the *Dallas Weekly*, a local Black citizen newspaper, *El Sol de Texas*, a local Spanish language newspaper, and the *Dallas Morning News*. Additional efforts for public involvement have included meetings and presentations at forums hosted by the City of Dallas, the Dallas City Council, and other civic groups. Future public outreach activities include, but are not limited to:

- A formal Public Hearing;
- Additional Interagency Executive Team and CAWG meetings;
- Project newsletters;
- A project-specific internet web page;
- Media outreach;
- Traveling kiosk;
- Additional meetings with local institutions, civic groups, business associations, neighborhood groups, and other local organizations; and
- Continued coordination with the City of Dallas that is committed to enhancing the Dallas urban environment and improving conditions for its citizens.

During the TPC MTIS/DEIS public involvement process, alternatives have been revised to reflect concerns expressed by neighborhoods (see **Chapter 2 Alternatives Considered**). Comments on alternatives and appropriate options were used to modify or eliminate alternatives. The DEIS build alternatives were identified based on their ability to satisfy the project's purpose and need, goals and objectives, community input, and to minimize the project's social, economic, and environmental impacts.

To date, neighborhood group representatives and individuals from the affected Black minority populations have indicated major issues of concern to be:

- Housing displacements;
- Loss of affordable housing;
- Relocation of businesses;
- Air quality, noise levels, and noise barrier location;
- Increased traffic at the southern terminus location (US-175/SH-310); and
- Construction impacts, such as noise and additional traffic.

These issues have been addressed in this DEIS. As previously described, future public outreach activities are planned and will continue throughout the EIS and design phases of the project. Specific impacts are described throughout this chapter, and proposed mitigation measures are further described in Section 9 *Mitigation and Compensation Options* and **Chapter 7 Mitigation Measures and Commitments**.

NCTCOG Transportation Public Involvement Process

As previously described in **Section 1.10** in **Chapter 1 Purpose and Need for Action**, the NCTCOG MTP *Mobility 2025 – 2004 Update* includes the Trinity Parkway as a major element of the freeway/toll road plan. Public involvement and outreach efforts to reach low-income and minority communities continue to be an important component of the NCTCOG MTP development process. One of the primary goals of the *Mobility 2025 – 2004 Update* plan is to provide a balanced transportation system that is responsive to all residents, including historically underserved populations.

The NCTCOG is committed to incorporating EJ (EO 12898) elements and Title VI (Title VI of the Civil Rights Act of 1964) considerations into its public involvement process. This is accomplished through an EJ and Title VI analysis, which measures mobility and accessibility for the identified protected class populations and non-protected class populations. The plan also reflects the continued recognition of quality-of-life issues and the relationship between community development and transportation in the sustainable development initiatives, which began in *Mobility 2025*.

During the public involvement process, populations that have been traditionally underserved by existing transportation systems, including but not limited to low-income and minority households, are sought out and their needs considered. Other fundamental concepts of EJ included in NCTCOG's policy are to ensure the full and fair participation by all potentially affected communities in the transportation decision making process; and to prevent the denial of, reduction in, or substantial delay in receipt of benefits by minority and low-income populations.

Pursuant to ISTEA/TEA-21 regulations, regular public meetings and outreach efforts are conducted prior to approval of, or amendments to, regional transportations plans (e.g., MTP/TIP). Notifications of public meeting activities are sent to selected newspapers, as necessary, to ensure regional coverage. All public meetings are posted on the Texas Secretary of State *Texas Register* website as part of the open meetings requirement. Public meeting notices are mailed to meeting location facilities, over 90 public libraries, and over 140 city and county offices for posting (NCTCOG, Department of Transportation, 2001a).

6. Limited English Proficiency Considerations

An analysis was conducted to identify residents in the project area that may have LEP, since these residents may not understand outreach materials. This analysis was conducted at the census tract level due to limited available data. The City of Dallas is included for comparison. **Table 4-14** provides a summary of this data.

TABLE 4-14. LANGUAGE SPOKEN AT HOME STATISTICS

Reference Areas			
Census Geography[1]	**Population[2]**	**Percent who Speak only English**	**Percent who Speak a Language Other than English**
City of Dallas	1,188,580	62.9	37.1
Project Area	60,251	56.9	43.1
Project Area Census Tracts			
20	7,271	26.7	**73.3**
33	2,066	44.7	**55.3**
34	1,460	83.4	16.6
39.02	2,099	90.5	9.5
40	1,496	89.7	10.3
41	1,440	75.0	25.0
42.01	5,449	38.6	**61.4**
43	2,860	28.8	**71.2**
86.03	1,687	61.5	**38.5**
89	2,730	87.0	13.0
100	9,614	83.0	17.0
101.01	3,766	65.8	34.2
101.02	3,460	16.9	**83.1**
102	2,356	79.7	20.3
105	2,378	76.8	23.2
106.01	5,163	15.3	**84.7**
115	4,956	74.0	26.0

Source: 2000 U.S. Census.

Notes: Bolded areas indicate project area census tracts with a higher percentage of people who speak a language other than English than the City of Dallas.

1. Census tracts within and/or adjacent to the project area were used to identify potential LEP residents potentially affected by the proposed action.
2. Population age 5 and older.

Table 4-14 shows seven tracts (20, 33, 42.01, 43, 86.03, 101.02, and 106.01) exceed the City of Dallas percentage for persons who speak a language other than English. Ten tracts (34, 39.02, 40, 41, 89, 100, 102, 105, and 115) had a lower percentage. Based on results of the *Disproportionate Effects Analysis* (see **Table 4-11**), none of the seven tracts (or inclusive block groups) described above would be disproportionately affected by the build alternatives.

According to 2000 Census data, of the non-English speaking residents located in the project area, the predominant language spoken is Spanish (37.6 percent). Other representative languages (less than 0.5 percent each) include German, French, Arabic, and Vietnamese. In addition, DISD personnel indicated that project area schools (see **Section 3.1.4**) have English as a Second Language (ESL) programs for both school age children and adults. Languages spoken in project area schools include a wide variety of European, African, and Asian dialects.

A field reconnaissance indicated English was the primary language used for building signage and other forms of posted information and advertisement along areas where impacts are likely to occur. Included were scattered areas of Spanish language signage, postings, and advertisements. These areas were primarily located in the Cedars/Fair Park/East Dallas, West Dallas – East of Hampton, West Dallas – West of Hampton, and North Oak Cliff neighborhood districts.

As previously described, efforts have been made to include all affected communities and populations, including potential minority and low-income populations, in the public involvement and decision making process. Public outreach efforts have included announcements in local English and Spanish media, the CAWG (which included representatives from project area neighborhoods), a public scoping meeting, and neighborhood meetings. Future public outreach activities will include additional announcements in local English and Spanish media, CAWG meetings, neighborhood meetings, public hearings, project newsletters, and a project web site. A proactive public involvement program will continue for the proposed project and all populations affected will have a continuing opportunity to participate in the development of the project.

7. Title VI of the Civil Rights Act of 1964

EO 12898 is an administrative directive to federal agencies and does not create any judicially enforceable rights; therefore, environmental justice proponents also look to the judicial system for guidance. Federal court decisions under Title VI have provided several criteria by which compliance with EO 12898 can be assessed. The following section deals with the application of these Title VI criteria, as well as EO 12898, to the case of the Trinity Parkway.

Among the most important environmental justice criteria that have evolved out of Title VI litigation are the requirements that:

- Defendants justify their actions by showing a legitimate non-discriminatory purpose; and
- Plaintiffs demonstrate that there is a reasonable alternative to the proposed action that is also non-discriminatory.

Due to the demographic composition and spatial distribution of minority populations within the project area, the proposed action would have unavoidable impacts to minority populations regardless of which build alternative may be identified as the preferred alternative. Therefore, the Title VI analysis suggests that it must be demonstrated that a legitimate, non-discriminatory purpose in implementing the proposed action would be achieved. The Title VI criteria would similarly require that the question of whether there is a reasonable, non-discriminatory alternative to the proposed action be addressed.

With respect to the first criterion – legitimate non-discriminatory purpose – there are a number of environmental and transportation issues which have led to the recommendation of the proposed action in this area of Dallas over other transportation alternatives. Throughout the TPC MTIS/DEIS process, the goal has been to minimize impacts on local residents, while accomplishing the primary goal of the roadway: reducing congestion in the Canyon/Mixmaster/Lower Stemmons corridors. The transportation planning, economic, and land use considerations that determined the location for the proposed action are manifest and have been discussed in **Chapter 1 Purpose and Need for Action**. Alternatives that were considered (e.g., mass transit, improvements to existing roadways, etc.) during the TPC MTIS/DEIS process have been discussed in **Chapter 2 Alternatives Considered**.

There are well supported environmental and transportation planning considerations that support the reasonableness of the proposed action. It has been previously demonstrated that other transportation alternatives create direct and indirect community impacts that may be at least as adverse as those of the proposed action. Transportation issues, however, create the strongest reasons for the preference of the proposed action over the other alternatives considered. It has been determined that while contributing to an overall improvement in the performance of the transportation system, these other alternatives – either separately or collectively – are not capable of meeting the purpose of and need for the project.

8. Toll Road Considerations

Consideration is also given to whether there is a disproportionate effect resulting from operation of the Trinity Parkway as a toll road. Generally speaking, because all motorists pay the same toll regardless of their income, the toll for using the Trinity Parkway may constitute a greater burden on lower-income motorists. The estimated cost to travel the Trinity Parkway (approximately 9 miles) is a full-length toll of

$1.00. However, the actual toll to be charged on opening day and beyond has not yet been established and is subject to ongoing consideration by the NTTA.

It should be noted that the toll for any motorist – regardless of income – who chooses to use the Trinity Parkway would constitute only a small portion of the total costs to operate a privately owned vehicle. This is because most motorists already incur a variety of costs including loan payments, vehicle depreciation, fuel, vehicle maintenance, insurance, parking, annual taxes, and state inspection.

Not withstanding these comparative cost considerations, should lower-income motorists choose not to use the Trinity Parkway, they can opt to using toll-free roadways in the area. The network of existing toll-free roadways within the study area is available to motorists who wish to avoid paying tolls (see **Section 3.2 Transportation Setting**).

9. Mitigation and Compensation Options

FHWA Order 6640.23 states that the agency shall identify and avoid disproportionately high and adverse effects on minority and/or low-income populations by

> "…proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse environmental health effects and interrelated social and economic effects, and providing offsetting benefits and opportunities to enhance communities, neighborhoods, and individuals affected by FHWA programs, policies, and activities…"

Due to the high concentration of Black minority populations in the study area (see **Table 4-12** and **Plate 4-22**), consideration of mitigation options is warranted. As previously described, the principal effects of the proposed action on these populations are expected to be relocation/displacements of residences and businesses and proximity impacts (e.g., noise and visual intrusion). When it is determined that a project may have disproportionately high and adverse effects on minority or low-income populations, mitigation and enhancement measures and potential offsetting benefits to the affected minority and/or low-income population should be taken into account. Factors should include design and comparative impacts. The proposed action should only be carried out if further mitigation measures or alternatives that would avoid or reduce any disproportionately high and adverse effects are not practicable. The social, economic, and environmental effects of avoiding or mitigating the adverse effects should be taken into account.

Avoidance of impacts to the identified Black minority groups would require construction of the facility away from the affected population or the recommendation of a No-Build Alternative. Construction of the Trinity Parkway at a different location would result in more severe impacts than the proposed build alternatives. No undeveloped corridor exists in or around the City of Dallas in which a facility could be

constructed with fewer displacements and/or less social disruption than the proposed action. In addition, a location too far removed from the project area would not satisfy the purpose of and need for the proposed action (see **Chapter 1 Purpose and Need for Action**).

The urbanized character of Dallas and north central Texas would preclude the construction of a facility without newly dividing communities or displacing more residents than the proposed build alternatives. Based on the demographic composition and spatial distribution of people in the City of Dallas and Dallas County, any construction of the Trinity Parkway on a different location would likely impact minority and/or low-income populations. As currently proposed, construction of the Trinity Parkway would result in displacements on the edges of residential neighborhoods along the build alternatives. While the build alternatives would result in social impacts to residents displaced and to those remaining, the impacts would be fewer and of less magnitude than if the facility were to be constructed at a different location.

The No-Build Alternative would avoid the impacts of the build alternatives, but would not provide:

- Access to neighborhoods to facilitate new development;
- Aesthetic improvements, such as landscaping;
- Access/service roads that would facilitate improved transit; or
- Sidewalks and/or trails.

Implementation of the build alternatives would result in some beneficial impacts, including:

- Improved access to some neighborhoods;
- The opportunity for improved transit;
- Sidewalks and/or trails adjacent to access roads for pedestrians/bicyclists; and
- Landscaping.

Offsetting benefits of implementation of the proposed build alternatives would include improved access, opportunity for improved transit, and the addition of sidewalks and/or trails. Mitigation in the form of landscaping, sidewalks/trails, and aesthetic improvements would be included in the project. This would be accomplished by adhering to the concepts and principles of FHWA's "Context-Sensitive Design" (CSD) approach. The CSD approach seeks to enhance the positive values of both the local community and the natural environment. CSD provides community benefits as it seeks to:

- Incorporate feedback from the local populace affected by proposed transportation facilities;
- Encourage collaboration between neighborhoods and local, state, and federal public officials;
- Enhance not only the roadway and transit communities, but the bicycle and pedestrian communities as well;
- Assist in the development of strategies for smart growth or sustainable development;
- Encourage assessments and design of alternatives consistent with local needs; and
- Help effectively merge transportation, engineering, architectural, historical, and natural environmental systems into transportation decision-making.

CSD contributes to community, safety, and mobility. It is a collaborative approach to developing and re-designing transportation facilities that fit into their physical and human environment while preserving its aesthetic, historic, community, and environmental values.

Those displaced would be relocated to decent, safe, and sanitary housing with assistance in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. More information about how this would be accomplished is provided in **Section 4.5 Relocation and Displacement Impacts** and **Appendix C Displacement/Relocation Assistance information**.

Other possible mitigation measures or offsetting benefits that could directly improve conditions at these locations include implementation of noise abatement measures, such as noise walls, if a determination is made that such measures are effective, reasonable, and feasible (see **Section 4.15**). The final decision to construct any proposed noise barrier would be made upon completion of the final design for the proposed action and the public involvement process.

Another possible mitigating measure would be the inclusion in the Trinity Parkway design of aesthetic enhancements along stretches of the right-of-way. The enhancements might include upgrades in the design and construction of retaining walls that improve their aesthetic appearance, including selection of wall materials, lighting, manipulation of structural design, and the use of native vegetation for the purposes of softening and enriching the wall surfaces. Similar improvements could be incorporated into the design of bridge structures and open areas underneath the elevated sections. These enhancements have been employed in and around the City of Dallas (e.g., President George Bush Turnpike and US-75 Central Expressway) and have generally met with positive responses by neighboring residents.

Plate 4-23 shows a conceptual representation of the southern terminus area (US-175/SH-310) where enhancements are proposed to mitigate community impacts. Included are proposed noise barrier wall locations, bicycle/pedestrian access improvements, and landscaping improvements. As previously described throughout this DEIS, this area is common to all build alternatives and would be affected no

matter which build alternative may be identified as the preferred alternative. Similar mitigation enhancements would be developed for any additional locations where mitigation is deemed warranted, such as the Black minority areas located west of the Dallas Floodway. It should be noted that the features shown on **Plate 4-23** are conceptual in nature and may be revised based on community input and prior to the project's ROD.

Potential mitigation measures planned for the proposed action may be eligible for funding and implementation through the DOT's TE program (see **Section 7.9 Potential Mitigation Enhancements**). These and other possible mitigation measures would be further considered by FHWA/TxDOT/NTTA with the solicited involvement of neighborhood residents and other interested parties, during and after the public hearing on this DEIS.

10. Summary of Environmental Justice Considerations

The proposed Trinity Parkway build alternatives were evaluated for compliance with EO 12898 and FHWA 6640.23. As discussed in the *Methodology and Approach* section above, a three-tiered approach was used to support a determination:

- Identify whether minority or low-income populations exist in the project area. The terms "minority populations" and "low-income populations" were defined. Sources of data used included census data; anecdotal information from coordination with local officials; and public involvement.
- Determine whether the proposed project may have disproportionately high or adverse effects on minority and/or low income groups.
- Identify impacts that would potentially affect any minority and low-income communities of concern and identify mitigation strategies for any identified adverse impacts.

As reported in the series of impact evaluations prepared for this DEIS, the project has the potential for disproportionate impacts on certain Black minority populations within the project area; however, based on the results of the analysis in this section, no disproportionate impacts are expected. With the proposed mitigation, it is anticipated that the impacts would be adequately mitigated and, therefore, would not be high or adverse. The proposed action is similarly consistent with Title VI of the Civil Rights Act in that there is no evidence of discriminatory intent or effect. The proposed action offers the possibility of long-term benefits to these areas and their residents.

Based on appropriate and adequate mitigation resulting in no disproportionately high or adverse impacts, the analysis concludes that the Trinity Parkway project can therefore be considered consistent with the policy established in EO 12898 and FHWA Order 6640.23.

4.3.4 Impacts to Various Community or Public Resources

4.3.4.1 No-Build Alternative

The No-Build Alternative could have indirect adverse effects on community and public resources within the Trinity Parkway study area. Increases in traffic congestion and travel delays could have adverse effects for schools, emergency services, recreational facilities, and businesses as mobility and access within the study area worsen. School buses and emergency service vehicles could experience increasing amounts of delay.

4.3.4.2 Build Alternatives

Several different types of adverse impacts to community and public resources may occur as a result of the proposed action. These impacts may include relocations, proximity effects, noise impacts, visual intrusion, or increased traffic on local arterials and residential collector streets (see **Table 4-15**). The impacts reported here are generalized and would not be uniform for all of the community or public resources specified. Impacts may be more pronounced or less pronounced depending on the proximity of each resource to a proposed alternative. In addition, noise levels are expected to rise near all resources that are adjacent, or in close proximity to, one of the build alternatives, but only those sites where a noise impact has been identified are reported. For detailed information on what constitutes a noise impact, see **Section 4.15 Noise Impacts**.

The impacts to community and public resources range from direct building impacts and relocations (see **Section 4.5**) to indirect proximity impacts such as noise (see **Section 4.15**), visual intrusion (see **Section 4.16**) and increased traffic on adjacent streets (see **Section 4.4**). Alternative 5 has the most community/public building relocations with four facilities impacted (seven buildings displaced). Alternative 2A has two facilities impacted (three buildings displaced) and Alternative 2B has three facilities impacted (five buildings displaced). Alternatives 3A, 3B and 4 have no community/public building relocations.

TABLE 4-15. POTENTIAL IMPACTS TO COMMUNITY OR PUBLIC RESOURCES

Plate ID No.	Facility	Address	Trinity Parkway Build Alternatives					
			2A	2B	3A	3B	4	5
Police and Fire Facilities								
1	Lew Sterrett Justice Center Parking Garage	133 N. Industrial Boulevard	P, V, T	P, V, T	P, V, T	P, V ,T	P, V, T	P, V, T
1A	Lew Sterrett Justice Center Gas Pump Building	111 W. Commerce	R	R	---	---	---	---
3	Fire Station No. 1	1901 Irving Boulevard	R (1 Bldg.)	R (1 Bldg.)	P, V, T	P, V, T	P, V, T	P, V, T
Schools/DISD Facilities								
9	Priscilla L. Tyler Elementary School	2333 Calypso Street	---	---	---	---	P, V, T	P, V, T
6	DISD Facility (Storage and Maintenance Facility)	3701 South Lamar	R (2 Bldgs.)	R (4 Bldgs)	P, V, T	P, V, T	P, V, T	P, V, T
Community and Recreation Centers								
14	West Dallas Community Center	2215 Canada Drive	---	---	---	---	P, V, T	P, V, T
Places of Worship								
21	Trinity Valley Church of God in Christ	2043 Canada Drive	---	---	---	---	P, V, T	P, V, T
22	Dallas 7th Day Adventist	2050 Canada Drive	---	---	---	---	P, V, T	P, V, T
24	Canada Drive Christian Church	2035 Canada Drive	---	---	---	---	P, V, T	P, V, T
25	Macedonia Baptist Church	1967 Canada Drive	---	---	---	---	P, V, T	P, V, T
26	Canada Drive Church of God in Christ	1833 Canada Drive	---	---	---	---	P, V, T	P, V, T
27	Leath Street Baptist Church	1831 Canada Drive	---	---	---	---	P, V, T	P, V, T
30	Victory Mission Baptist Church	2313 Canada Drive	---	---	---	---	P, V, T	P, V, T
41	Shiloh Missionary Baptist Church	1114 Comal Street	---	---	---	---	P, V, T	P, V, T
Pump Stations/Offices								
LO	City and County Levee Operations – Levee Operations Office	2255 Irving Boulevard	P, V, T	R (1 Bldg.)	---	**---**	---	---
A	City and County Levee Operations – Pump Station A	699 South Irving Boulevard	P, V, T	P, V, T	---	**---**	---	R (2 Bldgs.)
B	City and County Levee Operations – Pump Station B	2255 Irving Boulevard	P, V, T	P, V, T	---	**---**	---	R (2 Bldgs.)
C	City and County Levee Operations – Pump Station C	600 East Brazos	---	---	---	**---**	---	R (1 Bldg.)
D	City and County Levee Operations - Pump Station D	Westmoreland/Hamilton Sump Area (West Levee)	---	---	---	**---**	---	R (2 Bldgs.)

Key to Terms: **R** = relocation(s) anticipated at this location; **P** = proximity effect; **N** = noise impact; **V** = visual intrusion; **T** = increased traffic expected on local streets; **---** = no impacts anticipated for alternative.
Note: Plate ID numbers correspond with **Table 3-8** and **Plate 3-8 in Chapter 3** and **Plates 4-1** through **4-6** in **Chapter 4**.

Table 4-15 shows that each of the build alternatives would have some degree of adverse impact on a number of community and/or public resources. In some cases, impacts include the displacement and required relocation of one or more facilities, and for others proximity is the only impact. In most cases, however, proximity of the alternative results in multiple impacts including increased noise, visual intrusion, and increased traffic on local streets. Depending on the preferred alternative identified, many of these community and/or public resources, especially places of worship, may benefit somewhat due to increased visibility from the proposed major transportation facility.

4.4 TRANSPORTATION IMPACTS

The Trinity Parkway is a proposed north-south reliever route that would serve as an alternate route around downtown Dallas. Currently, the major north-south route in the study area is IH-35E, located east of the proposed Trinity Parkway. Based on traffic models, if the Trinity Parkway is not built as currently proposed, congestion on alternative routes in this section of Dallas would continue to rise (see **Section 4.4.1.1**). The existing IH-35E is a parallel highway facility, which already operates with unacceptable levels of congestion during peak commuting periods. As previously described in **Chapter 1 Purpose and Need for Action**, drivers would be required to tolerate more congestion and longer travel times if the Trinity Parkway is not built.

The information in this section is primarily based on the MTP *Mobility 2025 – 2004 Update*. The *Mobility 2025 – 2004 Update* plan recommends a complete metropolitan transportation system and serves as a guide for the expenditure of state and federal funds for the region through the year 2025. *Mobility 2025 – 2004 Update* was developed in accordance with the planning requirements established in the ISTEA of 1991, TEA-21, and the CAAA of 1990.

This section describes the impacts of the proposed action on the transportation system (see **Section 3.2 Transportation Setting**). Roads and highways, public transportation, freight activities, and pedestrian/bicycle issues are discussed in the following sections. Although each of these elements plays an important role in making up the overall use characteristics of the transportation system, each has unique characteristics and requirements. Included are discussions concerning the anticipated impacts related to traffic and public safety, travel patterns and accessibility, and toll road effects.

4.4.1 Roads and Highways

Any of the six build alternatives would have a similar impact on road and highway travel in the Trinity Parkway study area. The following sections describe the impacts the build alternatives would have on traffic volumes, congestion levels, safety, and general roadway system performance in the project study area.

4.4.1.1 Traffic Volumes

The traffic study completed for this project developed 2025 traffic volume projections based on *Mobility 2025 – 2004 Update* for the build alternatives using the DFWRTM. This model was validated to existing traffic volumes on the roadway network throughout the DFW area and then was used to project future traffic conditions for the Trinity Parkway under the alternative scenarios described in **Chapter 2**

Alternatives Considered. Forecasts generated by this model are based on population, employment, and land use projections developed by the NCTCOG and used in all of the region's transportation planning activities. To determine LOS, the model first calculates a peak-hour volume based on an average weekday travel forecast along with appropriate time-of-day, directional, and heavy vehicle factors. This volume is then used to define the lane warrants, using LOS E as the minimum acceptable LOS.

The No-Build Alternative and the build alternatives assume that all programmed projects are completed by the year 2025. These projects include improvements to the Canyon/Mixmaster/Lower Stemmons corridors (i.e., Project Pegasus) as well as other transportation improvement projects previously described in **Chapter 1 Purpose and Need for Action** and **Chapter 3 Affected Environment** (**Section 3.2 Transportation Setting**). The No-Build Alternative provides a point of comparison for evaluating the effects of constructing the Trinity Parkway. **Table 4-16** shows the existing and projected traffic volumes along with LOS characteristics for the No-Build Alternative and six build alternatives.

TABLE 4-16. EXISTING AND PROJECTED TRAFFIC VOLUMES AND LOS

Roadways	Existing Conditions (2000)		No-Build Alternative (2025)		Trinity Parkway Build Alternatives (2025)					
					2A, 2B		3A, 4, 5		3B	
	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS
IH-35E										
North of SH-183	148,000	E	184,300	F	118,600	D	118,200	D	119,700	D
SH-183 to DNT	279,000	E	354,800	F	283,800	E-F	280,300	E-F	283,800	E-F
DNT to IH-30	299,000	F	365,300	F	216,600	E-F	214,000	E-F	216,900	E-F
South of IH-30	203,000	E-F	218,800	F	227,000	E	216,600	D-E	217,600	D-E
IH-30										
West of IH-35E	151,000	E-F	184,900	F	154,200	E	169,700	E	170,000	E
East of IH-35E	172,000	E-F	205,000	F	253,000	F	233,300	E-F	230,500	E-F
East of IH-45	208,000	F	250,700	F	288,100	F	286,700	F	287,700	F
SH-183										
West of IH-35E	130,000	E-F	193,600	F	282,500	E	240,700	E	236,600	E
US-175										
East of SH-310	72,000	E-F	117,000	F	130,600	F	127,900	E	130,800	E
North of SH-310	70,000	D-E	93,000	E-F	20,500	A	21,900	A	22,100	A
IH-45										
North of Trinity River	128,000	F	118,600	F	137,100	E	121,600	D	121,100	D
US-75										
North of IH-30	160,000	E-F	213,600	F	179,300	D-E	217,700	D-E	197,100	D-E
North of Woodall Rodgers	194,000	F	286,200	E-F	220,900	F	198,000	F	217,500	F
Industrial Boulevard										
North of Woodall Rodgers	30,000	F	39,700	F	7,600	B	12,700	B	12,600	B
Irving Boulevard										
West of Sylvan Avenue	19,000	C	16,800	D	28,600	C	31,200	D	28,700	C
West of Westmoreland	32,000	D	34,600	D	30,600	C	33,300	D	34,700	D
Trinity Parkway										
Commonwealth to Hampton/Inwood	---	---	---	---	108,600	E	109,900	E	91,000	D
Hampton/Inwood to Wycliff/Sylvan	---	---	---	---	95,500	D	98,200	E	97,200	E
Wycliff/Sylvan to Woodall Rodgers	---	---	---	---	116,000	E	112,700	E	105,700	D-E
Woodall Rodgers to Houston/Jefferson	---	---	---	---	114,200	E	109,200	E	82,700	D
Houston/Jefferson to Corinth	---	---	---	---	93,300	E	102,700	E	93,300	E
Corinth to MLK	---	---	---	---	110,400	D	98,300	E	89,600	D
MLK to IH-45	---	---	---	---	110,300	D	102,800	D	112,500	D
IH-45 to US-175	---	---	---	---	130,600	D	127,900	C	130,800	C

Source: WSA, 2000; NCTCOG, 2003. **ADT** = Average Daily Traffic; **LOS** = Level of Service; **---** = None

Table 4-16 shows that the Trinity Parkway provides congestion relief benefits within the study area where traffic, mobility, and access issues are the most acute. When compared to the No-Build Alternative, each build alternative provides congestion reduction for major north-south roadways in the study area (i.e., IH-35E and Industrial Boulevard). For instance, traffic volumes on IH-35E, from the DNT to IH-30, would be reduced ranging from 148,700 ADT (Alternatives 2A and 2B) to 151,300 ADT (Alternatives 3A, 4, and 5).

Although each of the build alternatives have common termini and are similar in terms of overall length, the differences in interchange locations and configurations accounts for the primary differences in traffic projections between alternatives (see **Chapter 2** and **Section 4.4.6**).

Table 4-16 also shows a projected increase in traffic on US-175 ranging from 10,900 ADT (Alternatives 3A, 4, and 5) to 13,800 ADT (Alternative 3B) compared to the No-Build Alternative. This can be attributed to the Trinity Parkway because it would provide a regionally important connecting link to US-175 at SH-310. This connection creates an attractive and more efficient way for motorists traveling to and from communities in South Dallas, southern Dallas County, and beyond to access the major roadway network within the study area and surrounding the Dallas CBD. In contrast, traffic volumes on US-175 (SM Wright Freeway) north of SH-310 would be substantially reduced. With the Trinity Parkway in-place, the major bottle neck that occurs for motorists traveling between US-175 (CF Hawn Freeway) and US-175 (SM Wright Freeway) would be substantially improved.

4.4.1.2 Congestion

Substantial growth in area traffic volumes by the year 2025 would result in increased capacity deficiencies on the area transportation system. As shown in **Table 4-16**, under the No-Build Alternative both IH-35E and IH-30 are projected to operate at LOS F conditions during the peak hour. All of the Trinity Parkway build alternatives would reduce congestion on IH-35E, IH-30, and other major highways in the study area. Congestion on the major arterial streets would also improve, due to local street and access road improvements associated with the proposed action.

Additional TSM improvements to the local transportation system, although not sufficient by themselves to solve the congestion problem in the region, would further reduce traffic congestion. TSM strategies include better access and land use management to reduce turning movement conflicts and optimizing traffic signals to accommodate changes in traffic patterns after the facility was built. **Table 1-8** in **Chapter 1** provides a summary of the various TSM improvements and additional CMS strategies (i.e., signalization/intersection improvements, pedestrian/bicycle facilities, rail transit, ITS, HOV, etc.) programmed for the Trinity Parkway study area.

4.4.1.3 Measures of Effectiveness

The DFWRTM provides methods to measure the effectiveness to describe the existing and future performance of the roadway network throughout the study area. Measures of Effectiveness (MOEs) include the total daily VMT, total daily vehicle-hours of travel (VHT), average travel speed (mph),

congestion delay (vehicle-hours), and the percent of lane miles at LOS E or F. **Table 4-17** shows MOEs calculated for the Trinity Parkway study area roadway network.

TABLE 4-17. MEASURES OF EFFECTIVENESS

MOE [1] Parameter	2025 No-Build	2025 (Alts. 2A, 2B)	2025 (Alts. 3A, 4, 5)	2025 (Alt. 3B)
Vehicle Miles of Travel [2]	15,690,135	16,173,272	16,204,436	16,196,542
Vehicle Hours of Travel [3]	484,959	474,644	474,619	475,878
Average Speed (mph) [4]	32.35	34.07	34.14	34.04
Lane Miles	2,417	2,470	2,479	2,486
Congestion Delay (vehicle-hours) [5]	105,024	97,683	96,912	97,565
Percent Lane Miles at LOS E or F [6]	42.34	38.14	38.58	38.45

Source: NCTCOG DFWRTM. **LOS** = level of service; **mph** = miles per hour

Notes:
1. MOEs focus on the identified project needs and also provide a method to determine the degree that traffic conditions, such as congestion and mobility, can be improved by each of the build alternatives.
2. VMT = the total number of miles driven by all vehicles in the area on an average day.
3. Vehicle Hours of Travel (VHT) = the total time spent driving vehicles in the area on an average day.
4. Average Speed (mph) = VMT divided by the VHT.
5. Congestion Delay (vehicle hours) determines whether vehicles are experiencing substantial delays on the roadways and gauges the degree that congestion can be reduced by the various alternatives.
6. Percent Lane Miles at LOS E or F = percent of lane miles operating in congested conditions at LOS E or F.

As shown in **Table 4-17**, the total VMT would increase in 2025 for all of the alternatives, including the No-Build Alternative. As expected, the VHT would also increase for all of the alternatives. This reflects the increased demand and limited supply of transportation facilities in the study area. The No-Build Alternative would have less VMT because of the increased congestion on the roadway network. Due to the increased congestion, traffic would move slower and people would spend more time in their vehicles, yet still travel a shorter distance. Using the average speed as the MOE, all of the build alternatives were determined to be nearly equivalent.

4.4.2 Public Transportation

DART provides bus and rail transit service throughout the study area (see **Section 3.2 Transportation Setting**). In addition, Amtrak operates passenger rail service through the study area. Taxi service is provided on demand. None of the build alternatives would have any substantial adverse impact on DART operations or taxi service providers in the study area. All of the build alternatives would improve travel times into and out of the study area for transit service or taxis. The build alternatives would provide a new facility for buses and taxis, thus expanding the existing transit service in the study area. In addition, the build alternatives create potential alternative routes for transit service near the US-175/SH-310 interchange, which may provide an increased opportunity for additional transit service in this portion of the study area. Each build alternative would improve travel times by reducing congestion through the creation of alternative routes and additional capacity in the study area.

Low-income residents within the study area who rely on public transportation or who may be eligible for ride subsidies or "welfare-to-work" programs may also benefit from the Trinity Parkway. Access to jobs located within and outside the study area would be improved by each build alternative.

4.4.3 Movement of Freight

All of the build alternatives would generally improve conditions for the various types of freight traffic within the study area in comparison to the No-Build Alternative. This includes through rail freight; through truck freight on IH-35E, IH-30, US-75, IH-45, and other major routes; and local delivery truck traffic.

4.4.3.1 Trucking

IH-35E, IH-30, IH-45, and other major roadways are heavily traveled routes for freight truck movements. IH-35E is a part of the NAFTA Superhighway from Mexico to Canada. Reduced congestion on IH-35E would allow NAFTA-related commercial truck traffic to travel more quickly and efficiently through the study area. Because the Trinity Parkway is being planned as a toll facility, it is expected that the majority of trucks would continue to utilize IH-35E and other major freeways and arterials to travel into and out of the study area. However, the prohibition of heavy trucks is being considered for this project, which would require approval by the Dallas City Council. If heavy trucks were prohibited, truck traffic would continue to use the existing roadway system in the study area.

4.4.3.2 Freight Railroads

All of the build alternatives would cross existing railroad lines in the study area. At all such crossings, the Trinity Parkway mainlanes would be grade separated from the rail lines to ensure no interruption of rail service and no conflicts between trains and motor vehicles. None of the build alternatives would have any substantial impact on freight railroad operations through the study area.

4.4.4 Bicycle/Pedestrian

Bicycle and pedestrian facilities would be enhanced by the Trinity Parkway build alternatives. Many of the proposed bicycle/pedestrian facilities in the study area are being planned and may be developed concurrently with the proposed action (see **Section 3.3.2.3**). Sections of the Trinity Parkway with adjacent access roads may also have pedestrian walkways (i.e., sidewalks) within the right-of-way, outside of the access road. In other areas where existing or proposed sidewalks would be crossed by the Trinity Parkway right-of-way, provisions for safely connecting the walkway on either side of the facility would be considered. Any new pedestrian facilities, including pedestrian signals, would be in compliance

with the Americans with Disabilities Act (ADA). Additional pedestrian walkways/bicycle trails may be added to the Trinity Parkway right-of-way through partnerships between local sponsors and the NTTA.

4.4.5 Traffic and Public Safety

Some traffic safety improvements can be expected to occur as a result of making planned transportation improvements within the study area. However, by not constructing the proposed action, traffic congestion on IH-35E, IH-30, and other major roadways would continue to worsen. The accident rate for certain sections of these roadways can also be expected to remain unacceptably high, or possibly worsen, under the No-Build Alternative.

The proposed action would have an overall beneficial impact on the level of public safety in the study area. This improvement in public safety would be attributable to the diversion from local roads of motorists who would opt for the greater convenience and faster travel time of the new tollway. Similarly, any reduction in peak, weekday, weekend, and holiday local and non-local auto traffic on existing area roads would have beneficial public safety implications for the local area. Management of congestion on local roads could facilitate a reduction in response time for police, fire protection, and medical services.

Chapter 1 Purpose and Need for Action presented data from TxDOT that suggested reduced congestion could contribute to a decrease in traffic accidents along major roadways, such as the Canyon/Mixmaster/Lower Stemmons corridors (i.e., Project Pegasus). Safety for slow-moving vehicles (e.g., bicycles) and pedestrians would also increase on existing roadways as fast-moving traffic would be directed to the Trinity Parkway.

4.4.6 Travel Patterns and Accessibility

Travel patterns within the study area would remain largely unchanged if the proposed action is not constructed. This would result in a continuation of vehicular travel delays and access constraints that currently characterize the Trinity Parkway study area. Under the No-Build Alternative, the insufficient and underdeveloped transportation network within the study area would continue to pose mobility and access constraints. The adverse effect of impaired mobility in the study area would continue to be felt mainly by residents, commercial establishments, and other interests in the form of increased commute time and other costs of congestion. The lack of accessibility to key public facilities and centers of economic activity negatively affects interests located for the most part outside of the study area. This includes residents and commercial transporters trying to get to and from major regional transportation facilities, such as Dallas Love Field and DFW International Airport; major tourist and visitor destinations, such as the West End Historic District and Dallas Convention Center; and major business and employment centers

throughout the DFW metropolitan area. Additionally, the No-Build Alternative fails to address congestion and safety concerns, resulting in a negative impact on regional communities and a negative impact on IH-35E's ability to function efficiently as a national and international trade corridor.

The build alternatives offer improvements to travel patterns and accessibility within the study area. As an alternate route to IH-35E, especially in the more congested areas, the Trinity Parkway would present an attractive option for regional travel. Access to regional destinations would be improved by all of the build alternatives. Many of the vehicle trips bound for regional destinations that currently rely on IH-35E and other local roadways would have a convenient alternative in the Trinity Parkway, especially those trips that originate from the Dallas CBD and the communities, and towns/cities located south of the downtown area. Also, access to major employment centers in the study area would be improved by the Trinity Parkway.

Each of the build alternatives would cross numerous existing roadways. The highway design incorporates some form of connection or interchange on most of these intersections to provide uninterrupted service on existing roadways. Some alternative connections to existing roadways were not carried forward primarily due to right-of-way and engineering constraints, excessive costs, impacts to residential/commercial properties, and other socioeconomic and environmental effects. Of the relatively smaller roadways that are not provided with bridges or interchanges, connections are provided via access roads in order to maintain property access.

Finally, the Trinity Parkway would improve access for emergency vehicles responding to calls within the study area. In some instances, the new roadway would provide access into and out of the study area with a more direct and rapid route for emergency vehicles. In addition, NTTA policies permit the toll-free use of toll lanes by emergency vehicles in emergencies.

4.5 RELOCATION AND DISPLACEMENT IMPACTS

This section describes the potential relocation and displacement impacts for each of the Trinity Parkway alternatives. Displacements were determined from project mapping and aerial photography with alignment overlays. Impacts were confirmed through field inspections in the project area. Demographic characteristics of neighborhoods and their corresponding census block groups are provided in **Section 4.5.1.2**.

The NTTA/City of Dallas would provide relocation advisory assistance to any person, business, or non-profit organization displaced as a result of the acquisition of real property for public use. This would be

done in accordance with the Uniform Relocation Assistance and Real Property Acquisition Polices Act of 1970, as amended (see **Section 4.5.2**).

4.5.1 Estimated Number and Description of Relocations or Displacements

4.5.1.1 No-Build Alternative

The No-Build Alternative would not result in the displacement of any existing residence, business, or other type of facility; therefore, no relocations are required with this alternative. However, projects planned by others within the study area may have displacement/relocation impacts.

4.5.1.2 Build Alternatives

Table 4-18 summarizes the displacement impacts of each build alterative on existing buildings in the project area. Impacts are characterized by potentially displaced single-family residential buildings, commercial/industrial buildings, community/public facilities, schools, places of worship, and cemeteries. No schools, places of worship, or cemeteries would be displaced by any of the project alternatives. Additional details concerning impacts to community/public facilities are provided in **Section 4.3.4**. **Plates 4-1** through **4-6** show the location of anticipated building displacements for each alternative. **Table C-1** in **Appendix C** provides a list of building displacements by address.

TABLE 4-18. ESTIMATED NUMBER AND DESCRIPTION OF DISPLACEMENTS

Alternative	Residential Building	Commercial/ Industrial Building[1]	Community / Public Facility[2]	School	Places of Worship	Cemetery	Total
2A	13	281	3 (4)	---	---	---	297
2B	9	234	4 (7)	---	---	---	247
3A	8	23	---	---	---	---	31
3B	8	31	---	---	---	---	39
4	13	26	---	---	---	---	39
5	24	35	4 (7)	---	---	---	63

Notes: --- = no impact
1. The number of displaced buildings/structures is shown in this table; however, the number of individual businesses displaced may be higher due to multiple tenants in some buildings.
2. The first number is the number of facilities where a displacement occurs. The number in parenthesis is the total number of buildings displaced at these facilities.

As shown in **Table 4-18**, each of the build alternatives would result in varying degrees of residential and commercial displacements. For residential displacements, seven are common to all build alternatives. These are located near the southern terminus along Colonial Avenue and Starks Street between Lamar Street and US-175 (southern terminus). In addition to this common area, residential displacements occur as follows:

- Alternative 2A has two additional residential displacements at the south end along Colonial Avenue, three along Parnell Street near Lamar Street, and one at Metropolitan Avenue and Lamar Street. Alternative 2A has a total of 13 residential displacements.

- Alternative 2B has two additional residential displacements at the south end along Colonial Avenue (same displacements as Alternative 2A). Alternative 2B has a total of nine residential displacements.

- Alternatives 3A and 3B have one additional residential displacement at the south end along Colonial Avenue. Alternatives 3A and 3B each have a total of eight residential displacements.

- Alternative 4 has one additional residential displacement at the south end along Colonial Avenue (same displacement as Alternatives 3A and 3B). Alternative 4 also has five residential displacements along Gulden Lane, located west of the west levee at the Canada Drive/Beckley Avenue and Continental Avenue interchange. Alternative 4 has a total of 13 residential displacements.

- Alternative 5 has one additional residential displacement at the south end along Colonial Avenue (same as Alternatives 3A, 3B, and 4). Alternative 5 also has ten residential displacements along Gulden Lane (five of these are the same as Alternative 4), two along Pastor Street, one along Canada Drive, one along Eads Avenue, one along Millard Street, and one along Bataan Street. Alternative 5 has a total of 24 residential displacements.

No multi-family residential units would be displaced by the Trinity Parkway build alternatives. All of the displaced residential housing units represent affordable housing. According to personnel with the DHA, none of these represent true low-income housing (e.g., tenants who qualify for federal § 8 assistance).

For community/public facility displacements (see **Section 4.3.4**), Alternatives 2A and 2B have common displacements of Fire Station No. 1 along Irving Boulevard, two small buildings at the DISD storage and maintenance facility along South Lamar Boulevard, and a gas pump building associated with the Lew Sterrett Justice Center. Alternative 2B requires the additional displacement of one large building and one smaller building at the DISD facility and the City of Dallas Levee Operations office along Irving Boulevard. Alternative 5 requires the displacement of Pump Stations A, B, C, and D along the levees for a total of seven buildings.

For commercial facilities, 14 displacements are common to all alternatives. Four of these occur at the south end of the project between Lamar Street and US 75, while the remainder occur at the north end of the project near the IH-35/SH-183 interchange. Alternatives 2A and 2B have the most commercial displacements with 281 and 234, respectively. These displacements occur at the south end, north end, and along existing Irving/Industrial Boulevard. Alternatives 3A, 3B, 4, and 5 have commercial displacements of 23, 31, 26, and 35, respectively. These occur at the south end, north end, the IH-35/SH-183 interchange, and at the proposed Woodall Rodgers interchange.

The following paragraphs provide additional details concerning displacements associated with each of the build alternatives. The affected neighborhood districts and neighborhoods are described in detail in **Section 3.1.3**. In general, these districts and neighborhoods have demographic characteristics substantially different from the City of Dallas as a whole. No displacements would occur in the West Dallas – West of Hampton and Magna Vista/Cedar Crest Neighborhood Districts. Demographic characteristics of neighborhood census block groups with displacements are provided below (see **Tables 4-19** through **4-24**). The FEIS would provide more specific information about the direct displacement/relocation impacts once a preferred alternative has been identified.

Alternative 2A

Alternative 2A would result in the displacement of 13 single-family residences, 281 commercial/industrial buildings, and three community public facilities. Alternative 2A would have the highest number of commercial/industrial building displacements (281) of all the build alternatives. The majority of these displacements would occur in the Middle Stemmons/Brookhollow and Lower Stemmons neighborhood districts. The displaced single-family residents would be within the South Dallas HOA neighborhood. There are high percentages of minority and low-income populations present in this neighborhood (see **Section 4.4.3**). There would also be four buildings from three community/public facilities displaced under Alternative 2A. **Table 4-19** shows neighborhood census block groups with displacements under Alternative 2A and their demographic characteristics (see **Plates 4-1A** and **4-1B**).

TABLE 4-19. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 2A DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	9	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
	100/3	---	23	---	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Middle Stemmons/ Brookhollow ND	100/1	---	13	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Total		**---**	**45**	**---**	**---**								
Lower Stemmons ND													
Design District	100/3	---	60	1(1)	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Market/Technology Center		---	65	---	---								
Lower Stemmons ND		---	36	1(1)	---								
Total		**---**	**161**	**2(2)**	**---**								
Cedars/Fair Park/East Dallas ND													
Cedars/Fair Park/ East Dallas ND	34/2	---	5	---	---	693	8.9	91.1	16.7	16.2	$19,444	$46,700	$367
	33/2	---	29	---	---	516	41.1	58.9	62.6	2.3	$27,589	$37,500	$435
Total		**---**	**34**	**---**	**---**								
South Dallas ND													
South Dallas HOA	34/2	---	1	---	---	693	8.9	91.1	16.7	16.2	$19,444	$46,700	$367
	40/1	4	8	1(2)	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	9	28	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	34/2	---	4	---	---	693	8.9	91.1	16.7	16.2	$19,444	$46,700	$367
Total		**13**	**41**	**1(2)**	**---**								
Project Area Total		**13**	**281**	**3(4)**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.
Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

Alternative 2B

Displacement impacts under Alternative 2B would be smaller than under Alternative 2A. Many of these displacements are common with Alternative 2A. Alternative 2B would result in the displacement of nine single-family residences, 234 commercial/industrial buildings, and four community/public facilities. Similar to Alternative 2A, the displaced single-family units would be from the South Dallas HOA. There would also be seven buildings from four community/public facilities displaced under Alternative 2B. This alternative would have the highest number of impacted community/public facilities of all the build alternatives. **Table 4-20** shows the neighborhood census block groups with displacements under Alternative 2B and their demographic characteristics (see **Plates 4-2A** and **4-2B**).

TABLE 4-20. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 2B DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	17	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
	100/3	---	28	---	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Middle Stemmons/ Brookhollow ND	100/1	---	8	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Total		**---**	**53**	**---**	**---**								
Lower Stemmons ND													
Design District	100/3	---	43	1(1)	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Market/Technology Center		---	16	---	---								
Lower Stemmons ND		---	38	2(2)	---								
Total		**---**	**97**	**3(3)**	**---**								
Cedars/Fair Park/East Dallas ND													
Cedars/Fair Park/ East Dallas ND	34/2	---	2	---	---	693	8.9	91.1	16.7	16.2	$19,444	$46,700	$367
	33/2	---	48	---	---	516	41.1	58.9	62.6	2.3	$27,589	$37,500	$435
Total		**---**	**50**	**---**	**---**								
South Dallas ND													
South Dallas HOA	40/1	---	1	1(4)	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	9	29	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	34/2	---	4	---	---	693	8.9	91.1	16.7	16.2	$19,444	$46,700	$367
Total		**9**	**34**	**1(4)**	**---**								
Project Area Total		**9**	**234**	**4(7)**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.
Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

Alternative 3A

Alternative 3A would have the smallest amount of displacements (31) of all the build alternatives. Alternative 3A would result in the displacement of eight single-family residences and 23 commercial/industrial buildings. No community/public facilities would be displaced by this alternative. Similar to Alternatives 2A and 2B, the displaced single-family residences would be from the South Dallas HOA. **Table 4-21** shows the neighborhood census block groups with displacements under Alternative 3A and their demographic characteristics (see **Plates 4-3A** and **4-3B**).

TABLE 4-21. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 3A DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	7	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Middle Stemmons/ Brookhollow ND		---	8	---	---								
Total		**---**	**15**	**---**	**---**								
South Dallas ND													
South Dallas HOA	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	8	6	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
Total		**8**	**8**	**---**	**---**								
Project Area Total		**8**	**23**	**---**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.

Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

Alternative 3B

Alternative 3B would have the second smallest amount of displacements (39) of all the build alternatives. Alternative 3B would result in the displacement of eight single-family residences and 31 commercial/industrial buildings. No community/public facilities would be displaced by this alternative. Similar to Alternatives 2A, 2B, and 3A, the displaced single-family residences would be from the South Dallas HOA. **Table 4-22** shows the neighborhood census block groups with displacements under Alternative 3A and their demographic characteristics (see **Plates 4-4A** and **4-4B**).

TABLE 4-22. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 3B DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	10	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Middle Stemmons/ Brookhollow ND		---	8	---	---								
Total		**---**	**18**	**---**	**---**								
Lower Stemmons ND													
Design District	100/3	---	1	---	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Total		**---**	**1**	**---**	**---**								
Cedars/Fair Park/East Dallas ND													
Cedars/Fair Park/ East Dallas ND	33/2	---	4	---	---	516	41.1	58.9	62.6	2.3	$27,589	$37,500	$435
Total		**---**	**4**	**---**	**---**								
South Dallas ND													
South Dallas HOA	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	8	6	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
Total		**8**	**8**	**---**	**---**								
Project Area Total		**8**	**31**	**---**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.
Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

Alternative 4

Total displacements under Alternative 4 are the same as Alternative 3B (39). Unlike Alternatives 2A, 2B, 3A, and 3B, this alternative would have displacements on both sides of the Dallas Floodway. Alternative 4 would result in the displacement of 13 single-family residences and 26 commercial/industrial buildings. No community/public facilities would be displaced by this alternative. Similar to Alternatives 2A, 2B, 3A, and 3B, eight of the displaced single-family residences would be from the South Dallas HOA. However, this alternative would also displace five single-family residences in the La Bajada neighborhood within the West Dallas – East of Hampton Neighborhood District. **Table 4-23** shows the neighborhood census block groups with displacements under Alternative 4 and their demographic characteristics (see **Plates 4-5A** and **4-5B**).

TABLE 4-23. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 4 DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	9	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Middle Stemmons/ Brookhollow ND		---	8	---	---								
Total		**---**	**17**	**---**	**---**								
South Dallas ND													
South Dallas HOA	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	8	6	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
Total		8	8	**---**	**---**								
West Dallas – East of Hampton ND													
La Bajada	101.02/1	5	1	---	---	1,133	45.7	54.3	93.5	9.7	$27,159	$35,100	$324
Total		**5**	**1**	**---**	**---**								
Project Area Total		**13**	**26**	**---**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.

Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

Alternative 5

Displacements under Alternative 5 (66) are lower than Alternatives 2A and 2B, but higher than Alternatives 3A, 3B, and 4. As with Alternative 4, this alternative would have displacements on both sides of the Dallas Floodway. Alternative 5 would result in the displacement of 24 single-family residences, 35 commercial/industrial buildings, and four community/public facilities. Similar to Alternative 4, this alternative would also displace single-family residences (14) in the La Bajada neighborhood. In addition, Alternative 5 would displace two single-family residences from the East Oak Cliff Neighborhood District. There would also be seven buildings from four community/public facilities displaced under Alternative 5. **Table 4-24** shows neighborhood census block groups with displacements under Alternative 5 and their demographic characteristics (see **Plates 4-6A** and **4-6B**).

TABLE 4-24. DEMOGRAPHIC CHARACTERISTICS OF ALTERNATIVE 5 DISPLACEMENTS BY CENSUS BLOCK GROUPS

Neighborhood or Neighborhood District	Census Tract/ Block Group(s)	Displacements				Demographic Characteristics							
		Residential Building[1]	Commercial/ Industrial Building[2]	Community /Public Facility	Other[3]	Total Pop.	Percent White	Percent Racial Minority[4]	Percent Ethnic Minority[5]	Percent Elderly[6]	Median Household Income	Median Value of Owner-Occupied Housing Units	Median Contract Rent [7]
Middle Stemmons/Brookhollow ND													
Trinity Industrial District	100/1	---	9	---	---	338	32.8	67.2	15.7	29.3	$15,208	$36,300	NA
Middle Stemmons/ Brookhollow ND		---	8	---	---								
Total		**---**	**17**	**---**	**---**								
Lower Stemmons ND													
Design District	100/3	---	1	---	---	8,255	54.3	45.7	18.2	0.8	$48,750	$85,000	NA
Lower Stemmons ND		---	---	2(4)	---								
Total		**---**	**1**	**2(4)**	**---**								
South Dallas ND													
South Dallas HOA	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
	40/2	8	6	---	---	949	3.6	96.4	10.0	17.5	$15,781	$26,300	$298
South Dallas ND	40/1	---	1	---	---	547	5.5	94.5	15.9	18.3	$15,938	$35,600	$423
Total		**8**	**8**	**---**	**---**								
West Dallas – West of Hampton ND													
West Dallas – West of Hampton ND	102/1	**---**	**---**	1(2)	---	2,033	12.2	87.8	24.0	5.2	$6,925	$37,500	$121
Total		---	---	**1(2)**	**---**								
West Dallas – East of Hampton ND													
La Bajada	43/1	---	6	---	---	776	36.9	63.1	66.5	6.7	$23,950	$12,000	$436
	101.02/1	14	3	---	---	1,133	45.7	54.3	93.5	9.7	$27,159	$35,100	$324
Total		**14**	**9**	**---**	**---**								
North Oak Cliff ND													
North Oak Cliff ND	20/2	---	---	1(1)	---	1,659	39.4	60.6	64.4	9.4	$15,877	$162,500	$421
Total		**---**	**---**	**1(1)**	**---**								
East Oak Cliff ND	41/1	2	---	---	---	396	9.6	90.4	21.0	22.9	$14,205	$24,400	$355
Total		**2**	**---**	**---**	**---**								
Project Area Total		**24**	**35**	**4(7)**	**---**								

Source: 2000 U.S. Census. **ND** = Neighborhood District; **NA** = Not Available; **---** = No Impact

Notes: Census tracts/block groups are shown on **Plate 3-6** and neighborhoods/districts are shown on **Plate 3-7** at the end of **Chapter 3**, respectively.
Neighborhood and district boundaries do not correspond exactly with census tracts or block groups. A rough correlation has been established so that census data can be used to provide a general description of population, income, and housing characteristics. All Census figures shown are at the block group level.

1. Displacement counts are individual single-family residential buildings.
2. Displacement counts are individual buildings/structures; however, the number of individual businesses potentially affected may be higher due to multiple tenants in some buildings.
3. This category represents schools, places of worship, and cemeteries.
4. Total of persons reporting in non-white racial categories, including Black or African American, American Indian, Asian or Pacific Islander, some other race, or two or more races.
5. Total of persons reporting as Hispanic or Latino ethnic origin. As race and ethnic origin are two separate and distinct concepts, these persons may be of any race.
6. 65-years of age or older.
7. Median contract rent is the monthly rent agreed to or contracted for, regardless of any furnishings, utilities, fees, meals, or services that may be included.

4.5.2 Compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970

To ensure that decent, safe, and sanitary dwellings would be available to all affected residents, relocation assistance would be available to all those displaced as a result of the construction of the proposed action. Relocation assistance would be conducted in accordance with PL 96-146, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources would be made available to all individuals without discrimination and in accordance with the requirements of the Civil Rights Acts of 1964 and 1968 and the HUD Amendment Act of 1974. Special relocation considerations would be made to accommodate residents in need of additional assistance. Last Resort Housing would also be available in the event of a housing shortage or for residents who cannot find comparable housing within their means. Similar provisions in the Uniform Relocation Assistance Act apply to all businesses displaced by the proposed action. Refer to **Chapter 7 Mitigation Measures and Commitments** and **Appendix C** for a more detailed discussion of the relocation assistance process.

4.5.3 Available Replacement Properties

A survey of on-line real estate services for the DFW metropolitan area revealed an adequate supply of affordable housing available in the study area (as of October 2003). **Table 4-25** lists the number of units available in various zip codes located within, and adjacent to, the study area in a variety of price ranges. The study area zip codes are shown on **Plate 4-21**. The data suggest that sufficient vacancies exist to accommodate the relocations required by the proposed action. Within recent history, there have not been substantial housing shortages in the DFW metropolitan area. Barring dramatic changes in the local and regional economy, housing supply is expected to keep pace with demand.

Similarly, there is no shortage of commercial sites in the DFW metropolitan area. According to the Greater Dallas Chamber of Commerce (as of November 2003), DFW is the nation's third largest industrial real estate market, with more than 639 million square feet (approximately 23 square miles of area). It is also the fifth largest office real estate market, with more than 170 million square feet of space. The availability of vacant land for new business development and/or relocation is relatively limited within the project area; however, building occupancy is not 100 percent and the turnover of commercial space is typical as for any major U.S. urban area.

The *Year End 2003 Office Overview* published by the Wilcox Realty Group for the DFW metropolitan area indicates that approximately 25.8 percent of the office market, 12.5 percent of the industrial market, 14.5 percent of flex buildings, 11.3 percent of shallow bay distribution buildings, and 12.3 percent of warehouse buildings were vacant at the end of the fourth quarter 2003. These vacancy rates

demonstrate the ability for displaced businesses to be successfully relocated to comparable locations in the general area.

In addition, the proposed action would not discourage or provide disincentives to retail, commercial, and industrial redevelopment. Improved access and mobility would be an incentive to future development or redevelopment within the project area and beyond. Over the long term, the project area would benefit from the proposed action because of improved access and mobility, reduced traffic congestion, and increased safety. Due to the opportunities for business redevelopment and relocation in the area, re-employment opportunities for affected employees would likely occur in the vicinity of their current employment or at other similar business establishments. Assistance would also be available from both the public and private sectors for those who may need new employment.

TABLE 4-25. AVAILABLE HOUSING IN THE TRINITY PARKWAY STUDY AREA

Price Range	Zip Codes											
	75201	75202	75203	75207	75208	75212	75215	75216	75219	75226	75235	75247
Homes												
$0 to $20,000	0	0	0	1	0	0	2	1	0	0	0	0
$20,000 to $40,000	0	0	2	0	0	1	15	16	0	0	0	0
$40,000 to $60,000	0	0	4	0	2	0	13	38	1	0	1	1
$60,000 to $80,000	0	0	5	0	7	5	4	28	0	0	3	0
$80,000 to $100,000	0	0	7	0	14	8	4	17	2	0	6	0
$100,000 to $150,000	0	0	0	0	33	8	4	14	2	0	11	0
$150,000 to $200,000	0	0	0	0	20	3	2	0	3	1	6	0
Condominiums/Town Homes												
$0 to $20,000	0	0	0	0	0	0	0	0	0	0	0	0
$20,000 to $40,000	0	0	0	0	0	0	0	0	6	0	5	0
$40,000 to $60,000	0	0	0	0	0	0	0	0	11	0	1	0
$60,000 to $80,000	0	0	0	0	0	0	0	0	9	0	1	0
$80,000 to $100,000	0	0	0	0	0	0	0	0	25	0	8	0
$100,000 to $150,000	1	3	0	0	0	0	2	0	43	4	8	0
$150,000 to $200,000	3	0	0	0	0	0	1	0	42	0	0	0
Duplexes												
$0 to $200,000	0	0	2	0	2	0	1	1	4	1	1	0
Triplexes												
$0 to $200,000	0	0	0	0	1	0	0	0	0	0	0	0
Fourplexes												
$0 to $200,000	0	0	1	0	2	0	0	0	0	1	0	0
Total	**4**	**3**	**21**	**1**	**79**	**25**	**47**	**115**	**148**	**7**	**51**	**1**
Average Home Characteristics*												
Price (Dollars)	353,011	327,024	73,223	2.5M	212,232	71,606	71,157	55,122	291,890	255,570	118,254	79,363
Age (Years)	37	80	59	20	66	35	65	55	22	46	48	63
Square Feet	2,133	1,642	1,422	N/A	2,049	1,362	1,562	1,236	1,745	2,454	1,269	2,228
Lot Size (Acres)	1.92	2.00	0.64	1.00	0.72	1.69	1.58	1.39	2.24	0.50	1.74	0.50

Source: http://www.realtor.com, October 2003. **M** = Million; **N/A** = Not Available

Notes: Zip codes within and/or adjacent to the study area were used to identify available housing and average home characteristics. *These statistics – Home Price, Age of Homes, Square Footage, and Lot Size – are intended to provide general characteristics of the homes in a given zip code area. They are calculated using property data on REALTOR.com over a rolling 6-month period.

Toll Road Effects

As previously described in **Section 4.1 Land Use Impacts**, the Trinity Parkway may require additional right-of-way to accommodate ancillary toll facilities. The amount of additional right-of-way, if any, is subject to design. However, no additional displacements or relocations are expected to occur because of the need for additional right-of-way. The FEIS would describe whether and how much additional right-of-way is required at such locations and provide more specific information about the direct displacement/relocation impacts.

4.6 ECONOMIC IMPACTS

This section describes the impact of the build alternatives on economic activities within the economic region [Dallas Primary Metropolitan Statistical Area (PMSA)]. Economic activities that may be affected include employment, income, housing, and taxes. The primary impacts of the proposed action on the local economy are associated with the direct effects of right-of-way acquisitions and the resulting relocations of businesses and employees (see **Section 4.5 Relocation and Displacements Impacts** for potential relocation and displacement effects).

The construction and operation of any of the build alternatives would affect employment and income within the region both directly and indirectly. In the short term, project construction would provide direct economic benefits to the region by increasing employment and earnings in construction industry and, through economic multiplier effects, would provide benefits to the broader economy as well. In addition, by facilitating easier access to local areas, any of the build alternatives may induce long-term growth in the region through an improved transportation infrastructure. Other long-term effects would include those resulting from the operation and maintenance of any of the build alternatives.

When a construction project such as the Trinity Parkway is undertaken there are direct expenses for materials, labor, and fuel. These are the actual cash outlays of the contractor. Most of these outlays are spent in the region, having a direct effect on the regional economy. There are also indirect expenses to any construction project. The supplier furnishing concrete to the roadway construction must purchase cement, sand, and gravel. The contractor must maintain an office and furnish it with gas and electricity, maintain concrete trucks and buy fuel for them, and meet a payroll. Employees on the payroll in turn use the money they receive to buy groceries, pay a mortgage, and run a household. In short, the money paid to the supplier “trickles down” through the economy, producing a much larger effect than that simply resulting from the direct expenditures.

The methodology used to evaluate the effect of construction and operation of any of the build alternatives was input-output analysis. This type of analysis estimates the changes in output, earnings, and

employment in a regional economy occurring from additional dollars of output delivered to the final demand in another industry. In this document, the estimated costs of construction maintenance of the facility were analyzed to estimate direct, indirect, and induced effects on other industries reflect changes in regional household spending patterns as a result of changes in household income (generated from the direct and indirect effects of a change in the economic activity of a basic industry). The Regional Input-Output Modeling System (RIMS II) of the U.S. Department of Commerce (2003) Bureau of Economic Analysis (BEA) developed for the region of impact was used. The RIMS II model estimates multipliers for output, earnings, and employment for any region in the U.S. composed of one or more counties.

4.6.1 No-Build Alternative

The No-Build Alternative would not involve the expenditure of approximately $880 million (the average construction cost estimate for the build alternatives). As a result, no direct, indirect, or induced benefits in employment and income would be experienced. Under the No-Build Alternative, the local and regional economies of the area are likely to continue according to trends described in **Section 3.1.2.3 Economic Conditions**. However, in the future, travel delay costs associated with the existing and anticipated future congestion would be borne by roadway users and businesses that are dependent on corridor roadways for employment and commerce activities. Negative economic impacts of the No-Build Alternative may include reductions in workplace productivity due to excessive congestion and higher per-mile costs for vehicles idling in traffic.

4.6.2 Build Alternatives

The construction of the Trinity Parkway would have direct, indirect, and induced effects on the local, regional, and statewide economy. The following subsections summarize the estimated economic impacts associated with construction of the Trinity Parkway build alternatives.

4.6.2.1 Statewide and Regional Economic Effects

Statewide Economic Effects

The statewide economic effects of the Trinity Parkway project can be estimated using the 1989 *Texas Input/Output Model* (most recent available), prepared by the Economic Analysis Center of the Texas Comptroller of Public Accounts. This model has multipliers for final demand, employment, and income related to new road/highway construction. When multiplied by the construction cost, the factors produce estimates of the economic impacts of project construction on a statewide basis. The proportion of economic effects retained locally depends on capturing local materials and labor during the construction process.

Direct effects are those arising from purchases made by the new road/highway construction sector. Direct costs include wages and salaries paid to workers directly engaged in the project's construction as well as capital costs for equipment, materials, and supplies. The total of labor and capital costs is shown as output in **Table 4-26**. Induced effects of the proposed action are generated by the consumption of goods and services made possible by the payrolls associated with the construction project. Indirect effects are the sum of all the rounds of purchases by all interrelated sectors of the state economy (including direct, induced, and all additional effects), beginning with those that supply the suppliers of the new road/highway construction sector. Indirect effects distribute throughout the economy at each round of purchases. The total estimated statewide effects from project construction range from approximately $2.46 billion to $4.88 billion.

TABLE 4-26. ESTIMATES OF STATEWIDE ECONOMIC EFFECTS

Build Alt.	Construction Cost Estimate (Year 2003)	Income [1]			Employment [2]			Statewide Final Demand [3]
		Direct	Indirect	Total	Direct	Indirect	Total	
2A	$1,323,000,000	$382,611,601	$767,207,699	$1,149,819,300	36,100	35,025	71,124	$4,879,855,834
2B	$952,000,000	$275,318,400	$552,064,800	$827,383,200	25,977	25,203	51,180	$3,511,452,240
3A	$668,000,000	$193,185,600	$387,373,200	$580,558,800	18,227	17,864	35,912	$2,463,918,168
3B	$691,000,000	$199,837,200	$400,710,900	$600,548,100	18,855	18,293	37,148	$2,548,753,674
4	$726,000,000	$209,959,200	$421,007,400	$630,966,600	19,810	19,220	39,030	$2,677,851,183
5	$919,000,000	$265,774,800	$532,928,100	$798,702,900	25,076	24,329	49,405	$3,389,731,732

Source: Calculated using Texas Comptroller Office Employment, Income, and Final Demand Multipliers.

Notes: The model accounts for all economic activity that occurred in Texas in 1986 (the latest year for which sufficient statistics are available) with tables describing sales and purchases among the state's many industries, businesses, and institutions.

1. Personal income includes wages, salaries, dividends, rents, and other forms of payments to persons by businesses.
2. Person-years of employment (rounded to whole numbers) over total construction period. Person-years of employment do not necessarily indicate additional total employment.
3. Statewide Final Demand consists of the consuming sectors, such as households and government consumption. The *final demand multiplier* indicates the total effects, both direct and indirect, of the change in sector output (new road/highway construction) on output from all Texas sectors.

Regional Economic Effects

The U.S. Department of Commerce has developed a methodology for estimating the direct and indirect economic effects of a project on regional employment, earnings, and total output based on the amount of money spent on construction. **Table 4-27** indicates that during construction, the build alternatives would generate from approximately $323.5 million to $640.7 million in earnings, approximately $999.6 million to $1.9 billion in economic output, and approximately 11,737 to 23,246 jobs during construction. Jobs created include temporary and full-time jobs. This methodology does not distinguish between temporary and full-time jobs nor can it determine the duration of a worker's employment.

TABLE 4-27. ESTIMATES OF REGIONAL ECONOMIC EFFECTS

Category	Trinity Parkway Build Alternatives					
	2A	2B	3A	3B	4	5
Est. Construction Cost	**$1,323,000,000**	**$952,000,000**	**$668,000,000**	**$691,000,000**	**$726,000,000**	**$919,000,000**
Less 35 percent Spent Outside Region	$463,050,000	$333,200,000	$233,800,000	$241,850,000	$254,100,000	$321,650,000
Amount Spent in Region	$859,950,000	$618,800,000	$434,200,000	$449,150,000	$471,900,000	$597,350,000
Est. Increase in Regional Economic Output	$1,979,863,000	$1,424,663,000	$999,659,000	$1,034,078,000	$1,086,455,000	$1,375,279,000
Est. Increase in Regional Earnings	$640,723,000	$461,049,000	$323,510,000	$334,648,000	$351,599,000	$445,068,000
Est. Increase in Regional Employment	23,246	16,728	11,737	12,142	12,757	16,148

Source: Insight Research Corporation, 2004.
Calculated using the U.S. Bureau of Economic Analysis, RIMS II input-output multipliers (specific to the Dallas PMSA).

Notes: The study assumes that 35 percent of the construction costs would be spent outside of the region, thus, would not impact the regional economy.
The defined economic region for this study is the Dallas PMSA, which includes the counties of Collin, Dallas, Denton, Ellis, Hunt, Kaufman, and Rockwall in north central Texas.

4.6.2.2 Local Economic Effects

The Trinity Parkway project has been developed with continuous direct input from local government officials, representatives from the business community, and local residents. Throughout the project development process, the focus of discussion regarding the economic effects from the project has been recognition that it would benefit the local economy by reducing congestion and improving safety on the major routes bisecting the City of Dallas near and within the study area, especially along IH-35E.

Overall, economic impacts would be positive for this project. One of the more obvious positive impacts is the stimulation of the local economy for several years through the creation of construction jobs. The local economy would be infused with a substantial payroll and local businesses would benefit by supplying many items due to their proximity to the project.

While the Trinity Parkway is likely to facilitate an increase in local and regional transportation along its route, diversion of traffic flow from traditionally used routes (e.g., IH-35E) could diminish local business exposure and revenue in and around the CBD. However, the Trinity Parkway build alternatives would open up some areas having had little or no prior access or frontage exposure and thus create new opportunities for development. This would contribute to the economy through creation of jobs and revenue to local tax bases. The City of Dallas is a regional economic and cultural center and the presence of governmental offices, schools, medical facilities, neighborhoods, shopping centers, tourist attractions, major transportation facilities, and places of worship would continue to draw the regional population to and through the downtown area.

Another benefit would be increased industrial development potential. Interstate access is often a prerequisite for many national and international companies seeking sites for industrial and warehousing

operations. The perceived increase in accessibility to major interstates within and near the study area would greatly improve the future economic development potential of Dallas and north central Texas. The Trinity Parkway would also provide increased access to rapidly expanding commercial developments located throughout the region.

Direct interstate connections and a major north-south reliever route serving the entire community would improve the movement of people and goods throughout the City of Dallas and the north central Texas region. The currently available routes connecting study area residents with commercial and industrial developments in the northern and southern parts of the city require considerable indirections, delays, and inconveniences to motorists.

As previously discussed in **Section 4.1 Land Use Impacts**, changes in land use would affect the local economy. Where right-of-way is acquired for the Trinity Parkway, payments would be made to individual landowners based on the appraised land value, resulting in increased income for the year. However, the NTTA is not required to pay local property tax on land or improvements. As a result, and depending on the preferred alternative identified, local tax revenues could drop slightly, with private land being removed from the tax rolls. **Table 4-28** identifies the estimated tax lost as a result of land conversion to Government-owned property by build alternative and by taxing entity.

TABLE 4-28. ESTIMATED TAX VALUE LOST

Build Alternative	Total Tax Value Lost ($)	Estimated Taxing Entities Percent Loss to Tax Base		
		Dallas County	City of Dallas	DISD
2A	89,600,000	<1.0	<1.0	<1.0
2B	72,800,000	<1.0	<1.0	<1.0
3A	16,800,000	<1.0	<1.0	<1.0
3B	20,400,000	<1.0	<1.0	<1.0
4	20,000,000	<1.0	<1.0	<1.0
5	22,000,000	<1.0	<1.0	<1.0
Source: Insight Research Corporation, 2004. **<** = less than the quantity shown.				

As shown in **Table 4-28**, the estimated tax lost ranges from a low of $16.8 million (Alternative 3A) to a high of $89.6 million (Alternative 2A). The over all impact on the taxing entitles of Dallas County, City of Dallas, and the DISD, however, is less than 1 percent due to the large size of each of their tax bases and the relatively small size of the tax base loss.

While generated revenues may decrease in the short term, individuals who relocate within the vicinity of their original home or business and potential residential/commercial development attracted by the new highway would offset this initial decrease. The potential impacts on school district revenues are a function of the value of land removed from the tax rolls and the size and wealth of the affected district. Direct impacts occur where land and improvements are removed from the tax rolls. Over the long term, the increase in property tax revenue brought by growth in residential and commercial land use is likely to

offset a decrease of school, county, or eligible taxes. In addition, travelers utilizing a new highway inject the local economy with retail revenue and sales tax. These inputs are generally concentrated in travel-related businesses located within view of the roadway.

4.6.3 Effects on Property Values

4.6.3.1 No-Build Alternative

The No-Build Alternative is not expected to have an effect on property values in the study area. However, as a result of the anticipated increase in traffic congestion, there may be a negative effect on property values due to increased noise levels and air pollution and a decline in safety on area roadways.

4.6.3.2 Build Alternatives

Studies of highway impacts on property values document that highways generally improve the values of most adjoining commercial properties. The exposure provided by the Trinity Parkway build alternatives would potentially increase the commercial appeal and property value of land located primarily at on/off access points and along access/service roads. Initially, commercial development is likely to increase and develop at interchanges to serve local citizens and travelers passing through the area. Over time, the number and type of businesses within such commercial zones is likely to expand beyond the immediate interchanges.

The effects of highways on residential property values, however, are less clear. There are several negative effects associated with highways (e.g., noise, pollution, dust, and decreased privacy) that may decrease adjacent residential property values. Noise is usually the most objectionable effect, although people may perceive other issues such as aesthetics and proximity (Hall, Breston, and Taylor, 1978). The most important positive effect of highways is increased mobility and transportation access for those living nearby.

A study completed by the Washington State Department of Transportation showed that when a properly designed highway facility provided improved accessibility to nearby residences, property values increased by 12 to 15 percent. Unfortunately, the house closest to the highway had this increase partially offset by a 0.2 percent to 1.2 percent reduction for each 2.5 dBA increase in highway noise level. However, houses with highway noise were not found to take any longer to sell. In a commercial-industrial area, land values were found to increase 16.7 percent when a major highway facility was opened (Palmquist, 1980).

Other research into the effects of noise on property values tends to indicate that residential properties closest to highways experience lower rates of increase or even decline in value when compared with residences located farther away (Langley, 1976). A study by Hall, Breston, and Taylor, through a statistical analysis of two residential areas, concluded that it is possible to define a noise level where property values begin decreasing (Hall, Breston, and Taylor, 1978). The study determined that in areas where noise was greater than 70 dBA, property values are strongly related to noise levels. Based on the analysis conducted, when the noise level was below 70 dBA, property values were not related to noise to a substantial extent.

Another study found that although noise does affect housing prices, it is generally a weak influence. The study found that in one location a change of 1 dBA in the L_{10} noise level (97.5 percent level of confidence) would reflect a maximum change in market price equal to 0.15 percent of the house's market price or 0.75 percent for a 5 dBA change, meaning $500 for a $65,000 house (Allen, 1980). Refer to **Section 4.15 Noise Impacts** for details concerning the noise analysis conducted for the Trinity Parkway study area.

Despite the potential negative impacts of highways on residential properties, there also exists the possibility of positive impacts. In some circumstances, residential properties have been shown to increase 15 to 17 percent in value due to the advantages of increased accessibility (Palmquist, 1982).

Toll Road Effects

It is anticipated the Trinity Parkway build alternatives would improve mobility and decrease congestion levels within the study area, which may benefit the economy by decreasing costs associated with travel delay and the loss of worker productivity. In addition, some local employment opportunities, primarily related to toll collection, operations/maintenance, and security would be generated by the proposed toll facility.

4.7 CULTURAL RESOURCES AND PARKLANDS

The following sections describe the potential impacts to cultural resources and parklands identified in **Chapter 3 Affected Environment**. Potential impacts to cultural resources (archaeological/historical) are described in **Sections 4.7.1** and **4.7.2**. Potential impacts to parks/recreational areas are described in **Section 4.7.3.** For cultural resources, Tribal coordination by the FHWA occurred in August and September of 2002 (**Appendix B**). Particular emphasis is given to those cultural resources currently listed on, or eligible for, the NRHP. Archaeological and historic resources that are NRHP-listed, or determined to be eligible for the NRHP, are afforded special consideration and may require additional

documentation under § 4(f) of the DOT Act of 1966 (see **Chapter 5 Preliminary Section 4(f) Evaluation**).

4.7.1 Impacts to Archaeological Resources

4.7.1.1 No-Build Alternative

The No-Build Alternative would have no impacts on known prehistoric and/or historic archaeological resources. However, projects planned by others in the study area may impact archaeological resources.

4.7.1.2 Build Alternatives

There are four known archaeological sites that may be eligible for listing in the NRHP located in the general proximity of the six build alternatives (see **Plate 3-14** and **Plates 4-1** through **4-6).** However, these four sites are not within the established archaeological APE (i.e., within the proposed right-of-way limits) of any build alternative and, therefore, would not be impacted. Additionally, there are no known archaeological sites that are ineligible for listing on the NRHP or sites with an unknown potential for listing on the NRHP within the archaeological APE of any build alternative. Areas of high and low archaeological potential for the build alternatives are discussed below and shown for each alternative on **Plates 4-1** through **4-6**.

Areas of High Potential within the Archaeological APEs

Within the study area, the majority of the Trinity River has been diverted and channelized within the Dallas Floodway. The old natural river channel is located generally to the east of the Dallas Floodway east levee. Alternatives 2A and 2B are close to and in some places cross the old channel of the river. The most likely locations to encounter buried prehistoric archaeological deposits are along the meanders of the old Trinity River. **Plates 4-1** and **4-2** show the old Trinity River channel and Alternatives 2A and 2B alignments. Additionally, the north and south ends of Alternatives 2A and 2B cut across the first terrace of the Trinity River and thus have a potential for encountering prehistoric deposits in the terrace sediments. Terrace sediments are found in and above the old river channel and creek floodplains and are shown as the Quaternary Terrace (QT) on the Dallas Texas Geological Quadrangle Map prepared by the Bureau of Economic Geology (1972).

Alternatives 3A, 3B, 4, and 5 are located within or adjacent to the Dallas Floodway levees (see **Plates 4-3** through **4-6**). No prehistoric archaeological sites have been recorded inside the floodway levees within the APEs of these alternatives from west of Hampton/Inwood Road to east of the AT&SF Railroad Bridge. This is an area that in the past was designated as having a “high” potential for containing prehistoric cultural resources; however, in recent years it has been concluded that the designation was too broadly

defined. The THC has provided the opinion that the area within the floodway levees has little potential for containing preserved prehistoric archaeological deposits (Skinner, 2004). Therefore, Alternatives 3A, 3B, 4, and 5 APEs have little potential for encountering prehistoric archaeological deposits within the levees. However, archaeological deposits may be encountered where these alternatives or access roads cross old river channel segments and in first terrace deposits on the north and south ends of the project as described for Alternatives 2A and 2B.

In summary, prehistoric archaeological resources within the build alternative APEs may be encountered in areas where:

- Alternatives 2A and 2B cross the old natural, meandering channel of the Trinity River;
- Where all build alternatives may cross a tributary intersecting with the old channel; or
- Where all build alternatives cut across the first terrace of the Trinity River at the north and south ends of the project.

4.7.2 Impacts to Historical Properties

This section identifies historic/architectural resources (buildings, structures, objects, districts, etc.) that are listed on, or eligible for listing on, the NRHP. Impacts to historic resources can be classified as either direct or indirect, depending on the proximity of the proposed action. A direct impact is defined as a direct taking in which the proposed right-of-way would include all of an existing building and/or site or any portion of its associated land. An indirect impact, such as noise or visual intrusion, may occur to buildings and/or sites situated beyond the right-of-way, but within the defined APEs for each build alternative. Efforts to avoid or minimize such impacts were undertaken during the planning stages for each build alternative.

4.7.2.1 No-Build Alternative

Impacts to historic resources are not anticipated as a result of the No-Build Alternative. However, planned projects by others may affect historic resources within the study area.

4.7.2.2 Build Alternatives

The following tables and text identify the known historical/architectural resources and describe the physical relationship between the resource and the proposed build alternatives. The locations of these resources are shown on **Plate 3-14 (Chapter 3)** and **Plates 4-1** through **4-6** at the end of this chapter.

TABLE 4-29. IMPACTS TO PROPERTIES LISTED ON, OR ELIGIBLE FOR, THE NRHP

Plate ID Nos.	Resource	Potential § 4(f) Use (Yes/No)	Trinity Parkway Build Alternatives					
			2A	2B	3A	3B	4	5
PROPERTIES LISTED ON THE NRHP								
1	Houston Street Viaduct	Yes – Alts. 2A, 3A, 3B, 4, 5	Parkway over	Parkway under	Parkway under	Parkway under	Parkway under	Parkway under
			Ramp connection	No connection	Ramp connection	Ramp connection	Ramp connection	Ramp connection
2	Colonial Hill Historic District	Yes – Alts. 2A, 2B	Parkway adjacent	Parkway adjacent	Parkway near	Parkway near	Parkway near	Parkway near
PROPERTIES ELIGIBLE FOR THE NRHP								
3	UP RR Bridge	Yes – Alt. 5	Parkway over	Parkway over	Parkway under	Parkway under	Parkway under	Parkway under
			No connection	No connection	No connection	No connection	No connection	No connection
4	Corinth Street Viaduct	Yes – Alts. 3A, 3B, 4, 5	Parkway over	Parkway over	Parkway under	Parkway under	Parkway under	Parkway under
			Ramp connection	Ramp connection	Ramp connection	Ramp connection	Ramp connection	Ramp connection
5	AT&SF RR Bridge	Yes – All Alts.	Parkway under	Parkway under	Parkway under	Parkway under	Parkway under	Parkway under
			No connection	No connection	No connection	No connection	No connection	No connection
6	MKT RR Bridge	No	Parkway over	Parkway over	Parkway over	Parkway over	Parkway over	Parkway over
			No connection	No connection	No connection	No connection	No connection	No connection
7	Continental Avenue Viaduct	Yes – Alt. 5	Parkway over	Parkway over	Parkway under	Parkway under	Parkway under	Parkway under
			No connection	No connection	Ramp connection	Ramp connection	Ramp connection	No connection
8	Commerce Street Viaduct	Yes – Alts. 3A, 3B, 4, 5	Parkway over	Parkway over	Parkway under	Parkway under	Parkway under	Parkway under
			No connection	No connection	Ramp connection	No connection	Ramp connection	Ramp connection

The NRHP-listed Houston Street Viaduct is located within the APE of all build alternatives. Alternative 2A main lanes are proposed to go over the viaduct at Industrial Boulevard with no physical impact. Alternative 2A has elevated ramp connections to the viaduct outside the levee. Alternative 2B main lanes are proposed to go under the viaduct at Industrial Boulevard with no physical impact. Alternative 2B has no ramp connections to the viaduct. Alternatives 3A and 3B main lanes are proposed to go under the viaduct within the levee with no physical impact. Alternatives 3A and 3B have ramp connections to the viaduct on the inside and on top of the levee. Alternative 4 main lanes are proposed to go under the viaduct within the levee. The east levee main lanes go under the viaduct with no physical impact and have ramp connections on top of the levee. The west levee main lanes go under the viaduct in a section that is not arched. This section of the viaduct would be rebuilt. The west levee main lanes have ramp connections on top of the levee. Alternative 5 main lanes are proposed to go under the

View looking southwest toward the Houston Street Viaduct on the south side of the east levee of the Dallas Floodway.

viaduct outside the levee. The east levee main lanes go under the viaduct with no physical impact and have ramp connections on top of the levee. The west levee main lanes go under a newer rebuilt portion of the viaduct outside the levee. The west levee main lanes have ramp connections to the viaduct outside the levee.

The NRHP-listed Colonial Hill Historic District is located within the APE of all build alternatives. South Lamar Street forms the western boundary of the district. Alternatives 2A and 2B main lanes track along the west side of South Lamar Street and, consequently, are adjacent to the district. Both of these alignments are elevated (bridge or embankment) through this area. There are no direct impacts (displacements) to the district; however, there would be indirect impacts such as increased noise, visual intrusion, and proximity effects. Alternatives 3A, 3B, 4, and 5 main lanes are elevated (bridge) and are located approximately 1,000 feet west of the district and South Lamar Street. There are no direct impacts (displacements) to the district; however, there would be indirect impacts such as increased noise, visual intrusion, and proximity effects. Due to their greater distance away from the district, these indirect impacts would likely be less than Alternatives 2A and 2B.

View looking northwest along Lamar Street. All build alternatives will follow a path along the southwestern border of the Colonial Hill Historic District (to the right of the photograph).

The NRHP-eligible UP (Southern Pacific) Railroad Bridge is located within the APE of all build alternatives. In the area of Industrial Boulevard, the railroad is elevated on an embankment then bridges over Industrial Boulevard. The railroad continues west on an embankment to the Dallas Floodway east levee. The railroad crosses the floodway to the west levee via the UP Railroad Bridge. Alternatives 2A and 2B main lanes are elevated above Industrial Boulevard and are proposed to go over the railroad with no physical impact. Alternatives 3A, 3B, and 4 main lanes are proposed to go under the railroad within the levees with no physical impact. Alternative 5 main lanes are proposed to go under the railroad outside the levees. For the east levee lanes, a bridge section would be constructed outside the levee to replace the existing railroad embankment. For the west levee lanes, a bridge section would be constructed outside the levee to replace the existing railroad bridge and embankment.

View looking southwest toward the UP RR Bridge on the south side of the east levee of the Dallas Floodway.

The NRHP-eligible Corinth Street Viaduct is located within the APE of all build alternatives. The viaduct begins at the intersection of Industrial Boulevard and Corinth Street, and then crosses over the Trinity River levees and floodway. Alternatives 2A and 2B main lanes are elevated along Industrial Boulevard and are proposed to go over the viaduct with no physical impact. Alternatives 2A and 2B have ramp connections to Corinth Street outside the levee. Alternatives 3A, 3B, and 4 main lanes are proposed to go under the viaduct within the levee with no physical impact. Alternatives 3A, 3B, and 4 have ramp connections to the viaduct within and on top of the levee. Alternative 5 main lanes are proposed to go under the viaduct outside the levee with no physical impact. Alternative 5 has ramp connections to the viaduct outside the levee.

View looking southwest toward the Corinth Street Viaduct on the north side of the east levee of the Dallas Floodway.

The NRHP-eligible AT&SF Railroad Trestle is located within the APE of all build alternatives. This abandoned steel truss and wooden trestle bridge is a free span over the river, which features approaches supported by wood piers and earth embankments at each end. Stone piers support the central span across the Trinity River. The DART LRT Bridge spanning the floodway is located adjacent to the railroad trestle. Alternatives 2A, 2B, and 5 main lanes are proposed to go under the existing DART Bridge and through the east embankment of the abandoned railroad. Alternatives 3A, 3B, and 4 main lanes are proposed to go under the existing DART Bridge and under the former railroad in the area of the wooden trestles west of the embankment.

View looking west toward the AT&SF RR Bridge on the south side of the east levee of the Dallas Floodway.

The NRHP-eligible MKT RR Trinity River Bridge is located within the APE of all build alternatives. Each of the build alternative main lanes are proposed to go over the railroad embankment east of the river bridge with no direct impact.

The NRHP-eligible Continental Avenue Viaduct is located within the APE of all build alternatives. As proposed by TxDOT, this viaduct may be closed for vehicular traffic use at the completion of the Woodall Rodgers Extension project. Alternatives 2A and 2B main lanes are both elevated above Industrial Boulevard and are proposed to go over Continental Avenue with no physical impact. Alternative 2A and 2B have no ramp connections to Continental Avenue. Alternatives 3A and 4 main lanes are proposed to

go under the viaduct with ramp connections to the viaduct on top of the levee. Alternative 3B main lanes are proposed to go under the viaduct with ramp connections to the viaduct on top of the levee and outside of the levee. These ramp connections would require the replacement of a section of the existing viaduct. Alternative 5 main lanes are proposed to go under the viaduct outside the levees. For the east and west levee main lanes, bridge sections would be constructed outside the levee to replace the existing bridge or embankment.

View looking southwest toward the Continental Avenue Viaduct on the south side of the east levee of the Dallas Floodway.

The NRHP-eligible Commerce Street Viaduct is located within the APE of all build alternatives. Alternatives 2A and 2B main lanes are elevated above Industrial Boulevard and are proposed to go over Commerce Street with no physical impact. Alternatives 2A and 2B have no connections to Commerce Street. Alternatives 3A and 3B main lanes are proposed to go under the viaduct within the levee with no physical impact. Alternative 3A has ramp connections to the viaduct on the inside and on top of the levee and Alternative 3B has no ramp connections. Alternative 4 main lanes are proposed to go under the viaduct within the levees with no physical impact. Alternative 4 has ramp connections to the viaduct on top of the levees. Alternative 5 main lanes are proposed to go under the viaduct outside the levees with no physical impact. For the east levee lanes, ramps connect to the viaduct outside the levee. For the west levee lanes, ramps connect to a new bridge section that would be constructed outside the levee, replacing the existing bridge section.

View looking southwest toward the Commerce Street Viaduct on the south side of the east levee of the Dallas Floodway.

Historic Architectural Properties

Archival research and field surveys were conducted by architectural and historical specialists to identify potential impacts to historic resources (e.g., buildings, structures, objects, districts, etc.). All directly impacted structures (i.e., potentially displaced) were photographed, mapped, described, categorized, and submitted to the THC for determination of NRHP eligibility (Norman Altston Architects, 2000 and 2001). Consultation with the THC was initiated by letter dated June 5, 2002. The THC concurred by letter dated July 2, 2002 that six displaced properties were eligible for listing on the NRHP (see **Appendix B**). **Table 4-30** presents the building displacements (direct impact) for each alternative that were determined to be

eligible for listing on the NRHP. Their locations are shown on **Plates 4-1** through **4-6** at the end of this chapter. Note that Building ID 14 (Sportatorium) has been demolished and removed since the THC determination of eligibility in July 2002.

TABLE 4-30. POTENTIALLY DISPLACED HISTORIC PROPERTIES

Plate ID No.	Location	Building Type	NRHP Status	Trinity Parkway Build Alternatives					
				2A (Yes/No)	2B (Yes/No)	3A (Yes/No)	3B (Yes/No)	4 (Yes/No)	5 (Yes/No)
12	1715 Market Center – Pettigrew Associates	Commercial	Eligible [2]	Yes	No	No	No	No	No
13	1202 North Industrial – ACF Corp.	Commercial	Eligible [2]	Yes	No	No	No	No	No
14	1000 South Industrial – Sportatorium	Commercial	Eligible [1,4]	---	---	---	---	---	---
15	1212 South Industrial – Oak Cliff Box Co.	Commercial	Eligible [2]	Yes	No	No	No	No	No
16	3701 South Lamar – DISD - Storage and Maintenance Facility	Institutional	Eligible [3]	Yes (2 of 6 Bldgs.)	Yes (4 of 6 Bldgs.)	No	No	No	No
17	2255 Irving Boulevard – City and County levee Operations	Public Utility-Pump Station D	Eligible [2]	No	No	No	No	No	Yes
			Totals	**4**	**1**	**---**	**---**	**---**	**1**

Notes: 1. Eligible under Criterion A, Community Development, at the level of local significance.
2. Eligible under Criterion C, Architecture, at the level of local significance.
3. Eligible under Criterion A, Community Development, and Criterion C, Architecture, at the level of local significance.
4. Building has been demolished and removed by others since the THC determination of eligibility.
--- = No displacement(s) for this alternative.

Plate ID 16 in the above table, addressed 3701 South Lamar, refers to the DISD storage and maintenance facility. The facility was formerly the Procter and Gamble manufacturing facility built in the 1920s. The facility is approximately 30 acres in size and contains one large building and five smaller ancillary buildings. The large building at the facility, shown in the photo on the following page, has been declared eligible for listing on the NRHP. Alternative 2A requires the displacement of 2 ancillary buildings at the facility (see **Plate 4-1B**). Alternative 2B requires the displacement of the large building and three ancillary buildings at the facility (see **Plate 4-2B**).

View looking toward the NRHP-eligible property located at 1715 Market Center Boulevard.

View looking toward the NRHP-eligible property located at 1202 North Industrial Boulevard.

View looking toward the NRHP-eligible property located at 1212 South Industrial Boulevard.

View looking toward the NRHP-eligible property located at 3701 South Lamar Street.

View looking toward the NRHP-eligible property located at 2255 Irving Boulevard.

Table 4-31 summarizes the potential use of cultural resources by each of the Trinity Parkway alternatives.

TABLE 4-31. SUMMARY OF POTENTIAL CULTURAL RESOURCE USE BY ALTERNATIVE

Project Alternative	NRHP Districts	NRHP Bridges and Eligible Bridges	NRHP Eligible Properties (see Table 4-30)	Known Archeological Sites
1	None	None	None	None
2A	• Colonial Hill Historic District – potential proximity impacts	• Houston Street Viaduct – parkway over with ramp connections • AT&SF Railroad Bridge – parkway under and through east embankment	4 displaced	None
2B	• Colonial Hill Historic District – potential proximity impacts	• AT&SF Railroad Bridge – parkway under and though east embankment	1 displaced	None
3A	None	• Houston Street Viaduct – parkway under with ramp connections • Commerce Street Viaduct – parkway under with ramp connections • Continental Avenue Viaduct – parkway under with ramp connections • Corinth Street Viaduct – parkway under with ramp connections • AT&SF Railroad Bridge – parkway under and through substructure	None	None
3B	None	• Houston Street Viaduct – parkway under with ramp connections • Commerce Street Viaduct – parkway under with ramp connections • Continental Avenue Viaduct – parkway under with ramp connections and reconstruction of a bridge segment • Corinth Street Viaduct – parkway under with ramp connections • AT&SF Railroad Bridge – parkway under and through substructure	None	None
4	None	• Houston Street Viaduct – parkway under with ramp connections • Commerce Street Viaduct – parkway under with ramp connections • Continental Avenue Viaduct – parkway under with ramp connections • Corinth Street Viaduct – parkway under with ramp connections • AT&SF Railroad Bridge – parkway under and through substructure	None	None
5	None	• Houston Street Viaduct – parkway under with ramp connections • Commerce Street Viaduct – parkway under with ramp connections • Continental Avenue Viaduct – parkway under with no ramp connections • Corinth Street Viaduct – parkway under with ramp connections • AT&SF Railroad Bridge – parkway through east embankment • UP Railroad Bridge – parkway under and through west embankment	1 displaced	None
Note: Archeological sites are subject to § 4(f) only if the SHPO determines that preservation in place is warranted. This determination has not yet been made for any known archeological site within the study area. A more detailed analysis would be completed during preparation of the FEIS for this project (see **Chapter 5**).				

Summary

Alternative 2B affects three cultural resources. Alternatives 3A, 3B, and 4 each affect five cultural resources, and Alternatives 2A and 5 each affect seven cultural resources. The information developed thus far on cultural resources would be used for evaluation of alternatives leading to the recommendation of a preferred alternative. After a preferred alternative has been identified, additional investigations may be required. The type and amount of work required, if any, would be coordinated by the NTTA and the TxDOT–Environmental Affairs Division with the SHPO in compliance with § 106 of the NHPA and Texas Antiquities Code.

Potential adverse impacts to cultural resources (archeological/historical) would be assessed, in consultation with the SHPO, for the proposed action during review of the FEIS. This may include refinement of the planning concept to further avoid and minimize impacts to historic resources. In addition, § 4(f) evaluations would be undertaken as needed in order to further assess the avoidance or minimization of adverse effects to historic properties (see **Chapter 5 Preliminary Section 4(f) Evaluation**). Where avoidance is determined to be neither prudent nor feasible, adverse effects can be mitigated through historical documentation, archeological excavation, or some other appropriate treatment of the affected historic resource. More details concerning potential mitigation measures are described in **Chapter 7 Mitigation Measures and Commitments**.

4.7.3 Impacts to Parks and Recreational Areas

This section describes the potential impacts to parks and recreational areas (existing and/or planned) identified in **Chapter 3**. The properties included in this DEIS were evaluated in the context of their surrounding neighborhoods and adjacent properties; access routes between the facilities and their users; ownership and/or jurisdiction; proximity of the alternative alignments; and associated impacts. A discussion concerning the applicability of § 4(f) of the DOT Act of 1966 to these resources is also provided.

4.7.3.1 No-Build Alternative

Under the No-Build Alternative, the FHWA/TxDOT/NTTA would not continue to participate in cooperative planning for the Dallas Floodway and adjacent areas (i.e., Great Trinity Forest Park). The USACE/City of Dallas' plans for parks and recreational areas within the study area would not be affected by this alternative. The No-Build Alternative would not prohibit the USACE/City of Dallas' planned development of parkland within the Dallas Floodway or other areas; therefore, no impact would occur and no mitigation would be required.

Although the No-Build Alternative would avoid direct impacts to parks/recreational areas, potential joint development opportunities that would have been possible with one or more of the build alternatives would be lost. While it would have the least impact on the environment, the No-Build Alternative would contribute to increased traffic congestion as well as both human and air quality impacts. Traffic volume and congestion would continue to increase on the existing roadway network, possibly contributing to traffic congestion to and from parks and recreational areas, as well as unsafe bicycle and pedestrian use of trail systems.

4.7.3.2 Build Alternatives

Section 3.3.2 of this DEIS provided a description of the parks and recreational areas in the study area that may be affected by one or more of the build alternatives. Several different types of adverse impacts to existing and proposed parks/recreational areas are anticipated as a result of the proposed action. These impacts may include right-of-way acquisition or proximity effects (i.e., noise impacts and/or visual intrusion). This analysis includes those resources where the technical studies prepared for other sections of this document (i.e., land use, noise, visual, etc.) indicate that one or more direct and/or potential proximity impacts are possible. Where the technical studies have documented that there are clearly no direct impacts or potential proximity impacts to certain park/recreational resources, then those resources have not been analyzed below.

The impacts discussed in this section are generalized and would not be uniform for all locations within the park/recreational area. Impacts may be more pronounced or less pronounced depending on the proximity to a proposed alternative. In addition, proximity impacts would be expected to increase in park/recreational areas that are adjacent or near a build alternative. Only those areas where a proximity impact has been identified are shown in **Table 4-32**.

Notably, the City of Dallas PARD has indicated none of the Trinity Parkway build alternatives would have a negative impact to any of the existing/planned parks and recreational areas located in the study area. The PARD acknowledges one of the goals for the Trinity Parkway project as a whole is to improve access to existing and proposed recreational opportunities. In this regard, the Trinity Parkway would provide positive benefits for these resources (see **Appendix A-1, Page 66**).

TABLE 4-32. POTENTIAL IMPACTS ON PARKS AND RECREATIONAL AREAS

Plate ID Number	Site Description	Trinity Parkway Build Alternatives					
		2A	2B	3A	3B	4	5
1	Sleepy Hollow Park (Existing)	P, N, V	P, N, V	P, N, V	P, N, V	P, N, V	P, N, V
	Closest Distance to/from Build Alternative	720 feet (0.14 miles)	720 feet (0.14 miles)	720 feet (0.14 miles)	720 feet (0.14 miles)	720 feet (0.14 miles)	720 feet (0.14 miles)
3	Trinity River Greenbelt Park (Existing)	P, V	P, V	R (171) P, V	R (152) P, V	R (205) P, V	R (14) P, V
	Closest Distance to/from Alternative	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge	Encroaches within park	Encroaches within park	Encroaches within park	Encroaches within park
10	Oak Cliff Founders Park (Existing)	---	---	---	---	P, N, V	P, N, V
	Closest Distance to/from Alternative	2,880 feet (0.55 miles)	2,400 feet (0.45 miles)	1,980 feet (0.38 miles)	1,980 feet (0.38 miles)	300 feet (0.06 miles)	240 feet (0.05 miles)
12	Moore Park (Existing)	---	---	---	---	P, V	P, V
	Closest Distance to/from Alternative	2,520 feet (0.48 miles)	2,520 feet (0.48 miles)	1,980 feet (0.38 miles)	1,980 feet (0.38 miles)	1,980 feet (0.38 miles)	2,400 feet (0.45 miles)
17	Great Trinity Forest Park (Planned)	P, V	P, V	P, V	P, V	P, V	P, V
	Closest Distance to/from Alternative	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge	Adjacent to park at AT&SF RR Bridge

Key to Terms: **R** = right-of-way acquisition anticipated (estimated number of acres shown in parentheses) (see **Section 4.1.2**); **P** = proximity effects; **N** = noise impact (see **Section 4.15**); **V** = visual intrusion (see **Section 4.16**); **>** = greater than the quantity shown; **---** = no impact anticipated.

Notes: All distances shown in feet (miles). Calculated distances/areas are estimates only.
Plate ID numbers correspond to the locations shown on **Plate 3-15 (Chapter 3)** and **Plate 4-7 (Chapter 4)**.
Visual intrusion is generally considered to be the introduction of the highway facility into an area where none existed previously.

As shown in **Table 4-32**, each of the build alternatives would have some degree of adverse impact to four existing parks (Sleepy Hollow Park, Trinity River Greenbelt Park, Oak Cliff Founders Park, and Moore Park) and one planned park/recreational area (Great Trinity Forest Park). These areas are shown on **Plate 3-15** at the end of **Chapter 3** and **Plate 4-7** at the end of this chapter. Impacts to Trinity River Greenbelt Park include the acquisition of land for right-of-way and visual intrusion (e.g., ramps, bridges, main lanes, etc.) due to its proximity to one or more of the build alternatives. Impacts to Sleepy Hollow Park and Oak Cliff Founders Park involve an increase in noise levels and visual intrusion (e.g., ramps, bridges, main lanes, etc.) due to their proximity to one or more of the build alternatives. Impact to Moore Park, and the Great Trinity Forest Park involve visual intrusion (e.g., visible within the view shed of the park/parkland). As previously mentioned, no other park/recreational areas identified within the study area would be adversely impacted (directly or indirectly) by the build alternatives.

Table 4-32 shows that Alternatives 2A and 2B have the lowest degree of overall impact to park/recreational areas, followed by Alternatives 3A and 3B. Alternatives 4 and 5 have the highest of overall impact. Alternatives 3A, 3B, 4, and 5 require right-of-way acquisition from Trinity River Greenbelt Park. Of these, Alternative 5 requires the least amount of right-of-way (14 acres) while Alternative 4 requires the most (205 acres).

It should be noted that all of the parks identified in **Table 4-32** exist in an urban environment where the influences of the local transportation system are part of their operational and functional characteristics. All are located adjacent to or crossed by operating roadways, so the passage of vehicles nearby would not introduce an activity that has not previously existed.

Section 4(f) and Existing Parks/Recreational Areas

As previously described in **Section 3.3.2.2 (Table 3-11)**, the provisions of § 4(f) do not apply to the Dallas Floodway portion of the Trinity River Greenbelt Park. This is because the deed for this property includes a conveyance for transportation facilities (see **Appendix A-1, Page 39**). However, the provisions of § 4(f) would apply to the other existing park/recreational areas (i.e., Sleepy Hollow Park, Moore Park, Oak Cliff Founders Park) determined to have potential proximity impacts attributable to one or more of the build alternatives.

The project's noise analysis indicated that the predicted future noise levels would be equal to or slightly exceed FHWA impact criteria at Sleepy Hollow Park and Oak Cliff Founders Park (see **Section 4.15**). Both of these parks are located in urban areas with high volume streets and highways nearby. The predicted increase in noise levels (from 0 to 3 dBA) at these parks is barely perceptible to the human ear [23 CFR 771.135(p)]. Therefore, the purposes for which these parks exist would not be substantially impaired and a "constructive use" as defined under the provisions of § 4(f) would not occur.

Section 4(f) and Planned Parks/Recreational Areas

Section 3.3.2.3 of this DEIS provides a description of planned parks/recreational areas in the study area that may be affected by one or more of the build alternatives. Under certain conditions, § 4(f) may apply to publicly owned properties "planned" for parks and recreation purposes although they are not presently functioning as such. Section 4(f) applies if the agency that owns the property has formally designated and determined it to be significant for these purposes.

The NTTA continues to participate in a cooperative multi-project planning effort with the City of Dallas, Dallas County, TxDOT, FHWA, NCTCOG, and the USACE to implement various components of the City of Dallas' *Trinity River Corridor MIP/BVP*. The Trinity Parkway has been identified as a key component of

this plan. As previously described in **Section 3.3.2.2**, the *Trinity River Corridor MIP/BVP* incorporates the proposals from these agencies into one cohesive concept plan. These projects include:

- Dallas County Trail Plan;
- Trinity Trails System;
- Regional Veloweb;
- Great Trinity Forest Master Plan; and
- The DFE Project.

No direct use (i.e., property acquisition) of these planned resources would occur by any of the build alternatives. FHWA regulations stated in 23 CFR § 771.135(p)(5)(v) indicate that § 4(f) does not apply when "there are impacts to a proposed public park, recreation area…but the proposed transportation project and the resources are concurrently planned or developed." Therefore, § 4(f) would not apply to the above-mentioned parks and recreational resources because they continue to be planned and may be developed concurrently with the proposed action (see **Section 3.1.1.4 Potential Joint Development Projects**).

Potential proximity impacts caused by one or more of the build alternatives may include noise and/or visual intrusion of these planned resources. Mitigation for impacts to park/recreational areas initially involved the development of alternative alignments that avoided or minimized impacts to these resources. Any park/recreational use that may be affected by potential noise or visual impacts associated with the build alternatives can be planned and designed to avoid or minimize those impacts. For additional details, see **Section 7.1.2 Measures to Minimize Impacts to Neighborhoods**.

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As mentioned above, the NTTA is participating in a cooperative planning effort with all agencies involved with proposed recreational and non-recreational developments planned for the Dallas Floodway (i.e., Trinity Park) and DFE (i.e., Great Trinity Forest Park) portions of the study area. NTTA would work closely with these agencies in order to maximize these multi-project planning efforts and, thereby, work to minimize any potential adverse impacts that may result from the Trinity Parkway build alternatives. Once a locally-preferred alternative has been identified, a plan for compensatory replacement of the properties and their functions and values would be developed and presented in subsequent NEPA documentation.

<u>Section 4(f) and Planned Trails</u>

Table 3-11 in **Section 3.3.2.3** of this DEIS provided a list of proposed trails in the Trinity Parkway study area that may be affected by one or more of the build alternatives. As mentioned above, these proposed trail projects have been planned and may be developed concurrently with the proposed action. As a result, the provisions of § 4(f) would not apply to these proposed trail projects. Many of the proposed

trails are adopted elements of the TPC MTIS and are considered integral components of the regional transportation system as described in the MTP *Mobility 2025 – 2004 Update*.

Bike routes or bikeways are also considered under the provisions of § 4(f). According to FHWA's *Section 4(f) Policy Paper* (June 1989), if a bikeway is primarily for transportation and is an integral part of the local transportation system, the requirements of § 4(f) do not apply. Section 4(f) would apply to bikeways (or portions thereof) designated or functioning primarily for recreation unless the official having jurisdiction determines it not to be significant for such purpose. However, as with recreational trails, if the recreational bikeway is simply described as occupying the highway rights-of-way and is not limited to any specific location within that right-of-way, a "use" of land would not occur [§ 4(f) would not apply] provided adjustments or changes in the alignment of the highway or bikeway would not substantially impair the continuity of the bikeway. No official easements or rights-of-way have been established for any of the proposed trails within the study area. These proposed trail projects are being planned and coordinated with the proposed action and would not be implemented until a preferred alternative has been identified.

Section 6(f) Considerations

Section 6(f) lands in the study area (see **Table 3-11**) include a portion of Rochester Park located between IH-45 and the Amtrak rail line. Alternatives 3A, 3B, 4, and 5 travel to the north of, but do not contact, this area of Rochester Park. However, as currently planned, a proposed northbound connection ramp from IH-45 to Alternatives 3A, 3B, 4, or 5 may result in some degree of modification near, but outside of, Rochester Park. However, no direct impact to § 6(f) lands are anticipated because all work is assumed to take place within the existing TxDOT right-of-way for IH-45 and, therefore, would not result in a permanent loss of recreational land. No other § 6(f) lands are located within the project study area; therefore, no § 6(f) involvement is required (see **Appendix A, Page 24** and **Plate 4-7A**).

Access to Trinity Park

Depending on which alternative is identified as the preferred alternative, access to the future planned Trinity Park may be affected by the proposed action. Generally, Alternatives 3A, 3B, 4, and 5 would directly affect access to Trinity Park, while Alternatives 2A and 2B would have no effect. The proposed access to Trinity Park falls into two broad categories: vehicular/bicycle/pedestrian access from adjacent arterial streets and bicycle/pedestrian access from adjacent neighborhoods. The measures proposed to resolve the potential effects of the proposed action on access to Trinity Park are discussed in the following paragraphs.

Access from Arterial Streets

The City of Dallas proposes to access Trinity Park from several arterial streets, which currently cross the floodway on bridges. Some of the proposed access points are funded in the initial implementation of the

city's plan, while others are designated as future construction. For these access points, the city proposes to construct park access roads originating at the top of the east and west levees, which would travel down the riverside faces of the levees on an angled path to reach the floodplain. Alternatives 3A, 3B, and 4 may directly affect this type of access because the roadway may block the planned park access road if it were placed on the levee face. Alternative 5 may also have an effect in some locations.

The proposed resolution to this access issue is a structured ramp into the floodplain at each access location. The ramp would originate on the arterial street near the riverside edge of the proposed Trinity Parkway and would bring two-way traffic into the park areas without having to cross the facility. If provided by the NTTA, ramps of this kind would mitigate any cost impact to the city for park access. The proposed schematic plans for Alternatives 3A, 3B, 4, and 5 located at the end of **Chapter 2 Alternatives Considered** include these two-way ramp locations. **Plates 4-8** through **4-10** at the end of this chapter show typical park access points from arterial streets. The budgets for Alternatives 3A, 3B, 4, and 5 also include the costs for these ramps to a touchdown point in the floodway. **Table 4-33** provides a summary of the proposed park access ramps associated with the Trinity Parkway build alternatives.

TABLE 4-33. PROGRAMMED ACCESS RAMP IMPROVEMENTS FOR TRINITY PARK

Access Point No.	Proposed Access Location	Trinity Parkway Build Alternatives					
		2A	2B	3A	3B	4	5
5	Hampton Road Bridge, East Levee	---	---	Ramp	Ramp	Ramp	---
6	Hampton Road Bridge, West Levee	---	---	---	---	Ramp	---
11	Sylvan Avenue Bridge, East Levee	---	---	Ramp	Ramp	Ramp	---
12	Sylvan Avenue Bridge, West Levee	---	---	---	---	Ramp	---
17*	Commerce Street Viaduct, East Levee	---	---	Ramp	Ramp	Ramp	---
18	Commerce Street Viaduct, West Levee	---	---	---	---	Ramp	---
19*	Reunion Gateway, East Levee	---	---	Ramp	Ramp	Ramp	Ramp
20	Reunion Gateway, West Levee	---	---	---	---	Ramp	Ramp
23	Houston/Jefferson Viaduct, East Levee	---	---	Ramp	Ramp	Ramp	---
24	Houston/Jefferson Viaduct, West Levee	---	---	---	---	Ramp	---
29	MLK/Gateway, East Levee	---	---	Ramp	Ramp	Ramp	Ramp

Source: City of Dallas, 1999b and 2003.
Notes: Access point locations are shown on **Plates 4-8** through **4-10 (Chapter 4)** and **Plate 2-6 (Chapter 2)**.
* = Access ramp funded as part of the City of Dallas' *Trinity River Corridor MIP/BVP*. **---** = No action

Access from Adjacent Neighborhoods

The *Trinity River Corridor MIP/BVP* includes proposed bicycle/pedestrian access points to Trinity Park from adjacent neighborhoods. These proposed access routes are bicycle/pedestrian trails, which would go up and over the floodway levees, typically using a zigzag layout on the levee slopes in order to meet ADA grade requirements. The proposed bicycle/pedestrian trails would be directly affected by Alternatives 3A, 3B, 4, and 5, while Alternatives 2A and 2B would have no effect.

To resolve the neighborhood access issue, it has been proposed that both underpasses and overpasses of the Trinity Parkway main lanes would provide bicycle/pedestrian access to Trinity Park from adjacent

neighborhoods. The underpass version takes advantage of several existing drainage channels in the floodway, which are located at outfalls of gravity sluices and pump stations. Since these channels would need to be bridged by the Trinity Parkway main lanes, it has been proposed that these bridge locations be modified as needed in order to accommodate trails to be located under one or both abutments. The overpass version would be considered on a case-by-case basis in the future and is not proposed to be funded by NTTA. The one exception is the main lane toll plazas in the floodway, which the NTTA intends to consider pedestrian overpasses on the roof of the toll collection structures. The schematic plans for Alternatives 3A, 3B, 4, and 5 located at the end of **Chapter 2 Alternatives Considered** show the proposed underpass/overpass locations. **Plates 4-8** through **4-14** at the end of this chapter show typical park access from adjacent neighborhoods. **Table 4-34** provides a summary of the proposed neighborhood access locations associated with the Trinity Parkway build alternatives.

TABLE 4-34. PROGRAMMED NEIGHBORHOOD ACCESS IMPROVEMENTS FOR TRINITY PARK

Access Point No.	Proposed Access Location	Trinity Parkway Build Alternatives					
		2A	2B	3A	3B	4	5
3	Old Meanders Stemmons/Quebec, East Levee	---	---	B/P underpass	B/P underpass	B/P underpass	B/P underpass
4	Bernal Trail, West Levee	---	---	---	---	B/P underpass	---
7	Old Meander North No. 1, East Levee	---	---	Potential B/P overpass on toll plaza	---	Potential B/P overpass on toll plaza	Potential B/P overpass on toll plaza
8	West Dallas/Vilbig, West Levee	---	---	---	---	B/P underpass	B/P underpass
9	Old Meander North No. 2, East Levee	---	---	B/P underpass	B/P underpass	B/P underpass	B/P underpass
10	West Dallas/Winnetka, West Levee	---	---	---	---	Possible future B/P overpass	Possible future B/P overpass
13	Oak Lawn, East Levee	---	---	B/P underpass	B/P underpass	B/P underpass	B/P underpass
14	Sylvan South/Bataan, West Levee	---	---	---	---	B/P underpass	---
15	Continental Avenue Viaduct, East Levee	---	---	Bridge left in place for B/P access	Bridge left in place for B/P access	Bridge left in place for B/P access	Bridge left in place for B/P access
16	Continental Avenue Viaduct, West Levee	---	---	---	---	Bridge left in place for B/P access	Bridge left in place for B/P access
21	Oak Cliff/Coombs Creek, West Levee	---	---	---	---	---	B/P underpass
22	Oak Cliff Gateway, West Levee	---	---	---	---	B/P underpass	B/P underpass
25	Cedars Crossing, East Levee	---	---	B/P underpass	B/P overpass	B/P underpass	B/P underpass
26	Tenth Street/Oak Cliff Park, West Levee	---	---	---	---	---	---
27	AT&SF RR Bridge, East Levee	---	---	B/P Overpass over Toll Plaza	---	B/P Overpass over Toll Plaza	B/P Overpass over Toll Plaza

Source: City of Dallas, 1999b and 2003.
Notes: Access point locations are shown on **Plates 4-11** through **4-14 (Chapter 4)** and on **Plate 2-7 (Chapter 2)**.
B/P = Bicycle/Pedestrian; **---** = No action

4.8 IMPACTS TO WETLANDS AND WATERS OF THE U.S.

EO 11990 (*Protection of Wetlands*, 1977) mandates that a project should avoid wetlands or, if no practicable alternative exists that avoids wetlands, impacts to wetland areas should be minimized as much as possible. With the exception of Alternative 2A, build alternatives for the proposed Trinity Parkway may potentially impact a number of wetland areas. It would be difficult to construct a roadway running north-south through the study area without crossing wetlands associated with the existing drainage network. An overview of the wetlands and other jurisdictional waters (e.g., rivers, creeks, and sumps) within the study area is presented in **Section 3.4.6 Wetlands and Waters of the U.S**.

4.8.1 No-Build Alternative

The No-Build Alternative would result in no impacts to wetlands and waters of the U.S. However, projects planned by others within the study area would require water body modifications, which may have impacts to these resources.

4.8.2 Build Alternatives

The proposed Trinity Parkway would cross water bodies within the study area using bridges or concrete box culverts. Although the use of bridges would likely minimize impacts to wetlands and aquatic areas, bridge construction may require placement of fill material, such as dirt, concrete, or bridge pillars within jurisdictional areas. Construction of the roadway and bridges may in itself alter the wetlands by removing vegetation, excavating and/or compacting soils, and changing the hydrology of the immediate area, even if only temporarily. Precautions would be taken to avoid unnecessary impacts during construction.

4.8.2.1 Build Alternatives and Borrow Areas

The build alternatives as well as borrow areas would require the placement of fill material in or the excavation of jurisdictional waters of the U.S., including wetlands. **Plate 4-15 A-D** shows the locations of waters of the U.S. that would be potentially impacted by fill activities. **Table 4-35** presents the potential impacts to waters of the U.S. including wetlands. The table also provides a descriptive analysis of the potential functional impacts that may be incurred by the proposed alternatives. The primary aquatic functions served throughout the study corridor include short-term and long-term storage of surface water, retention of particulates, energy dissipation, and the maintenance of plant communities and wildlife habitat. The quality for each of the waters of the U.S. was evaluated based on the relative size, number, and degree of functions each resource provides. The degree of function was based in comparison to

wetland systems in the DFW Trinity River floodplain that function at the highest level of ecological performance (e.g., mature forested wetlands).

TABLE 4-35. IMPACTED WATERS OF THE U.S. BY FEATURE

Plate ID Number	Type/Class	Function	Quality	Trinity Parkway Build Alternatives											
				2A		2B		3A		3B		4		5	
				Fill	Ex.	Fill	Ex.	Fill	Ex.	Fill	Ex.	Fill	Ex.	Fill	Ex.
1	Wetland	B, C, D, E, F	Medium	--	--	--	--	--	--	--	--	--	--	--	--
2	Wetland	B, C, D, E, F	Medium	--	--	--	--	--	--	--	--	--	--	--	--
3	Wetland	A	Low	--	--	--	--	2.2	--	2.2	--	2.6	--	--	--
4	Wetland	A, B, D	Medium	--	--	--	--	10.3	2.5	10.3	2.5	7.9	2.5	--	--
5	Sump	B, D	Low	--	--	--	--	--	1.3	--	1.3	0.5	1.3	--	--
6	Wetland	B, D	Low	--	--	--	--	1.1	2.6	1.1	2.6	0.6	2.6	--	--
7	Wetland	A, D	Low	--	--	--	--	0.3	1.7	0.3	1.7	0.3	1.7	--	--
8	Wetland	A, D	Low	--	--	--	--	--	0.6	--	0.6	--	0.6	--	--
9	Sump	B, D	Low	--	--	--	--	--	1.6	--	1.6	0.2	1.6	--	--
10	Sump	B, D	Low	--	--	--	--	--	0.9	--	0.9	--	0.9	--	--
11	Wetland	A, D	Low	--	--	--	--	0.2	1.9	0.2	1.9	--	1.9	--	--
12	Sump	B, D	Low	--	--	--	--	--	2.1	--	2.1	0.3	2.1	--	--
13	Wetland	A, D	Low	--	--	--	--	1.4	--	1.4	--	1.4	--	--	--
14	Open Water	B	Low	--	--	--	--	--	--	--	--	--	--	--	--
15	Sump	B, D	Low	--	--	--	--	--	--	--	--	0.4	--	--	--
16	Sump	B, D	Low	--	--	--	--	--	--	--	--	0.3	--	--	--
17	Wetland	A, D	Low	--	--	--	--	0.9	--	0.9	--	0.6	--	--	--
18	Wetland	B, C, D	Low	--	--	--	--	1.1	--	1.1	--	--	--	--	--
19	Sump	B, D	Low	--	--	--	--	--	1.6	--	1.6	0.6	1.6	--	--
20	Wetland	A	Low	--	--	--	--	--	--	--	--	--	--	--	--
21	Channel	B, C, D, E, F	Medium	--	--	0.9	--	--	--	--	--	--	--	--	--
22	Sump	B, D, E, F	Low	--	--	0.9	--	--	--	--	--	--	--	--	5.0
23	Wetland	B, D, E, F	Low	--	--	--	--	--	1.7	--	1.7	--	1.7	--	--
24	Wetland	A, D, E, F	Medium	--	--	--	--	--	81.6	--	81.6	1.9	79.7	--	--
25	Wetland	B, C, D, E, F	Medium	--	--	--	--	--	--	--	--	--	--	--	--
26	Wetland	B, C, D, E, F	Medium	--	--	--	--	--	--	--	--	--	--	--	--
27	Wetland	B, C, D, E, F	High	--	--	--	--	--	--	--	--	--	--	--	--
28	Sump	B, D	Low	--	--	--	--	--	1.5	--	1.5	0.2	1.3	--	--
29	Sump	B, D	Low	--	--	--	--	--	1.3	--	1.3	0.3	1.0	--	--
30	Wetland	A, D, E, F	Low	--	--	--	--	--	1.0	--	1.0	--	1.0	--	--
31	Sump	B, D	Low	--	--	--	--	--	1.7	--	1.7	0.3	1.4	--	--
32	Sump	B, D	Low	--	--	--	--	--	1.6	--	1.6	0.3	1.3	--	--
33	Wetland	A, B, C, D, E, F	Medium	--	--	--	--	--	5.0	--	5.0	0.5	4.5	--	--
34	Wetland	A, D	Low	--	--	--	--	--	1.2	--	1.2	0.6	1.2	--	--
35	Wetland	A, B, C, D, E, F	Medium	--	--	--	--	--	7.3	--	7.3	1.1	6.3	--	--
36	Wetland	A, C, D, E, F	Medium	--	--	--	--	--	3.8	--	3.8	0.4	3.3	--	--
37	Sump	B, D	Low	--	--	--	--	--	--	--	--	0.2	--	--	--
38	Wetland	B, D, E, F	Low	--	--	--	--	--	--	--	--	1.2	--	--	--
39	Wetland	A, D	Low	--	--	--	--	--	--	--	--	--	--	--	--
40	Wetland	A	Low	--	--	--	--	--	--	--	--	0.2	--	--	--
41	Wetland	A	Low	--	--	--	--	--	3.7	--	3.7	--	3.7	--	--
42	Wetland	B, D	Low	--	--	--	--	--	--	--	--	0.2	--	--	--
43	Wetland	A, B	Low	--	--	--	--	--	2.5	--	2.5	0.4	2.5	0.4	--
44	Sump	B, D	Low	--	--	--	--	--	0.6	--	0.6	--	0.6	--	--
45	Sump	B, D, E, F	Low	--	--	--	--	--	--	--	--	--	--	--	--
46	Wetland	B, D, E, F	Low	--	--	--	--	--	--	--	--	--	--	--	--
47	Sump	B, D, E, F	Low	--	--	--	--	--	--	--	--	--	--	--	--

Notes: Calculated based on site conditions as of January 2004. All quantities shown in acres. Calculated areas are estimates only and may change as final lake configuration is refined.
Plate ID numbers correspond to the locations shown on **Plate 4-15**.
Potential impacts to wetlands may occur from bridge column construction and can be quantified/mitigated during final design.
A = Short-term storage of surface water delays delivery of downstream peak flows; also replenishes soil moisture.
B = Long-term storage of surface water maintains vegetation composition and aquatic habitats; replenishes groundwater.
C = Energy dissipation reduces erosive velocities and increases deposition of suspended materials.
D = Retention of particulates reduces sediment load downstream.
E = Provides long-term and short-term habitat for resident or migratory animals.
F = Provides variety of habitats and serves as travel corridor.
Ex. = Excavation - impacted areas may change as final lake configuration is refined.

Table 4-36 summarizes the potential acreage impacts for each alternative.

TABLE 4-36. IMPACTED WATERS OF THE U.S.

Build Alternative	Emergent Wetlands		River Channel		Drainage Sumps		Open Water	
	Fill	Ex.	Fill	Ex.	Fill	Ex.	Fill	Ex.
2A	---	---	---	---	---	---	---	---
2B	<1	---	<1*	---	<1	---	---	---
3A	18	115	4**	---	---	14	---	---
3B	18	115	4**	---	---	14	---	---
4	20	112	4**	---	4	13	---	---
5	<1	---	---	---	5	---	---	---

Notes: Calculated based on site conditions as of January 2004. All quantities shown in acres. Calculated areas are estimates only.
Potential impacts to wetlands may occur from bridge column construction and can be quantified/mitigated during final design.
--- = No impact anticipated for this alternative. **<** = less than the quantity shown.
* Approximately 1,000 feet of old river channel would be impacted by this alignment.
** Would require the realignment of approximately 2,500 feet of the existing Trinity River channel.

As shown in the above tables, the interior levee alternatives (Alternatives 3A, 3B, and 4) would result in the largest acreage loss of waters of the U.S. Losses are typically associated with a number of scattered floodway depressions that are dry during portions of the year. These depressions are important as they periodically pond water which increases the ability of the wetlands to perform other wetland functions. However, the maintenance mowing of the floodway prohibits the succession of these depressions into natural riverine wetlands, which limits the functional capacity of the wetlands in general. Therefore, wetland surface water storage is likely to be the primary function lost by Alternatives 3A, 3B, and 4 as it is dependent on flood frequency and microtopography, which are maintenance independent. This loss of wetland surface water storage could affect remaining aquatic features within the floodway by altering one or more components of the system. Alternative 5 could impact the interior drainage sumps that are jurisdictional, while Alternative 2B may have minor impacts on the old river meanders.

Where possible, the project would avoid impacting wetlands or alter waters of the U.S. outside the rights-of-way. Disturbed areas would be treated with native grass seeding, mulching, erosion blankets, or similar erosion preventative measures to provide short-term soil stabilization until natural revegetation stabilizes disturbed areas. Additional details concerning minimization and avoidance techniques are discussed in **Chapter 7 Mitigation Measures and Commitments**.

4.8.2.2 Agency Coordination and Permit Requirements

The USACE is in the process of reviewing the delineation of waters of the U.S., including wetlands and aquatic sites subject to regulation under § 404 of the CWA. A copy of the USACE correspondence is presented in **Appendix A-1 Correspondence**. Based on the initial assessment of impacts, all but Alternative 2A would exceed the impact threshold allowed by Nationwide Permit 14 – Linear

Transportation Crossings – and would require a § 404 Individual Permit. Alternative 2A would not impact waters of the U.S. and would not require USACE authorization under the § 404 program.

The proposed action would also comply with the CWA § 404(b)(1) *Guidelines for Specification of Disposal Sites for Dredged or Fill Material* (40 CFR Part 230), administered by the EPA and the USACE. These guidelines mandate that dredged or fill material should not be discharged into aquatic ecosystems (including wetlands), unless it can be demonstrated that there are no practicable alternatives to such discharge, that such discharge will not have unacceptable adverse impacts, and that all practicable measures to minimize adverse effects are undertaken.

As previously discussed in **Section 3.5.8 Navigation**, the Trinity River is officially designated a navigable waterway within the study area. As a result, coordination with the USCG has been initiated under 23 CFR § 650 Subpart H (see **Appendix A-1**). A response from the USCG and additional coordination would determine whether or not a permit would be required for the proposed action under Title 33 USC § 525.

4.9 WATER BODY MODIFICATION; VEGETATION AND WILDLIFE IMPACTS

The construction of a new roadway affects the environment at various levels of geographic scale, from the microscopic to the landscape level. On a landscape level, the ecological communities currently existing along the proposed build alternatives would be fragmented to some degree. It is difficult to quantify this effect, primarily because there are numerous dynamic variables involved. Many generalizations regarding the concept of habitat fragmentation are well accepted, but specific processes and functional relationships are site specific, dynamic, and are interrelated.

The direct effects of construction, operation, and maintenance of the new right-of-way add an element of disturbance to the ecosystem. The cumulative effects of numerous secondary developments resulting from roadway developments could continue to displace existing species from an area, or potentially alter important migratory routes for others. The vegetation communities occurring along the proposed build alternatives would be directly impacted by construction-related activities. The inevitable fragmentation of contiguous habitat blocks, the impacts on mature woodlands and potential modifications of hydrologic and nutrient cycling and transfer processes are also likely to have some effects on natural communities.

Wetland and aquatic systems are impacted in a similar fashion through direct disturbance by heavy machinery compaction and scarification, placement of fill and construction materials, and the disruption of hydrological and nutrient cycling. As with other elements of the ecosystem, wildlife communities are impacted by the permanent loss of habitat. In addition to direct construction-related mortality or injury,

wildlife populations often suffer impacts associated with displacement into adjacent habitats, which often are already at carrying capacity (i.e., the maximum sustainable level) for that species.

4.9.1 No-Build Alternative

The No-Build Alternative would result in no water body modifications and no vegetation or wildlife impacts other than what would develop from existing urban-related activities. However, projects planned by others within the study area would require water body modifications, which may have vegetation and wildlife impacts.

4.9.2 Build Alternatives

4.9.2.1 Water Body Modification

One or more of the build alternatives would cross numerous drainages, including the Trinity River within the Dallas Floodway, drainage sumps associated with the old Trinity River channel, as well as other drainage features for the Trinity Parkway. As discussed above, such drainages and the adjacent bank-side vegetation often serve as travel corridors for various wildlife species. Construction of the facility across a drainage channel can impede the movement of wildlife and can serve to fragment and reproductively isolate vegetational communities. There is a potential for indirect impacts during construction and operation of the Trinity Parkway build alternatives. Indirect impacts may include construction and traffic noise, increase in dust and debris, non-natural lighting, and shading from bridge structures.

The proposed roadway would cross smaller channels through the use of various-sized concrete box culverts, while larger drainages would be bridged. Depending upon the drainage geometry at alignment crossings, some channel modification may be necessary along certain drainages, although this would be a relatively infrequent occurrence and avoided if at all practicable. Specific locations along each alignment where channel modification would be necessary for required drainage crossings have not yet been identified. However, potential large-scale water body modification would be required for the construction of Alternatives 3A, 3B, 4, and 5. As currently proposed, Alternatives 3A, 3B, 4, and 5 would require excavation and earthwork activities within the Dallas Floodway, which would also require modification of the existing Trinity River channel. Detailed information concerning the proposed design and construction of Alternatives 3A, 3B, 4, and 5 within and adjacent to the Dallas Floodway is presented in **Chapter 2 Alternatives Considered**. Alternatives 2A and 2B do not propose any construction that directly impacts the Dallas Floodway.

The proposed project would require coordination and permitting with the USACE under § 404 of the CWA. Affected water body crossings should meet criteria under the USACE's Nationwide Permit Program; otherwise an Individual Permit may be required. USCG permitting may also be required for proposed bridge crossings of the Trinity River. Additional details are presented in **Chapter 7 Mitigation Measures and Commitments**.

4.9.2.2 Vegetation Impacts

The primary impact of the proposed action to various vegetation types would be the direct conversion to impervious roadbed and roadside vegetation cover. Secondary impacts relate more to the potential degradation of the quality of vegetational communities and reduction of their value as wildlife habitat surrounding the direct impact zone. These impacts are often cumulative and associated with increased development surrounding the roadway.

A description of the different vegetation types within the study area is discussed in **Section 3.4.3 Vegetation within the Study Area**. To determine the potential direct impacts, each vegetation type was identified within the proposed right-of-way boundaries of each build alternative. The total acreage amount of each vegetation type occurring within the right-of-way of each alternative was then calculated. **Table 4-37** summarizes the total acres of vegetation cover types directly impacted by the Trinity Parkway build alternatives.

TABLE 4-37. ACRES OF VEGETATION COVER TYPES DIRECTLY IMPACTED BY THE TRINITY PARKWAY BUILD ALTERNATIVES

Build Alternatives	Forested Impacts†	Emergent Wetlands	Non-vegetated Open Waters*	Floodplain Grassland	Urban Landscape	Non-Impacts ROW (Bridges)
2A	7	---	---	---	---	274
2B	7	1	2	---	360	---
3A	7	133	22	121	85	16
3B	7	133	22	121	85	16
4	7	132	21	220	85	16
5	7	1	5	---	373	16

Notes: All quantities shown in acres. Calculated areas are estimates only.
Potential impacts to wetlands may occur from bridge column construction and can be quantified/mitigated during final design.
*** =** Includes impacts associated with drainage sumps, open water, and river channel.
† = Impacts resulting from construction of DFE/Lamar Levee project.
--- = No impact anticipated for this alternative.
ROW = right-of-way

As shown in **Table 4-37**, the total amount of vegetative cover impacted by the build alternatives varies greatly based on vegetative cover type. The majority of impacted vegetation cover types consist of floodplain grassland and urban landscaped habitats. Urban landscape impacts are likely to occur on landside alignments (Alternatives 2A, 2B, and 5), and floodplain grassland impacts would only occur in riverside alignments (Alternatives 3A, 3B, and 4). All build alternatives would impact approximately 7

acres of riparian-bottomland forests between the DART Bridge and MLK. Most of the riparian bottomland forest impacts would be associated with the construction of the Lamar Levee as part of the USACE DFE project.

The potential introduction of invasive plant species exists under the build alternatives. This potential exists because, as with almost any type of construction project, ground-disturbing activities occur that require seeding, landscaping, and long-term maintenance. Barring appropriate mitigation measures, invasive plant species can be introduced into a corridor during erosion control and revegetation operations. Weed seed can be inadvertently introduced into a corridor during construction on equipment or through the use of imported mulch, soil, gravel, or sod.

Until the *National Vegetation Management Plan* specified by EO 13112 (1999) is completed, the proposed action is relying on the Texas noxious weed list to define the invasive plants that must be addressed and the measures to be implemented to minimize their harm. The NTTA would not plant any of the prohibited noxious weed seeds from the statewide list.

4.9.2.3 Wildlife Habitat Impacts

Habitat used by wildlife species is a complex matter. Wildlife diversity and density correlate strongly with vegetation diversity and the type, degree, and frequency of disturbances to which an area's vegetation is subjected. Therefore, for the purposes of evaluating the potential impacts to wildlife resources of the proposed roadway project, vegetation impacts serve as a useful indicator of the magnitude of the various wildlife habitats. For this reason, **Table 4-37** provides useful data in this assessment.

Urban landscaped areas and floodplain grasslands account for the majority of the aerial coverage of the vegetation portions of the build alternatives. However, the greatest impact to wildlife would result from the destruction of forest and wetland habitats. Forested areas require greater regenerative time after clearing as compared to grasslands or emergent wetlands. Furthermore, the vegetation type and associated transition areas to riverine wetlands provide the most valuable habitat for wildlife within the study area. These areas typically contain the greatest diversity of wildlife species. The effects of forest fragmentation particularly threaten neo-tropical migratory birds and other area-sensitive, interior-woodland avian species. For these reasons, the evaluation of project-related impacts on wildlife is largely focused on the amount of woodlands, especially riparian, as well as the amount of aquatic habitat impacted by the various build alternatives. The appropriate vegetation community data provided in **Table 4-37** have been configured in several ways to assess acreage impacts to general "wildlife habitat" (e.g., urban landscaped plus aquatic habitat) and "highest quality wildlife habitat" (e.g., riparian woodlands plus aquatic habitat).

The only impacts to mature woodlands would involve the removal of 7 acres of bottomland riparian forest between the DART Bridge and MLK. The removal of this habitat would be associated with the construction of the DFE/Lamar Levee project. The riverside alignments (Alternatives 3A, 3B, and 4) would potentially convert a large amount of emergent wetlands to un-vegetated open water, which would result in some loss of habitat quality. However, these habitat types are relatively abundant throughout the floodway and are relatively easy to re-establish.

4.9.2.4 Threatened and Endangered Species

This section describes the potential effects to threatened and endangered species from the proposed action and summarizes the coordination process with the USFWS under § 7 of the ESA and the Migratory Bird Treaty Act.

4.9.2.5 No-Build Alternative

No effects to any endangered, threatened, proposed, or candidate species are anticipated from the No-Build Alternative.

4.9.2.6 Build Alternatives

No known occurrences of federally listed endangered or threatened species have been documented within the Trinity Parkway study area, and no effects to any federally listed species are anticipated. **Table 3-18** in **Section 3.4.5.2** provides a list of all sensitive species potentially present within the study area. A description of the habitat requirements for each of the sensitive species of potential occurrence in the study area was presented by species in this section of the DEIS.

4.9.2.7 Coordination with the U.S. Fish and Wildlife Service

Coordination with the USFWS regarding threatened and endangered species protected under § 7 of the ESA and the Migratory Bird Treaty Act has been initiated. Following the identification of the preferred alternative, the USFWS may prepare a Biological Assessment covering any species listed threatened or endangered under the federal ESA that may be affected by the proposed action. Coordination with the USFWS would be initiated following identification of the preferred alternative and during preparation of the Biological Assessment, if required. The Biological Assessment would identify potential effects of the preferred alternative and propose mitigation for any affected species. The FEIS would include information covered during consultation with the resource agencies and the Biological Assessment.

4.10 MICROCLIMATE IMPACTS

The influence of urbanization, including roadway construction, on climate (local or global) is difficult to predict because the exchanges of energy, mass, and momentum are very complex. A city's compact mass of buildings and pavement exhibits a complex geometry of street canyons and a large spatial heterogeneity and constitutes a profound alteration of the natural landscape, which may result in a large number of microclimates. These microclimates may be revealed by the existence of so-called "urban heat islands," where temperature changes of the atmosphere may reach several degrees in comparison to rural areas.

In urban areas, buildings and paved surfaces have gradually replaced preexisting natural landscapes. As a result, solar energy is absorbed into roads and rooftops, which may cause the surface temperature of urban structures to become much higher than the ambient air temperature. **Table 4-38** shows "albedo" or reflectivity values for typical urban surfaces. The albedo is a measure of the amount of solar energy reflected by the surface. As such, low albedo values imply higher surface temperatures, since larger amounts of energy are absorbed.

TABLE 4-38. TYPICAL URBAN SURFACE ALBEDO

SURFACE	UNITS
Asphalt	0.05-0.20
Concrete	0.10-0.35
Brick/Stone	0.20-0.40
Tar and Gravel Roof	0.03-0.18
Highly Reflective Roof	0.60-0.70
Trees	0.15-0.18
Grass	0.25-0.30
Colored Paint	0.15-0.35
White Paint	0.50-0.90
Source: Global Hydrology and Climate Center, 2000.	

Table 4-38 shows that darker surfaces (e.g., asphalt, tar and gravel roof, and trees) have the lowest albedo values and absorb much more heat than lighter-colored surfaces. As a result, darker surfaces can become very hot (as much as 70°F above the air temperature). The main contributors are dark roofs and asphalt pavements.

4.10.1 No-Build Alternative

The No-Build Alternative would have no anticipated microclimate impacts.

4.10.2 Build Alternatives

The proposed action may have a direct microclimate impact by increasing surface temperatures on and immediately adjacent to the roadway itself (within the right-of-way), especially during summer months. However, all build alternatives would be constructed within a major pre-existing urban environment surrounded by typical urban structures, such as buildings, bridges, and asphalt/concrete-paved roadways. When combined with existing conditions, the proposed action would have no perceivable impact to the so-called "urban heat island" effect. No adverse microclimate impacts – either separately or collectively – are anticipated as a result of the proposed action.

4.11 TOPOGRAPHY, GEOLOGY, AND SOILS

4.11.1 No-Build Alternative

No impacts to topography, geology, and soils would occur in the study area under the No-Build Alternative. However, projects planned by others within the study area may impact topography, geology, and soils.

4.11.2 Build Alternatives

Topography

As previously described in **Section 3.5.3.1**, the study area is located within the northernmost section of the Gulf Coastal Plain, which is characterized as "flat to gently dipping..." The Dallas Floodway is the dominant topographic feature within the study area. This large, man-made grassy open space is bounded by flood control levees (approximately 30 feet in height) and accounts for approximately 50 percent of the study area. Otherwise, the study area is dominated by urban development (e.g., buildings, roads, bridges) and floodplain areas (see **Section 3.1**).

All of the build alternatives would involve some degree of change to surface topography due to cut and fill slopes, embankment material, excavation, ditching, and/or trenching. Alternatives 2A and 2B would have the least impacts to surface topography. Alternatives 3A, 3B, 4, and 5 would have the most impacts because construction of either of these alternatives may involve joint development with other projects (see **Section 4.2**) and, therefore, require substantial modifications to the Dallas Floodway (e.g., construction of roadway embankments, levee modification, lake excavation). Of these, Alternative 4 would have the most impacts to surface topography of all the alternatives. A summary of the estimated excavation and/or fill quantities required for each of the build alternatives is provided in **Section 4.20.8 Construction Excavation and Fill Requirements**.

Geology and Soils

The project study area is considered to be free of geologic conditions that would be expected to constitute potentially adverse impacts, hazards, or impediments to construction. The proposed action is located in a region of relatively low seismicity. Project features would be designed to incorporate provisions for mitigation of expansive soils and possible local presence of weak soils, flood control features (i.e., levees, embankments, sump areas, etc.), and high water table conditions.

During and immediately following construction, there would be exposed soils. Soils within the build alternative rights-of-way, in general, are classified as having slight to moderate potential for erosion (see **Section 3.5.3**). The relatively flat topography in the study area reduces the potential for erosion during project construction. Erosion is expected to be limited to the immediate vicinity of the proposed roadway, new embankment slopes, and at interchanges and overpasses. The potential for soil erosion would occur during the construction period; however, it is expected to be negligible.

Mineral resources within the study area are limited to near-surface deposits of sand and gravel. Extensive areas of sand and gravel extraction have occurred along the floodplain/terrace complexes of the Trinity River. Currently, there are no active quarries within the project study area. None of the alternatives would impact mineral production within the study area.

4.12 WATER QUALITY IMPACTS

This section describes potential surface water and groundwater quality impacts that may result from the proposed action. Included is a description of the regulatory requirements involved with impacts to water quality. Many of the potential impacts are common to all build alternatives. In some instances, a brief discussion of mitigation measures is included in the discussion. Construction-related water quality impacts are further described in **Section 4.20 Temporary Effects during Construction**.

4.12.1 Agency Coordination and Regulatory Requirements

FHWA Requirements

The proposed action would comply with FHWA's *Erosion and Sediment Control Final Rule*, published in 59 FR 42 (FHWA, 1994a). This final rule revised 23 CFR 650, Subpart B, *Erosion and Sediment Control on Highway Construction Projects*, to formally adopt Volume III of the American Association of State Highway and Transportation Officials (AASHTO) *Highway Drainage Guidelines* (1992), which are to be followed for all projects funded under Title 23 USC.

Texas Pollutant Discharge Elimination System Permit Requirements

The TPDES program implements the federal NPDES program in the state of Texas. On September 14, 1998, the EPA authorized State of Texas to develop and implement the TPDES Program, including the TPDES storm water permitting for construction activity (63 FR 185). As of March 2003, the TCEQ administers TPDES storm water permits for construction activity.

Construction of the proposed action would disturb more than 5 acres of ground surface; therefore, this project must comply with the conditions of TCEQ's TPDES General Permit Number TXR150000, under provisions of § 402 of the CWA and Chapter 26 of the Texas Water Code. A SW3P is required for each construction project or site covered under this permit.

For the SW3P to be approved, the TCEQ requires that the plan:

- Be prepared in accordance with good engineering practices;
- Identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges from the construction site;
- Describe and ensure the implementation of practices that would be used to reduce the pollutants in storm water discharges associated with construction activity at the site; and
- Assure compliance with the terms and conditions of the TPDES General Permit.

TCEQ Water Quality Certification

Pursuant to § 401 of the CWA, the project applicant must obtain a Water Quality Certification from the TCEQ. This Water Quality Certification provides reasonable assurance that an activity that may result in discharge to waters of the U.S. would not violate water quality standards.

Section 404 Permit Requirements

The USACE regulates activities resulting in fill within any jurisdictional waters of the U.S. pursuant to § 404 of the CWA. Given the proposed extent of fill for the build alternatives (except for Alternative 2A) and potential impacts to floodplains, the proposed action would require a § 404 individual permit. Additional details regarding permitting and compliance requirements that may be required for the proposed action are provided in **Chapter 7 Mitigation Measures and Commitments**.

4.12.2 No-Build Alternative

The No-Build Alternative would not have a direct impact to water quality in the Trinity Parkway study area. Increased congestion on local roadways and the resulting stop-and-go traffic may add to the build-up of pollutants on road surfaces and rights-of-way in the study area. This has the potential to have long-term

adverse impacts on the quality of surface and ground water. In addition, decreased traffic safety due to congestion may increase the potential for an accidental spill of toxic or otherwise hazardous materials along existing roadways, such as IH-35E or IH-30.

4.12.3 Build Alternatives

Surface Water Impacts

The major short-term water quality issues associated with construction activities are erosion and sedimentation. Erosion and sedimentation are accelerated when vegetation is cleared in preparation for the construction of the roadway. These cleared areas and any other exposed ground are susceptible to erosion. Each of the build alternatives requires the crossing of several water bodies within the study area, including the Trinity River and its network of drainage sumps and tributaries. The potential erosion and sedimentation are dependent upon local conditions (i.e., soil type, slope, and vegetation) and construction practices. Bridge construction also has the potential to create soil erosion, which could affect sedimentation and turbidity of water. Eroded sediment may then redeposit downstream, resulting in the disruption of the aquatic ecosystem and water quality degradation. In addition, storm water runoff from the completed facility could also contain pollutants that could have effects on the quality of surface water.

<u>Beneficial Use of Water Resources in the Area</u>

The toll road "footprints" for the build alternatives would require fill in various locations which could include portions of the Dallas Floodway or associated flood control storage sumps (old Trinity River channel) and wetlands in the study area. Alternatives 3A, 3B, and 4 require fill in the Dallas Floodway while the other alternatives (Alternatives 2A, 2B, and 5) do not. This fill would affect the beneficial use of wetlands and aquatic habitats. In addition, increased pavement area and ADT over the life of the proposed action have the potential to discharge storm water pollutants to these water bodies and wetlands in concentrations that could negatively affect aquatic life.

<u>Evaluation of Potential Runoff Effects on Aquatic Resources</u>

Existing water quality data suggest that surface water quality has already been compromised by wastewater effluent and local urban runoff, including storm water runoff from existing roadways in the study area and beyond (see **Section 3.5.6 Baseline Surface Water Quality**). Concentrations of several pollutants in water and sediment within the Trinity River, including the study area, exceed water quality and aquatic wildlife objectives established by the TCEQ and TDH. Furthermore, existing concentrations of contaminants (i.e., nitrite plus nitrate, phosphorus, orthophosphorus, fecal coliform bacteria, zinc, chlordane, PCBs, etc.) may be adversely affecting the local aquatic environment.

The most common contaminants in highway runoff are heavy metals, inorganic salts, aromatic hydrocarbons, and suspended solids that accumulate on the road surface as a result of regular highway operation and maintenance activities. Salting and sanding practices may leave concentrations of chloride, sodium, and calcium on the roadway surface. Ordinary operations and the wear and tear of vehicles also result in the dropping of oil, grease, rust, hydrocarbons, rubber particles, and other solid materials on the highway surface. Although leaded gasoline is no longer in use, lead is still being deposited on highway surfaces through sources such as paints used on roadways and atmospheric deposition.

The ability to predict highway runoff quality is limited by the many variables that combine to make each storm event unique. Differences in antecedent dry conditions, rainfall intensity, traffic volume, surrounding land use, highway surface type, and drainage method result in a wide range of concentrations for many of the pollutants observed in runoff.

Construction and operation of the proposed action may result in the following potential chemical and water quality effects:

1. **Temperature or Thermal Balance:** Storm water runoff may cause a slight rise in water temperature in adjacent surface water (i.e., retention basins, sumps, creeks, streams, etc.) and local shallow groundwater, but the project should have a negligible effect on water temperature in the Trinity River.
2. **Total Dissolved Minerals:** During construction, local surface waters may experience a slight rise in total dissolved solids due to increased erosion and suspended sediments. The long-term infiltration of storm water runoff could potentially increase levels of total dissolved minerals and other runoff pollutants in local shallow groundwater. However, shallow groundwater is not a likely source of drinking water.
3. **Suspended Solids (Either Organic or Inorganic):** Refer to Item 2 above.
4. **pH:** Accidental spills of concrete wash water (very alkaline water) may impact local water bodies and waterways.
5. **Dissolved Oxygen:** During construction, local surface water bodies may experience a slight increase in dissolved and suspended solids, containing inorganic and organic particulates. The resultant increase in oxygen demand would lower the concentration of dissolved oxygen.
6. **Rates of Chemical or Biochemical Reaction:** The potential for increased erosion and sediment loads and accidental spills of chemicals during construction could affect water bodies and wetlands.
7. **Toxicity to Indigenous Aquatic Biota:** The implementation of measures to minimize harm would reduce or eliminate long-term impacts to water quality. Accidental spills of toxic materials

during construction may impact water quality. In addition, contaminated soil and/or groundwater may be encountered during soil excavation activities along the build alternatives. If these contaminated materials are exposed to storm water runoff or waterway erosion, local waterways could be adversely impacted, which may have a short-term or long-term impact on water quality.

8. **Nutrient Concentrations:** Changes in suspended and dissolved solids and rates of chemical and biochemical reactions would result in a change in nutrient concentrations in water bodies and wetlands.
9. **Oxidation-Reduction Potential:** This chemical reaction in local surface water bodies would also be affected by changes in suspended and dissolved solids and other physical properties that may be altered during construction.
10. **Density:** Density is dependent on such parameters as suspended and dissolved solids and may be slightly altered during construction.

Throughout the mid-1980s, the FHWA conducted extensive nationwide studies to determine highway runoff constituents, amount relative to roadway types and traffic conditions, and the potential impacts to surface water resources (Driscoll, Shelley and Strecker, 1990). FHWA's research concluded that pollutants in highway runoff are not present in amounts sufficient to threaten surface or groundwater where ADT volumes are below 30,000.

Table 4-39 lists the FHWA study results for pollution concentrations in highway runoff for highways with ADT volumes less than 30,000 and more than 30,000.

TABLE 4-39. POLLUTANT CONCENTRATIONS IN HIGHWAY RUNOFF

Pollutant	Event Mean Concentration (mg/L) ADT Less Than 30,000	Event Mean Concentration (mg/L) ADT More Than 30,000
Suspended Solids	41.0	142.0
Lead	0.080	0.400
Zinc	0.080	0.329
Copper	0.022	0.054

Source: Driscoll, Shelley and Strecker, 1990.
Notes: Event mean concentrations were derived by averaging from several storm events.
mg/L = milligrams per liter (by volume)
ADT = Average Daily Traffic

In order to put the above-noted pollutant concentrations in perspective, the EPA acute toxicity threshold levels for human health are 0.477 mg/L for lead, 0.800 mg/L for zinc, and 0.065 mg/L for copper. The values shown in **Table 4-39** for these constituents are below these levels. Concerning pollutant threshold levels that may cause adverse impacts to aquatic life, the FHWA concluded that:

- Pollutants in runoff for highways with less than 30,000 ADT, and without runoff abatement, would not cause adverse effects to aquatic life; and

- Pollutants in runoff for highways with more than 30,000 ADT have the potential, without runoff abatement, for adversely affecting aquatic life.

As previously described in **Section 4.4 Transportation Impacts**, the projected traffic volumes for each of the build alternatives would exceed 30,000 ADT. Regardless of the future ADT volumes, highway runoff abatement measures would be incorporated into all of the detailed study build alternatives in accordance with NPDES/TPDES permit requirements, which require the use of storm water BMPs that would assure this project would not have a negative impact on water quality.

In consideration of the Executive Memorandum on Beneficial Landscaping (FHWA, 1994b), landscaping activities for each build alternative would utilize techniques to minimize the adverse effect that landscaping may have on the local environment. In particular, this means employing landscaping practices and technologies that conserve water and prevent pollution. By using effective landscape management practices, appropriate application of pesticides and fertilizers, and runoff reduction practices, potential impacts to water quality would be minimized.

The proposed action would not affect any public water supply, water treatment facilities, or water distribution systems; however, rainfall runoff rates would increase slightly due to the increase in impervious cover. This increased runoff could have adverse impacts over the long term if the possibility of overland flow is not available and proper control measures are not implemented. To minimize the possibility of contamination of surface water due to pollutant runoff, proper control measures would be implemented during construction and operation of the proposed action.

Ground Water Impacts

During the short term, the primary impacts to ground water are associated with erosion during construction. During this time, the exposed earth and stockpiled materials may be eroded and transported into nearby surface water features, which may have the potential to recharge underground water supplies. Temporary BMPs would be used to minimize the potential for such adverse impacts during construction.

Ground water quality would not be substantially affected by any of the build alternatives. Continued urban development along with potential channel modifications within the Dallas Floodway may slightly alter local ground water inflows and outflows of the Trinity River; however, these flow changes should not cause any substantial ground water quality problems.

Over the long term, the main potential impact to ground water would come from the continuing runoff of debris and pollutants that accumulate on the road surface and along the right-of-way, or possibly an

isolated spill event. An accidental release of hazardous materials could have an adverse impact on the quality of ground water, especially if such an accident were to occur at a bridge crossing of the Trinity River.

Mitigation of Long-Term Impacts

In summary, the overall mitigation structure for water quality impacts is a condition of the NPDES/TPDES requirements as well as other local, state, and federal storm water runoff control and management programs. Implementation details for these mitigation measures would be developed and incorporated into project design and operations prior to project start-up. With proper implementation and monitoring of appropriate mitigation measures, short-term (construction-related) and long-term (operation-related) water quality impacts would be avoided or minimized. Detailed information concerning measures to minimize water quality impacts is provided in **Chapter 7 Mitigation Measures and Commitments**.

4.13 FLOODPLAIN IMPACTS

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*. The intent of these regulations is to avoid or minimize highway encroachments within base floodplains, where practicable and to avoid supporting land use development that is incompatible with floodplain values. To comply with EO 11988, the project must be designed to avoid floodplain impacts when practicable and to adequately mitigate unavoidable impacts.

This section summarizes the impacts of project alternatives on the base floodplain (see **Section 3.5.7 Floodplains and Flood Control Features**). This includes a description of the encroachments in the base floodplain areas, the potential flood-related risks, impacts to natural and beneficial floodplain values, and the potential for incompatible floodplain development attributable to the proposed action.

4.13.1 No-Build Alternative

The No-Build Alternative would not encroach on any existing floodplains or regulatory floodways, nor would it have any effect on base flood elevations in the study area. Development independent of the Trinity Parkway is planned and is occurring in the study area. The compatibility of such development with floodplains and regulatory floodways is subject to federal, state, and local standards and regulations.

4.13.2 Build Alternatives

Impact Assessment Methodology

Potential floodplain impacts of affected streams and other water bodies were evaluated by use of FIRMs published by FEMA, previous engineering studies for interior drainage facilities that drain to or are a part of the Dallas Floodway or DFE, and hydraulic model studies conducted on the Trinity River using the USACE's Hydrologic Engineering Center – River Analysis System (HEC-RAS) program.

Floodplains impacted within Zone X and Zone AE (as designated on the FIRM maps) was determined for each build alternative. Zone AE is defined as Special Flood Hazard Areas Inundated by 100-year Flood – Base Flood Elevations Determined. Zone X is defined as Other Flood Areas – areas of 500-year flood; areas of 100-year flood with average depths of less than 1-foot with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

The potential floodplain impacts for each build alternative were then identified, evaluated, and calculated based on preliminary plans for the roadways and their corresponding rights-of-way. For the purposes of evaluation, the alternative routes were split into evaluation reaches by route stations or road crossings. Floodplain impacts were then addressed for each build alternative. The areas impacted represent actual alternative right-of-way areas situated within a designated Zone X, Zone AE, or other Zone AE – Other (sumps and waterways) for a particular reach or route segment.

Floodplain Impacts

The construction of each build alternative would result in unavoidable direct floodplain impacts or "encroachments" in several areas, as shown on **Plate 4-15 A-D**. Such floodplain encroachments can occur in two ways, transverse stream crossings, and longitudinal encroachments into floodplain areas.

Transverse crossings occur when a stream is crossed and roadway construction in the floodplain is generally perpendicular to the stream flow. Longitudinal encroachment occurs when roadway construction in the floodplain is generally parallel to the stream flow. In either case, the additional fill required to raise, widen, or construct a new roadway can reduce the cross-sectional area of the floodway necessary to convey the flow or can reduce the volume available for flood storage. Encroachments farther from the channel banks have a reduced effect since the conveyance capacity in the distant floodplain is smaller compared to that of the main channel. In general, the floodplain capacity has to be maintained within the Dallas Floodway levees as mandated by USACE, and rises in the floodplain elevation would not be allowed. **Table 4-40** provides a summary of the potential floodplain impacts for the Trinity Parkway build alternatives.

TABLE 4-40. SUMMARY OF POTENTIAL FLOODPLAIN IMPACTS

FEMA Flood Zone	Trinity Parkway Build Alternatives					
	2A	2B	3A	3B	4	5
Zone X (500-year)	179	252	39	54	45	64
Base Floodplain (100-year)						
Zone AE – Trinity River	33	42	344	332	441	285
Zone AE – Other	6	14	1	1	1	39
Base Floodplain Total	**39**	**56**	**345**	**333**	**442**	**324**
Notes: All quantities shown in acres. Calculated areas are estimates only.						

As shown in **Table 4-40**, each of the Trinity Parkway build alternatives result in floodplain encroachments ranging from 39 acres (Alternative 3A) to 252 acres (Alternative 2B) of areas designated Zone X; from 33 acres (Alternative 2A) to 441 acres (Alternative 4) of areas designated Zone AE – Trinity River; and from 1 acre (Alternatives 3A, 3B, and 4) to 39 acres (Alternative 5) of areas designated Zone AE – Other. Alternatives 2A and 2B result in the least amount of encroachment on the base floodplain (Zone AE – Trinity River and Zone AE – Other), from a total of 39 acres to 56 acres, respectively. Alternatives 3A, 3B, 4, and 5 would result in the greatest amount of encroachment on the base floodplain, ranging from a total of 333 acres (Alternative 3B) to 442 acres (Alternative 4).

Summary of Hydraulic Design Studies

Based on preliminary hydraulic analyses conducted during the TPC MTIS/DEIS, encroachments on the floodplains would not increase the base flood elevation to a level that would violate applicable FEMA floodplain regulations. The proposed facility would permit the conveyance of the 100-year flood without causing substantial damage to the roadway, water bodies, or other property and would not be designed to support incompatible floodplain development.

The hydraulic design practices for the construction of all of the build alternatives would be in accordance with current FHWA design policies and standards. During the final design phase of the preferred alternative, a detailed location hydraulic study would be conducted in accordance with 23 CFR 650. The study would determine if the 100-year base flood elevations would increase due to the construction of the new facility within the impacted floodplains. The detailed hydraulic analysis would demonstrate that adequate measures have been taken to ensure that any floodplain encroachments would not increase the risk of flooding to adjacent properties and comply with all federal, state, and local floodplain regulations (44 CFR Part 60.3 [floodplain management criteria for flood-prone areas] and Part 65.12 [revision of flood insurance rate maps to reflect base flood elevations caused by proposed encroachments]).

The complete hydrologic and hydraulic design data file for all water crossings involved with the project would be maintained by NTTA as part of its standard procedures. This complete file would include such items as structures investigated, photographs, cost estimates, runoff investigations, drainage area maps,

100-year water surface profiles and floodways, and general statements concerning historical high-water levels.

Flooding Risk

Areas of Zone X (Areas Outside of the Dallas Floodway)

By definition, a project located in areas designated Zone X would not have an effect on the base floodplain. Since the majority of the study area outside of the Dallas Floodway and adjacent storage sump areas are located in Zone X, the flooding risks associated with Alternatives 2A, 2B, and 5 are considered very low. All of the build alternatives would be designed to avoid and/or minimize the potential impact on sump storage capacity. Any potential impacts to storage sumps would be offset by providing additional excavated areas to ensure no net loss of flood water storage capacity.

Base Floodplain Areas (Dallas Floodway)

Within the Dallas Floodway, Zone AE has a base floodplain elevation ranging from approximately 423 feet (upstream end of Dallas Floodway) to approximately 414 feet (just upstream of MLK). Because the profile grade of each alignment and the proposed floodwalls associated with Alternatives 3A, 3B, and 4 would be constructed at or above base floodwater surface elevations, there would be a low risk of floodwaters overtopping the roadway/floodwalls or causing damage to adjacent property at these locations with no substantial effect on the base flood water surface elevation. In accordance with 23 CFR 650 Subpart A, the design of encroachments would be consistent with standards established by FEMA, state, and local governmental agencies for the administration of the NFIP.

Bridges/Structures (All Base Floodplain Areas)

The proposed elevated and/or bridge structures associated with the build alternatives would constitute transverse encroachments into the base floodplain. In accordance with 23 CFR 650 Subpart A, these structures would be designed to avoid the base floodplain, where practicable. As currently proposed, these structures would be supported with concrete piers placed a minimum distance of 100 feet apart to minimize head losses. Under these conditions, the proposed structures would have no substantial effect on the base floodwater surface elevation and there would be a low risk of water overtopping the roadway or causing additional damage to adjacent property. Since the proposed structures would be constructed above existing water bodies and displace only a small portion of Zone AE, the encroachment into the floodplain is considered minimal.

The proposed facility would be designed to avoid or minimize any risk of increasing flood potential in the base floodplain. This would be accomplished either by completely bridging the regulatory floodway and/or floodplain sump areas or providing a detailed analysis and design of the project in compliance with FEMA guidelines, local regulations, and directives from 23 CFR 650 Subpart A. Analysis of the

preliminary project designs for each of the build alternatives, hydraulic modeling data, and recommended mitigation measures and commitments indicates this project would not constitute a significant encroachment into the base floodplain and does not create a significant risk as defined by 23 CFR 650 Subpart A.

This project does not constitute a significant risk of increased flooding since the adverse consequences associated with the probability of flooding attributable to this project are negligible. There would be no increase in flood heights at any existing structure.

Incompatible Floodplain Encroachment

Highway projects can impact floodplains indirectly by facilitating or inducing development in floodplains. Incompatible floodplain encroachment is defined as development inconsistent with a community development plan (FHWA, 1987). The applicable community development plan for the City of Dallas is the *Trinity River Corridor MIP/BVP* and the ongoing *Trinity River Corridor Comprehensive Land Use Plan* (see **Section 3.1.1.1**), which are both subject to the CDC process. The CDC process was developed with the coordination of the NCTCOG and the joint efforts of the participating nine cities and three counties along the Trinity River corridor to adopt a cooperative management program whereby each city retains development permit authority within its jurisdiction, but bases its permit decision on a set of common permit criteria. Local government agencies with development permitting authority within the river corridor are implementing the CDC process. Technical aspects of the CDC process are managed by the USACE – Fort Worth District.

The CDC process ensures that a development's effect, including cumulative effects, on future flooding is considered in floodplain permitting decisions. Floodplain development can continue, but specific standards ensure that this development does not exacerbate flooding. In addition to all local agency requirements for fill permits, when a property is located within the 100-year floodplain of the Trinity River, the Elm Fork, and portions of Lower White Rock Creek and Lower Fivemile Creek, which is called the *Regulatory Zone* under the CDC process, the applicant has to apply for a CDC permit. This involves technical review by the USACE, and a CDC permit must be obtained from the local agency prior to approval of a fill permit. For property located within the *Review Zone*, which is the area between the 100-year and the SPF flood boundaries (including FEMA Zone X), no CDC permit is required. However, the applicant must apply to the CDC/Floodplain Administrator(s) (Part I of the CDC application) to inform them of the plans and activities.

The CDC process incorporates common permit criteria developed to ensure a consistent design level of protection and minimal adverse effects on flooding, upstream or downstream of the project, unless granted a variance. In order to receive a CDC permit, the applicant is required to evaluate and comply

with the criteria established for hydraulic impacts (water surface elevations, valley storage capacity, velocities, and conveyance); cumulative impacts (upstream, adjacent, and downstream effects); and preservation of adjacent project storage (i.e., respect the valley storage provided by adjacent projects by ensuring that their hydraulic connection to the river is maintained). In addition, other permitting and design criteria must also satisfy the requirements of the USACE, FEMA, TCEQ, and any other local criteria for pertinent flood events. Because the City of Dallas has taken steps to plan, mitigate, and restrict development in flood-prone areas by implementing the Trinity River Corridor CDC process, the proposed action would not support or promote incompatible floodplain development.

This project would not have a substantial adverse impact on natural and beneficial floodplain values. For any of the build alternatives, compensatory excavation needed to replace floodwater storage capacity along with adequate replacement of wetlands would have a positive impact on the natural moderation of floods within the study area. Those floodplain values related to wetlands (fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, water quality maintenance, and groundwater recharge) would have a minor temporary adverse impact to the taking of wetlands, but would have a long-term beneficial impact due to the establishment of new wetlands in excess of current conditions.

The wetland areas proposed to be taken by this project are not likely candidate wetlands for scientific study. The greatest potential is in the study of freshwater wetland creation techniques, which could be developed for any new wetlands proposed as part of the mitigation plan for this project.

Bridges would be designed to allow for wildlife movement. Nevertheless, the height and width of the structures above the base floodplain may present a physical constraint on wildlife movement within the base floodplain. The proposed bridge structures at all stream crossings for all of the build alternatives would cause shading impacts to the base floodplain.

There would be some minor adverse impacts on floodplain values. The potential for an accident involving hazardous or toxic spills would be slightly higher, although the design of the facility would help minimize this risk. This may involve orienting drainage structures away from sensitive water bodies and thus providing longer travel paths for contaminants from a spill site, which could allow more time for clean up before contamination reaches the water body. The construction of permanent sediment basins (ponds) as well as other appropriate structural and non-structural BMPs would also trap contaminants for more efficient clean up.

The project would have a minor temporary adverse impact on water quality since erosion and sedimentation always accompany construction projects of this magnitude. However, erosion and

sedimentation should be effectively minimized through the use of both temporary and permanent BMP techniques, and the net increase in wetlands would have a net long-term effect of improving water quality.

The preceding discussion documents the project would not have a substantial adverse impact on natural and beneficial floodplain values. Since this project:

- Does not have a significant potential for interruption or termination of a transportation facility needed for emergency vehicles that provides a community's only evacuation route (see **Sections 3.2** and **4.4**);
- Does not pose a significant risk; and
- Does not have a significant adverse impact on natural and beneficial floodplain values, then the project does not constitute a significant encroachment as defined by 23 CFR 650 Subpart A.

Significant Floodplain Encroachment

Federal regulations require that a finding of no practicable alternative be prepared for projects that result in a significant floodplain encroachment. If a build alternative is recommended that substantially affects the base floodplain, a "No Practicable Alternative Finding" would be included in the FEIS. A significant floodplain encroachment, as defined in 23 CFR 650 Subpart A, is an encroachment and any direct support of likely base floodplain development that would involve one or more of the construction- or flood-related impacts:

- A significant potential for interruption or termination of a transportation facility, which is needed for emergency vehicles or provides a community's only evacuation route;
- A significant risk; or
- A significant adverse effect on natural and beneficial floodplain values.

Development normally accompanies the construction of roadway projects in urban areas. However, the majority of the base floodplain that would be incorporated into the design of the Trinity Parkway is in public ownership, which would minimize the potential of development within the base floodplain. This feature provides the mechanism for the establishment of floodplain/wetlands and park/recreational areas (existing and/or planned), which would protect this land from incompatible floodplain development.

There is no practicable way to completely prohibit development within a floodplain. Indeed, FEMA guidelines along with local rules and regulations do not prohibit development within the base floodplain, rather they prescribe methods and procedures by which development can occur. Development within the base floodplain areas within the study area has occurred in the past, and will likely occur in the future.

In accordance with 23 CFR 650 Subpart A, the floodplain encroachments resulting from the Trinity Parkway build alternatives are not considered to be substantial because emergency vehicles would not be hindered during construction or flooding of the proposed project. The project, when completed, would serve as an alternate north-south roadway through the study area and reduce traffic congestion, thereby improving use of IH-35E and other study area roadways as emergency vehicle and evacuation routes. In addition, this facility would not be over-topped by the 100-year flood so there is no substantial potential for interruption or termination of service.

Furthermore, the proposed project does not support incompatible floodplain development and would not result in any substantial new risks during construction or flooding. It would not noticeably increase the base flood elevation or flood risk to property or to human life. In order to prevent a substantial adverse impact on natural and beneficial floodplain values, appropriate mitigation measures would be incorporated into the project. Therefore, the proposed project does not constitute a significant floodplain encroachment as defined in 23 CFR 650 Subpart A and does comply with EO 11988.

4.13.3 Measures to Minimize Floodplain Impacts

The design of the Trinity Parkway would result in minimal effects on the base floodplain. Routine construction procedures would minimize impacts during construction. These procedures include limiting the area affected by construction to the minimum necessary, using barriers or fences to protect sensitive areas, and employing BMPs to control erosion and runoff. It may be possible that physical disturbance of the base floodplain would be minimized by constructing bridge sections elsewhere, transporting them to the site, and placing them, rather than building forms and falsework, casting sections, and removing forms on-site. Alternatives 2A, 2B, and 5 would not have major floodplain impacts, while Alternatives 3A, 3B, and 4 could have major impacts that could be balanced or minimized by carefully analyzed cut/fill and joint development efforts (see **Section 4.2** for more details concerning potential joint development actions).

Toll Road Effects

The designation of the Trinity Parkway as a toll road would only result in encroachments beyond those of a free road if toll plazas are to be located within one or more of the floodplains. The potential for additional encroachment, if any, would be determined when the design and location of the proposed toll plazas are finalized. Proposed toll plaza locations are shown on **Plates 2-1** through **2-6** at the end of **Chapter 2 Alternatives Considered**.

4.14 AIR QUALITY IMPACTS

Section 3.6 in **Chapter 3 Affected Environment** provided details concerning air quality regulatory requirements (see **Section 3.6.1**); existing project area air quality, including transportation-related pollutants and attainment status (see **Section 3.6.2**); local meteorology and topography (see **Section 3.6.3**); and the 1990 CAAA conformity requirements (see **Section 3.6.4**).

Of the criteria pollutants the EPA has identified as being of nationwide concern, CO is the only pollutant currently requiring a detailed, micro-scale mobile source impact analysis for transportation projects. Details concerning the analysis methodology as well as analysis results for each alternative are presented in the following sections.

4.14.1 No-Build Alternative

The No-Build Alternative would not reduce congestion on IH-35E, IH-30, or other study area roadways. In fact, it would lead to increased congestion and decreased mobility. As a result, the No-Build Alternative would not provide emission reduction benefits within the study area or north central Texas region.

4.14.2 Build Alternatives

To assess the effects of the proposed action on air quality, a TAQA was conducted to determine the potential impacts on air quality in the study area. These impacts are compared to the NAAQS for acceptable air quality for the region. The following sections document the analysis methodology and air quality impacts associated with operation of the build alternatives.

4.14.2.1 Analysis Methodology

The TAQA for the proposed project was prepared in accordance with TxDOT's *1999 Air Quality Guidelines*. The TAQA was conducted for CO concentrations using the EPA-approved MOBILE6/CAL3QHC computer programs for the Estimated Time of Completion (ETC) year 2010 and design year 2025. CAL3QHC is a line-source dispersion model specifically designed for the prediction of pollutant concentrations in the vicinity of highways. Additional details concerning the MOBILE6 and CAL3QHC models are described in this section of the DEIS.

Appropriate vehicle emission values from MOBILE6 for the years 2010 and 2025 were input into CAL3QHC. MOBILE6 input factors (to simulate the driving fleet characteristics for the region) include parameters for

tampering rates, vehicle speeds, vehicle registration by vehicle type and age, percentage of vehicles in cold start mode, atmospheric temperature, humidity, and type of vehicle inspection/maintenance program. Projected CO concentrations were then calculated using a *worst-case analysis* for each alternative for receivers located at the proposed right-of-way boundaries. The variables used in the analysis involved generally worst-case assumptions regarding meteorological conditions, vehicle fleet operating characteristics, traffic, and local terrain.

MOBILE6 Model

The EPA's highway vehicle emission factor model, MOBILE, is a FORTRAN program that provides average in-use fleet emission factors for three criteria pollutants (VOC, CO, and NOx) for each of eight categories of vehicles. These emission factors can be provided for any calendar year between 1952 and 2050 and under various conditions affecting in-use emission levels (e.g., ambient temperatures, humidity, average traffic speeds, and gasoline volatility).

The output from the model is in the form of emission factors expressed as grams of pollutant per vehicle mile traveled (g/mi). Because newer cars with better pollution-control devices are replacing older cars, the vehicle mean exhaust emission factors usually decrease faster than the traffic volumes increase each year. As a result, the projected first year of traffic activity is used to simulate (even overestimate) a "worst-case" situation for the design life span of the alternatives. The Air Quality Analysis Section of the TxDOT Environmental Affairs Division (TxDOT-ENV) in Austin, Texas, provided the MOBILE6 output data used in this study.

MOBILE6 Inputs

MOBILE6 default values for the DFW area operating mode (percent cold and hot starts) and percent of diesel vehicles were used. Since vehicle exhaust emissions are higher during colder months, average ambient temperatures of 34.0° F (low) and 54.1° F (high) were assumed. The ETC year 2010 and year 2025 were input into the model to calculate the exhaust emission factors.

Emission Factors. Emission factors for vehicular traffic are derived using the MOBILE6 output and projected peak-hour traffic and vehicle categories. While heavy-duty vehicles 8,501 pounds and higher gross vehicle weight (GVW) may be prohibited from using the Trinity Parkway, this study included all eight vehicular categories to calculate the average in-use emission factors. This approach provides more of a "worst-case" situation. The composite emission factors used for the roadway segments analyzed are:

Roadway Segment	Emissions (g/mi)	
	Year 2010	Year 2025
Mainlane Toll Plaza (All Build Alternatives)		
-Lanes 1-2 (Change Made)	10.684 – 22.315	9.123 – 19.975
-Lanes 3-4 (Exact Change)	10.684 – 22.315	9.123 – 19.975
-Lanes 5-6 (Toll Tag)	10.684 – 11.261	9.123 – 9.614
Other Roadway Segments		
-Irving/Industrial Boulevard (Alternative 2A)	10.410	8.888
-Frontage/Access Roads (Alternative 2B)	10.410	8.888

CAL3QHC Model (Version 3.1.1)

The CAL3QHC model is listed in 40 CFR Appendix W, *Guidelines on Air Quality Models (guidance)* as an appropriate model. CAL3QHC can predict CO or other inert pollutant concentrations from both moving and idling vehicles. The model is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize the pollutant dispersion over the roadway.

CAL3QHC Inputs

Meteorology. The regulatory default values for the following parameters were used:

Wind Speed: 1 meter/second

Wind Angle: "Worst-Case" wind direction angle (variable at 10-degree increments)

Stability Class: D – for an urban area

Mixing Height: 1,000 meters

Emission Factors. The composite emission factors derived from the MOBILE6 program were input.

Roadway and Receptor Parameters. The geometrics of the proposed roadways were derived from preliminary design schematics developed by the project study team. Based on the projected traffic volumes and peak-hour congestion levels, receptor points were placed near the proposed mainlane toll plaza locations for each build alternative. Receptor points were placed along the proposed right-of-way boundaries in increments of approximately 50 meters (164 feet).

Receptor heights were input at 6.0 to 38.0 feet above ground surface. Receptor heights at 38.0 feet represent points along the proposed right-of-way 6.0 feet above the top of the existing river levees for Alternatives 3A, 3B, 4, and 5. All other receptor heights were input at 6.0 feet (i.e., Alternatives 2A and 2B). For each alternative, the receptor with the highest CO concentration is reported.

Source heights were input depending on roadway type (e.g., at-grade, bridge, or elevated on fill) for each alternative. Source heights for Alternative 2A were input at 30.0 feet above ground. Source heights for Irving/Industrial Boulevard (located beneath Alternative 2A) were input at 0.0 feet above ground. Source heights for Alternative 2B, including adjacent frontage/access roads, ranged from 0.0 feet to 20.0 feet above ground. Source heights for Alternatives 3A, 4, and 5 were input at 22.0 feet above ground. Source heights for Alternative 3B ranged from 26.9 to 32.8 feet above ground.

Other Site Variables. A surface roughness factor (Z_0) of 1.0 meter was input. The settling velocity (V_s) and deposition velocity (V_d) were each set at zero because CO is a gaseous emission. All projected CO concentrations are based upon an averaging time of 60 minutes.

Background Concentrations. Background concentration (or ambient level) is a summation of all CO concentrations that are from other than project mobile sources. Included are natural sources, point sources, non-project mobile sources, residential and industrial heating, and other industrial emissions. The background concentration is intended to represent a conservative constant that is used homogeneously throughout the project area. It is then added to the predicted values to be compared to the NAAQS for a more accurate picture of the project's effect on the area. Model calculations included TxDOT's recommended background CO concentrations of 3.7 ppm for the 1-hour average and 2.3 ppm for the 8-hour average for the years 2010 and 2025.

Traffic Parameters. Morning and evening traffic volumes for the years 2010 and 2025 were obtained from the traffic study conducted by the NCTCOG (see **Section 4.4**). This study projected the peak-hour traffic volumes for roadways within the study area, including the proposed action. Included were traffic projections along segments of each build alternative where mainlane toll plazas are proposed (see **Plates 2-1** through **2-6** at the end of **Chapter 2** for mainlane toll plaza locations). The worst-case traffic volumes (p.m. peak-hour) input for each build alternative is:

	Year 2010		**Year 2025**	
Location	**Northbound**	**Southbound**	**Northbound**	**Southbound**
Alternative 2A	2,892	3,163	4,486	5,744
-Irving Boulevard	1,291	1,291	1,730	1,730
Alternative 2B	2,892	3,163	4,486	5,744
-Frontage Roads	1,291	1,291	1,730	1,730
Alternatives 3A, 4, and 5	3,337	3,454	4,634	6,022
Alternative 3B	2,532	1,988	5,601	5,093

Conversion from the 1-Hour Standard to the 8-Hour Standard. The NAAQS 1-hour CO standard is 35 ppm and the 8-hour standard is 9 ppm. The conversion from the 1-hour to 8-hour standard is accomplished using the following mathematical formula:

$$CO_8 = (CO_1 - BG_1)\ PF + BG_8$$

where

CO_8 = 8-hour CO concentration

CO_1 = 1-hour CO concentration

BG_1 = 1-hour background CO concentration

PF = 0.60 (meteorological persistence) x 0.67 (8-hour traffic factor) = 0.4

BG_8 = 8-hour background CO concentration

Once the 1-hour and 8-hour CO concentrations are calculated, the results are converted to a percentage of the 1-hour and 8-hour CO NAAQS, respectively (TxDOT, 1999).

4.14.2.2 Micro-Scale Carbon Monoxide Analysis

The projected 2010 concentrations for 1-hour and 8-hour CO and percentage of the NAAQS for each build alternative are presented in **Table 4-41**.

TABLE 4-41. PROJECTED CO CONCENTRATIONS – YEAR 2010

Build Alternative	1-Hour CO (ppm)	Percent of NAAQS (1-Hour)	8-Hour CO (ppm)	Percent of NAAQS (8-Hour)
2A	7.4	21.1	3.8	42.2
2B	5.2	14.9	2.9	32.2
3A	5.0	14.3	2.8	31.1
3B	4.6	13.1	2.7	30.0
4	5.1	14.6	2.9	32.2
5	5.2	14.9	2.9	32.2

Notes: The receptor with the highest CO concentration is reported for each build alternative.
CO 1-hour concentrations include an ambient background level of 3.7 ppm.
ppm = parts per million

The CO concentrations ranged from 4.6 ppm (Alternative 3B) to 7.4 ppm (Alternative 2A) for the 1-hour and 2.7 ppm (Alternative 3B) to 3.8 ppm (Alternative 2A) for the 8-hour time period. The analysis results indicated the 2010 CO concentrations for each alternative are below the NAAQS of 35 ppm for 1-hour and nine ppm for 8-hour time period as set by the EPA. As a result, no substantial air quality impacts are anticipated for any area along the proposed build alternatives in the ETC year 2010.

The projected 2025 concentrations for 1-hour and 8-hour CO and percentage of the NAAQS for each build alternative are presented in **Table 4-42**.

TABLE 4-42. PROJECTED CO CONCENTRATIONS – YEAR 2025

Build Alternative	1-Hour CO (ppm)	Percent of NAAQS (1-Hour)	8-Hour CO (ppm)	Percent of NAAQS (8-Hour)
2A	8.7	24.9	4.3	47.8
2B	5.6	16.0	3.1	34.4
3A	5.7	16.3	3.1	34.4
3B	5.4	15.4	3.0	33.3
4	5.8	16.6	3.1	34.4
5	6.0	17.1	3.2	35.6

Notes: The receptor with the highest CO concentration is reported for each alternative. CO 1-hour concentrations include an ambient background level of 3.7 ppm.
ppm = parts per million

As shown in **Tables 4-41** and **4-42**, the highest projected 1-hour CO concentrations occur with Alternative 2A. The highest projected 1-hour CO concentration for the year 2010 is 7.4 ppm, which is 21.1 percent of the NAAQS. For the year 2025, the highest projected 1-hour CO concentration 8.7 ppm or 24.9 percent of the NAAQS. Any value less than 50 percent of the NAAQS is deemed by TxDOT to be an insubstantial increase not amounting to an adverse impact. None of the projected 8-hour CO concentrations exceeded 50 percent of the NAAQS. Even if a projected 8-hour CO concentration exceeded the 50 percent threshold, it would not amount to an adverse impact because it would represent the absolute peak for the entire length of the project under worst-case meteorological conditions. Beyond the right-of-way, CO concentrations would be diminished and under average conditions, impacts to sensitive receptors are not anticipated.

Toll Road Effects

The designation of the Trinity Parkway as a toll road and the use of toll collection booths could result in increased mobile source emissions of CO as well as NOx and VOCs; the latter two are precursors to the formation of ground-level O_3. Emission factors for these compounds, as generated by the EPA's MOBILE6 Mobile Source Emissions Model, indicate that as motor vehicles speeds decrease, as they would to pay a toll, for instance, their emissions of CO and VOCs would increase. In addition, levels of NOx increase as motor vehicles accelerate.

With respect to CO, the use of tollbooths could result in the formation of localized pockets or "hot spots" of increased CO levels at roadway rights-of-way in these locations. As shown in **Tables 4-41** and **4-42**, these elevated CO concentrations do not exceed the 1-hour and 8-hour NAAQS. In addition, the presence of natural and/or man-made barriers (e.g., buildings, bridges, and flood control levees) in the study area would have a minimal effect on the atmosphere's ability to disperse concentrated build-ups of pollutants.

4.14.3 Air Quality Conformity Statement

The proposed action is consistent with the area's financially constrained MTP *Mobility 2025 – 2004 Update* and the *2004-2006 TIP*, which were found to conform to the CAAA of 1990 by the USDOT on April 8, 2004. *Mobility 2025 – 2004 Update: The Metropolitan Transportation Plan* was developed in accordance with the planning requirements established in the ISTEA/TEA-21 and the CAAA. A major emphasis of *Mobility 2025 – 2004 Update* is on the management of the regional transportation system. As required by § 176(c)(4) of the CAAA, an air quality conformity analysis was conducted for the long-range transportation plan (*Mobility 2025 – 2004 Update*). The analysis was conducted to verify that the federal transportation actions are consistent with the objectives of the air quality planning process and the SIP. Qualitative and quantitative analyses were conducted for the *Mobility 2025 – 2004 Update* by the NCTCOG. Additionally, the project comes from an operational CMS that meets all requirements of 23 CFR Parts 450 and 500 (see **Section 1.10.3** for a description of CMS operational improvement projects within the study area).

4.14.4 Other Air Quality Considerations

As previously described in **Section 3.6.1**, six pollutants are of concern with regards to air quality in urban areas, including CO, NO_2, O_3, particulate matter ($PM_{2.5}$ and PM_{10}), SO_2, and Pb. The EPA establishes NAAQS (see **Table 3-31**) for these identified air pollutants that represent exposure levels where potential threats to human health occur. Currently, the DFW area (Collin, Dallas, Denton, and Tarrant counties) is in non-attainment only for O_3.

<u>Urban Air Toxics</u>

In addition to the NAAQS, EPA has also established a list of 33 urban air toxics. Urban air toxics, also known as hazardous air pollutants, are those pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. Most air toxics originate from man-made sources, including on-road mobile sources (e.g., cars, trucks, buses), non-road mobile sources (e.g., construction equipment, aircraft, lawnmowers), and stationary sources (e.g., refineries, power plants, factories), as well as indoor sources (e.g., building materials). Some air toxics are also released from natural sources, such as volcanic eruptions and forest fires.

These pollutants are in our atmosphere as a result of our industrialized society, but science has been providing more evidence about the risks they pose to human health. The health risks for people exposed to urban air toxics at sufficiently high concentrations or lengthy durations include an increased risk for getting cancer or experiencing other serious health effects. These health effects can include damage to

the immune system, as well as neurological, reproductive, developmental, respiratory, and other health problems.

To better understand the harmful effects mobile sources of urban air toxics have on human health, in 1996 EPA developed a list of 22 mobile source air toxics (MSAT), such as acetaldehyde, benzene, formaldehyde, diesel exhaust, acrolein, and 1,3-butadiene, and assessed the risks of various kinds of exposures to these pollutants on human health. In July 1999, the EPA published a strategy to reduce urban air toxics. In March 2001, the EPA issued regulations for the producers of urban air toxics to decrease the amounts of these pollutants by target dates in 2007 and 2020. Under these regulations, between 1999 and 2020, mobile source emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde will be reduced by 67 to 76 percent, and mobile source particulate matter emissions will be reduced by 90 percent. These reductions are due to the effects of national mobile source control programs, including the reformulated gasoline program, a new cap on the toxics content of gasoline, the national low emissions vehicle standards, the Tier II motor vehicle emissions standards, and on-road diesel fuel sulfur control requirements. These are net emission reductions (i.e., the reductions that will be experienced even after growth in VMT is taken into account).
Currently, there are no standards for MSAT and there are no tools to determine the significance of localized concentrations or of increases or decreases in emissions. Without the necessary standards and tools, transportation agencies cannot analyze the specific effects of certain transportation-related projects in any meaningful way. With the information currently available, all that can be concluded is (1) there are likely to be localized concentrations of air toxics along a new tollway that are similar to those experienced by existing residences at similar distances from other similar arterial corridors, and (2) regardless of the alternative, emissions in the project area will decrease over time due to EPA's national control programs.

Particulate Matter

There are two types of particulate matter for which EPA has set national standards for: $PM_{2.5}$ and PM_{10}, which are respectively defined as particles with an aerodynamic diameter less than or equal to a nominal 2.5 and 10 micrometers. The particulate matter NAAQS reflect values the EPA deems safe for both the general population and sensitive populations (i.e., young, old, pulmonary impaired, etc.). These standards also have an additional margin of safety built into them. Both on-road and non-road mobile sources emit fine particulate matter. Diesel-powered vehicles and engines contribute more than half of the mobile source particulate emissions.

The health risk from potential air pollutants is generally determined on a regional basis with the EPA designating areas where the potential for threat to human health exists as non-attainment areas for specific air pollutants. The EPA, however, has not designated the DFW area as a non-attainment area for either $PM_{2.5}$ or PM_{10}. Non-attainment designation, moreover, is not eminent for the DFW area. In

addition, while EPA has indicated that $PM_{2.5}$ and PM_{10} are pollutants of concern for mobile source projects, the EPA has not adopted $PM_{2.5}$ and PM_{10} hot spot analysis guidance. For these reasons, the FHWA does not require evaluation of the potential impacts of $PM_{2.5}$ or PM_{10} for the Trinity Parkway project.

The EPA has determined the health effects of fine particulate matter and has set the $PM_{2.5}$ standard to ensure public health is protected. Many areas of the country, including Texas, are in the process of monitoring levels of $PM_{2.5}$. This monitoring will serve as the basis for whether this pollutant needs to be addressed at the regional scale, local scale, or both. All Texas counties are currently monitoring attainment. The FHWA/TxDOT/NTTA are confident that the standards EPA has set for $PM_{2.5}$ or PM_{10}, as well as other NAAQS pollutants, are adequate and since the DFW area remains in attainment for $PM_{2.5}$ or PM_{10}, that the public health is being adequately protected.

Consideration of Federal Emission Standards

In December 1999, the EPA announced new engine and gasoline standards commonly known as Tier II. The standards were designed to reduce the emissions from new passenger cars and light trucks, including pick-up trucks, minivans, and sport utility vehicles. Beginning in 2004, the nation's refiners and importers of gasoline will have to manufacture gasoline with sulfur levels capped at 300 ppm. By 2006, refiners will meet a 30 ppm average sulfur level with a maximum cap of 80 ppm.

In December 2000, the EPA issued new heavy-duty diesel emission standards to reduce diesel emissions from heavy-duty trucks and buses. Beginning in 2006, refiners will be required to start producing diesel fuel for use in highway vehicles with a sulfur content of no more than 15 ppm. This is down from the current level of 500 ppm, a 97 percent reduction.

Increased roadway usage, which would occur either under the no-build scenario or the Trinity Parkway project, however, would not necessarily lead to increases in harmful emissions (e.g., NOx, VOCs, particulate matter, and air toxics). Such emissions from vehicles are expected to continue the current dramatic pattern of decrease, even with the continuing increases in VMT, for several reasons:

- Automotive design technology continues to improve. Older, more polluting vehicles continue to be retired and replaced with newer, cleaner vehicles;
- Newer technology vehicles are getting cleaner with each subsequent model year;
- Fuels are improving and continue to improve. For instance, reformulated gasoline, in use in the DFW area since the mid-1990s, has produced reductions in air toxics;
- Emissions from heavy-duty on-highway vehicles are expected to decrease. Between 2007 and 2030, these EPA's heavy-duty diesel emission standards are predicted to reduce NOx and

particulate matter emissions from heavy-duty diesel engines by 88 percent and 64 percent, respectively; and

- Emissions from light-duty on-highway vehicles are expected to decrease. The Tier II regulations are predicted to decrease NOx emissions by 61 percent, and VOC emissions by 24 percent between 2004 and 2030 (FHWA, 2002).

Current traffic in the study area is highly congested at times, and future traffic is anticipated to increase this congestion under the no-build scenario. Congested roadways with increased individual vehicle starts and stops typically produce high per vehicle emission rates. Traffic volumes on study area roadways would increase whether or not capacity is increased. The Trinity Parkway would reduce emissions from vehicles because it would reduce congestion and stop-and-go conditions in the study area.

It is anticipated the Trinity Parkway would be completed in 2010 (see **Section 4.14.2.1**). At that time, the technology of the vehicular mix utilizing the facility would be substantially different than the technology today. Also, vehicular fuels and associated vehicular emissions would be substantially improved over current conditions. These projected air emission reductions would be realized even with the predicted continued growth in VMT.

4.15 NOISE IMPACTS

This analysis was accomplished in accordance with TxDOT's (FHWA approved) *Guidelines for Analysis and Abatement of Highway Traffic Noise* (1996).

4.15.1 Introduction

The FHWA Traffic Noise Model (TNM) was used to calculate existing and predicted traffic noise levels at sensitive receiver areas within 1,000 feet of each alternative. TNM is a noise prediction computer program that estimates the acoustic intensity at various receiver locations. TNM primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills and natural berms; surrounding terrain features; and the locations of receivers likely to be impacted by the associated traffic noise. The traffic noise analysis typically includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise;
- Determination of existing noise levels;
- Prediction of future noise levels;
- Identification of possible noise impacts; and
- Consideration and evaluation of measures to reduce noise impacts.

4.15.2 Description of FHWA Noise Abatement Criteria

The FHWA has established the following Noise Abatement Criteria (NAC) for various land use activity areas. The NAC is used as one of two ways to determine when a traffic noise impact would occur. The NAC criteria are shown in **Table 4-43**.

TABLE 4-43. FHWA NOISE ABATEMENT CRITERIA (NAC)

Activity Category	NAC (dBA)	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary value and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: TxDOT 2001.
Note: Primary consideration is given to exterior areas (Category A, B, or C) where frequent human activity occurs. However, interior areas (Category E) are used if exterior areas are physically shielded from the roadway, or if there is little or no human activity in exterior areas adjacent to the roadway.

4.15.3 Impacts to Noise Receivers

A noise impact occurs when either the absolute or relative criterion, described below, is met:

- Absolute criterion: the predicted noise level at a receiver approaches, equals, or exceeds the NAC. "Approach" is defined as 1 dBA below the NAC. For example a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dBA or above.
- Relative criterion: the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially exceeds" is defined as more than 10 dBA. For example, a noise impact would occur at a Category B residence if the existing level is 54 dBA and the predicted level is 65 dBA (11-dBA increase).

4.15.4 No-Build Alternative

As previously described in **Section 3.7.3**, traffic noise is a primary component of the existing ambient noise level in the study area. Many areas near existing roads and highways have elevated noise levels. With the No-Build Alternative, traffic and congestion on area roadways would likely increase and this may have an effect on the future noise levels.

4.15.5 Build Alternatives

Existing and predicted traffic noise levels were modeled at receiver locations that represent the land use activity areas adjacent to the proposed alternatives that may be impacted by traffic noise and may potentially benefit from feasible and reasonable noise abatement. These areas include Category B land use activity areas. No Category A land use activity areas are in the study area and there were no predicted noise impacts to Category C areas (retail, commercial, and industrial). **Plates 4-16** through **4-19** show the general areas near each build alternative where noise impacts are predicted to occur and where mitigation would be considered. **Table 4-44** provides the number of predicted future build impacted Category B receivers for each of the Trinity Parkway build alternatives.

TABLE 4-44. SUMMARY OF NOISE IMPACTS

Build Alt.	Single-Family	Multi-Family	School	Park	Community Center	Church	Total
2A	208	0	0	1	0	0	**209**
2B	201	0	0	1	0	0	**202**
3A	127	0	0	1	0	0	**128**
3B	127	0	0	1	0	0	**128**
4	164	0	0	2	0	0	**166**
5	224	0	0	2	0	0	**226**

As shown in **Table 4-44**, the build alternatives with the fewest Category B impacts are Alternatives 3A and 3B, followed by Alternatives 4, 2B, 2A and 5.

All of the build alternatives merge together at both the north and south termini of the study area. As a result, 126 of the above listed noise impacts are common to each build alternative. These common noise impacts include 125 residences and one park (Sleepy Hollow Park). The following paragraphs describe the common areas and impacts:

Common area at north terminus of study area – an existing heavy traffic area at the IH-35E and SH-183 split. Land use is retail/commercial with a residential neighborhood known as Sleepy Hollow located approximately 300 feet east of the existing freeways. In this area, the proposed build alternative alignments are the same, consisting of connecting ramps to the existing freeways system. Nineteen residences and one small playground/park (Sleepy Hollow Park) have noise levels that exceed NAC criteria in the future build year.

Common area at south terminus of the study area – an existing heavy traffic area with south US-75 connecting with US-175. Land use is single-family residential with a few retail/commercial facilities. In this area, the proposed build alignments merge near the Lamar Street and Starks Avenue intersection. At this location the build alternatives are on elevated structure, they continue eastward dropping in

elevation to go under the US-75 Bridge, merging with US-175 to the end of the project. A total of 106 residences have noise levels that exceed NAC criteria in the future build year.

The following paragraphs describe impacts for each alternative, which are in addition to the above common area impacts:

Alternatives 2A and 2B – from the south common area, the alternatives track Lamar Street, Industrial Boulevard, and Irving Boulevard to the north common area. Land use is primarily retail/commercial/industrial along the corridor with the exception of a residential neighborhood located adjacent to Lamar Street between MLK and Starks Avenue. A portion of this neighborhood (between IH-45 and Hatcher Street) is designated as the Colonial Hill Historic District. In addition to the common area impacts, 83 residences (Alternative 2A) and 76 residences (Alternative 2B) have noise levels that exceed NAC criteria in the future build year. These impacts primarily occur along Lamar Street between MLK and Starks Avenue.

Alternative 3A and 3B – from the south common area, these alternatives track through an industrial area, then enter the Trinity River floodplain and levee system near the AT&SF/DART railroad bridges. The alternatives track along the interior side of the east levee and exit the levee system near Hampton Road. The alternatives then track through a commercial area to the north common area. In addition to the common area impacts, 2 residences have noise levels that exceed NAC criteria in the future build year.

Alternative 4 – from the south common area, the alternative tracks through an industrial area, then enters the Trinity River floodplain and levee system near the AT&SF/DART railroad bridges. The alternative splits with travel lanes tracking along each interior side of the levees and exits the levee system near Hampton Road. The alternative then tracks through a commercial area to the north common area. In addition to the common area impacts, 39 residences and 1 park (Oak Cliff Founders Park) have noise levels that exceed NAC criteria in the future build year. These noise impacts occur at ramp connections to existing roads along the exterior side of the west levee.

Alternative 5 – from the south common area, the alternative tracks through an industrial area, then enters the Trinity River floodplain and levee system AT&SF/DART railroad bridges. The alternative splits with travel lanes tracking along each exterior side of the levees and exits the levee system near Hampton Road. The alternative then tracks through a commercial area to the north common area. In addition to the common area impacts, 99 residences and 1 park (Oak Cliff Founders Park) have noise levels that exceed NAC criteria in the future build year. These noise impacts occur at ramp connections to existing roads along the exterior side of the west levee.

4.15.6 Description of Noise Levels at Nearby Parks and Amenities

Table 4-45 describes the noise levels at nearby parks and amenities and shows the potential noise impacts by each alternative. Parks in the study area are shown on **Plate 3-15** at the end of **Chapter 3**.

TABLE 4-45. DESCRIPTION OF NOISE LEVELS AT NEARBY PARKS AND AMENITIES

Park	Noise Impact (Yes/No)						Description
	2A	2B	3A	3B	4	5	
Sleepy Hollow Park	Y	Y	Y	Y	Y	Y	Located at the north end of the study area, approximately 300 feet east of IH-35E. This is a neighborhood park with picnic, swimming pool, playground, and multi-use court facilities. In this area, all proposed build alternative alignments are the same (common), consisting of connecting ramps to the existing freeway system. The park has existing noise levels of 66 dBA. This noise level is due to existing traffic on IH-35E. The predicted noise level at the park for all build alternatives remains at 66 dBA, indicating that the IH-35E traffic is the dominant noise generator in the area. Based on the impact criteria, all build alternatives have absolute criteria noise impacts at the park (see **Section 4.7.3.2**).
Trinity River Greenbelt Park (Trinity Park)	N	N	N	N	N	N	Portions of Alternatives 3A, 3B, 4, and 5 are located within the Trinity River levees from just north of Hampton/Inwood Road to the AT&SF/DART Bridge. This land is commonly known as the Trinity River Greenbelt Park (Trinity Park within the limits of the Dallas Floodway). The designated primary use of the Trinity River Greenbelt Park is floodplain and flood control, with secondary use as park and open space. The land within the levees is currently undeveloped and there are no existing facilities near any alternative with the exception of Crow Lake (discussed below). Human recreational activity within the levees is sporadic and generally consists of the occasional hiker, bird watcher, or canoeist. According to TxDOT *Guidelines for Abatement of Highway Traffic Noise*, a project's noise analysis should evaluate noise levels where frequent human activity occurs. Because of infrequent human use, there are no noise impacts to the Trinity Park. Future recreational facilities that are proposed to be constructed within the Trinity Park would be planned concurrently with the roadway project (if Alternative 3A, 3B, 4 or 5 are identified as the preferred alternative). To avoid noise impacts that may result from future development of activities adjacent to the project, local officials responsible for land use control programs should ensure, to the maximum extent possible, that new activities within Trinity Park are planned or constructed with the following predicted noise environment in mind. Alternatives 3A, 3B, 4, and 5 are benched (elevated) on the side of the levee, and the noise level at the riverside toe of the levee (roadway embankment) is typically 62 dBA. The existing ambient noise levels within the levee are predicted to increase in those areas that are currently very quiet (i.e., away from existing roadways) and near a build alternative These areas within the levee are located north of Hampton Road, between Hampton Road and Sylvan Avenue, between Sylvan Avenue and Continental Avenue, and south of IH-35. Noise levels in other areas within the levee, such as between Continental Avenue and IH-35, would have minimal predicted noise level increases because of the traffic noise coming from the existing crossing roads.

TABLE 4-45. DESCRIPTION OF NOISE LEVELS AT NEARBY PARKS AND AMENITIES

Park	Noise Impact (Yes/No)						Description
	2A	2B	3A	3B	4	5	
Oak Cliff Founders Park	N	N	N	N	Y	Y	Located west of the west levee and bounded by Zang Boulevard and Marsalis Avenue. This park is an urban open space park with a 0.25 mile hike/bike trail and several sitting benches in its eastern part (nearest the levee). The eastern portion of the park has existing noise level of 66 dBA. This noise level is due to existing traffic on Zang Boulevard and Marsalis Avenue, which are major city arterials. Alternatives 2A, 2B, 3A, and 3B have no effect on the park due to distance away. The predicted noise level at the park for Alternatives 4 and 5 is 69 dBA, an increase of 3 dBA over existing levels. Based on the impact criteria, Alternatives 4 and 5 have absolute criteria noise impacts at the park (see **Section 4.7.3.2**).
Moore Park	N	N	N	N	N	N	Extends into the floodway in the southwest portion of the study area near the AT&SF and DART Railroad. None of the build alternatives is adjacent to or in close proximity to this park. The existing noise levels at the park nearest any build alternative ranges from 43 to 48 dBA. The predicted noise level at the park for all build alternatives ranges from 46 to 50 dBA. Based on the impact criteria, this park is not noise impacted by any of the build alternatives.
Rochester Park	N	N	N	N	N	N	Extends into the floodway in the southwestern portion of the study area near IH-45. None of the build alternatives are adjacent to or in close proximity to this park. The existing noise levels at the park nearest any build alternative ranges from 59 to 61 dBA. The predicted noise level at the park for all build alternatives ranges from 59 to 62 dBA. Based on the impact criteria, this park is not noise impacted by any of the build alternatives.
Eloise Lundy Park	N	N	N	N	N	N	Located adjacent to the west levee, southeast of the IH-35 crossing of the floodway. At the corner nearest the levee, the park has existing noise levels of 57 dBA. Alternatives 2A, 2B, 3A and 3B have no effect on the park due to distance away. Alternatives 4 and 5 depart the west levee area between IH-35 and the park. The predicted noise level at the park for Alternative 4 is 60 dBA, an increase of 3 dBA over existing levels. The predicted noise level at the park for Alternative 5 is 62 dBA, an increase of 5 dBA over existing levels. Based on the impact criteria, this park is not noise impacted by any of the build alternatives.
Bickers Park	N	N	N	N	N	N	Located about 2 blocks west of the west levee between Hampton/Inwood Road and Sylvan Ave. The park has existing noise levels of 54 dBA. Alternatives 2A, 2B, 3A, and 3B have no effect on the park due to distance away. The predicted noise level at the park for Alternative 4 is 57 dBA, an increase of 3 dBA over existing levels. The predicted noise level at the park Alternative 5 is 59 dBA, an increase of 5 dBA over existing levels. Based on the impact criteria, this park is not noise impacted by any of the build alternatives.
Planned Great Trinity Forest Park	N	N	N	N	N	N	This planned "umbrella" park is located within the Trinity River floodway extending from south of Corinth Street southward to IH-20. None of the proposed alignments cross any area of the planned park boundary. The area of this planned park nearest the proposed alignments is currently undeveloped land with no existing park facilities or existing activity areas of frequent human use. Because park amenities would be planned concurrently with the proposed action, no noise impacts are predicted to occur at the park.
Crow Lake	N	N	N	N	N	N	This amenity of Trinity Greenbelt Park is located within the levees adjacent to Sylvan Avenue. Crow Lake is not a designated City of Dallas Park. Amenities at Crow Lake include a small lake, sculptures, a volleyball court, a jogging trail, and access to a canoe launch at the river. The existing noise level at Crow Lake ranges from 57 to 63 dBA. Alternatives 2A and 2B have no effect due to distance away. The predicted noise level at Crow Lake associated with Alternatives 3A, 3B, 4, and 5 ranges from 58 to 63 dBA. Based on the impact criteria, Crow Lake is not noise impacted by any of the build alternatives.
All Other Parks in Study Area	N	N	N	N	N	N	All other parks in the study area have no predicted noise impacts from project traffic noise due to distance away. These include: Pegasus Park, Nash/Davis Park, Shaw Park, Benito Juarez Park, Pueblo Park, Hattie Moore Park, and Forest Park.
Total	**1**	**1**	**1**	**1**	**2**	**2**	

4.15.7 Summary of Potential Mitigation Measures

As indicated in **Table 4-44**, the proposed project will result in a traffic noise impact and the following noise abatement measures were considered:

- Traffic management;
- Alteration of horizontal and/or vertical alignments;
- Acquisition of undeveloped property to act as a buffer zone; and
- The construction of noise barriers.

Before any abatement measures can be incorporated into the project, it must be both feasible and reasonable. To be feasible, the measure should reduce noise levels by at least 5 dBA at impacted receivers; and to be reasonable it should not exceed $25,000 for each benefited receiver.

(a) Traffic Management: traffic management measures typically considered for noise abatement are reduced speed and time/use restrictions for certain vehicles. Reduced speeds are not an effective noise mitigation measure since a substantial decrease in speed is necessary to provide a perceptible noise reduction. The minor benefit of 1 dBA per 5 mph reduction in speed does not outweigh the associated increase in congestion and air pollution. Additionally, traffic control is not appropriate for the access-controlled facility that by design encourages free flow of traffic. Vehicle time/use restrictions are already in place for this facility, since heavy trucks are likely to be prohibited from using the facility.

(b) Alteration of horizontal and/or vertical alignments: the alteration of the horizontal alignment is limited by the available right-of-way along the alternative corridors. This could displace existing businesses and residences, require additional right-of-way, and would not be cost effective or reasonable.

(c) Buffer Zone: the acquisition of sufficient undeveloped land adjacent to the build alternative would not be cost effective or reasonable, and in most locations would not be possible because of developed properties abutting the right-of-way line.

(d) Noise barriers: this is the most commonly used noise abatement measure. Noise barriers are normally solid wall-like structures constructed between the noise source (roadway) and the impacted receivers. Noise barriers are constructed only if they are both feasible and reasonable and with the approval of adjacent landowners. Factors used to evaluate noise barriers include the following:

- Noise barriers should have a continuous length with no breaks or gaps for crossing roads, driveways, or walkways;

- Effective noise mitigation should create an insertion loss (the difference in noise levels after mitigation and before mitigation) of 5 dBA or greater; and
- Noise barrier costs should not exceed $25,000 for each benefited receiver (noise barriers are normally not cost effective for an individual receiver).

A noise barrier analysis was performed for the impacted areas of each alternative. Based on the analysis, noise barriers were determined to be both feasible and reasonable only at the residential neighborhoods located in the common area at the south terminus of the project. **Plates 4-16** through **4-19** show the proposed noise barriers. In this area, from Lamar Street to the south project termini, all project alternatives are the same, and consequently, the proposed noise barriers are reasonable and feasible for all alternatives.

When a preferred alternative is identified, the noise barrier analysis would be reviewed for each traffic noise-impacted area of the preferred alternative. Any additional areas where a noise barrier is determined to be both reasonable and feasible would be reported in the FEIS. The final decision to construct any proposed noise barrier would be made upon completion of the final design for the proposed action and the public involvement process.

A copy of the traffic noise analysis would be provided to local officials to ensure, to the maximum extent possible, future developments are planned, designed, and programmed in a manner that would avoid traffic noise impacts. On the date of approval of this document (Date of Public Knowledge), FHWA, TxDOT, and NTTA are no longer responsible for providing noise abatement for new developments adjacent to the proposed project.

4.16 VISUAL IMPACT ANALYSIS

The visual impact assessment conducted for the proposed action was completed in accordance with FHWA's guidance *Visual Impact Assessment for Highway Projects* (1988). According to the FHWA, visual impacts result from the modification of existing visual resources or the view of and from the project. These impacts are particularly important for projects in visually sensitive urban or rural settings where design and planning considerations include methods for avoiding, minimizing, or reducing effects. Impacts to visual resources as a result of implementation of the alternatives are discussed below. All of the build alternatives would have short-term visual impacts during construction.

The proposed action's alternatives are described in **Chapter 2 Alternatives Considered**. The existing visual and aesthetic qualities of the study area are described in **Section 3.8**. A discussion of potential

measures to minimize adverse visual impacts is provided in **Chapter 7 Mitigation Measures and Commitments**.

Visual Assessment Methodology

The visual assessment of the Trinity Parkway study area included 63 key observation points (KOP) that were identified and cataloged. These KOPs are located throughout the study area and are representative of land use types, including transportation corridors.

The original 63 KOPs were reduced to 27 representative observation points based on citizen input from the CAWG. The 27 selected KOPs represent best visual advantages in the study area. Each KOP was assigned a numerical identification and was mapped for each build alternative. Directional arrows indicate the observation direction. The KOP locations are shown on **Plate 4-20** at the end of this chapter.

A visual impact assessment summary table was created from the KOPs assessment pages (see **Table 4-46**). Each observation point was then rated according to visual impacts (i.e., none, weak, moderate, and strong impacts). The three land use types or user groups included park user, neighborhood, and businesses. Additional information concerning visual impacts to parks and recreational areas is provided in **Section 4.7.3.2**. Potential mitigation measures are described in **Section 7.1.2**.

TABLE 4-46. VISUAL IMPACT ASSESSMENT

Trinity Parkway Build Alternatives	KEY OBSERVATION POINTS																										
	1	4	5	9	17	19	20	23	24	26	29	30	34	42	45	49	50	51	52	55	57	58	59	61	62	63
2A Industrial Boulevard Elevated																										
Park User	W			W					W	W		W	W		W	W				W		W			W	
Neighborhood(s)	W	W	W	W				W		W		W	W												W	
Businesses										W		W	W												W	
2B Industrial Boulevard At Grade																										
Park User	W	W		W				W	W	W					W	W						W			W	
Neighborhood(s)	W	W	W	W				W		W															W	
Businesses										W															W	
3A Combined Parkway East Levee (Original)																										
Park User	W	W											W	W	W	W				W						
Neighborhood(s)	W	W					W				W		W	W										W		
Businesses							W				W		W	W										W		
3B Combined Parkway East Levee (Modified)																										
Park User	W	W											W	W	W	W				W						
Neighborhood(s)	W	W					W				W		W	W										W		
Businesses							W				W		W	W										W		
4 Split Riverside																										
Park User	W	W													W	W										
Neighborhood(s)	W	W				W	W							W						W						W
Businesses						W	W							W						W						W
5 Split Landside																										
Park User	W	W		W		W				W	W	W			W	W						W		W		
Neighborhood(s)	W	W		W								W		W												
Businesses				W								W		W												

Visual Impact	Visual Items
None	**No Visual Change**
W Weak	**Minimal Visual Change** - At-Grade, Landscaping, One Roadway
Moderate	**Moderate Visual Change** - Low Retaining Walls, Interchange, Underpass, and Overpass
Strong	**Strong Visual Change** - High Retaining Walls, Bridge Columns, Elevated Roadways, Multiple Roadways

North of the Continental/Industrial intersection all of the build alternatives would have similar visual impacts, but Alternative 2A would have the most impact in this area. From within the Dallas Floodway, Alternative 4 would have the greatest visual impact. Alternatives 3A, 3B, and 5 would share a lesser degree of visual impact to this area, while Alternatives 2A and 2B would not visually impact the Dallas Floodway viewers. Along the Irving/Industrial Boulevard corridor, Alternatives 3A, 3B, and 4 would have no visual impact. Alternative 2A would have the greatest visual impact, followed by 2B and 5 respectively. From southwest of the west levee, Alternatives 2A, 2B, 3A, 3B, and 4 would have no visual impact; therefore Alternative 5 would have the largest impact from this area. Southeast of MLK Boulevard (IH-45) all of the alternatives would have a similar degree of visual impact.

4.16.1 No-Build Alternative

There would be no impacts to the views or other aesthetic conditions within the study area as a result of the No-Build Alternative. However, planned developments by others may have an effect on the visual character of the study area.

4.16.2 Build Alternatives

Northern and Southern Termini

The project's northern terminus is located at the IH-35E/SH-183 interchange. Construction of the build alternatives in this area would be primarily on elevated structure. Views from the northern terminus by future motorists would include short-range vistas of the immediate landscape. Long-range vistas would be evident from the elevated sections. Views toward any of the build alternatives would be primarily from motorists traveling area roadways, although existing nearby businesses would have limited views as well.

The southern terminus of any of the build alternatives intersects US-175 at SH-310. An at-grade section proposed for the southern terminus would link any of the build alternatives to the US-175/SH-310 interchange. Views from any of the build alternatives by future motorists would provide limited long-range vistas of the adjacent residential and commercial developments. The southern terminus of any of the build alternatives would become a dominant visual feature and would be viewed by adjacent residential and commercial developments, as well as motorists traveling area roadways.

Alternative 2A

Views from Alternative 2A to Adjacent Areas

View looking northwest along Industrial Boulevard toward the Industrial/Irving/Market Center Boulevard Intersection from under Alternative 2A.

The most common view for motorist from Alternative 2A would be the sides and tops of commercial businesses and residential neighborhoods. The elevated facility would block skyward views from Irving/Industrial Boulevard and limit the views toward the previously mentioned facilities. The east levee would obstruct some of the views from the elevated Trinity Parkway towards the Dallas Floodway and beyond. The buildings in and around the Dallas CBD would be quite visible throughout Trinity Parkway (Alternative 2A), except from segments along Irving/Industrial Boulevard.

Views to Alternative 2A from Adjacent Areas

Alternative 2A would be a new visible obstruction to the adjoining Irving/Industrial Boulevard properties. Adjacent storefronts, depending on the proximity to the proposed facility, would have restricted skyward views, views toward the horizon, and across Industrial/Irving Boulevard. The topographic relief and numerous large buildings would restrict visibility of the roadway to the immediate vicinity, other than elevated roadways and buildings near the Dallas CBD. Most commercial businesses and residential structures beyond the immediate Irving/Industrial Boulevard corridor would not have their views restricted or impeded by Alternative 2A. This alternative would not be visible to most of the views from the Dallas Floodway area and beyond due to the east levee, which would be a visual barrier.

Alternative 2B

Views from Alternative 2B to Adjacent Areas

Similar to Alternative 2A, the most common view for motorists from Alternative 2B would be the sides of commercial businesses and a few residential neighborhoods. Unlike Alternative 2A, this "at-grade" facility would not block skyward views from Irving/Industrial Boulevard or restrict the views predominately towards these facilities, except for locations where bridges would be placed. This would limit skyward views and expose the top of the previously mentioned buildings in some locations. The east levee and the buildings in the Dallas CBD views would be similar to those in Alternative 2A.

View looking northwest along Industrial Boulevard toward the Industrial/Irving/Market Center Boulevard Intersection adjacent to Alternative 2B.

Views to Alternative 2B from Adjacent Areas

Alternative 2B would experience visibility effects similar to Alternative 2A in places where this alternative would utilize elevated facilities to by-pass existing local thoroughfares. Since this alternative is predominantly an "at-grade" facility, it would be visible to fewer viewer groups than Alternative 2A. Building removal associated with this alternative would result in the expansion of views across the landscape where the roadway maintains an "at-grade" profile, especially along Irving/Industrial Boulevard.

Alternative 3A

Views from Alternative 3A to Adjacent Areas

The most common view for motorist from Alternative 3A would be of the Dallas Floodway. The east levee would limit the views from this alternative towards some of the sides and tops of commercial businesses and some residential neighborhoods, and the Dallas CBD. The west levee would limit the view of most structures to the west and southwest.

View looking northwest on top of the east levee toward the Commerce Street Viaduct alongside Alternative 3A

Views to Alternative 3A from Adjacent Areas

Outside of the floodway levees, Alternative 3A would have visibility effects similar to Alternative 2A in places where this alternative would be elevated. Topographic relief and large buildings would restrict most views of this alternative beyond the immediate corridor. The east levee would restrict views of the alternative from viewers in the Dallas Floodway and beyond.

View looking northwest on top of the east levee toward the Commerce Street Viaduct alongside Alternative 3A

Inside the floodway levees, Alternative 3A would be partially visible from adjacent storefronts, depending on the proximity to the proposed facility. In contrast, this alternative would be highly visible to people in the Dallas Floodway. The topographic relief, east levee, and numerous large buildings would restrict Trinity Parkway's visibility to the immediate vicinity, other elevated roadways, and buildings in the Dallas CBD. This alternative would not substantially limit the views of most commercial businesses and residential neighborhoods beyond the immediate corridor. The west level would restrict most of the views toward this alternative from the west and southwest the Dallas Floodway.

Alternative 3B

Views from Alternative 3B to Adjacent Areas

Views from Alternative 3B would be similar to Alternative 3A, except that Alternative 3B has fewer interchange connections and elevated sections.

Views to Alternative 3B from Adjacent Areas

Views to Alternative 3B would be similar to Alternative 3A, except this alternative has fewer interchange connections and elevated sections to reduce visibility and visible obstruction.

Alternative 4

Views from Alternative 4 to Adjacent Areas

Outside of the floodway levees, Alternative 4 would provide motorists a view that would be of the sides and tops of commercial businesses and few residential neighborhoods, and buildings in the Dallas CBD. The east levee would limit the view of the Dallas Floodway and west levee would limit the views of the areas to the west and southwest of the Dallas Floodway.

View looking northwest on top of the east levee toward the Commerce Street Viaduct alongside Alternative 4.

Inside the floodway levees, this alternative would provide motorists vantage points from both sides of the Dallas Floodway. The levees would partially restrict or obscure views of the surrounding buildings and neighborhoods with the exception of the tall buildings in the Dallas CBD.

Views to Alternative 4 from Adjacent Areas

Outside the floodway levees, Alternative 4 would traverse the urbanized corridor on its way to and from of the Dallas Floodway. The “at-grade” portions of this alternative would be visible to viewers in the immediate vicinity and from taller buildings in the Dallas CBD. Overpasses, ramps, and other elevated structures of this alternative would also be visible to more viewer groups.

Inside the floodway levees, Alternative 4 would be highly visible to viewers in the Dallas Floodway and buildings in the Dallas CBD. This alternative would not limit visibility outside of the Dallas floodway any more than the levees themselves. Most commercial businesses and residential neighborhoods beyond the immediate levees would only have their views slightly restricted or impeded by Alternative 4, if at all.

Alternative 5

Views from Alternative 5 to Adjacent Areas

Similar to Alternative 4, Alternative 5 would provide motorist a view of the sides and tops of commercial businesses, residential neighborhoods, and the Dallas CBD approaching and leaving the east levee.

View looking northwest on top of the east levee toward the Commerce Street Viaduct alongside Alternative 5.

Unlike Alternative 4, this alternative is located along the "landside" of the levees. Alternative 4 would provide motorists a view from both sides the Dallas Floodway of the tops and sides of adjoining buildings and neighborhoods and the buildings in the Dallas CBD would also be visible. The floodway levees would partially block the view of the Dallas Floodway.

Views to Alternative 5 from Adjacent Areas

Approaching the east levee, Alternative 5 would traverse the urbanized corridor on its way to and from of the Dallas Floodway similar to Alternative 4. Views to Alternative 5 would be similar to Alternative 4 in this portion of the alternative.

Along the "landside" of the levees, this alternative would be visible to commercial buildings and residential neighborhoods in the immediate corridor along the east levee and the buildings in the Dallas CBD, as well as commercial buildings and residential neighborhoods in the immediate corridor along the west levee. Most of this alternative, except for the upper portions of elevated structures and floodway crossings would not be visible from the Dallas floodway because of the levees.

Toll Road Effects

The designation of the Trinity Parkway as a toll road would not add to the visual impacts created by the highway itself. The opportunity exists to design the toll plazas in an aesthetically pleasing manner so as to minimize any perceived denigration of the visual landscape and commitments.

Urban Design Enhancements

Once a preferred alternative has been identified and as roadway design plans are developed, urban design enhancements would be considered to better define the proposed project to conform to the existing project corridor. Urban design enhancements would be consistent with FHWA's CSD approach and NTTA's *System-Wide Design Guidelines* (NTTA 2003, as amended). Urban 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, right-of-way fencing, and cross street identification). For additional details, see **Section 7.1.2 Measures to Minimize Impacts to Neighborhoods**.

Investment in urban design would enhance the corridor and minimize community impacts. Urban design elements and proper landscaping would help buffer the effects of the Trinity Parkway and may help maintain the property values of businesses and residential areas adjacent to the facility.

4.17 HAZARDOUS/REGULATED MATERIALS

This section summarizes the potential construction impacts of the No-Build and build alternatives with regard to hazardous and regulated materials. Hazardous and regulated materials impacts are anticipated only during construction activities. Thus, additional detail regarding these potential impacts is presented in **Section 4.20 Temporary Effects during Construction**.

The construction of the proposed action poses little risk of hazardous waste contamination of the environment. Hazardous waste impacts associated with the proposed action are more likely to be associated with present and past sites and facilities that have already impacted the existing environment or have the potential to impact the existing environment. Such facilities that are located within the preferred alternative right-of-way would be acquired by NTTA and secured in accordance with FHWA policies and applicable state and federal laws to ensure that no contaminants are released to the environment.

Environmental liabilities may be associated with the acquisition of contaminated properties. CERCLA can hold past and present owners of real property liable for the costs of site investigations and remediation. CERCLA provides a defense to this liability (the "innocent landowner" defense) if the owner or operator, prior to acquisition of the property, conducted all appropriate inquiry into the condition of the property (i.e., "due diligence" investigation). Where appropriate inquiry reveals no contamination at the time of acquisition, but contamination is later discovered, the purchaser could be released from liability.

Table 3-38 in **Section 3.9** lists 54 sites within 500 feet of the build alternative right-of-ways that were identified as hazardous waste/material sites of potential environmental concern. The table also identifies the regulatory ID number, status, and other information about each site. Examples of hazardous waste/material sites with potential environmental concerns are landfills, active Superfund sites, RCRA sites with reported violations, and reported LUST sites that have not attained closure status.

4.17.1 No-Build Alternative

The No-Build Alternative would have no impact on hazardous waste/materials sites. However, projects planned by others may have an effect on any such sites within the Trinity Parkway study area. Implementation of these projects would include the potential to uncover or disturb hazardous waste/materials materials during construction activities.

4.17.2 Build Alternatives

The 54 sites within 500 feet of the build alternatives were further segregated to identify only those sites that are located within or adjacent to the alternative right-of-ways.

Table 4-47 provides a summary of the identified hazardous waste/material sites within or adjacent to the proposed right-of-way boundaries for each of the Trinity Parkway build alternatives. **Plate 4-7** shows the location of these sites.

TABLE 4-47. SUMMARY OF HAZARDOUS WASTE/MATERIAL SITES POTENTIALLY AFFECTED BY THE TRINITY PARKWAY BUILD ALTERNATIVES

Plate ID Number	Regulatory Database*	Facility Name/Address	Trinity Parkway Build Alternatives					
			2A	2B	3A	3B	4	5
2	RCRIS-SQG LUST RST	Hylift, Inc. 2928 Irving Boulevard	Yes	Yes	---	---	---	---
4	LUST RST	Bright Truck Leasing 3020 Irving Boulevard	Yes	Yes	---	---	---	---
5	LUST RST	Aladdin Car Wash 1449 Inwood Road	Yes	Yes	---	---	---	---
6	LUST RST	Lewis Transfer and Storage (Bradford Co./Former Central Transfer) 3060 Irving Boulevard	---	Yes	Yes	Yes	Yes	Yes
7	RCRIS-SQG CERCLIS	Motor Works/Dallas Battery, Inc. 2743-45 Irving Boulevard	Yes	Yes	---	---	---	---
8	IOP LUST RST	Pioneer Concrete of Texas/Hanson Aggregate Central 2151 Irving Boulevard	Yes	Yes	---	---	---	Yes
10	LUST	Jack's Drive-In 1601 Market Center Boulevard	Yes	Yes	---	---	---	---
12	LUST RST	Hargrove Electric Co. 1522 Market Center Boulevard	---	Yes	---	---	---	---

TABLE 4-47. SUMMARY OF HAZARDOUS WASTE/MATERIAL SITES POTENTIALLY AFFECTED BY THE TRINITY PARKWAY BUILD ALTERNATIVES

Plate ID Number	Regulatory Database*	Facility Name/Address	Trinity Parkway Build Alternatives					
			2A	2B	3A	3B	4	5
17	LUST RST	Auto Detail and Service 1101 N. Industrial Boulevard	Yes	Yes	---	---	---	---
18	LUST RST	Payless Convenience Store 1000 N. Industrial Boulevard	Yes	Yes	---	---	---	---
20	RCRIS-SQG	TU Electric Payne Street Service Center (Dallas Power and Light Materials Reclaim) 100 Payne Street	---	---	---	---	---	Yes
24	RCRIS-SQG	Oak Cliff Plating Co. 2330 N. Beckley Avenue	---	---	---	---	---	Yes
28	LUST RST	Kwik Stop (Diamond Shamrock) 418 Corinth Street	Yes	---	---	---	---	---
29	LUST RST	Texaco Service Station (Gulf/Chevron/Metro Cost Plus) 201 Corinth Street	Yes	Yes	---	---	---	---
31	VCP	Atlas Scrap Iron and Metal Company 2209 S. Industrial Boulevard	Yes	Yes	---	---	---	Yes
32	RCRIS-SQG RST	Faubion Associates, Inc. (Dresser Industries Guiberson Div.) 1000 Forest Avenue	Yes	Yes	Yes	Yes	Yes	Yes
33	RCRIS-SQG RCRIS-TSD RAATS RST LUST	Praxair, Inc. (Union Carbide Corp./Linde Gases of the South/Airgas Southwest) 1001 Forest Avenue	Yes	Yes	Yes	Yes	Yes	Yes
34	RCRIS-LQG LUST RST	Brockway Standard Southwestern Steel Plant 3301 S. Lamar Street	Yes	Yes	---	---	---	---
35	RCRIS-SQG LUST RST	Proctor and Gamble Manufacturing (Dallas Public Schools Transportation Dept. facility) 1301 McDonald/3701 S. Lamar	Yes	Yes	Yes	Yes	Yes	Yes
36	LUST RST RCRIS-SQG VCP	Beall Concrete (Tri Gas, Inc. /Chemetron Corp.) 3301 S. National Street	Yes	Yes	Yes	Yes	Yes	Yes
37	RCRIS-LQG	Occidental Chemical Corp. Dallas Plant (Diamond Shamrock Corp. Dallas Silicate/Oxychem) 1100 Lenway Street	Yes	Yes	Yes	Yes	Yes	Yes
38	RCRIS-LQG RST	Okons Iron and Metal Co. (Trinity Recycling) 4801 S. Lamar Street	Yes	Yes	Yes	Yes	Yes	Yes
39	CLI – Closed Landfill	Herman Gibbons 5003 S. Lamar Street	Yes	Yes	Yes	Yes	Yes	Yes
40	LUST RST	Vacant Station 5006 S. Lamar	Yes	Yes	Yes	Yes	Yes	Yes
41	LUST RST	Bordens/Meadow Gold Dairy 5327 S. Lamar	Yes	Yes	Yes	Yes	Yes	Yes
43	SWF/LF – Closed Landfill	City of Highland Park Landfill 1261 Conveyor Lane	---	---	Yes	Yes	Yes	Yes
45	Not Registered (PSTs)	Artistic Furniture Craftsmen 1820 Irving Boulevard	Yes	Yes	---	---	---	---
46	Not Registered (PSTs)	Abandoned Gas Station 1129 N. Industrial Boulevard.	Yes	Yes	---	---	---	---
48	CLI – Landfill closed in 1930s	Unnamed Landfill E. Side of Trinity River, S. of MLK	Yes	Yes	Yes	Yes	Yes	Yes
49	Not Registered (PSTs)	Former Wrecking Company 4901 S. Lamar Street	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 4-47. SUMMARY OF HAZARDOUS WASTE/MATERIAL SITES POTENTIALLY AFFECTED BY THE TRINITY PARKWAY BUILD ALTERNATIVES

Plate ID Number	Regulatory Database*	Facility Name/Address	Trinity Parkway Build Alternatives					
			2A	2B	3A	3B	4	5
50	Not Registered – Abandoned Landfill	Forest Avenue Landfill North of MLK on east side of Trinity River	Yes	Yes	Yes	Yes	Yes	Yes
51	NPL CERCLIS RCRIS-SQG/TSD CORRACTS	Murmur Corporation Site (Murph Metals/RSR Corporation) 2727 Westmoreland Road	---	---	---	---	Yes	Yes
52	VCP IOP	Dover Elevator 7017-7021 Carpenter Freeway	Yes	Yes	Yes	Yes	Yes	Yes
		Totals	**27**	**28**	**15**	**15**	**16**	**20**

Notes: Plate ID numbers correspond to the locations on **Plate 4-7**.
Yes = Site is potentially affected by the build alternative indicated.
--- = No impact anticipated.
* **Table 3-38** (**Chapter 3**) gives additional details about each site and the EPA and TCEQ regulatory reference numbers.

As shown in **Table 4-47**, a total of 33 hazardous/regulated material sites were identified along or within the right-of-way of the build alternatives. Each of the six build alternatives would impact hazardous/regulated material sites ranging from 15 (Alternatives 3A and 3B) to 28 (Alternative 2B).

During the preliminary design stage for each of the build alternatives, the project engineers attempted to minimize the total amount of right-of-way crossing the various landfills and other hazardous/regulated materials sites, thereby reducing the degree of impacts to these areas. Based on preliminary design schematics of the build alternatives, these areas could not be avoided during the planning and construction of the transportation facility. These build alternatives were based on geotechnical as well as engineering considerations. Vehicle speed, ramp and structure locations, and design geometry limit the opportunities to avoid the various landfills and other hazardous/regulated materials sites.

All of the sites listed in **Table 4-47** were identified as environmental concerns located adjacent to or within an alternative alignment. The majority are RCRA sites with reported violations or LUST sites that have not yet attained closure status. Two active Superfund (CERCLA) sites (Plate ID Numbers 7 and 51) were identified in the study area. Four sites (Plate ID Numbers 8, 31, 36, and 52) are sites where contamination of soils and/or groundwater has been documented, and as a result, have voluntarily been entered into a state regulatory program. Four sites (Plate ID Numbers 39, 43, 48, and 50) are landfills (see **Table 3-38** for details). Two sites (Plate ID Numbers 35 and 37) are industrial sites with known on-site disposal areas. All of the alternatives are on structure (elevated bridge) through the above-mentioned landfills and industrial disposal areas.

When the preferred alternative is identified and prior to right-of-way acquisition, it is recommended that a Phase I Environmental Site Assessment [in accordance with the most current American Society for Testing and Materials (ASTM) standards] be performed for right-of-way acquisitions and adjacent sites

and/or facilities that have known or potential occurrences of hazardous materials. Based on the results of the Phase I Environmental Site Assessment, sampling and analysis activities and potential remedial activities can be evaluated for the preferred alternative. Additional information is provided in **Chapter 7 Mitigation Measures and Commitments**.

4.18 UTILITIES

This section describes the potential impacts to various utility systems located throughout the study area. As previously described in **Section 3.1.5**, several major utilities are located within the study area, which are shown on **Plates 3-9** through **3-11** and **Plate 3-20** at the end of **Chapter 3**. Should any utility relocation be necessary, NTTA would comply with 23 CFR Chapter I, Subchapter G, Part 645 (*Utilities*); Subpart A (*Utility Relocations, Adjustments, and Reimbursement*); and Subpart B (*Accommodation of Utilities*). NTTA would also follow the procedures involved in Public Utilities Commission (PUC) *General Order 131-D*, dated August 11, 1995.

4.18.1 No-Build Alternative

Impacts to utilities would not occur under the No-Build Alternative. However, major developments planned by others within the study area may affect utilities.

4.18.2 Build Alternatives

Each of the Trinity Parkway build alternatives would impact major utilities differently. Overhead electrical, telephone, and television cables would be relocated. The exact locations of underground cables or fiber-optic lines would be identified once the preferred alternative has been identified. The potential impacts to known major utilities associated with each build alternative are presented in **Table 4-48**.

TABLE 4-48. POTENTIAL IMPACTS TO MAJOR UTILITIES

Plate ID	Description of Major Utilities	Trinity Parkway Build Alternatives					
		2A	2B	3A	3B	4	5
Plate 3-9	**Water Lines -** *Key to Symbols:* **R** = Relocation (number of linear feet); **N** = No Impact						
1	48-inch concrete water line	R (1,600)	R (1,600)	R (1,600)	R (1,600)	R (1,600)	R (1,600)
2	36-inch water line	R (500)	R (700)	N	N	N	N
3	24-inch water line	N	N	N	N	R (500)	R (1,300)
6	24-inch concrete water line	R (14,000)	R (14,000)	N	N	N	N
7	20-inch cast-iron water line	R (9,100)	R (9,100)	N	N	N	N
8	24-inch concrete water line	R (9,100)	R (9,100)	N	N	N	N
9	66-inch concrete water line	R (6,000)	R (6,000)	N	N	N	N
Plate 3-10	**Sanitary Sewer Lines -** *Key to Symbols:* **R** = Relocation (number of linear feet); **N** = No Impact						
3	60-inch sludge force main	R (6,000)	R (6,000)	N	N	N	N
4	12-inch concrete sanitary sewer	R (2,500)	R (2,500)	N	N	N	N
5	10-inch concrete sanitary sewer	R (2,000)	R (2,000)	N	N	N	N
6	12-inch sanitary sewer	R (1,200)	R (1,200)	N	N	N	N
Plate 3-11	**Natural Gas Lines -** *Key to Symbols:* **R** = Relocation (number of linear feet); **N** = No Impact; **TXU** = Texas Utilities Corp.						
1	24-inch TXU gas line	N	N	N	N	N	R (16,600)
4	16-inch TXU gas line	N	N	N	N	N	R (4,300)
Plate 3-11	**Electrical – Overhead Transmission Lines -** *Key to Symbols:* **R** = Relocation (number of towers); **A** = Adjustment (number of towers); **N** = No Impact; **KV** = kilovolts (of electricity)						
1	Oncor 138 KV trans. line (1)	N	N	A (2)	R (2); A (2)	A (4)	R (23); A (15)
2	Oncor 138 KV trans. lines (2)	N	N	R (2); A (4)	R (2); A (2)	A (6)	R (2)
3	Oncor 138 KV trans. line (1)	A (2)	R (1); A (1)	R (4); A (7)	R (6); A (3)	R (4); A (7)	R (26); A (1)
4	Oncor 345 KV and 138 KV trans. line (1)	N	N	N	N	R (1); A (10)	R (1); A (2)
5	Oncor 138 KV trans. line (1)	R (1)	R (1)	N	A (3)	A(2)	R (1); A(2)
6	Oncor 138 KV trans. line (1)	N	N	A (1)	R (1); A (2)	A (1)	R (1)
7	Oncor trans. line (1)	R (1)	R (1)	R (1)	R (1)	R (1)	R (1)
8	Oncor 138 KV trans. line (1)	A (2)	R (1); A (1)	N	N	N	N
9	Oncor trans. lines (4)	R (2); A (6)	R (2); A (6)	N	N	N	N
Plate 3-11	**Electrical – Substations -** *Key to Symbols:* **R** = Relocation; **N** = No Impact						
1	West Network Substation (Oncor)	N	R	N	N	N	N
Plate 3-20	**Storm Drainage – Pump Stations** *Key to Symbols:* **R** = Reconstruction; **N** = No Impact						
As Labeled	Pump Station 'A' – 2 buildings	N	N	N	N	N	R
As Labeled	Pump Station 'B' – 2 buildings	N	N	N	N	N	R
As Labeled	Pump Station 'C' – 1 building	N	N	N	N	N	R
As Labeled	Pump Station 'D' – 2 buildings	N	N	N	N	N	R
Plate 3-20	**Storm Drainage – Storm Water Outfalls -** *Key to Symbols:* **E** = Extension; **B** = Bridge (over outfall); **N** = No Impact						
As Labeled	Hampton Pump Station Outfall	N	N	B	B	B	N
As Labeled	Pavaho Pump Station Outfall	N	N	N	N	B	N
As Labeled	Pump Station 'A' Outfall	N	N	E	E	E	N
As Labeled	Pump Station 'B' Outfall	N	N	B	B	B	N
As Labeled	Pump Station 'C' Outfall	N	N	N	N	E	N
As Labeled	Pump Station 'D' Outfall	N	N	N	N	B	N
As Labeled	Turtle Creek Pressure Sewer	N	N	B	B	B	N
As Labeled	Woodall Rodgers Pressure Sewer	N	N	E	E	E	N
As Labeled	Dallas Branch Pressure Sewer	N	N	E	E	E	N
As Labeled	Bellevue Pressure Sewer	N	N	B	E	B	N
As Labeled	Lake Cliff Pressure Sewer	N	N	N	N	E	N
As Labeled	Coombs Creek Pressure Sewer	N	N	N	N	B	N
As Labeled	Coombs Creek Relief Sewer	N	N	N	N	B	N
Plate 3-20	**Storm Drainage – Storage Sumps -** *Key to Symbols:* **I** = Impact; **N** = No Impact						
As Labeled	Sump 2E	N	N	N	N	N	I
As Labeled	Sump 4E	N	N	N	N	N	I
As Labeled	Sump 6E	N	N	N	N	N	I
As Labeled	Sump 7E	I	I	N	I	N	I
As Labeled	Sump 1W	N	N	N	N	N	I
As Labeled	Sump 2W	N	N	N	N	N	I
As Labeled	Sump 3W	N	N	N	N	N	I
As Labeled	Sump 4W	N	N	N	N	N	I

Table 4-48 shows that each of the build alternatives, to a certain degree, would have impacts to major/minor utilities located in the study area. Based on this information, Alternative 5 would have the most impacts to major storm drainage pump stations, storm drainage storage sumps, natural gas lines, and overhead electrical transmission lines. Alternatives 2A and 2B would have the most impacts to major sanitary sewer lines and water lines. Alternatives 3A, 3B, and 4 would have the least impact to major utilities in the study area. A summary of the information shown in **Table 4-48** is provided in the following paragraphs.

Water Lines

Alternatives 2A and 2B have the most impacts to major water lines by requiring the relocation of an estimated 40,300 and 40,500 feet of water lines, respectively. Alternatives 4 and 5 each require the relocation of an estimated 2,900 feet of water lines. Alternatives 3A and 3B have the least impact to water lines (approximately 1,600 feet).

Sanitary Sewer Lines

Alternatives 2A and 2B have the most impacts to major sanitary sewer lines, with each alternative requiring the relocation of an estimated 11,700 feet of sewer lines. Alternative 3B would require the relocation of an estimated 2,000 feet of sewer lines. None of the remaining build alternatives impact major sanitary sewer lines.

Natural Gas Lines

Alternative 5 has the most impacts to major natural gas lines by requiring the relocation of an estimated 20,900 feet of gas lines. None of the remaining build alternatives impact major natural gas lines.

Electrical Facilities

Alternatives 4 and 5 have the most impacts to major electrical transmission lines by requiring the relocation/adjustment of seven major lines and associated support towers. Alternative 3B requires the relocation/adjustment of six major lines and associated support towers. Alternatives 2A, 2B, and 3A have the least amount of impacts, requiring the relocation/adjustment of five major lines and associated support towers. In addition, Alternative 2B requires the relocation of the TXU West Network Substation. None of the remaining build alternatives impact electrical substations.

Storm Drainage

Alternative 5 has the most impacts to major storm drainage facilities by requiring the displacement and relocation of Pump Stations A, B, C, and D, and by direct impacts to eight drainage storage sumps (Sumps 2E, 4E, 6E, 7E, 1W, 2W, 3W, and 4W). None of the remaining build alternatives would impact pump station facilities. Alternatives 2A, 2B, and 3B would impact Sump 7E. None of the remaining build

alternatives would impact storage sumps. Alternatives 3A, 3B, and 4 would require bridges and/or extensions to several pump station outfall channels and pressure sewers, to varying degrees. Alternative 4 has the most impacts and would require eight bridges and the extension of two outfall channels and three pressure sewers. The least amount of impacts to storm drainage facilities occurs with Alternatives 2A and 2B.

4.19 ENERGY REQUIREMENTS

4.19.1 No-Build Alternative vs. Build Alternatives

A detailed energy analysis has not been conducted for this study. However, certain generalizations can be applied to the study area to estimate the effect of the proposed action with respect to energy expenditures. Transportation-related energy is usually separated into two main categories: direct energy, which is fuel consumed by traveling vehicles and indirect energy, which is the energy associated with the construction, operation, and maintenance of the roadway itself. The No-Build Alternative would not require the use of these energy resources, whereas these and other energy resources, such as petroleum fuel, lubricants, and paving products, would be used for any of the six build alternatives. In contrast, the energy required by the No-Build Alternative would be in the form of increased fuel consumption due to congestion and deterioration of the existing transportation network. In addition, under heavy traffic conditions automobiles may use up to three times more energy to travel a certain distance when compared to normal conditions. Therefore, the overall amount of energy resources saved by the proposed action over its design life, due to improved traffic flow on other area roadways, is expected to at least compensate for the energy resources required for its construction and maintenance.

4.19.2 Mineral and Energy Resource Impacts

There are no mineral or energy resource impacts anticipated by any of the proposed alternatives. A discussion by alternative follows.

4.19.2.1 No-Build Alternative

No impacts to mineral or energy resources are expected with the No-Build Alternative. No gravel or other type of mineral mining operations would be interrupted, nor would any oil or gas wells be displaced.

4.19.2.2 Build Alternatives

No impacts to mineral or energy resources are expected as a result of the proposed action. No gravel or other type of mineral mining operations would be interrupted, nor would any oil or gas wells be displaced.

Toll Road Effects

The designation of the Trinity Parkway as a toll road may require additional consumption of energy resources due to the stop-and-go nature of cash booths at toll plazas; however, this is not expected to result in an adverse impact to energy resources. The toll designation would allow the roadway to be built much sooner than with traditional funding; therefore, network congestion reduction would occur much sooner. This would result in energy consumption reductions, which may offset any additional energy consumed resulting from the operation of the Trinity Parkway as a toll road. The increasing use of electronic toll tags and express lanes would greatly reduce the stop-and-go conditions associated with the traditional cash toll plazas.

4.20 TEMPORARY EFFECTS DURING CONSTRUCTION

This section describes potential temporary impacts of the build alternatives that may occur during project construction. Because the No-Build Alternative would not involve any project-related construction, discussions are focused on the build alternatives. In general, the potential for disruptive construction effects would correspond to the type and location of activities proposed in each construction stage and the duration of the overall construction process associated with each alternative. Measures to minimize construction-related impacts are described in **Chapter 7 Mitigation Measures and Commitments**.

Roadway construction activities would result in several inconvenience-causing impacts. These impacts can be categorized as follows:

- Airborne dust due to clearing, grubbing, hauling, and construction activities;
- The use of local and regional streets and arterials to haul materials to and from the site;
- Increase in noise levels due to construction activities and equipment;
- Temporary traffic detours; and
- Mud and water runoff due to rain and dust control.

4.20.1 Community Impacts

Potential construction period impacts to residents and businesses within the study area are addressed in the following paragraphs.

Neighborhoods and Businesses

During construction, motorists and pedestrians would experience some delays and detouring. Some streets may be temporarily closed during construction and others would be subject to periodic lane closures. Further delays may occur as construction vehicles and equipment use local streets.

Traffic Disruptions

Construction activities under all build alternatives would result in some traffic disruption on major freeways and arterials in the project area. Construction could also temporarily affect local streets providing access to businesses and residents in the project area. In addition, to temporary traffic disruptions (closures and detours), construction traffic would be noticeable on area roadways and could contribute to periods of localized congestion.

Safety and Security

Safety and security issues associated with construction activities include potential disruption of traffic movements and potential access constraints for emergency and law enforcement vehicles. Heavy vehicle movements, possible hazardous waste excavation and transport, and construction site activity would also create potential safety concerns.

Construction Employment

Economic activity generated by the Trinity Parkway is anticipated to benefit the DFW region and would also follow the labor and material markets for roadway and bridge construction. Refer to **Section 4.6 Economic Impacts** for a description of construction-related employment associated with the proposed action.

4.20.2 Construction Period Visual Changes

Impacts to the visual landscape would occur during construction. The excavation and movement of fill materials from the borrow pit excavations (lakes) in the center of the Dallas Floodway and placed on the levees to include height or width of the levees would be a visual change. This activity would only occur if one of the river alternatives (Alternative 3A, 3B, or 4) is identified as the preferred alternative. The potential “taking” of structures and their ultimate removal would also change the visual character of the Irving/Industrial Boulevard alternatives (Alternatives 2A and 2B). The placement of a new roadway through an old retail/commercial area would also change the visual characteristics of the area.

4.20.3 Construction Period Air Quality

Impacts to ambient air quality would occur as a result of construction activities. Fugitive dust and particulate matter emissions, including those less than 10 microns in size (PM_{10}), would be generated during project construction activities. Construction equipment and off-site vehicles used for hauling debris and supplies would also produce emissions during the construction. The pollutants of primary concern include fugitive dust, PM_{10}, reactive organic gases, NOx, CO, and, to a lesser extent, SO_2.

Because the variables affecting construction emissions (e.g., type of construction vehicles, timing and phasing of construction activities, haul routes, etc.) cannot be determined until the project is ready for construction, no estimate of construction emissions can be undertaken. However, project construction would be conducted in accordance with all federal, state, and local regulations that govern construction activities and emissions from these vehicles.

4.20.4 Construction Period Noise

Noise associated with the construction of the project is difficult to predict. 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. None of the receivers is expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions would 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.

4.20.5 Hazardous/Regulated Materials

The impacts from hazardous/regulated material use and handling during construction activities associated with the proposed action pose a minimal risk of impacts to the environment. Temporary ASTs and equipment, vehicles, and machinery that contain oil and use diesel fuel are typically utilized during major construction projects. Typical impacts would include leaking valves, hoses, or small spills that may occur during refueling activities associated with ASTs or small leaks that may occur from equipment, vehicles, and/or machinery. However, these impacts would be minimal and typically do not pose a substantial risk to the environment.

4.20.6 Water Quality

The project engineer would ensure that appropriate steps are taken to control water pollution during construction. The amount of disturbed earth would be limited so that potential for excessive erosion is minimized and sedimentation outside of the right-of-way is avoided. Existing vegetation would be preserved wherever possible. Temporary erosion and sedimentation control measures such as silt fences, rock berms, sedimentation basins, and/or soil retention blankets would be implemented as needed prior to the initiation of construction. Permanent soil erosion control features would be constructed as soon as feasible during the early stage of the contract through proper sod placement and/or seeding techniques. Disturbed areas would be restored and stabilized as soon as the construction schedule permits, and temporary sod would be considered where large areas of disturbed ground would be left bare for a considerable length of time.

With respect to potential surface water contamination due to erosion and sedimentation, the critical time period occurs between the removal of existing vegetation to begin site work and the completion of construction and revegetation. There are numerous activities associated with construction that accelerate the rate of erosion. Virtually all of these activities involve the removal of vegetation and/or the movement of soil to provide a construction site.

Waterways adjacent to and downstream from construction sites can be adversely impacted by erosion and sedimentation. The most obvious damage is physical, where the effect can be seen as gullies or rills cutting across the affected area. Sediment loss resulting from erosion can provide a medium for unwanted vegetative growth in the waterway, resulting in slowing of the natural flow of water and deposition of more sediment. Subsequent to this physical damage, the ecological relationships in the water and the substrate are disrupted or destroyed.

Protection of the water quality, ecological, and other functions of the natural and man-made drainages adjacent to the Trinity Parkway should be a high priority in the detailed engineering design phase for the proposed action.

4.20.7 Natural Resources

Each of the build alternatives may potentially impact wetlands and other aquatic resources by temporarily increasing sedimentation from land clearing activities and altering wetland hydrology by changing drainage patterns. Construction activities may result in displacement of wildlife due to noise and human activity or cause barriers to wildlife movement. Impacts to these resources would be further avoided and/or minimized during the design phase. Additional details are provided in **Chapter 7**.

4.20.8 Construction Excavation and Fill Requirements

Each of the build alternatives would require excavation and fill on land, in water and/or floodplain areas, and to allow construction equipment access to construction sites. A summary of the estimated excavation and/or fill quantities required for each of the build alternatives is provided in **Table 4-49**.

TABLE 4-49. ESTIMATES OF EXCAVATION AND FILL QUANTITIES

Build Alternative	Location	Roadway Excavation (cubic yards)	Roadway Embankment (cubic yards)	Net Borrow (Excludes Shrinkages)
2A	Floodway or other	---	0.3 million	-0.3 million
2B	Floodway or other	0.2 million	1.1 million	-0.9 million
3A	Floodway Borrow	0.1 million	4.1 million	-4.0 million
3B	Floodway Borrow	0.1 million	4.1 million	-4.0 million
4	Floodway Borrow	0.2 million	4.2 million	-4.0 million
5	Floodway or other	0.5 million	2.7 million	-2.2 million

Notes: Roadway embankment only. All quantities shown in cubic yards. Calculations are estimates only and are expected to change once a preferred alternative has been identified and more information becomes available from the City of Dallas' MIP/BVP.

A detailed erosion and sedimentation control plan would be required as part of the construction contract specifications. The plan would follow BMPs and would be approved, if necessary, by regulatory agencies prior to project construction. Additionally, construction activities would require a permit under the rules of the TPDES (see **Section 7.2**).

4.21 LIST OF REQUIRED FEDERAL, STATE, AND LOCAL PERMITS AND ACTIONS

Table 4-50 provides a summary of the required federal, state, and local actions and approvals anticipated for the proposed action.

TABLE 4-50. ANTICIPATED FEDERAL PERMITS AND APPROVALS

Federal Agency	Regulated Activity	Required Permit or Approval
U.S. Army Corps of Engineers	Regulates placement of dredged or fill material into waters of the U.S.	Clean Water Act, § 404
	Basic Project Purpose	Clean Water Act, § 404
	Regulates work in navigable waters of the U.S.	Rivers and Harbors Act, § 10
	Trinity River Corridor CDC Process	Corridor Development Certificate (CDC) permit review and commenting authority. Section 404 permit is required for CDC permit approval.
	NEPA	Commenting authority
	Protection of existing Dallas Floodway and authorized Dallas Floodway Extension project purposes	Review of project features on direct and indirect impacts to USACE projects to include flood conveyance operation and maintenance and environmental restoration and mitigation of project features
Advisory Council on Historic Preservation (ACHP)/SHPO	NHPA § 106	Memorandum of Agreement (MOA)/Programmatic Agreement between FHWA, SHPO, and the ACHP
	Section 4(f)	Commenting authority.
U.S. Environmental Protection Agency	Clean Water Act	§ 404 permit review and veto authority
	Clean Air Act	Compliance and enforcement of regulations
	NEPA	Commenting authority
U.S. Fish and Wildlife Service	Fish and Wildlife Coordination Act	Reviews/comments on federal actions that affect wetlands and other waters, including § 404 permit applications. May prepare Biological Assessment for preferred alternative
	NEPA	Commenting authority
	Migratory Bird Treat Act (MBTA)	Reviews/comments on federal actions that could harm migratory bird species.
U.S. Department of Interior	Land and Water Conservation Fund Act (LWCF)	§ 6(f) review authority
	NEPA/§ 4(f)	Commenting authority
	NHPA § 106	Commenting authority
U.S. Department of Housing and Urban Development	NEPA/§ 4(f)	Commenting authority
U.S. Department of Transportation (USDOT) – Federal Highway Administration (FHWA)	NEPA/§4(f)	DEIS, FEIS, § 4(f), and ROD approval
	Toll Agreement	Toll Agreement between FHWA, TxDOT, and NTTA
	Interstate Access Agreement	Interstate Access Agreement between FHWA, TxDOT, and NTTA
	23 CFR § 650.805 Bridges Not Requiring U.S. Coast Guard (USCG) Permit	Responsible under 23 USC § 144(h) to determine if a USCG permit is not required for bridge construction
USDOT – Federal Aviation Administration	Navigable Airspace	Conformance Requirement for Obstruction Marking and Lighting
USCG	Regulates navigable waterways of the U.S.	Rivers and Harbors Act, § 9
	General Bridge Act of 1906	Regulates permitting for bridge construction in and over waters of the U.S.
Federal Emergency Management Agency (FEMA)	EO 11988 (Floodplain Management)	Reviews/comments on federal actions that affect floodplains, including § 404 permit applications
	National Flood Insurance Act Flood Disaster Protection Act	Changes to FEMA maps require a Conditional Letter of Map Revision (CLOMR)
	Trinity River Corridor CDC Process	CDC permit review and commenting authority
	City of Dallas Fill Permit	Permit review and commenting authority

4.22 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

4.22.1 No-Build Alternative

The No-Build Alternative would not require the commitment of any resources associated with the construction of the proposed action.

4.22.2 Build Alternatives

Constructing any of the build alternatives involves the commitment of a range of natural, human, physical, and fiscal resources. Land used in the construction of the proposed facility is considered an irreversible commitment during the period the land is used for transportation purposes. However, if a greater need arises for use of the land, or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion would be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as steel, cement, aggregate, and bituminous material would be expended. In addition, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are not generally retrievable. They are not in short supply and their use would not have an adverse effect upon continued availability of these resources. Any construction would also require a substantial one-time expenditure of state, federal, and private funds, which are not retrievable. The commitment of these resources is based on the concept that residents in the immediate area, region, state, and nation would benefit by the improved quality of the transportation system. These benefits would consist of improved accessibility and safety, savings in time, fuel savings, and greater availability of quality services, which are anticipated to outweigh the commitment of these resources.

4.23 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

4.23.1 No-Build Alternative

The short-term impacts associated with the No-Build Alternative are inconsistent with the maintenance and enhancement of long-term local, state, and national productivity. Short-term impacts include increasing levels of traffic congestion on IH-35, IH-30, and other major transportation facilities; a continuation of poor mobility; and a continuation of limited accessibility for important public facilities within and adjacent to the study area. These impacts are not consistent with national trade policy (NAFTA) objectives. They hinder the growth patterns and policies of local jurisdictions, and they limit the

functionality of major public facilities such as Dallas Love Field, DFW International Airport, and other important intermodal transportation facilities.

4.23.2 Build Alternatives

The construction phase of the project would cause limited adverse effects on the environment, which have been deemed short-term. Adverse effects have been evaluated and mitigation (i.e., avoidance or minimization) measures have been identified. In addition, careful attention would be given to the problems identified during the design phase. Proposed mitigation measures, some temporary and some permanent, would minimize adverse short-term effects and avoid any substantial long-term damage.

The proposed project would be classified as a long-term productive facility. This project, with its desirable design characteristics, would provide for safe and efficient vehicle operation for future, as well as present, traffic volumes. The benefits, such as reduced operating costs, reduced travel time, reduced traffic accidents, and general economic enhancement of the area offered by the long-term productivity of this project, should more than offset the short-term inconvenience and adverse effects on the human environment.

4.24 SECONDARY AND CUMULATIVE IMPACTS

This section describes the secondary and cumulative impact assessment prepared for the proposed Trinity Parkway project. The assessment was conducted in accordance with FHWA and CEQ regulations and guidance documents.

4.24.1 Secondary Impacts

Secondary or indirect impacts are defined as those "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable" (40 CFR 1508.8). This kind of impact is typically considered to be an effect indirectly caused or induced by construction of the proposed action. The FHWA has developed a position paper on this subject, *Position Paper: Secondary and Cumulative Impact Assessment in the Highway Development Process* (FHWA, 1992). In January 2003, the FHWA prepared *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process* (FHWA, 2003). FHWA has developed these guidance documents for incorporating the effects of secondary and cumulative impacts so that this information can be included in the project's environmental analysis.

For the Trinity Parkway, potential secondary impacts include:

- Development and land use changes due to improved access to study area land;
- Runoff increases due to changes in land use and increased development on land surrounding the proposed facility;
- Increased sedimentation of wetlands and streams and decreased water quality due to future development of land adjacent to the new facility;
- Loss of wildlife habitat and decreased habitat value in areas of increased land development;
- Impact to cultural resource sites from development projects on private property that do not require cultural resource investigation because public funds or permits are not required;
- Increased use of parks and recreational areas due to more convenient access;
- Continuing changes in the aesthetic quality of urban areas as future development takes place;
- Stimulation of the local economy from the circulation of construction spending; improved access to employment opportunities, markets, goods, or services such as health and education; an increased work force related to construction; development stemming from the new facility; and an increase in visitors and tourism;
- Increases in population in local neighborhoods and communities that may create more demand for local services;
- Need for additional utilities as population increases and land use changes;
- Changes in land use to other uses as more areas near the roadway become easily accessible and more attractive for development, which could also help with revitalization efforts in and around the Dallas CBD; and
- Changes in land use that promote livable, sustainable communities by placing priority on enhancing community character, neighborhood cohesion, social interaction, safety, economic prosperity, and general quality of life.

Land Use

As previously discussed in **Section 4.1.1**, construction of the proposed action may indirectly affect land use within the study area by helping to enhance land development opportunities. However, the proposed action is only one factor in creating favorable land development conditions. Other prerequisites for growth within the study area include demand for new development, favorable local and regional economic conditions, adequate utilities, and supportive local land development regulations and policies.

Development impacts – both beneficial and adverse – would continue to be felt within the study area regardless of whether or when the Trinity Parkway is constructed. Nevertheless, the Trinity Parkway build alternatives may contribute to secondary social, economic, and environmental impacts due to potential acceleration or reshaping of land development. Efforts to enhance beneficial aspects and minimize

adverse effects of development are subject to the existing land use plans/policies and development controls of local jurisdictions. This includes adherence to various rules and regulations associated with comprehensive land use planning, zoning, subdivision regulations, site plan permitting, and building permitting.

Water Quality

Some long-term water quality impacts of the Trinity Parkway build alternatives may be generated indirectly by development attracted by the location of the road. As development occurs, new chains of activities and impacts are begun – all of which are in varying degrees stimulated by the presence of the highway. Examples of secondary impacts include temporary effects on water quality as developments are constructed and potential long-term effects from runoff from paved areas and developed sites.

Biological Resources

Secondary impacts to biological resources could result from the operation and maintenance of the Trinity Parkway and from secondary land development. As a direct effect of the parkway, vegetation communities would be impacted on a landscape scale by fragmentation (in areas where no roadways currently exist) and loss of habitat continuity. These types of impacts may affect the processes and functions of communities including seed dispersal, reproductive activities, and the cycling and transfer of nutrients. Road kills may also affect biological resources, although no endangered species would conceivably be affected. Additional losses of vegetation would also be incurred if secondary land development takes place.

4.24.2 Cumulative Effects

This section describes potential cumulative effects to the environment that could be associated with implementation of the build alternatives for the Trinity Parkway project. Specifically, this analysis is prepared in accordance with the requirements of NEPA and guidance from the federal CEQ, *Considering Cumulative Effects under the National Environmental Policy Act*, 1997b. Other regulatory guidance publications used for this analysis include:

- CEQ, Executive Office of the President. *Incorporating Biodiversity Considerations into Environmental Impact Analysis under the National Environmental Policy Act,* 1993;
- FHWA. *Position Paper: Secondary and Cumulative Impact Assessment in the Highway Project Development Process*, 1992;
- FHWA. *Interim Guidance: Questions and Answers Regarding Indirect and Cumulative Impact Considerations in the NEPA Process*, 2003;
- U.S. EPA. *Consideration of Cumulative Impacts in EPA Review of NEPA Documents*, 1999a;

- U.S. EPA. *Considering Ecological Processes in Environmental Impact Assessments*, 1999c; and
- U.S. EPA. *Evaluation of Ecological Impacts from Highway Development*, 1994.

4.24.2.1 Introduction

The CEQ regulations define cumulative effects as:

> …the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR § 1508.7).

Cumulative effects analysis is an emerging discipline, and the continuing challenge of this analysis is to focus on the important cumulative issues, recognizing that a better decision, rather than a perfect cumulative effects analysis, is the goal of NEPA. There is no universally accepted approach to the preparation of cumulative effects analyses. In the past, transportation, as well as other types of construction projects, oftentimes was found not to have significant direct environmental effects, yet cumulative effects were really not considered.

For a cumulative effects analysis to be worthwhile it must be limited through scoping to the effects that can be evaluated meaningfully. A significant cumulative effect on the environment means a substantial, or potentially substantial, adverse or beneficial change in any of the physical conditions within the area affected by the project that results from the compounded or incremental individual environmental effects.

4.24.2.2 Analysis Methodology

The analysis of potential cumulative effects in this section follows the process recommended in the CEQ's handbook, *Considering Cumulative Effects under the National Environmental Policy Act* (1997b). This process includes the identification, through research and consultations, of federal, non-federal, and private actions with possible effects that would be coincident with those of the proposed action on resources, ecosystems, and human communities. Coincident effects would be possible if the geographic and time boundaries for the effects of the proposed action and past, present, and reasonably future actions overlap.

The CEQ developed an 11-step approach to evaluate cumulative effects (see **Table 4-51**). Steps 1 through 4 address scoping, which sets the boundaries for the analysis by narrowing the focus to meaningful issues and the sustainability of affected resources. Steps 5 through 7 describe the affected

environment (resources, ecosystems, and human communities) in terms of the stresses it experiences and its responses to change, capacity to withstand stresses, regulatory thresholds, and baseline condition. Steps 8 through 11 describe the environmental consequences. The last four steps include cause-and-effect relationships, magnitude, significance, and measures to avoid, minimize, mitigate, monitor, and manage consequences.

TABLE 4-51. STEPS IN THE CUMULATIVE EFFECTS ANALYSIS

Environmental Impact Assessment Component	Steps in the Cumulative Effects Analysis
Scoping	1. Identify the significant cumulative effects issues associated with the proposed action, and define the assessment goals. 2. Establish the geographic scope for the analysis. 3. Establish the time period for the analysis. 4. Identify other actions affecting the resources, ecosystems, and human communities of concern.
Describing the Affected Environment	5. Characterize the resources, ecosystems, and human communities identified in scoping in terms of their response to change and capacity to withstand stresses. 6. Characterize the stresses affecting these resources, ecosystems, and human communities and their relation to regulatory thresholds. 7. Define a baseline condition for the resources, ecosystems, and human communities.
Determining the Environmental Consequences	8. Identify important cause-and-effect relationships between human activities and resources, ecosystems, and human communities. 9. Determine the magnitude and significance of cumulative effects. 10. Modify or add alternatives to avoid, minimize, or mitigate significant cumulative effects. 11. Monitor the cumulative effects of the selected alternative and adapt management.

4.24.2.3 Step 1 Scoping – Identify Issues and Goals

Scoping Step 1 requires the identification of significant cumulative effects issues associated with the proposed action and definition of assessment goals. CEQ guidelines recommend narrowing the focus of the cumulative effects analysis to important issues of national, regional, or local significance so as to "count what counts." In order to complete Step 1, the project study team identified six resource categories (see **Table 4-52**), which are judged to have a potential for cumulative effects related to the proposed action. In addition, the selection of the six categories has been made with input from the involved agencies and also reflects comments and concerns of the general public made during the scoping phase. Additional information regarding project's public scoping process is provided in **Chapter 10** and **Appendix A**.

TABLE 4-52. POTENTIAL CUMULATIVE EFFECTS

Resource Category	Resources/Ecosystems/ Human Communities	Potentially Important from Cumulative Effects Perspective
1. Land Use	a. Relationship between land use and transportation b. Socioeconomic c. Public services: medical, fire, police, etc.	a. Facilitate already established growth trends b. Population and employment growth, changing community cohesion, building displacements c. Overburdened services
2. Water Resources	a. Wetlands and waters of the U.S. b. Floodplains c. Water quality	a. Degradation or loss (erosion, filling), potential for loss of biological resources b. Degradation or loss (erosion, filling), potential for more flooding c. Sedimentation, contamination from pollutants such as roadway runoff constituents, altered hydrology, potential impact to designated water uses
3. Air Quality	Exceedence of standards for CO and other air pollutants Long-range transport of air pollutants Conformity with SIP	Degradation of regional air quality; long-term human health effects
4. Cultural Resources	Historic structures and archeological sites	Loss of resource or proximity effects
5. Park/Open Space Resources	Active/passive recreation sites/facilities	Loss of resource or proximity effects
6. Biological Resources	Wildlife diversity, habitat fragmentation, threatened and endangered species, intrusion into urban open space areas, vegetation loss during construction	Degradation of habitats and wildlife populations; impacts from construction and ongoing operation

4.24.2.4 Scoping Steps 2 and 3 – Defining Geographic and Time-Related Boundaries

In order to identify cumulative effects, a baseline is identified that establishes the impacts that have or would occur without the project. The direct and indirect impacts associated with the project are the "incremental impacts" beyond the baseline condition. These impacts are used to assess cumulative effects.

In general, the description of existing (baseline) environmental conditions in **Chapter 3** includes the impacts of most past and present actions on the environment within the study area. The impacts of past and present actions are, therefore, generally encompassed in the **Chapter 4** analyses of potential environmental impacts of the proposed action because the baseline for these analyses is the affected environment described in **Chapter 3**.

The resources identified in **Table 4-52**, however, encompass a varying range of geographic areas when considered from the perspective of cumulative effects. For the cumulative effects of the Trinity Parkway project, the spatial limits are selectively expanded beyond the established project area to consider possible effects on the wider region. These "potential impact zones" for the six resource categories identified above are:

1. Land Use – DFW metropolitan area;
2. Water Resources (wetlands and waters of the U.S., floodplains, and water quality) – Trinity River Basin;
3. Air Quality – DFW 1-hour O_3 non-attainment area (Collin, Dallas, Denton, and Tarrant counties). [Note: Dallas County (along with Collin, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties) was designated non-attainment for the 8-hour O_3 standard by EPA, effective June 15, 2004. A demonstration of transportation conformity for added capacity projects to the 8-hour O_3 standard is not required until the end of the 1-year grace period (June 15, 2005)];
4. Cultural Resources – Dallas County;
5. Park/Open Space Resources – City of Dallas; and
6. Biological Resources – Blackland Prairie Ecoregion.

The time frame for future cumulative effects assessed in this DEIS is the period from 2004 to 2025, consistent with the time frame for the impact analyses presented in **Chapter 4**. The time frame for historical cumulative effects has been varied depending upon availability of information. For example, for biological resources, information concerning impacts from the pre-European settlement time frame (circa 1850) to the present was used, whereas the air quality analysis was restricted to the period of available records, the mid-1970s through 2003.

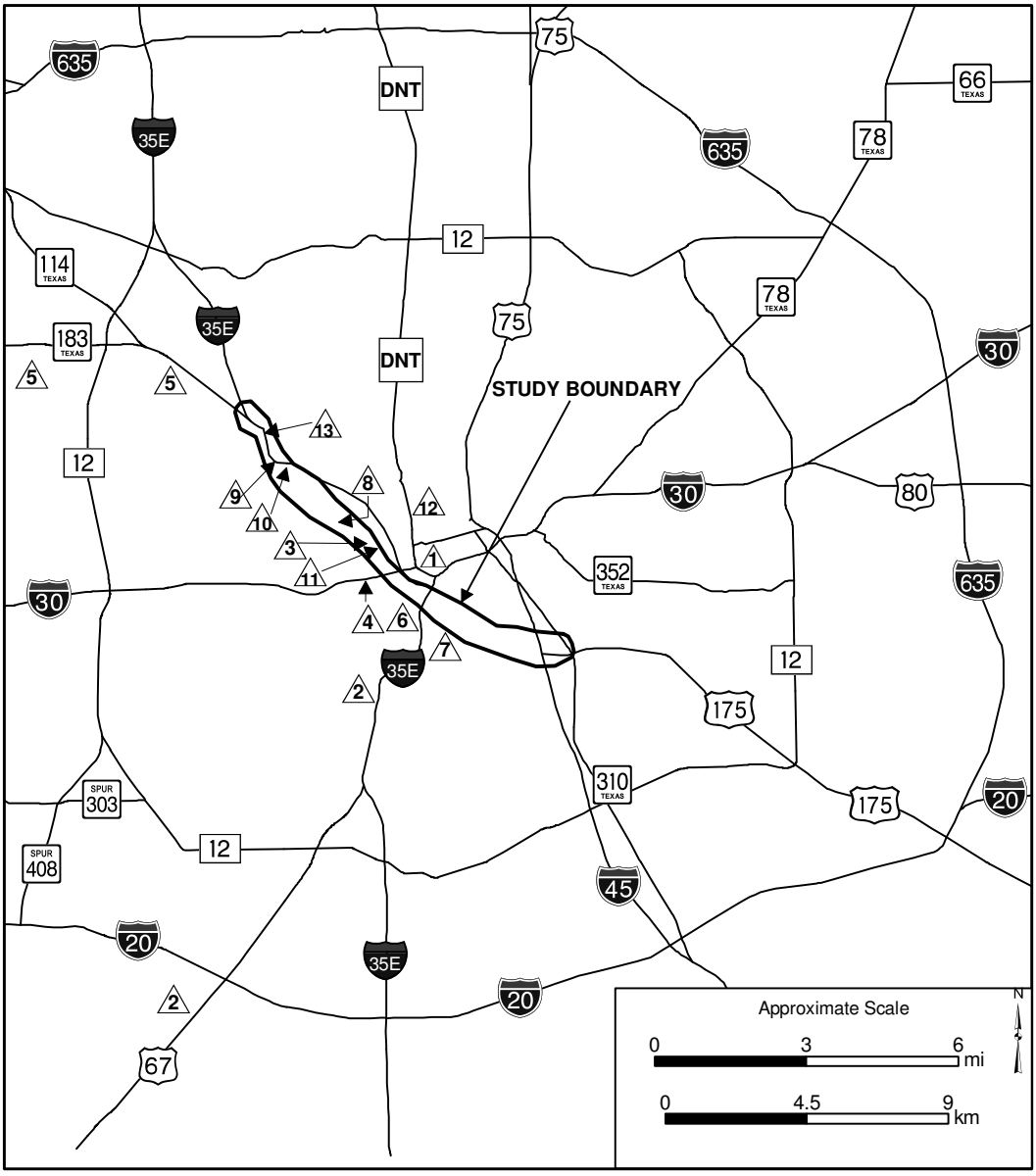
4.24.2.5 Scoping Step 4 – Other Contributing Actions

This section identifies actions that could have effects that may coincide in time and space with the effects from the proposed Trinity Parkway. The identification of the relevant actions is based on reviews of resource, policy, development, land use plans prepared by government agencies, and other NEPA documents. Consistent with CEQ regulations 40 CFR 1502.16(c) and 1506.2, in addition to the assessment of potential cumulative effects, the analysis considered potential conflicts with plans issued by various governmental entities to the extent practicable and to the extent they provided relevant information. **Table 4-53** lists identified transportation projects and **Figure 4-1** shows their location in relation to the Trinity Parkway study area.

TABLE 4-53. REASONABLY FORESEEABLE ACTIONS – TRANSPORTATION PROJECTS

Project Name	Description	Approximate Size
Project Pegasus – Canyon/Mixmaster/Lower Stemmons Improvements	Includes total reconstruction of the Canyon/Mixmaster interchange, Lower Stemmons segment (including the IH-35E/DNT connection), and the installation of a continuous HOV system through the Canyon (see **Section 3.2.7**).	Improvements total 3.5 miles in length along existing highway corridors. Extends beyond study area boundaries.
The Southern Gateway – IH-35E/US-67 Improvements	A MIS/EA to address transportation deficiencies along the IH-35E/US-67 corridor. Project limits extend from IH-35E south of the CBD to IH-20 and along US-67 from IH-35E to FM-1382 in southern Dallas County (see **Section 3.2.7**).	Improvements total 19 miles in length along existing highway corridors. Extends beyond study area boundaries.
Woodall Rodgers Freeway Extension	New bridge crossing over Trinity River from CBD to Singleton Boulevard. Project design includes "signature" bridge concept (long-span arch) (see **Section 3.2.7**).	0.5 miles in length.
IH-30 (Trinity River) Bridges	Bridge replacement project. Bridges are considered candidates for "signature" design concept (see **Section 3.2.7**).	Includes a 0.5-mile long Dallas Floodway crossing.
SH-183/West Fork Corridor Improvements	A MIS/EA to address transportation deficiencies along the SH-183/West Fork corridor. Project limits extend from IH-35E to SH-360 in eastern Tarrant County. Improvements to SH-183 include mainlane widening and the installation of a continuous HOV system connecting to IH-35E. The MIS also recommended a new "West Fork Reliever Road" be constructed from SH-360 to the proposed Trinity Parkway at Hampton Road (see **Section 3.2.7**).	SH-183 improvements are 12.5 miles in length. Majority extends beyond study area boundaries.
Houston Street Viaduct	Transportation enhancement project involving the repair, rehabilitation, and subsequent preservation of this NRHP-listed bridge (see **Section 3.2.7**).	0.9 miles in length.
Corinth Street Viaduct	Bridge expansion project involving the construction of an adjacent, parallel structure and preservation of the existing NRHP-eligible bridge (see **Section 3.2.7**).	0.9 miles in length.
Continental Avenue Viaduct	This NRHP-eligible bridge is planned for conversion to a "pedestrian only" facility after the Woodall Rodgers Freeway Extension is completed (see **Section 3.2.7**).	0.5 miles in length.
Hampton/Inwood Road Bridge	Bridge replacement project (see **Section 3.2.7**).	0.75 miles in length.
Sylvan/Wycliff Bridge	Bridge replacement project. Replaces the existing at-grade crossing of the Dallas Floodway with an elevated structure (see **Section 3.2.7**).	0.65 miles in length.
Beckley Avenue	Roadway widening to a six-lane divided thoroughfare from Singleton Boulevard to IH-30 (see **Section 3.2.7**).	0.7 miles in length.
Oak Lawn Avenue/DNT (NTTA, TxDOT, City of Dallas, and Dallas County project)	Includes roadway widening and geometric improvements to Oak Lawn between Maple and IH-35E. Also includes new access ramp connections from Oak Lawn to DNT. Improvements to DNT include bridge replacement over Oak Lawn and adding an auxiliary lane to improve traffic flow from southbound DNT to IH-35E.	1.0 mile in length. Located beyond study area boundaries.
BNSF/TRE Bridge (DART/T)	Involves repair of existing rail bridge and construction of a new parallel rail bridge to serve the TRE from Dallas to Fort Worth.	300 feet in length.
Various Trail Projects	Includes several planned, programmed, and funded trails and bicycle routes (e.g., regional Veloweb) throughout the study area and beyond (see **Sections 3.2.7** and **3.3.2.3**).	Unknown. Majority extends beyond study area boundaries.

FIGURE 4-1. REASONABLY FORESEEABLE ACTIONS - TRANSPORTATION PROJECTS



1. Project Pegasus
2. The Southern Gateway
3. Woodall Rodgers Freeway Extension
4. IH-30 Trinity River Bridges
5. SH-183/ West Fork Corridor
6. Houston Street Viaduct
7. Corinth Street Viaduct
8. Continental Avenue Viaduct
9. Hampton/Inwood Road Bridge
10. Sylvan/Wycliff Bridge
11. Beckley Avenue
12. Oak Lawn/DNT
13. BNSF/TRE Bridge

LEGEND

3 = Transportation Project

Notes: Locations are approximate. Reference **Table 4-53**.

Table 4-54 lists identified projects by other agencies or private interests. **Figure 4-2** shows the location of the majority of these projects in relation to the Trinity Parkway study area. Refer to **Table 4-54** for a description of the geographic area covered by large-scale plans/projects (e.g., Dallas County Open Space Plan) not shown in **Figure 4-2**.

TABLE 4-54. REASONABLY FORESEEABLE ACTIONS – DEVELOPMENT PROJECTS

City of Dallas	Project Description	Approximate Size
Trinity River Corridor Master Implementation Plan	This comprehensive plan is intended to serve as the footprint to guide the implementation of recreational amenities, lakes, and trails in the Dallas Floodway and the Great Trinity Forest. The plan incorporates the proposals from other projects into one cohesive concept plan. These projects include (a) Dallas County Trail Plan, (b) Trinity Trails System, (c) Regional Veloweb, (d) Great Trinity Forest Master Plan, (e) DFE Project, and (f) Trinity Parkway (see **Sections 3.1.1.1, 3.1.1.3,** and **3.1.1.4**).	The scope includes over 2,000 acres of the Dallas Floodway and over 6,000 acres of the Great Trinity Forest within the limits of Dallas, and extends more than 20 miles from the northwestern to the southeastern limits of the city. Extends beyond study area boundaries.
Trinity River Corridor Land Use and Economic Development Plan	This plan has been initiated to analyze the existing land uses within the Trinity River corridor and to develop land use plans related to proposed flood control and recreational improvements. The key objectives are to promote compatible land uses, define strategies to stimulate economic revitalization, and maximize the value of the Trinity River project (see **Section 3.1.1.1**). There are 22 primary study areas between Walnut Hill Lane to the north and IH-635 to the south.	14 square miles. Extends beyond study area boundaries.
Stemmons/Design District Land Use Plan	Mixed Use: Proposed PDD (mixed-use), Residential, Park/Open Space, Katy Trail Bike Route, and Transit Oriented Development (TOD) Linkage (see **Section 3.1.1.1**).	194 acres
West Dallas Comprehensive Land Use Plan	Provides an inventory of all West Dallas land uses as well as zoning. It discusses strategic issues/options that would influence the positive redevelopment and stability of the area (see **Section 3.1.1.1**).	17 square miles. Extends beyond study area boundaries.
10th Street Land Use Plan	Provides strategies to revitalize and redevelop neighborhoods in the study area. The northern portion of the district is located in the Trinity Parkway study area (see **Section 3.1.1.1**).	1.5 square miles. Extends beyond study area boundaries.
Oak Cliff Gateway TIF District	Represents an opportunity to create a TIF district to improve the major entry into Oak Cliff from the CBD and to support economic development and neighborhood revitalization in this community (see **Section 3.1.1.1**).	2.0 square miles. Extends beyond study area boundaries.
The Cedars TIF District	Created a TIF district to promote development by utilizing public investments to attract private investment. Located east of the study area south of the CBD (see **Section 3.1.1.1**).	350 acres. Extends beyond study area boundaries.
Elm Fork Master Plan	Floodplain reclamation and recreation plan for the Elm Fork of the Trinity River within the City of Dallas.	8.5 square miles. Located beyond study area boundaries.

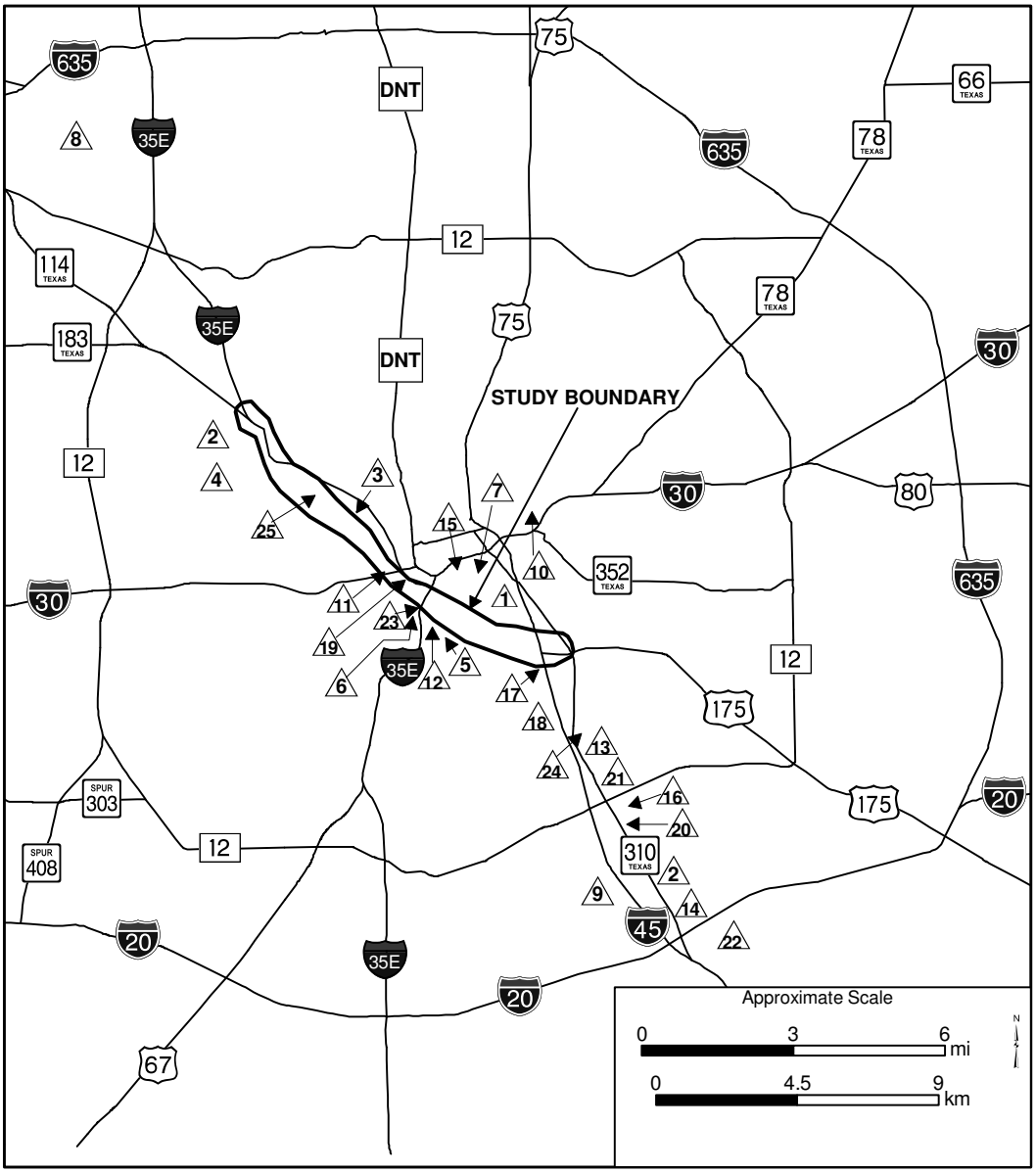
TABLE 4-54. REASONABLY FORESEEABLE ACTIONS – DEVELOPMENT PROJECTS

City of Dallas	Project Description	Approximate Size
Fivemile Creek Master Plan	Floodplain reclamation and recreation plan for Fivemile Creek and the Trinity River between Loop 12 and IH-20 to Bonnie View to the west in the City of Dallas.	5,700 acres. Located beyond study area boundaries.
Mill Creek Master Plan	Flood control and recreation plan for Mill Creek located in the Mill Creek sub-watershed in the City of Dallas.	2,000 acres. Located beyond study area boundaries.
Trinity River Corridor Urban Design Study	An on going study coordinated through *The Dallas Plan* to develop appropriate balance of multi-modal transportation, flood control, recreation and open space, environmental management, and economic and community development for the Trinity River corridor in Dallas.	30 square miles. The study area is defined as the Dallas Floodway and DFE areas, and the adjacent developed areas extending 1-mile on either side. Extends beyond study area boundaries.
Dallas Park Long-Range Development Plan	Provides an inventory of park and open space resources within the City of Dallas and plans for future development.	Includes the entire City of Dallas. Extends beyond study area boundaries.
Moore Park Master Plan	Identified in the *Trinity River Corridor MIP* as a proposed neighborhood gateway leading to the Trinity River. Includes park expansion with trails, active recreation facilities, and a canoe launch at the Trinity River near the DART Bridge (see **Sections 3.1.1.1** and **3.3.2**).	24 acres
Dallas County Open Space Plan	Used for planning and priority acquisition of open space in Dallas County, with emphasis on the Trinity River and major tributaries, and White Rock Escarpment (see **Section 3.3.2**)	Park acquisitions from 10 to 300 acres throughout Dallas County. Extends beyond study area boundaries.
Dallas Interpretive Center within Great Trinity Forest Park	Planning of nature interpretive center in Great Trinity Forest Park along Trinity River south of the Dallas Floodway.	2,000 acres. Extends beyond study area boundaries.
McCommas Bluff Landfill Expansion	Involves expansion of the landfill area with levee and hydraulic swale, and includes a wetland mitigation plan. Located along the Trinity River north of IH-20 in Dallas.	2,000 acres. Located beyond study area boundaries.
Cadiz Interceptor Sewer Line	Involves construction of a 102-inch gravity sewer line connecting the Cadiz pump station. Located east of IH-35E crossing the Trinity River.	0.5 miles in length. Extends beyond study area boundaries.
Dallas Central WWTP Sludge Force Main	Construction of a 16-inch diameter sanitary sewer sludge force main generally parallel to the Trinity River from the Central WWTP to the Southside WWTP.	15 miles in length. Located beyond study area boundaries.
USACE – Fort Worth District	**Project Description**	**Approximate Size**
Dallas Floodway Extension Project	Flood control project authorized to provide flood damage reduction, ecosystem restoration, recreation, and environmental mitigation. Features include new levees, constructed wetlands, river channel realignment, and recreation amenities. Mitigation includes the acquisition, preservation, and management of 1,179 acres of forested wetlands. The DFE is considered a potential joint development project with the Trinity Parkway, depending on the alternative recommended (see **Section 3.1.1.3**)	The study area includes that portion of the Trinity River between the confluence of Fivemile Creek near IH-20 and the downstream end of the Dallas Floodway. Also includes the White Rock Creek tributary between IH-30 to its confluence with the Trinity River. Extends beyond study area boundaries.
Dallas Floodway Project (City of Dallas LPP)	An on going EIS to evaluate various flood control, ecosystem restoration, and recreation improvements. The City of Dallas LPP includes a proposed levee raise, lake construction, channel realignment, hike/bike trails, and other recreational amenities. The LPP is considered a potential joint development project with the Trinity Parkway, depending on the alternative recommended (see **Section 3.1.1.3**).	1,422 acres. Extends beyond study area boundaries.

TABLE 4-54. REASONABLY FORESEEABLE ACTIONS – DEVELOPMENT PROJECTS

City of Dallas	Project Description	Approximate Size
Old Trinity River Channel Wildlife Restoration Project	Ecosystem restoration project with minor flood control improvements along remnants of the West Fork channel and a hike/bike trail component (see **Sections 3.1.1.3, 3.3.2.3,** and **3.5.7**).	100 acres. Extends beyond study area boundaries.
Joppa Preserve Habitat Restoration Plan	Habitat enhancement and recreational amenities project for Lemon Lake and Little Lemon Lake area. Located south of Loop 12 along the Trinity River	315 acres. Located beyond study area boundaries.
Private Developments	**Project Description**	**Approximate Size**
Joppa Rodeo and Community Park	Development of rodeo arena, football field, and community park. Located at Loop 12 and Carbondale Street in Dallas.	21 acres. Located beyond study area boundaries.
Trinity River Mitigation Bank – Fin and Feather Club Lake	Habitat preservation and enhancement, and creation of bottomland hardwood forest and emergent wetlands project. Located south of IH-20 and east of Cleveland Road in Dallas County.	500 acres. Located beyond study area boundaries.
Oak Cliff Gateway/Burnett Field	Proposed mixed-use development containing office, retail/commercial, and multi-residential located adjacent to the Dallas Floodway at IH-35E.	35 acres
UP Railroad Intermodal Expansion	Expansion of the intermodal truck freight to train loading/unloading facility located east of the UP Railroad and north of Linfield Road in Dallas.	25 acres
Oncor West Levee - Norwood Project	Proposed 345 kV electrical transmission line. Located between the West Levee SW switching station near the west levee south of Singleton Boulevard and the Norwood switching station located between Loop 12 and the Trinity River in Irving.	6 miles in length. Extends beyond study area boundaries.

FIGURE 4-2. REASONABLY FORESEEABLE ACTIONS - DEVELOPMENT PROJECTS



1. Trinity River Corridor MIP
2. Trinity River Corridor Land Use and Economic Development Plan
3. Stemmons/Design District Land Use Plan
4. West Dallas Comprehensive Land Use Plan
5.10th Street Land Use Plan
6. Oakcliff Gateway TIF District
7. The Cedars TIF District
8. Elm Fork Master Plan
9. Five Mile Creek Master Plan
10. Mill Creek Master Plan
11. Trinity River Corridor Urban Design Study
12. Moore Park Master Plan
13. Dallas Interpretive Center
14. McCommas Bluff Landfill Expansion
15. Cadiz Interceptor Sewer Line
16. Dallas CWWTP Sludge Force Main
17. DFE Project
18. Dallas Floodway Project
19. Old Trinity River Channel Wildlife Restoration Project
20. Joppa Preserve Habitat Restoration Plan
21. Joppa Rodeo and Community Park
22. Trinity River Mitigation Bank
23. Oakcliff Gateway/Burnett Field
24. UP Railroad Intermodal Expansion
25 Oncor West Levee - Norwood Project

LEGEND
3 = Development Project

Notes: Locations are approximate. Reference **Table 4-54.**

4.24.2.6 Steps 5, 6, and 7 Affected Environment – Resources, Stresses, Current Condition

The affected environment analysis characterizes the existing key resources, ecosystems, and human communities in terms of their response to change; stresses imposed on them; their capacity to withstand these stresses; the pertinent regulations, standards, and development plans that establish thresholds (levels of stress beyond which the desired condition degrades); and their current status (baseline condition). This information is summarized in **Table 4-55**.

TABLE 4-55. SUMMARY OF AFFECTED ENVIRONMENT ANALYSIS

Resource	Potential Change	Potential Stresses	Capacity to withstand Stresses	Regulatory Thresholds	Baseline Condition
1. Land Use	**a. General Land Use:** Increase in development, consumer services, and public services. Increase in infrastructure demand (road, transit, utilities, etc.).	Water resources, air quality, pollution, and habitat reduction.	Regulations and standards are used to minimize adverse effects. Development standards can require compensatory storage and natural drainage measures to mitigate effects of new development.	Land use is regulated through the Dallas City Council according to the city's regulations and zoning ordinances.	Ambitious growth and revitalization plans for Trinity River Corridor (see **Section 3.1.1.1**).
	b. Socio-economics: Increase in population and employment.	Development is increasing demand on infrastructure. Decrease in mobility. Increase in travel times and land density.	Municipal providers responding to near term needs on a priority basis, recognizing fiscal constraints. Municipal planners encouraging in-fill growth, sensible growth initiatives, and growth near transportation.	Long-range infrastructure planning provided by NCTCOG, NTTA, TxDOT, DART, city, county, and others to improve transportation service (see **Chapter 1**).	Continued population and employment growth anticipated through 2025 regardless of major transportation improvements (see **Chapter 1** and **Section 3.1.2**).
	c. Public Services: Increase in demand for access to education, health care, fire and police services, and transit.	Increase in population and development, which increases demand on service.	An expanded tax base and increase which would help offset the costs if the increase in various services to expanding communities.	State, county, and municipal government provides the delivery of services, operation, and long-term maintenance.	The study area is responding to growing demands on basic public services; however, trends show that population growth is outpacing needed infrastructure improvements.
2. Water Resources	**a. Wetlands and waters of the U.S.:** Direct impacts: loss of wetlands, channelization, and excavation/filling. Indirect impacts: hydrology issues.	Continued growth and development.	Mitigation for wetlands/waters of the U.S. is stabilizing the loss of resources.	USACE, USFWS, TPWD, and USCG enforce a no net loss of resources and protection of rivers/channels for projects subject to federal and state jurisdiction (see **Section 3.4.6** and **4.8.2**).	Impacts have been stabilized by mitigation requirements.

TABLE 4-55. SUMMARY OF AFFECTED ENVIRONMENT ANALYSIS

Resource	Potential Change	Potential Stresses	Capacity to withstand Stresses	Regulatory Thresholds	Baseline Condition
	b. Floodplains: Loss of floodplains.	New development and associated infrastructure improvements.	The City of Dallas, TCEQ, USACE, and FEMA have ample regulatory authority to control encroachment upon floodways and floodplains, and provide compensatory mitigation as required.	Cognizant resource agencies enforce a policy of no net loss of floodplains through the CDC permit review process (see **Section 3.5.7.1**).	Flood control improvements and regulatory requirements have stabilized or slightly improved flooding in the area.
	c. Water Quality: Increase in pollutant concentrations in water bodies. Increase in erosion and sediment from other development (roads, commercial, utilities, etc.).	New development, storm water runoff, and construction and operation of roadway improvements.	The use of BMPs for all project development would minimize pollutant and sediment concentration in runoff. New development plans must incorporate structural and non-structural BMPs designed to reduce runoff and pollutant loads.	EPA/TCEQ regulates large-scale construction activities under NPDES/TPDES permit program. TCEQ provides water quality certification under § 401 of the CWA, which is mandatory for all projects requiring § 404 permits (see **Section 4.12.1**).	Recent trends show water quality improving in study area. USACE, EPA, TRA, NCTCOG, and TCEQ programs have been improving water quality (see **Section 3.5.5**).
3. Air Quality	Increase in air pollution.	Increase in traffic volumes and congestion.	Transportation improvements would reduce congestion and travel times, thereby helping compliance with standards. New technology producing cleaner fuels, and more efficient cars.	Federal CAA (NAAQS), statewide and regional SIP (see **Section 3.6**).	DFW region is currently in NAAQS attainment for all criteria pollutants, with the exception of O_3. Ozone exceedances have steadily improved over the past 10-15 years. Also, see **Section 4.14.3**).
4. Cultural Resources	Preservation of historic and archeological resources.	Increase in development and transportation improvements. Limited/no protection on private lands.	Design considerations that would modify the facility, thereby minimizing or avoiding resource impact. Established programs providing awareness and protection: -Local designations; -Statewide inventories; and -Context-sensitive design.	Historic/archeological resources reviewed with the SHPO in accordance with 36 CFR 800.4; § 106 of the NHPA; § 4(f) of the DOT Act and local/county preservation ordinances (see **Section 3.3.1**).	NRHP listed, eligible, and potentially eligible historical resources are located in the study area (see **Section 3.3.1**).
5. Park and Open Space Resources	Preservation of parks/open space resources.	Increase in development and transportation improvements.	FHWA, U.S. DOI, TPWD, and local agencies have ample regulatory authority to protect and preserve encroachment upon parks/open space areas, and provide compensatory mitigation as required. Design considerations that would modify the facility, thereby minimizing or avoiding resource impact.	Chapter 26 of TPWD Code, § 4(f) of the DOT Act, § 6(f) of the LWCF Act, and local/county preservation ordinances (see **Section 3.3.2**).	Ambitious park/recreational development and open space preservation plans for Trinity River Corridor (see **Section 3.3.2.3**).

TABLE 4-55. SUMMARY OF AFFECTED ENVIRONMENT ANALYSIS

Resource	Potential Change	Potential Stresses	Capacity to withstand Stresses	Regulatory Thresholds	Baseline Condition
6. Biological Resources	Impacts to habitats harboring special status plant and animal species.	Increase in development and transportation improvements.	Design considerations that would modify the facility, thereby minimizing or avoiding resource impact. Streams/rivers would not be impeded thereby allowing wildlife movement along these waterway corridors.	USFWS (under § 7 of the federal ESA) and TPWD (see **Section 3.4.5**).	No listed species have been identified in the study area. Bird species represent the majority of listed species with potential habitat in the study area. Urban tolerant species occur mostly throughout Dallas County, and species intolerant to urban conditions are known to occur in more secluded, rural areas.

4.24.2.7 Step 8 Determining Environmental Consequences – Cause and Effect

The cause-and-effect relationships between the key resources, ecosystems, and human communities and the various stress factors identified for the proposed action are summarized in **Table 4-56**. The table shows response of a given resource to a change in its environment.

TABLE 4-56. CAUSE-AND-EFFECT FOR RESOURCES, ECOSYSTEMS, AND HUMAN COMMUNITIES

Resource	Cause of Change	Potential Effect of Change
1. Land Use	Population and employment growth, accompanied by new transportation, residential, commercial, industrial, and service-oriented development Right-of-way acquisition Public services	Loss of open space. Increased traffic, congestion, and travel times. Increase in infrastructure demand (transit, utilities, etc.). Environmental justice considerations. Disruption of community mobility. Loss of neighborhood or community character.
2. Water Resources	New development with increased impervious surface area Storm water runoff during construction and operation Stream channel erosion Non-point source pollution Human access	Degradation of surface and groundwater. More rapid, higher discharge runoff pattern. Over draught of groundwater. Impaired groundwater recharge rates. Wetland degradation, fragmentation, and loss. Disturbance of hydrology. Diminished flood control capacity. Sediment delivery and pollutant loading. Deterioration of recreational water bodies - litter and refuse deposits.
3. Air Quality	Highway construction, traffic volumes, and congestion	Increased pollution from vehicle emissions.
4. Cultural Resources	Right-of-way acquisition Stream bank erosion Land leveling and construction Vandalism	Cultural site degradation. Fragmentation of historic districts. Development pressure.
5. Park/Open Space Resources	Population growth Right-of-way acquisition Urban development	Inadequate park/recreational opportunities. Loss of park/open space areas. Development pressure.
6. Biological Resources	Highway construction Urban development	Habitat fragmentation and loss. Loss of biological diversity; introduction of invasive species. Degradation of sensitive ecosystems. Detrimental effects on food chains.

4.24.2.8 Step 9 Determining Environmental Consequences

This section discusses the magnitude and significance of potential cumulative effects for the specific resource categories of interest. For the purpose of this analysis, magnitude has been presented in terms of the relative size or amount of the effect, and significance is discussed in terms of its geographic extent (i.e., how wide-spread the effect might be), as well as in terms of duration and/or frequency (i.e., temporary, short term, or long term).

1. Potential Land Use/Socioeconomic Effects

The Trinity Parkway study 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, and could also be both beneficial and adverse. Beneficial effects include new economic opportunities, housing alternatives, employment, community services, and recreational resources. Potential adverse cumulative effects include the loss of habitat, water quality impacts, and air quality impacts associated

with the continued urbanization within the study area. The 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 social and economic conditions in the DFW area described in **Section 3.1** provide an indication of land use trends, since absorption of developed land has a fairly direct correlation to population growth. Population in the DFW area grew approximately 70 percent from 1995 to 2000. However, on a local level, the pace of population growth has declined in recent years, as vacant developable land has been substantially reduced. Growth has become more dominant in the counties surrounding Dallas County, such as Collin and Denton. There has been a resurgence of interest in recent years in redevelopment of the central core areas of Dallas County, as evidenced by residential redevelopment in and around the Dallas CBD. This kind of redevelopment is encouraged by NCTCOG through its sustainable growth initiative promoted as part of the MTP (*Mobility 2025 – 2004 Update*). Potential redevelopment of land within and surrounding the Trinity Parkway study area could be expected to generally support this regional initiative.

Cumulative Transportation Effects

Upon completion, the Trinity Parkway and related transportation projects (see **Section 3.2.7**) would improve local and regional traffic circulation. The benefits of the proposed action include:

- Management of congestion on Dallas city streets;
- Reduced congestion in the Canyon, Mixmaster, and Lower Stemmons corridors;
- Additional system capacity;
- Improved regional mobility;
- Accident reduction; and
- Travel timesavings (see **Section 4.4**).

Capacity increasing projects and operational improvement projects throughout the Trinity Parkway corridor would remove or reduce bottlenecks at interchanges (e.g., IH-35E/IH-30). The Woodall Rodgers Freeway extension and the proposed reconstruction of IH-35E and portions of the Canyon/Mixmaster in conjunction with HOV lane additions (i.e., Project Pegasus) would provide additional capacity and reduce the existing and projected traffic congestion and delays. It would also improve traffic operations on/near the US-175/SH-310, IH-35E/SH-183, and IH-35/IH-30 interchanges and major highways/roadways, including arterial streets adjacent to the corridor. Reconstruction of the Canyon/Mixmaster would reduce peak-hour traffic congestion, reduce the need for drivers to use diversion routes, accommodate projected increases in traffic, and improve traffic safety and operations.

On the regional level, cumulative effects would occur from additional improvements to the regional transportation system. For example, TxDOT has completed the SH-183/West Fork Corridor MIS (April 2000), which recommended added capacity improvements in the SH-183 corridor between SH-360 to the west and IH-35E to the east. The SH-183/West Fork Corridor MIS eastern study limit connects to the west end of the Trinity Parkway study area limits (Westmoreland Road). This study area overlaps with two other MIS projects: The TxDOT Loop 12/IH-35E Corridor MIS and DART's Northwest Corridor MIS.

The SH-183/West Fork Corridor MIS recommended plan of action includes the reconstruction and widening of SH-183 (from six to eight general-purpose lanes) and a managed HOV system on SH-183 from SH-360 to a connection with the proposed IH-35E system within the Trinity Parkway study area. It also recommends the construction of a new reliever roadway as a strategic regional arterial west of Loop 12 and a tollway east of Loop 12, with provisions for a future extension west to the City of Fort Worth. The study suggests this "West Fork Reliever Road" be designated a six-lane super arterial from SH-360 to Loop 12 and a six-lane tollway from Loop 12 to the proposed Trinity Parkway at Hampton Road. The specific alignment is preliminary and subject to the requirements of NEPA. Cumulative effects of this proposed network of new roadway facilities in Dallas County would include improvements to local and regional travel conditions as well as increased mobility and access within the north central Texas region.

There are also several other on going transportation improvement studies throughout the north central Texas region, such as FHWA's (in cooperation with TxDOT and other state DOTs) IH-35 Trade Corridor Study; TxDOT's IH-35E/US-67 (The Southern Gateway) MIS/EA, IH-35 East Corridor MIS (Denton County), IH-635/LBJ Freeway MIS (from IH-35E to US-80), and SH-360 Corridor Improvement Study (CIS)/EA project (western Dallas County); NTTA's President George Bush Turnpike project (Collin, Dallas, and Denton counties); and DART's East Corridor (IH-30/US-80) MIS. The construction of these planned transportation improvements would also result in cumulative effects to the human environment, including socioeconomic, physical, and natural environmental effects. Other potential transportation improvements within the region – roadways, public transportation, TSM/TDM measures, commuter rail, and light rail – would cumulatively improve local and regional travel conditions within the study area and beyond, which in turn would help to sustain growth throughout the region.

Cumulative Noise Effects

The highway traffic noise associated with the proposed action and all other noise sources associated with past, present and reasonably foreseeable future actions were evaluated to determine their likely cumulative effects on the human environment in the study area. An analysis of the study area indicated that highway traffic noise has been, is and would continue to be the primary/dominant source of noise in frequently used human activity areas. The traffic noise analysis for the proposed action determined where noise impacts would occur and where noise abatement would likely be feasible and reasonable.

The analysis included a prediction of future noise levels that were derived, in part, from future increases in highway traffic due to both existing land uses and future development likely to occur in the study area. No other past, present or future actions are expected to substantially affect the overall noise environment (see **Section 4.15** for the discussion of the proposed project's direct traffic noise impacts).

2. Water Resources

The project study area is located within the Trinity River watershed, one of the state's major river basins (see **Figure 3-2**). The Trinity River watershed drains approximately 18,000 square miles from just south of the Oklahoma border in north central Texas to Galveston Bay on the Gulf of Mexico. The watershed includes the large metropolitan areas of DFW and Houston. The following sections describe the potential cumulative effects for water resources in this watershed, which includes (**2a**) wetlands and waters of the U.S., (**2b**) floodplains, and (**2c**) water quality.

2a. Wetlands and Waters of the U.S.

Section 3.4.6 provides a detailed description of wetlands and waters of the U.S. in the Trinity Parkway study area. Approximately 205 acres of wetlands are present in the study area, based on the project's wetland delineation. Most of these wetlands consist of low- to medium-quality shallow depressions within the Dallas Floodway. **Section 4.8** describes the incremental impacts to wetlands and waters of the U.S. for each of the Trinity Parkway build alternatives.

Historically, wetlands have not been recognized for their ecological importance. Over time, many of these areas were filled, dredged, or developed to make the land useful for housing, commercial/industrial development, and agriculture. From the mid-1800s until about 1970, approximately one-half of Texas' historic wetlands acreage was converted from natural systems in response to society's demand for food and urban development. Since 1970, wetlands have been identified as providing important economic and environmental functions, such as temporarily storing floodwater, filtering sediment and pollutants, and providing important habitat for many species of plants and wildlife.

A 1980 statewide inventory of forested wetlands identified 5,973,000 acres of bottomland hardwoods and 95,000 acres of swamps remaining in Texas. These acreages reflect an estimated 63 percent loss of these types of wetlands from their pre-settlement high of more than 16 million acres. According to the USFWS report, *Status and Trends of Wetlands in the Conterminous United States*, 6.2 percent of U.S. forested wetlands were lost from the 1970s to the 1980s, while 2.3 percent were lost between 1986 and 1997. Nationally, the majority of all freshwater wetlands losses have been attributed to development. The analysis during this study period attributed causes of all wetland losses to the following:

- Urban development (30 percent);
- Agriculture (26 percent);
- Silviculture (23 percent), and
- Rural development (21 percent) (USFWS, 2002a).

In Texas, low-density development in distinct cities or towns almost doubled between 1955 and 1992, consuming more than 86,000 acres of wetlands (TPWD, 2002a).

In regard to other waters of the U.S., the DFW metropolitan area accounts for the most urbanized portion of the upper Trinity River watershed. Floodplains have been affected both physically and indirectly by urbanization impacts, such as storm water runoff and past agricultural, drainage, and mining activities. Straightening of channels, dredging and filling of streambeds, ditching and draining of wetlands, construction of levees, and removal of natural vegetation has also occurred in certain areas. The most obvious manifestation of this urban development is the increase in impervious cover and the corresponding loss of natural vegetation. Land clearing, soil compaction, riparian corridor encroachment, and modifications to the surface water drainage network have all accompanied urbanization of the DFW area.

These human activities are most evident within the Trinity Parkway study area. Human use of the Trinity River in this portion of Dallas has included activities to straighten, narrow, deepen, fill, block, and otherwise encroach upon the river channel. In the study area, the entire length of the river has been reconstructed from well upstream of Westmoreland Road to downstream of Corinth Street, with the only remnant pieces of the old river channel now existing as drainage sumps landside of the east and west floodway levees. Upstream, multi-purpose federal reservoirs have altered seasonal and shorter-term river flows. As a result, much of the channel system has become simplified, stabilized in position, disconnected from part of the historical stream meander corridor and floodplain, and subject to stabilized stream flows that have lost part of their flow variability. These physical alterations have had an impact on the associated natural ecosystem and native biota that evolved and depended upon natural conditions. The magnitude of these impacts is unknown and cannot be determined within the scope of this DEIS.

In 1991, Texas adopted state goals for “no net loss” of acreage or ecological function of wetlands. These goals reflect the CWA, federal legislation that prohibits the discharge of soil into waters of the U.S. unless authorized by a permit issued under § 404 of the Act. The USACE has authority over such actions and requires the permittee to restore, create, enhance, or preserve nearby wetlands as compensation for any damage. This means of compensatory mitigation is intended to comply with the general goals of the CWA and the specific goal of “no net loss” of wetlands. Several regulations have been enacted on a federal, state, and local level to achieve these goals.

According to the USACE–Fort Worth District Office, a total of 770 projects were authorized in the upper Trinity River basin during the period from December 1, 1999 through September 1, 2002 (most recent available). Of these, 55 were individual permits and 570 were nationwide general permits. The nationwide permit authorizations resulted in 93.85 acres of impacts to waters of the U.S. However, 198.66 acres of compensatory mitigation was provided to offset these impacts.

Notably, during the years 2001 and 2002 a total of 1,427 acres of wetlands, waters, and riparian habitat were restored or protected through USFWS/USACE coordination on individual mitigation plans located within the area of jurisdiction administered by the USFWS–Texas Ecological Field Office in Arlington, Texas. The USFWS is also coordinating with the USACE to restore and/or protect an additional 2,669 acres of wetlands, waters, and riparian zones enabled in large part to the 2,185 acres in the Trinity River, Big Woods on the Trinity, and West Mineola "mitigation banks." These banks have been designed to restore and enhance forested and emergent wetlands, while providing compensation for a variety of adverse impacts resulting from rapidly expanding development in this region of Texas. Strategically located, the banks provide crucial habitat for a variety of migratory and resident wildlife species, such as neo-tropical songbirds, shorebirds, and waterfowl, as well as provide significant hydrological and water quality benefits. The mitigation banks could be expanded depending upon their success (USFWS, 2002b).

Future trends in wetland regulation are likely to focus on compensatory mitigation requirements. Regulatory agencies are expected to develop procedures to track the success and completion of mitigation efforts as the focus moves toward replacement of wetland functions, rather than replacement of wetland area. Additional researches and publications show strong indication that mitigation banking is becoming a more favored means of mitigating wetland loss.

Urbanization is the primary cause of wetland loss in and around the project study area. Individual developments may cause direct loss of wetlands due to displacement. Additionally, primary wetland functions may be lost due to increases in impervious surfaces, which reduces groundwater recharge, alters wetland hydrology, and may cause a decrease in overall wetland area and functional capability. Impacted functions include fish and wildlife habitat, storm water retention, and sediment and toxics retention.

As previously described in **Sections 3.4.6** and **4.8**, the protection of wetlands is required by § 404 of the CWA and EO 11990 *Protection of Wetlands.* EO 11990 mandates that a project should avoid wetlands or, if no practicable alternative exists that avoids wetlands, impacts should be minimized as much as possible. Section 404 of the CWA authorizes the USACE to issue permits for the discharge of dredged or fill material into waters of the U.S. at specified disposal sites. Selection of such sites must be in

accordance with § 404(b)(1) guidelines developed by the EPA in conjunction with the USACE. In conjunction with the § 404 permit process, permit applications are reviewed by the TCEQ for compliance with § 401 of the CWA (see **Section 7.2**).

In accordance with CWA § 404 (b)(1) guidelines, wetland mitigation is identified as avoidance, minimization, and compensatory mitigation. These guidelines stress the avoidance of adverse impacts to wetlands with the goal of no overall net loss of wetland functions. Consideration for avoidance and minimization of impact to wetlands would be given throughout the design and construction process. However, because avoidance is not possible across an entire alignment, mitigation includes minimizing or compensating unavoidable impacts (see **Section 7.4**).

As previously described in **Section 4.8**, none of the impacts associated with the proposed action are to high-quality wetlands. All wetlands impacted would be mitigated to an acceptable level based on the regulatory requirements described above. Therefore, the incremental impacts to wetlands from the proposed action are considered insignificant in relation to historical and future cumulative effects.

Other planned transportation system improvements, flood control projects, and development projects (see **Tables 4-53** and **4-54**) would also be subject to the requirements of EO 11990 as well as all other applicable federal, state, and local regulations, thereby ensuring their impacts are mitigated. With the implementation of BMPs and planned ecosystem restoration projects, future potential impacts would be substantially reduced. Cumulative project impacts for wetlands and waters of the U.S. are therefore considered to be insignificant.

2b. Floodplains

A description of floodplains and flood control features within the Trinity Parkway study area is provided in **Section 3.5.7**. Included are descriptions of the regulatory requirements for the protection of floodplains, historical flood data, major flood control features, and the history of flood control measures for the study area. The proposed action's incremental impacts are described in **Section 4.13**, which provides a description of potential impacts of the project alternatives on the base floodplain. This includes encroachments in the base floodplain, potential flood-related risks, impacts to natural and beneficial floodplain values, and the potential for incompatible floodplain development attributable to the proposed action.

Floodplains are an important asset to the community. In their natural condition, floodplains serve vital functions. These include temporary storage of floodwaters, moderation of peak flood flows, maintenance of water quality, groundwater recharge, prevention of erosion, and provision of habitat for wildlife. They also provide recreational opportunities and establish an aesthetic quality to natural areas. These

functions are best served if floodplains are kept in their natural state. The cumulative results of damaging human impacts on floodplains and stream systems include:

- Degradation of the physical, chemical, and biological integrity of the water resource;
- Reduction of life-supporting complexity and diversity of the riverine ecosystem;
- Impairment of beneficial functions and natural stream processes; and
- Loss of beneficial uses of stream resources, that is, water supply, recreation, fish consumption, and aquatic life uses.

Over the past several decades, major flood control measures have been implemented within the Trinity River watershed. For instance, there are 22 man-made reservoirs with more than 10,000 acre-feet of storage and hundreds of smaller reservoirs, mostly flood control structures built by the SCS (predecessor to NRCS). These reservoirs have an appreciable effect on stream flow and water quality in the basin. In addition, there are 38 water districts, levee districts, or floodwater districts that have been involved in levee construction and improvements. Twenty-two of these are situated at least partially in the floodplain of the Trinity River. These levee and floodway districts provide varying degrees of protection for more than 134,000 acres of land along the Trinity River. Between Dallas and the proposed Tennessee Colony Lake site in Anderson County, about 80 percent of the river has a levee on at least one side and about 63 percent has a levee on both sides (TRA, 2001).

Completion of the major flood control reservoirs has reduced the catastrophic damages to downstream interests, particularly in the reaches immediately downstream from the flood control reservoirs. Also, no failure of a major urban levee has occurred in the DFW area (TRA, 2001).

As previously described in **Section 3.5.7**, the protection of floodplains and floodways is required by EO 11988 *Floodplain Management* and is implemented by the FHWA through 23 CFR 650 Subpart A *Location and Hydraulic Design of Encroachments on Floodplains*. At the local level, floodplain regulations are contained in Sections 51A-5.101 through 5.106 of the City of Dallas Development Code. The intent of these regulations is to avoid or minimize highway encroachments within base floodplains, where practicable, and to avoid land use development that is incompatible with floodplain values. To comply with EO 11988, the proposed action must be designed to avoid floodplain impacts, when practicable, and to adequately mitigate unavoidable impacts.

Practical measures to minimize harm to floodplains are incorporated into the preliminary designs of the Trinity Parkway build alternatives, which directly affect the Dallas Floodway. Little or no change to historic drainage patterns is expected within or down gradient from the study area. Impacts to the Dallas Floodway are minimized with the river alternatives and avoided by the Irving/Industrial alternatives.

Bridge and roadway designs seek to minimize impacts to floodplains in compliance with FHWA requirements – including efforts to span 100-year (base) and SPF floodplains. Final designs would adhere to FHWA drainage criteria for both minor and major hydraulic structures, as well as follow all FEMA and USACE requirements. Specific measures and commitments are described in **Chapter 7**.

As previously described in **Section 4.13**, the proposed action does not support incompatible floodplain development and would not result in any substantial new risks during construction or flooding. It would not increase the base flood elevation or flood risk to property or to human life. In order to prevent a substantial adverse impact on natural and beneficial floodplain values, appropriate mitigation measures would be incorporated into the project. Therefore, the proposed action does not constitute a significant floodplain encroachment as defined in 23 CFR 650A and is in compliance with EO 11988.

Other planned transportation system improvements, flood control projects, and development projects (see **Tables 4-53** and **4-54**) would also be subject to the requirements of all applicable federal, state, and local regulations, including EO 11988, thereby ensuring their impacts are mitigated. With the implementation of BMPs and planned ecosystem restoration projects, future potential impacts would be substantially reduced. Cumulative project impacts are therefore considered to be insignificant.

In addition to EO 11988 and the other regulatory requirements described above, there are important regional policies and programs developed since the mid-1980s that are specifically intended to reduce adverse cumulative effects to floodplains within the watershed. The cooperative regional effort to manage the Trinity River corridor began in the early 1980s when the USACE began working on a Regional EIS to address the cumulative effects of individual permitting decisions. The studies showed that the cumulative effects of various floodplain developments would cause an increase in flooding.

In response, the affected local governments and the NCTCOG initiated the Trinity River COMMON VISION program, a regional approach to manage floodplain issues. Flood damage reduction, recreation, and environmental quality are the primary goals of the program. In addition, a request was made to Congress to authorize the USACE to complete a study to determine if a feasible flood protection plan(s) could be identified to reduce the risk of flooding, as well as address water quality, recreation, environmental enhancements, and other allied purposes. The results of this reconnaissance study led to a cooperative effort to prepare the first phase of the *Upper Trinity River Feasibility Study*. In the first phase, more than 100 economically viable projects were identified, including several structural flood control measures; water quality improvement, environmental enhancement, and recreational development measures; and cooperative approaches to watershed management. The results of this phase led to the preparation of the USACE's PEIS, which addresses the potential direct and cumulative

effects resulting from the implementation of the USACE's proposed projects and other entities projects on the human and natural environment (see **Section 3.1.1.3**).

The second phase of the *Upper Trinity River Feasibility Study* is currently in progress. This phase identifies implementable projects through project management plans to reduce flood risks, restore environmental values, and meet other study purposes. Example projects include the Trinity Trails System (see **Section 3.3.2.3**), the Dallas Floodway EIS project (see **Section 3.1.1.3**), and the CDC process (see **Sections 4.13** and **7.5**). The regional CDC processes requires no net loss of valley storage due to levee or fill projects along the river and stream systems of the DFW area. This cooperative regional permit process, administered by the NCTCOG, assures that design flow rates on the area's river systems would be stabilized over time.

The COMMON VISION program also includes intergovernmental partnerships among the various local governments with federal and state agencies. Representative state and federal agencies include the Texas Water Development Board (TWDB), TPWD, TCEQ, and FEMA. In addition, several state and federal agencies work with the NCTCOG in a program called the "Stream Team." This group consists of representatives from the EPA, USACE, TPWD, USFWS, NRCS, TCEQ, United State Geological Survey (USGS), FEMA, and NCTCOG. Upon request from a local government or developer, this group of agencies works together to provide technical advice on flood control, stream bank erosion, stream restoration, § 404 mitigation, and other types of stream corridor, floodplain, or stream channel projects, at no cost, prior to regulatory review. The Stream Team would make recommendations based on all stream and riparian functions, including:

- Fish and wildlife habitat;
- Water quality maintenance; sediment transport; and
- Surface and groundwater storage, recharge, and supply (NCTCOG, 2001a).

Proper adherence to the policies and recommendations of the COMMON VISION program would help to reduce the potential cumulative effects of the proposed action and other present or future projects on floodplains throughout the watershed.

2c. Water Quality

Section 3.5.4 provides a description of the hydrology and water quality characteristics of the Trinity Parkway study area, including major surface water bodies and groundwater features. **Sections 3.5.5** and **3.5.6** provide detailed water quality information, including baseline surface water quality data for the Trinity River. The proposed action's incremental impacts are described in **Section 4.12**, which includes a

description of the potential impacts of the project's alternatives on surface water and groundwater resources.

The urbanization of the Trinity River watershed has contributed to past and present water pollution problems. Over time, the primary sources of water pollution have changed. Historically, industrial and municipal discharges were considered the main sources of water quality impairment in the Trinity River. However, storm water runoff carrying pollutants from impervious surfaces, lawns, developed sites, and farmland are currently responsible for a substantial portion of the area's water pollution problems. Runoff containing pesticides, herbicides, and other contaminants, particularly in the DFW area, have combined to cause serious deterioration of water quality. The most severely affected area is the 250-mile long stretch that extends from DFW downstream to the headwaters of Lake Livingston in the lower part of the watershed.

The DFW metropolitan area is the largest inland population center in the U.S. and has had a profound impact on water quality in the upper Trinity River basin. By 1900, the Trinity River water quality for many miles downstream from DFW was notorious. Sewage collection and treatment began in 1910-1920, but the situation was still odious and unhealthy (TRA, 1999). In 1925, the Trinity River was characterized by the State Health Department as a "mythological river of death" because Dallas led the state in deaths associated with typhoid. With a rapid expansion of industry and population, and only primary wastewater treatment beginning in the late 1920s and secondary treatment in the mid-1930s, water quality conditions in the area were still poor (Land, et al, 1998). Since that time, there have been major wastewater treatment improvements every decade or so, with some consequent improvement in river water quality. However in the early 1970s the river was still heavily polluted and a state survey found no fish in the river (TRA, 1999).

Substantial improvements have been made to the water quality of the Trinity River over the past several decades, and the river in many areas is returning to a more natural state. Nevertheless, the basin is impacted from a variety of activities including urbanization, construction of reservoirs, and agriculture. All of these affect the water quality, as well as the physical and biological integrity of the Trinity River, its reservoirs, and tributaries. In several cases, these impacts result in use impairments (TRA, 2000a). However, studies have shown how dissolved oxygen has increased from close to zero much of the time to above a stream standard of 5 mg/L almost all of the time. Additionally, total ammonia nitrogen has decreased almost one-hundred fold. This has occurred because major wastewater plant improvements have radically reduced loadings of biochemical oxygen demand (BOD) and ammonia, even while flows in those plants were doubling (TRA, 1999).

During 1970 to 1985, 13 fish kills were documented in the Trinity River in the reach from Dallas to Lake Livingston. The magnitude and frequency of the fish kills resulted in a depleted fish community, particularly in the reach of the Trinity River immediately downstream from Dallas. An estimated 1.04 million fish died in these 13 kills. Twelve of the 13 fish kills were associated with minor flooding from rainfall in the DFW metropolitan area. According to the TPWD, the probable cause was the resuspension of bottom sediments and associated organic material during floods that caused an increase in BOD and a rapid drop in dissolved oxygen. Ironically, improvements in water quality during the 1970s set the stage for the fish kills by allowing appreciable fish populations to live in this reach of the Trinity River (Land, et al, 1998).

The most substantial impacts from agriculture on a regional basis appear to occur in reservoirs, which receive large loads of water quality constituents, such as pesticides, during rainy months. Evidence for this observation is seen in that every reservoir identified as having elevated levels of atrazine, a common herbicide used on row crops and in commercial weed-and-feed products in the surrounding Blackland Prairie ecoregion. Those reservoirs lying within this ecoregion that do not have elevated levels of atrazine have the greatest amount of urbanization in their watersheds. This is despite the fact that atrazine is readily detected in urban streams. It suggests that the quantity, or mass loading, resulting from runoff of agricultural land is more substantial than the relatively constant urban sources. This is true for nutrients as well and applies to wastewater treatment plants. A recent study on Grapevine Lake determined that non-point sources are the predominant source of nutrients for the reservoir, despite the fact that several municipalities discharge treated effluent into the lake (TRA, 2000a).

Impacts from urbanization have included physical modifications and heavy management of stream and river channels for flood control; storm water runoff from residential, commercial, and industrial areas; and discharges from municipal wastewater treatment plants. Of these three types of urban impacts, those involving the physical modification of stream channels are expected to have the greatest impact on biological integrity, while storm water runoff is expected to have the greatest impact on use attainability based on human health concerns. Point sources from municipal discharges are expected to have the least effect on use attainability. The impacts on biological integrity within the DFW area, though not severe enough to constitute use impairment, have been documented by the USGS (TRA, 2000a).

Impacts from urban runoff have, however, 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, including the Trinity River (see **Section 3.5.6**). Numerous studies examining storm water runoff have documented that this is the predominant source for these water quality constituents. Municipal wastewater discharges, on the other hand, have not been directly linked to any use impairments in the

Main Stem Trinity River or other urbanized areas in the basin. The most obvious impacts from these sources are seen in elevated nutrient concentrations (TRA, 2000b).

In the future, additional urbanization and industrial development would likely occur in and around the Trinity Parkway study 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 TMDL limitations prescribed by the TCEQ.

Individually, any of the Trinity Parkway build alternatives would have minimal impacts on water quality. The proposed action may have a slight contribution to the historic and ongoing trends of increased surface water runoff. These would be due to more paved surfaces and decreased surface water quality due to increased development. The NTTA would be required to meet all state and federal requirements pertaining to storm water runoff. In addition, the proposed action's contribution to cumulative construction impacts on water quality would be mitigated to insignificance with implementation of the required SW3P (see **Chapter 7**).

Other planned transportation system improvements, flood control projects, and development projects (see **Tables 4-53** and **4-54**) would also be subject to individual SW3P implementation, ensuring that their impacts would be mitigated. Cumulative project impacts on water quality are therefore considered to be insignificant.

In addition to the above, there are existing programs that would help to reduce the potential cumulative effects of the proposed action and other present or future projects on water quality in the Trinity River watershed. For instance, the Texas Clean Rivers Act, as enacted with Senate Bill 818 by the 72nd Texas Legislature in 1991, requires the TCEQ to ensure the performance of regional assessments of water quality on a watershed basis through the Clean Rivers Program (CRP).

The CRP is a statewide program to collect and assess water quality data throughout the river basins. The CRP program addresses both basin and state monitoring objectives through collaboration and coordination with the TCEQ State Water Quality Monitoring (SWQM) program, other governmental agencies, and the private and public sectors. The CRP conducts routine, periodic, and targeted monitoring activity comparable to the SWQM program. The compatibility of monitoring efforts facilitates collaboration between these programs to assess, manage, and disseminate water quality data used in developing basin-specific monitoring plans. The TRA implements the CRP program for the Trinity River Basin. The NCTCOG also has regional water quality responsibilities, and has for the past decade been

working with local governments to coordinate a regional storm water monitoring program. Both regional entities conduct their water quality activities primarily at the watershed level.

The objectives of the CRP are to use the watershed management approach to identify and evaluate water quality issues, to establish priorities for corrective action, and to implement those actions. The Trinity River Basin CRP is committed to developing a comprehensive water quality monitoring network throughout the basin. Due to the heavy urbanization and development of the upper basin and importance of the lower basin as a source of water for the City of Houston, there exist numerous entities within the basin with existing, extensive water quality monitoring programs, including the City of Dallas (TRA, 2000a).

3. Air Quality

Section 3.6 presents a detailed description of the local and regional air quality in the DFW region. **Table 3-31** in this section provides a historical summary of the tons of criteria pollutant emissions in Dallas County for the 11-year period from 1986 through 1996 (most recent information available from the EPA). **Figure 3-5** provides a historical summary for the number times the O_3 level has exceeded the federal standards within the DFW region from 1974 through 2003.

The historical data represents an improving trend in air quality over this period. This is attributable in part to the effective integration of highway and alternative modes of transportation, cleaner fuels, and NCTCOG's regional clean air initiatives. This is encouraging in view of the large increases in population, vehicular traffic, and industrial activity throughout the region. Although there have been year-to-year fluctuations, O_3 trends continue to show improvement. Potential emission increases due to substantial growth in traffic and industrial activity have been reduced by improved emission control technologies and a regional commitment to reduce overall emissions by the government, community, and industry. However, continued improvement in air quality is required by both federal statute and state regulation. Even with these improvements, the DFW region remains a non-attainment area and must be brought into compliance for the O_3 standard as required by the CAA.

As previously described in this DEIS, the DFW region is expected to continue to experience economic development, and increased development would be expected to increase associated emissions to the atmosphere. Examples include construction of new industry as well as growth in personal and commercial VMT within the region. However, despite projections of continued growth in the future, it is expected that the air quality in the DFW region would improve over time. The exact quantity of emissions reductions needed to achieve and sustain the O_3 NAAQS cannot be precisely determined with a high degree of certainty at this time. This is due in part to limitations in the current atmospheric and emissions

models used to develop air quality planning strategies and due to large-scale weather patterns that inconsistently produce meteorological conditions that are conducive to O_3 formation in the area.

If the associated air emissions were unregulated, new development in the study area would result in emissions increases in the area. These emissions increases could prevent the attainment of the O_3 air quality standard in the region and possibly lead to the future non-attainment of other air quality standards. However, government agencies are mandated to ensure that such growth would not prevent compliance with the O_3 standard or threaten the maintenance of other air quality standards. These agencies, the TCEQ and EPA, measure air quality levels over a regional monitoring network to identify the potential for ambient air quality that may approach or exceed established standards. These agencies also track changes in emissions of air pollutants in order to identify relationships between changing emissions and changes in air quality.

As previously described, Dallas County (along with Collin, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant Counties) was designated non-attainment for the 8-hour ozone standard by EPA, effective June 15, 2004. A demonstration of transportation conformity for added capacity projects to the 8-hour ozone standard is not required until the end of the one-year grace period (June 15, 2005).

If the TCEQ and EPA determine that an air quality standard is being exceeded, the agencies are responsible for implementing regulations and control strategies that would facilitate attainment of the standard. For example, the TCEQ is required by the CAA to develop a plan that shows how the O_3 ambient air quality standard would be met by the attainment year while accommodating foreseeable growth. This plan was adopted by the TNRCC (predecessor of TCEQ) on April 19, 2000, and is to be constantly updated to account for changing conditions.

Although there is a particular focus on attainment of the O_3 standard in the DFW region at present, the TCEQ also has regulations in place to regulate emissions of other pollutants even though the air quality standards for those pollutants are being met. These regulations are designed to limit emissions growth in a way that would assure continued maintenance of the standards.

The emissions associated with past, present, and future projects and activities in DFW that produce air emissions in the region would be addressed through this regulatory system to achieve, maintain, and improve compliance with air quality standards. In addition, transportation agencies in the DFW region continue to work cooperatively with regulatory agencies to identify ways to continue to reduce emissions from all man-made emission sources.

Air quality cumulative effects associated with transportation projects are addressed at the regional level by analyzing the air quality impacts in the MTP (*Mobility 2025 – 2004 Update*) and the TIP. The USDOT is responsible for determining the conformity of the MTP and TIP with local air quality goals as presented in the SIP. The Trinity Parkway project appears in the MTP and the TIP and has been determined to conform to the SIP. **Section 4.14** demonstrates the Trinity Parkway project would be in compliance with federally established air quality standards. The project-specific TAQA was conducted in compliance with applicable federal regulations, including the provisions of 40 CFR 93.110.

As previously discussed in this DEIS, planned transportation improvements in the Trinity Parkway study area are intended to cumulatively reduce congestion on a regional scale, with a resultant decrease in air pollution. Therefore, when combined, these proposed actions are anticipated to have a cumulatively beneficial impact on air quality.

As previously described in **Section 4.20.3**, construction of the Trinity Parkway project would contribute to short-term localized air quality impacts. However, project construction would be conducted in accordance with all federal, state, and local ordinances and regulations that govern construction activities and emissions from vehicles. Proper adherence to these ordinances and regulations would help to minimize potential cumulative air quality effects. Likewise, construction activities associated with other transportation projects and developments planned within the study area are also expected to contribute to short-term localized air quality impacts. Should these projects undergo construction during the same period as the Trinity Parkway project, minor short-term cumulative effects to air quality can be expected.

4. Cultural Resources

A description of the cultural resources identified within in the Trinity Parkway study area is provided in **Section 3.3.1**. The proposed action's incremental impacts are described in **Section 4.7**. **Chapter 5** provides a preliminary analysis of these potential impacts in compliance with § 4(f) of the DOT Act of 1966.

Cultural resources, such as buildings or artifacts, are tangible remains of our heritage that remind us of important people or events in our history, represent examples of art or architecture identified with particular movements or periods of history, or allow us to learn more about activities of past human occupation. Protecting these tangible remains is a difficult task given the patterns of rapid development and urban sprawl occurring today. Often, construction cannot avoid cultural resources.

Recognizing the need to document and preserve the important tangible remains of our past, both the federal government and the State of Texas passed laws to protect important historic structures and archeological sites from damage due to construction. As massive government-sponsored construction

projects, such as the interstate highway system and urban renewal in older cities, became commonplace after World War II, an estimated 25 percent of the nation's finest historic sites were lost. In response to growing public concern, Congress passed the NHPA in 1966. The law established a national policy for the protection of important historic buildings and archeological sites and outlined responsibilities for federal and state governments to preserve our nation's heritage (THC, 2002b).

The THC is the state agency charged with responsibility for historic preservation. The agency also serves as the SHPO, administering the NHPA for Texas. Established in 1953 by the 53rd Texas Legislature as the Texas State Historical Survey Committee (predecessor to THC), its first task was to identify important historic sites across the state and erect markers for places of historical importance. The group soon discovered that hundreds of ancient archeological sites, historic structures, and other important places were being thoughtlessly destroyed. After a sunken Spanish treasure ship was plundered off the Texas coast during the late 1960s, the state passed the Texas Antiquities Code in 1969 to protect historic buildings and archeological sites on public land (THC, 2002c).

Under the requirements of the Antiquities Code, 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.

In the past 30 years, surveys of the historic and cultural resources of Texas have revealed a vast and varied collection of sites, objects, districts, buildings, and structures recognized for cultural, historic, architectural, or archeological importance on a local, state, or national level. Of these, more than 2,700 Texas properties are listed in the NRHP, including approximately 240 historic districts with as few as two or as many as 1,718 contributing buildings and objects. These diverse examples of Texas' cultural and technical achievements contribute to a comprehensive record of the states past (THC, 2002a).

Growth and development are perhaps the most complex and pervasive challenge to preserving the historic fabric of Texas. With more than 129 million acres of farm and ranch land located around surging urban areas, the problem of growth, development, and sprawl are obvious. This growth has taken shape in all forms – traditional sprawl, inner city and downtown revitalization, and "smart growth" developments – that challenge preservation efforts (THC, 2002a).

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. It should be noted that cultural resources have little to no protection on private lands. Should cultural resources be damaged or destroyed by development projects on private lands, potential adverse cumulative effects can be expected to occur.

The proposed action would include mitigation measures to address the impacts of the Trinity Parkway on historic properties (see **Chapter 7**). As a result, it would not contribute substantially to a cumulative effect on cultural resources. In addition, each of the projects listed in **Tables 4-53** and **4-54** would be subject to NHPA compliance, which requires consultation with the SHPO on project effects to cultural properties. This results in specific mitigation, thereby reducing the cumulative effect of the projects.

In addition to the above, there are additional programs that would help to reduce the potential cumulative effects of the proposed action and other present or future projects on cultural resources. In January 2002, the THC published *Preserving Our Heritage: A Statewide Plan for Texas*, a roadmap for the state's preservation efforts. Included in the Plan are national and state preservation resources and information about an innovative new program that helps communities strategically plan their preservation efforts, the THC's *Visionaries in Preservation Program* (THC, 2002a).

The City of Dallas is one of three pilot *Visionaries in Preservation* communities in Texas (Castroville and San Augustine County are the others) that are currently participating in the program. This THC program is partnering with the local group Preservation Dallas in an effort to educate neighborhoods, increase awareness of the built environment, identify opportunities for compatible redevelopment and private investment, and establish an enduring preservation ethic for the city. *Discover Dallas!* is a project that seeks to identify historical and architectural resources from the 19th century through the latter part of the 20th century and coordinate diverse organizations into a long-range strategic plan for their preservation (THC, 2002d).

The City of Dallas has long been committed to the preservation of its historic resources. In 2001, the city developed the *Neighborhood Revitalization and Historic Preservation Program* to encourage the restoration of historic buildings and the revitalization of neighborhoods throughout Dallas. The program consists of tax incentives, conservation easements, and transfer of development rights. The current program has evolved from 15 years of offering incentives for the restoration of historic properties. The goals of the program respond to the broad vision Dallas has for redevelopment, revitalization, and preservation. The Department of Planning and Development manages the program in partnership with the Dallas Landmark Commission, the Dallas County Appraisal District, and the Dallas Tax and Revenue Department (City of Dallas, 2001b).

5. Park/Open Space Resources

A description of existing and planned park/open space areas within in the Trinity Parkway study area is provided is **Section 3.3.2**. Included are descriptions of the regulatory requirements for their protection and a history of the planning efforts conducted for the multiple large-scale recreational/open space projects planned within the study area. The proposed action's incremental impacts are described in **Section 4.7**.

Park and open space resources benefit the community in many ways. Both offer opportunities for recreation and provide direct ecosystem benefits. Park/open space areas add aesthetic value and pleasure and give relief from the harsh city landscape.

Of the most populous cities in Texas, Dallas has among the highest acres of park/open space areas per 1,000 population, with 19.7 acres. Austin has the most, with 37.2 acres, followed by Fort Worth with, 21.1 acres. Houston has 10.3 acres and San Antonio has 7.9 acres (TPWD, 2002b). Currently, the Dallas PARD maintains more than 21,000 park acres including 17 lakes with 4,400 surface acres of water at 17 park sites, 17,196 acres of greenbelt/parkland, and 61.6 miles of jogging and bike trails at 24 locations. There are 406 neighborhood, community, and regional parks.

Notably, several park/open space facilities in Dallas have been donated by private individuals over many years. The Dallas PARD estimates that 30 percent of its land for park sites has been donated. The major land donations in Dallas are the Samuell donations. These lands were donated between 1933 and 1954. The major donations were Samuell-East (608 acres), Samuell-Garland (46 acres), Samuell-Grand (99 acres), and Samuell-New Hope (120 acres). Other major parks are Bachman Lake (600 acres), Mountain Creek Lake (4,500 acres under lease), North Lake (1,200 acres under lease), Rochester (1,000 acres), Trinity River Greenbelt (3,233 acres), and White Rock Lake (2,333 acres) (U.S. DOI, 1977).

Historically, rapid urbanization has drastically altered the city/county landscape. The county's urbanized area contains approximately 56 percent of the land area, while approximately 30 percent is undeveloped agriculture or rangeland. Woodland and open water represent 8 percent and 3 percent, respectively. The urbanization that has taken place over the past several decades continued the long-term trend of open space conversion to urban land uses. This does not discount the fact that public and private park and open space was indeed established over the years. The pace of urbanization was, however, much faster. As development occurred, the extent of the county's remaining farm and ranch land, wooded creek corridors, and uplands decreased (Dallas County Commissioners Court, 1991). The magnitude of these impacts is unknown and cannot be determined within the scope of this DEIS.

The proposed action has been considered an important component of the city's planned open space development of the Dallas Floodway since the late 1960s (see **Section 1.3)**. In 1969, the Dallas Park Board published the *Coordinated Plan – Open Space Development Trinity River System in Dallas, Texas*. This plan called for multiple uses of the Dallas Floodway, including recreation, drainage, transportation, water supply, flood control, effluent disposal, and utility service. One of the major non-recreation components specified in the plan was the proposed "Trinity River Freeway."

In 1972, the Dallas Floodway property was donated to the City of Dallas by the Industrial Properties Corporation (see **Section 2.3.11**). The property was given to the city as long as its use was generally consistent with the 1969 *Open Space Plan* (see **Section 3.3.2.3**). Since that time, the city has considered this property, or a portion thereof, "reserved" for future transportation facilities.

In 1996, the TxDOT initiated the TPC MTIS (see **Section 1.4**). Throughout the TPC MTIS/DEIS process, one of the primary goals has been to integrate the proposed action with community plans and goals for the Dallas Floodway (see **Section 1.3**). An additional goal is to provide compatibility with local development plans (see **Section 1.6**). Due to the multiple planning objectives under consideration in the project study area (i.e., transportation, recreation, flood control, economic development, and environmental preservation), compatibility with local planning objectives is an important consideration for the Trinity Parkway project.

Another primary goal of the proposed action is to recommend a preferred alternative that is supported by local government agencies. To ensure agency support, there would be a continued and extensive effort throughout the EIS process to accommodate and consider agency input and concerns. As previously described, the FHWA recognizes there may be integration and coordination issues with foreseeable flood control and recreational developments within the Dallas Floodway. However, since the Trinity Parkway DEIS includes build alternatives located within and outside of the floodway, it is not possible to fully determine the degree of integration with other floodway improvements at this time. The FHWA intends to process the Trinity Parkway DEIS to a point that the preferred alternative can be identified. At the conclusion of this effort, one of the two anticipated actions previously described in **Section 4.2.7** can be expected to occur.

The protection of park/open space and recreational areas is required under § 4(f) of the DOT Act, § 6(f) of the LWCF Act of 1965, and Chapter 26 of the Texas Parks and Wildlife Code (see **Section 3.3.2.1**). The intent of these regulations is to avoid the use or taking of any public land used as a park unless it is determined that there is no feasible and prudent alternative and that the project/program includes all reasonable planning to minimize harm to the land. Section 6(f) of the LWCF Act requires that any outdoor recreational facilities acquired with DOI financial assistance under the act, as allocated by the

TPWD, may not be converted to non-recreational use unless approval is granted by the director of the NPS.

The proposed action would include mitigation measures to address the impacts of the Trinity Parkway on park/open space and recreational resources (see **Chapter 7**). As a result, it would not contribute substantially to a cumulative effect on these resources. As previously mentioned in this DEIS, the NTTA is participating in a cooperative planning effort with all agencies involved with proposed recreational and non-recreational developments planned for the Dallas Floodway (i.e., Trinity Park) and DFE (i.e., Great Trinity Forest Park) portions of the study area. NTTA would continue to work closely with these agencies in order to maximize these multi-project planning efforts and, thereby, work to minimize any potential adverse effects, including potential cumulative effects that may result from the Trinity Parkway build alternatives.

Other planned transportation system improvements, flood control projects, and development projects (see **Tables 4-53** and **4-54**) would also be subject to the requirements of the above federal and/or state regulations ensuring their impacts were mitigated to insignificance, thereby reducing the cumulative effect of these projects. As shown in **Table 4-54**, the majority of foreseeable development projects include provisions for the acquisition, preservation, and/or development of park/open space areas, some of which are substantial. Implementation of these planned park/open space areas and recreational amenities would result in a beneficial cumulative effect.

6. Biological Resources

A detailed description of the biological resources located within the project study area is provided in **Section 3.4**. This includes is the existing wildlife habitat characteristics, including baseline vegetation communities and associated wildlife, special status plant and animal species, wetlands, and waters of the U.S. As previously described in **Section 3.4**, the diversity and abundance of aquatic and wildlife resources has been substantially degraded throughout the project study area and beyond. Urbanization, floodplain reclamation, channel modification and levee construction, upstream reservoirs, and wastewater discharge have degraded the physical and chemical characteristics of these habitats.

The project study area is located within the most severely altered of Texas' ecoregions – the Blackland Prairie (see **Figure 3-1**). Most of this ecoregion has been converted from its natural condition to crops or development (TPWD, 2002b). By the early 1980s, 90 percent of this ecoregion had been converted into agricultural land or tame pasture. Many wildlife species have disappeared from the Blacklands in the past 125 years. It appears that only those species with the ability to adapt to human encroachment have been able to survive.

Nine percent of the nearly 13 million acres of the Blackland Prairie is urbanized. Blackland Prairie counties contain about 7.6 percent of the land in Texas, but they contain 6.2 million people, or more than 38 percent of the state's population. Population growth within the counties that contain the Blackland Prairie is related to the proximity of each county to major urban centers, such as the DFW metropolitan area. The average rate of urbanization over the last 20 years in the Blackland Prairie has been 167 square miles per year.

Of special consideration in the Blacklands has been the destruction of streamside vegetation along the major drainages that cross the region, including the Trinity River. It was along these corridors that many of the faunal elements, not adapted for life in the prairies, lived and traveled through the region. Urban development and sprawl have further served to restrict natural habitats by fragmenting the prairie into isolated islands too small to support viable populations of many species. Other human activities, including excessive use of pesticides and other chemicals, as well as over-hunting and animal control practices, have undoubtedly contributed to reducing many wildlife populations below their capacity to recover. All in all, the pressures of human population growth and development, associated with the unwise and excessive use of natural resources, have produced an environment in the Blackland Prairie region which now exceeds the ability of many wildlife species to survive (Sharpless and Yelderman, 1993).

All of the vegetation that now exists within the project study area is directly affected by human influences. Virtually all uplands along the Trinity River floodplain have been developed for residential or industrial use, and many of the lower lying areas have been protected from flooding by the construction of levees or flood channels. Abandoned sand and gravel pits and numerous landfills also dominate the floodplain areas of the Trinity River within the floodway extension area (USFWS, 1997).

Past development in the study area has resulted in loss of natural habitats through residential, commercial, and industrial development; habitat fragmentation from infrastructure construction or changes in land use; and disruption of fish and wildlife populations. 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). The cumulative effects of future developments would involve a continuation of this longstanding situation.

According to the EPA, highway development in urban settings may have little impact on sensitive habitats, or natural ecosystems of any kind. Often, road construction affects only previously developed areas and may not have even indirect effects on natural habitats. Because of the extensive development

in urban areas, cumulative and secondary development impacts from highway development are usually minor (EPA, 1994).

Impacts to biological 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 CWA) and the USFWS (under the ESA) 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, no substantial adverse effects on protected biological resources are anticipated as a cumulative consequence of continuing historic development patterns.

4.24.2.9 Step 10 Determining Environmental Consequences – Alternatives and Measures to Avoid, Minimize, or Mitigate Effects

The magnitude and significance of negative cumulative effects of the project on the resources in the project impact zones are expected to be limited and controllable. Efforts have been made to avoid and minimize impacts, and measures would be implemented to mitigate the loss of resource.

The right-of-way requirements for the project alternatives comprise commercial/industrial, residential, parks and open space, and transportation facilities. When the alternatives were developed, several environmental issues were considered that influenced the location of the Trinity Parkway. Among the environmental constraints analyzed were the potential for involvement with § 4(f)/§ 6(f) resources, avoiding and minimizing the filling of wetlands and floodplains, and hazardous waste/material sites. Other factors affecting the proposed action were also studied, namely compatibility with local land use plans/policies, housing and business displacements, socioeconomic issues, and community interests. The alternatives evaluation process was based on the philosophy of avoidance first, minimization second, and mitigation last. Refer to **Chapter 7** for a discussion of the proposals and concepts for the mitigation of resource losses or managing short-term and long-term social effects.

4.24.2.10 Step 11 Determining Environmental Consequences – Monitoring of Cumulative Effects

All project-specific commitments and conditions of approval, including resource agency permitting compliance and monitoring requirements, would be stated in the FEIS and/or ROD prepared for the Trinity Parkway project. These project-specific commitments and conditions for approval may vary depending on which alternative is identified as the preferred alternative. Mitigation monitoring would be conducted by the NTTA, TxDOT, and other appropriate federal, state, and local agencies to ensure compliance (see **Section 7.10**).

4.24.2.11 Conclusion

The DFW area is undergoing rapid population and employment growth. This growth is anticipated to continue through the year 2025 and beyond. Local and regional government agencies continue to plan for this growth and have adopted various land use and transportation plans for the DFW area. The Trinity Parkway combined with other local/regional development efforts would serve to accommodate growth and development, either present or planned, within the areas influenced. In addition, a number of regulatory mechanisms are already in place to offset or minimize the adverse effects of social and economic growth. Also the magnitude of secondary and cumulative effects for the proposed action is not substantial, and thus would require mitigation commensurate with its levels of impact.

4.25 COMPARISON OF ALTERNATIVES

This chapter of the Trinity Parkway DEIS has described social, economic, and environmental impacts of the proposed alternatives, including the No-Build Alternative. As noted throughout this DEIS, the identification of a preferred alternative would not be made until the impacts and comments on the DEIS and from the Public Hearing have been fully evaluated.

The preceding discussion impacts included several categories where the impacts were similar for the various build alternatives. In these cases, a general discussion of the impacts was presented. In other cases, specific impacts were reported for each alternative, allowing for a greater degree of differentiation between alternatives. **Table 4-57** compares the alternatives against important factors and impact categories that permit distinctions to be made about each alternative.

TABLE 4-57. COMPARISON OF DEIS ALTERNATIVES

Comparison Factors	Unit of Measure	Trinity Parkway Alternatives						
		1 (No-Build)	2A	2B	3A	3B	4	5
Roadway Characteristics								
Total Length	Miles	---	8.83	8.83	8.67	8.67	8.84	8.90
Total Land Converted to Right-of-Way	Acres	---	252.1	342.3	393.1	393.5	495.2	393.6
Total Cost (Construction + Right-of-Way)	2003 Dollars	---	$1,323M	$952M	$668M	$691M	$726M	$919M
Traffic Utilization								
Commonwealth to Hampton/Inwood	Year 2025 ADT	---	108,600	108,600	109,900	91,000	109,900	109,900
Hampton/Inwood to Wycliff/Sylvan		---	95,500	95,500	98,200	97,200	98,200	98,200
Wycliff/Sylvan to Woodall Rodgers		---	116,000	116,000	112,700	105,700	112,700	112,700
Woodall Rodgers to Houston/Jefferson		---	114,200	114,200	109,200	82,700	109,200	109,200
Houston/Jefferson to Corinth		---	93,300	93,300	102,700	93,300	102,700	102,700
Corinth to MLK		---	110,400	110,400	98,300	89,600	98,300	98,300
MLK to IH-45		---	110,300	110,300	102,800	112,500	102,800	102,800
IH-45 to US-175		---	130,600	130,600	127,900	130,800	127,900	127,900
Measures of Effectiveness								
Daily VMT	Year 2025 (M)	15.69	16.17	16.17	16.20	16.20	16.20	16.20
Daily VHT	Year 2025	484,959	474,644	474,644	474,619	475,878	474,619	474,619
Average Speed (mph)	Year 2025	32.35	34.07	34.07	34.14	34.04	34.14	34.14
Lane Miles	Year 2025	2,417	2,470	2,470	2,470	2,486	2,470	2,470
Congestion Delay (Vehicle-Hours)	Year 2025	152,804	139,328	139,328	138,652	138,652	138,652	138,652
Percent Lane Miles at LOS E or F	Year 2025	42.34	38.14	38.14	38.58	38.45	38.58	38.58
Socioeconomic								
Consistent with Regional Plans/Policies	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Consistent with Local Plans/Policies (Balanced Vision Plan)	Yes/No	No	No	No	No	Yes	No	No
Local Government Support	Yes/No	No	No	No	No	Yes	No	No
Potential for Joint Development	Yes/No	No	No	No	Yes	Yes	Yes	Yes
Residential Relocations	Number	---	13	9	8	8	13	24
Commercial Displacements	Number	---	281	234	23	31	26	35
Community/Public Facility Displacements[1]	Number	---	3 (4)	4 (7)	---	---	---	4 (7)
Consistent with EJ Order	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 4-57. COMPARISON OF DEIS ALTERNATIVES

Comparison Factors	Unit of Measure	Trinity Parkway Alternatives						
		1 (No-Build)	2A	2B	3A	3B	4	5
Parks and Recreational Impacts (Trinity River Greenbelt Park)	Acres	---	---	---	171	152	205	14
Physical Environment								
Meets Air Quality Standards	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Noise Receivers Impacted	Number	---	209	202	128	128	166	226
Hazardous Material Sites Impacted [2]	Number	---	27	28	15	15	16	20
Water Quality Impacts	Yes/No	No	Yes	Yes	Yes	Yes	Yes	Yes
Visual Impacts	Low/Med/High	Low	High	Med	Med	Med	Med	Med
Natural Environment								
100-Year (Base) Floodplain Impacts	Acres	---	39	56	345	333	442	324
Wetlands and waters of the U.S.	Acres	---	---	<3	155	155	153	<6
Threatened/ Endangered Species	Yes/No	No	No	No	No	No	No	No
Impacts to High-Quality Wildlife Habitat [3]	Acres	---	7	7	7	7	7	7
Grassland	Acres	---	---	---	121	121	220	---
Section 4(f) Involvement								
Potential § 4(f) Properties Involved – NRHP Historic Districts	Number	---	1	1	---	---	---	---
Potential § 4(f) Properties Involved – NRHP Historic Bridges	Number	---	2	1	5	5	5	6
Potential § 4(f) Properties Involved – NRHP Historic Properties	Number	---	4	1	---	---	---	1

Notes: **M** = Millions; **ADT** = Average Daily Traffic; **VMT** = vehicle miles traveled; **VHT** = vehicle hours traveled; **LOS** = Level of Service; **NRHP** = National Register of Historic Places; **EJ** = Environmental Justice; **mph** = miles per hour; **§** = Section; **<** = less than the quantity shown; **---** = no impacts anticipated for this alternative.
1. The first number is the number of facilities where a displacement occurs. The number in parenthesis is the total number of buildings displaced at these facilities.
2. Hazardous waste/material sites within or adjacent to proposed right-of-way.
3. Woodland impacts associated with USACE DFE Lamar Levee construction.

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Chapter 5

Preliminary Section 4(f) Evaluation

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CHAPTER 5
PRELIMINARY SECTION 4(f) EVALUATION

5.0 INTRODUCTION

Section 4(f) of the DOT Act of 1966, codified in 49 USC § 303, declares that "it is the policy of the U.S. government that special effort should be made to preserve the natural beauty of the countryside and public park and recreation land, wildlife and waterfowl refuges, and historic sites." Section 4(f) specifies that "the Secretary [of Transportation] may approve a transportation program or project…requiring the use of publicly owned land of a public park, recreation area, historic site, or wildlife and waterfowl refuge of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- There is no prudent and feasible alternative to using such land; and
- The program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use."

Section 4(f) has been part of federal law in some form since 1966. It was enacted as § 4(f) of the DOT Act of 1966 and originally set forth in Title 49, USC § 1653(f). Section 4(f) applies <u>only</u> to agencies within the USDOT. Also in 1966, a similar provision was added to Title 23, USC § 138. The wording was somewhat different, but in 1968 the Federal-aid Highway Act of 1968 amended the wording in both sections to be consistent. In January of 1983, as part of an overall re-codification of the DOT Act, § 4(f) was amended and codified in 49 USC § 303 (FHWA 1989).

The "use" of a § 4(f) resource occurs when:

1. Land from a § 4(f) site is permanently acquired for a transportation project;
2. When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose; or
3. When the proximity impacts of the transportation project on the § 4(f) site, without acquisition of land, are so great that the purpose for which the § 4(f) site exists are substantially impaired.

The third type of use is also known as a "constructive use." Constructive use occurs when the transportation project does not incorporate land from a § 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection

under § 4(f) are substantially impaired. Constructive use has been determined to occur under the following cases:

- The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a resource protected by § 4(f).
- The proximity of the proposed project substantially impairs aesthetic features or attributes of a resource protected by § 4(f), where such features or attributes are considered important contributing elements of the value of the resource.
- The project results in a restriction on access, which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.
- The ecological intrusion of the project substantially diminishes the value of wildlife habitat in wildlife or waterfowl refuge adjacent to the project or substantially interferes with the access to a wildlife or waterfowl refuge, when such access is necessary for established wildlife migration or critical life cycle processes [23 CFR § 771.135(p)].

Section 4(f) is also applicable to historic sites and archeological resources when the resource is included on, or eligible for, the NRHP [23 CFR 771.135(e)]. Section 4(f) does not apply to archeological sites where it is determined after consultation with the SHPO and ACHP that the resource is important chiefly because of what can be learned by data recovery and has minimal value for preservation in place. Constructive use is defined as not occurring when compliance with the requirements of §106 of the NHPA (16 USC § 470) and related regulations for proximity impacts of a proposed project on an NRHP site results in a finding of “no effect” or “no adverse effect” (36 CFR § 800.9).

Section 4(f) further requires consultation with DOI and, as appropriate, the involved offices of the USDA and U.S. Department of Housing and Urban Development (HUD) in developing transportation projects and programs, which use lands protected by § 4(f). Consultation with the USDA would occur whenever a project uses § 4(f) land from the National Forest System. Since the Housing and Urban Rural Recovery Act of 1983 repealed the use restrictions for the Neighborhood Facilities Program (authorized by Title VII of the HUD Act of 1965) and the Open Space Program (authorized by Title VII of the Housing Act of 1961), the number of instances where coordination with HUD should be accomplished has been substantially reduced. Coordination with HUD should occur whenever a project uses § 4(f) land for/on, which certain HUD funding (other than the above) has been utilized.

The § 4(f) evaluation is a separate analysis of impacts the various alternatives would have on § 4(f) resources. “Use” of § 4(f) land is usually considered to be acquisition of part or all of the property, although substantial access, visual, noise, ecological intrusion, or other proximity impact may constitute a “constructive use” if they are of such magnitude to substantially impair the § 4(f) functions, activities, or

qualities of the site. Archeological sites are subject to § 4(f) only if the SHPO determines that preservation in place is warranted. This determination has not yet been made for any known archeological site within the study area and would be made during the design phase, prior to construction.

This preliminary § 4(f) evaluation describes the § 4(f) resources likely to be affected by each of the alternatives considered in the Trinity Parkway DEIS and provides an estimation of impacts based on project planning concepts. The No-Build Alternative is considered in the DEIS analyses as a baseline alternative and here as an "avoidance" alternative. Avoidance alternatives and measures to minimize harm are also discussed.

5.1 PROJECT DESCRIPTION

The Trinity Parkway project is described fully in **Chapter 1 Purpose and Need for Action** and **Chapter 2 Alternatives Considered** of this DEIS.

5.2 PURPOSE AND NEED

A complete description of the purpose and need for the proposed action is provided in **Chapter 1 Purpose and Need for Action** of this DEIS.

5.3 ALTERNATIVES EVALUATED

Seven alternatives are evaluated in an attempt to identify the most practicable options to achieve the project objectives. Alternatives that clearly did not meet the project purpose and need, were not feasible to construct, or would have unacceptable levels of social, economic, and environmental impacts were eliminated from consideration during the TPC MTIS/DEIS process. Alternatives included in the DEIS are fully described in **Chapter 2 Alternatives Considered**, and include:

- Alternative 1 – No-Build
- Alternative 2A – Irving/Industrial Boulevard (elevated)
- Alternative 2B – Irving/Industrial Boulevard (at-grade)
- Alternative 3A – Combined Parkway, Riverside of Dallas Floodway East Levee
- Alternative 3B – Combined Parkway, Riverside of Dallas Floodway East Levee (modified)
- Alternative 4 – Split Parkway, Riverside of Dallas Floodway Levees
- Alternative 5 – Split Parkway, Landside of Dallas Floodway Levees

5.4 SECTION 4(f) PROPERTIES

Section 4(f) resources in the study area are described in **Sections 3.3** and **4.7 (Cultural Resources and Parklands)**. No wildlife or waterfowl refuges are located within the study area. **Sections 4.7.3, 4.15,** and **4.16** provide information concerning § 4(f) properties in the study area that will not be "used" by the proposed action. **Section 4.7.3** also includes a discussion of the reasons why § 4(f) does or does not apply to certain other properties within the study area.

The following list of § 4(f) properties was compiled from the findings in both **Sections 3.3** and **4.7** of this DEIS. All or portions of these properties are potentially used by construction of the proposed action. Their locations are shown on **Plates 4-1** through **4-6** at the end of **Chapter 4**.

National Register Historic Districts

- Listed - Colonial Hill Historic District (Plate ID 2)

National Register Historic Bridges

- Listed - Houston Street Viaduct (Plate ID 1)
- Eligible - Corinth Street Viaduct (Plate ID 4)
- Eligible - AT&SF Railroad Bridge (Plate ID 5)
- Eligible - UP Railroad Bridge (Plate ID 3)
- Eligible - Commerce Street Viaduct (Plate ID 8)
- Eligible - Continental Avenue Viaduct (Plate ID 7)

National Register Historic Properties

- Eligible - Commercial building, 1715 Market Center Boulevard (Plate ID 12)
- Eligible - Commercial building, 1202 North Industrial Boulevard (Plate ID 13)
- Eligible - Commercial building, 1212 South Industrial Boulevard (Plate ID 15)
- Eligible - DISD Maintenance and Storage facility, 3701 Lamar Street (Plate ID 16)
- Eligible - City/County Levee Operations – Pump Station, 2255 Irving Boulevard (Plate ID 17)

5.5 POTENTIAL IMPACTS TO SECTION 4(f) PROPERTIES

Each of the build alternatives evaluated in the DEIS would require the use of § 4(f) properties. Impacts are here described and defined in accordance with § 4(f). Impacts are further described in **Sections 4.7.2** and **4.7.3** of this DEIS. **Table 5-1** provides a summary of the § 4(f) properties potentially used by the proposed action.

TABLE 5-1. POTENTIAL USE OF SECTION 4(f) PROPERTIES

Project Alternative	NRHP Districts	NRHP Bridges and Eligible Bridges	NRHP Eligible Properties	Known Archeological Sites
1	None	None	None	None
2A	• Colonial Hill Historic District – potential constructive use due to proximity impacts	• Houston Street Viaduct – parkway over with ramp connections • AT&SF Railroad Bridge – parkway under and through east embankment	4 displaced 1715 Market Center 1202 N. Industrial 1212 S. Industrial 3701 S. Lamar (2 of 5 buildings)	None
2B	• Colonial Hill Historic District – potential constructive use due to proximity impacts	• AT&SF Railroad Bridge – parkway under and through east embankment	1 displaced 3701 S. Lamar (5 of 5 buildings)	None
3A	None	• Houston Street Viaduct – parkway under with ramp connections on east side • Commerce Street Viaduct – parkway under with ramp connections on east side • Corinth Street Viaduct – parkway under with ramp connections on east side • Continental Avenue Viaduct – parkway under with ramp connections on east side • AT&SF Railroad Bridge – parkway under and through substructure on east side	None	None
3B	None	• Houston Street Viaduct – parkway under with ramp connections on east side • Commerce Street Viaduct – parkway under with no ramp connections • Corinth Street Viaduct – parkway under with ramp connections on east side • Continental Avenue Viaduct – parkway under with ramp connections and reconstruction of a bridge segment • AT&SF Railroad Bridge – parkway under and through substructure on east side	None	None
4	None	• Houston Street Viaduct – parkway under with ramp connections on east and west side • Commerce Street Viaduct – parkway under with ramp connections on east and west side • Corinth Street Viaduct – parkway under with ramp connections on east side • Continental Avenue Viaduct – parkway under with ramp connections on east side • AT&SF Railroad Bridge – parkway under and through substructure on east side	None	None

TABLE 5-1. POTENTIAL USE OF SECTION 4(f) PROPERTIES

Project Alternative	NRHP Districts	NRHP Bridges and Eligible Bridges	NRHP Eligible Properties	Known Archeological Sites
5	None	• Houston Street Viaduct – parkway under with ramp connections on east and west side • Commerce Street Viaduct – parkway under with ramp connections on east and west side • Corinth Street Viaduct – parkway under with ramp connections on east side • AT&SF Railroad Bridge – parkway through embankment on east side • Continental Avenue Viaduct – parkway under with no ramp connections and reconstruction of a bridge segment • UP Railroad Bridge – parkway under and through west embankment between levee and Beckley Avenue	1 displaced 2255 Irving Boulevard	None
Note: Archeological sites are subject to § 4(f) only if the SHPO determines that preservation in place is warranted. This determination has not yet been made for any known archeological site within the study area. More detailed analyses will be completed during preparation of the draft and final § 4(f) evaluations for this project.				

As shown in **Table 5-1**, all of the § 4(f) properties potentially used by the proposed action are those listed on, or eligible for, the NRHP. Of these, there is one historic district, six historic bridges, and five historic properties protected under the provisions of § 4(f). Consultation pursuant to § 106 of the NHPA for this project is on going and has involved representatives of NTTA, TxDOT, FHWA, USACE, SHPO, and various local agencies and private groups (see **Appendix A** and **B**).

As previously described in **Section 3.3.1.1**, § 106 of the NHPA is a different regulatory requirement from § 4(f). Section 106 evaluates "effects" on a historic site, while § 4(f) protects a historic site from "use" by a project. Therefore, even though there may be an "adverse effect" under § 106 due to the effects upon the site, the provisions of § 4(f) are not automatically triggered because the project would not result in an "actual use" or occupancy of land from the historic site. If there is not an actual use, the analysis regarding whether § 4(f) provisions are triggered needs to evaluate whether there is a "constructive use." A constructive use is determined to occur "when the transportation project does not incorporate land from a § 4(f) resource, but the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under § 4(f) are substantially impaired. Substantial impairment occurs when the protected activities, features, or attributes of the resource are substantially diminished" [23 CFR § 771.135(p)(2)].

Historic sites are listed on or eligible for the NRHP for their architectural significance and/or their associations with broad historical patterns. The features and attributes that qualify them for the NRHP are not typically affected by proximity impacts because those features and attributes remain in place after project implementation. This is in contrast to publicly owned parks, recreation areas, and wildlife refuges, which more typically have "activities" that could be substantially impaired by proximity impacts.

In this section, the impact to each historic resource for which there would be a potential "use" under § 4(f) is described, to the extent possible based on the conceptual level of the project elements, and alternatives that would avoid or minimize any use of the property are described.

5.5.1 No-Build Alternative

The No-Build Alternative assumes that no highway would be constructed in the Trinity Parkway study area by NTTA. Under the No-Build Alternative, the identified § 4(f) resources would not be affected. Additionally, while it may be deemed a feasible alternative, it is not likely to be prudent to leave the roadway network in the study area as it currently exists. While it would have the least impact on the environment as a whole, the No-Build Alternative would contribute to increased traffic congestion as well as various human and air quality impacts.

5.5.1.1 Consideration of Avoidance Alternatives

FHWA regulations for § 4(f) evaluations require the analysis of alternatives which would avoid the use of properties afforded protection under § 4(f). During the TxDOT TPC MTIS (see **Chapter 2**), an evaluation process considered 38 alignment alternatives for the Trinity Parkway and reduced the number of alternatives to those considered the most reasonable and best able to meet project objectives. Both the TPC MTIS and DEIS evaluation processes have involved extensive public/agency coordination since the TPC MTIS began in 1996. Coordination has included meetings with community groups, agencies, developers, landowners, special interest groups, and the general public. The alternatives evaluated in this DEIS are those determined to best meet the purpose and need of this project (see **Chapter 1**), while avoiding, to the maximum extent possible, impacts to § 4(f) resources.

In the event subsequent NEPA documentation is prepared, a draft § 4(f) evaluation would accompany it. The FEIS would include a final § 4(f) evaluation detailing the § 4(f) resources associated with the preferred alternative. These evaluations would include progressively more detailed plans showing the boundaries of § 4(f) properties and conceptual right-of-way limits of the preferred alternative. In accordance with FHWA's Technical Advisory T 6640.8A, location and design alternatives would be evaluated. Generally, this would include alternatives to either side of the property. This detailed evaluation will explain more specifically the problems associated with avoiding each § 4(f) resource and will specifically discuss the measures proposed to minimize harm to each § 4(f) resource.

5.5.2 Alternative 2A

Alternative 2A may require a constructive use of the Colonial Hill Historic District, use of the Houston Street Viaduct and AT&SF Railroad Bridge, and the use (acquisition) of four historic properties.

This alternative requires construction within the existing roadway (Lamar Street) adjacent to the Colonial Hill Historic District. No new right-of-way acquisition is required within the district; however, a constructive use could result due to proximity impacts. This alignment concept would have a discordant visual impact within the historic district, which would not be consistent with the historic character of this single-family residential area. Additional proximity impacts (e.g., air and noise impacts, increased traffic, and safety problems) would also occur in this area. Avoidance or minimization of impacts may be possible with modifications to the planning concept alignment (i.e., shifting the centerline, etc.).

Alternative 2A proposes to use the Houston Street Viaduct for access ramp connections. This concept requires modification to the historic bridge for both northbound and southbound entrance and exit ramps. Impacts could be minimized by design that was consistent with the existing historic structure. With concurrence from the SHPO, it is anticipated this action would result in no adverse effect because the overall use and historic value of the bridge would not change.

Alternative 2A requires use of the AT&SF Railroad Bridge. To facilitate construction of this alternative, this concept requires the modification of the bridge by removing portions of the substructure and embankment located directly adjacent to the Dallas Floodway east levee. The bridge is currently owned and maintained by DART. However, the steel tracks have been removed and it has been abandoned since the early 1990s. The City of Dallas plans to remove portions of the structure to increase flood control within the Dallas Floodway. In additional, TxDOT plans to enhance, restore, and maintain the suspended steel truss section over the existing river channel and use it for a section of the planned "Trestle Trail" portion of the regional veloweb. No other alignment is feasible that would completely avoid impacts to the bridge, primarily due to right-of-way and engineering constraints and additional adverse socioeconomic and environmental impacts. Impacts are minimized by routing the proposed alignment on the extreme east end of the structure, which was rebuilt after being damaged by fire several decades ago, and by the use of existing levee right-of-way.

Alternative 2A would result in the use (acquisition) of all or part of four NRHP eligible historic properties (1715 Market Center Boulevard, 1202 Industrial Boulevard, 1212 Industrial Boulevard, and 3701 South Lamar Boulevard). No other alignment is feasible that would completely avoid impacts to these historic properties, primarily due to right-of-way and engineering constraints and additional adverse

socioeconomic and environmental impacts. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.5.3 Alternative 2B

Alternative 2B would have similar effects as Alternative 2A to the Colonial Hill Historic District and AT&SF Railroad Bridge, and would require the use (acquisition) of one historic property (3701 Lamar Street).

Alternative 2B does not require use of the Houston Street Viaduct or the four historic properties used by Alternative 2A. Due primarily to right-of-way and engineering constraints and to avoid additional adverse socioeconomic and environmental impacts, the proposed alignment for Alternative 2B was shifted further south in the vicinity of these historic resources. Although Alternative 2B does not affect the Houston Street Viaduct or four historic properties used by Alternative 2A, construction of this alternative does require use of the AT&SF Railroad Bridge and one NRHP eligible historic property (3701 Lamar Street).

As with Alternative 2A, this alternative requires construction within the existing roadway (Lamar Street) adjacent to the Colonial Hill Historic District. No new right-of-way acquisition is required within the district; however, a constructive use could result do to proximity impacts. This alignment concept would have a discordant visual impact within the historic district, which would not be consistent with the historic character of this single-family residential area. Additional proximity impacts (e.g., air and noise impacts, increased traffic, and safety problems) would also occur in this area. Avoidance or minimization of impacts may be possible with modifications to the planning concept alignment (i.e., shifting the centerline, etc.).

No other alignment is feasible that would completely avoid impacts to these historic resources, primarily due to right-of-way and engineering constraints and additional adverse socioeconomic and environmental impacts. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.5.4 Alternative 3A

Alternative 3A would require use of the Continental Avenue Viaduct, Houston Street Viaduct, Commerce Street Viaduct, Corinth Street Viaduct, and AT&SF Railroad Bridge. No other historic properties would be affected by this alternative. Alternative 3A would affect the AT&SF Railroad Bridge similar to Alternatives 2A and 2B, but would require modification to a larger portion of the structure due to the proposed width of the alignment at this location.

Alternative 3A proposes to use the Continental Avenue Viaduct, Houston Street Viaduct, Commerce Street Viaduct, and Corinth Street Viaduct for access ramp connections. The concept for each bridge requires modifications for both northbound and southbound entrance and exit ramps.

No other alignment is feasible that would completely avoid impacts to these historic resources, primarily due to right-of-way and engineering constraints and additional socioeconomic and environmental impacts. Impacts could be minimized by using a design consistent with the existing historic structures. With concurrence from the SHPO, it is anticipated this action would result in no adverse effect because the overall use and historic value of these bridges will not change. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.5.5 Alternative 3B

Alternative 3B would have similar effects to the same historic bridges described for Alternative 3A. No other historic properties would be affected by this alternative. The primary differences involve the proposed use of the Continental Avenue Viaduct and Commerce Street Viaduct for access ramp connections. Based on different ramp connection requirements, Alternative 3B would have fewer impacts to the Continental Avenue Viaduct than Alternative 3A; however, Alternative 3B would require reconstruction of the Continental Avenue Viaduct along the landside of the east levee to accommodate the northbound mainlanes for this alignment. While Alternative 3A would use the Commerce Street Viaduct at locations on the east side of the Dallas Floodway, Alternative 3B would not connect to this historic structure.

No other alignment is feasible that would completely avoid impacts to these historic resources, primarily due to right-of-way and engineering constraints and additional socioeconomic and environmental impacts. Impacts could be minimized by using a design consistent with the existing historic structures. With concurrence from the SHPO, it is anticipated this action would result in no adverse effect because the overall use and historic value of these bridges would not change. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.5.6 Alternative 4

Alternative 4 would have similar effects to the historic bridges described for Alternative 3A and 3B. The primary differences involve the proposed use of the Houston Street Viaduct, Commerce Street Viaduct, and Corinth Street Viaduct for access ramp connections. No other historic properties would be affected by this alternative. While Alternatives 3A and 3B would use each bridge at locations on the east side of

the Dallas Floodway, Alternative 4 would require the use of each bridge at locations on both the east and west sides of the floodway.

Construction of this alternative also requires additional modifications to the west section of the Houston Street Viaduct adjacent to the Dallas Floodway west levee. As currently proposed, this alignment would require reconstruction of the supporting structure beneath the existing bridge deck to allow unobstructed clearance for the southbound mainlanes. Unlike the typical concrete arch supports, which are the most notable characteristic of the bridge, this section of the bridge is supported with vertical concrete piers constructed at a later date.

No other alignment is feasible that would completely avoid impacts to these historic resources, primarily due to right-of-way and engineering constraints and additional socioeconomic and environmental impacts. Impacts could be minimized by using a design consistent with the existing historic structures. With concurrence from the SHPO, it is anticipated this action would result in no adverse effect because the overall use and historic value of the bridges will not change. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.5.7 Alternative 5

Alternative 5 would have similar effects to the four historic bridges described for Alternatives 3A, 3B, and 4. However, this alternative would require the use of two additional historic bridges (Continental Avenue Viaduct and UP Railroad Bridge) and the use (acquisition) one historic property (2255 Irving Boulevard).

Alternative 5 proposes to use the Houston Street Viaduct, Commerce Street Viaduct, and Corinth Street Viaduct similar to Alternative 4. Alternative 5 affects the Houston Street Viaduct nearly identical to Alternative 4, except modifications to the bridge would be required adjacent to the landside of the west levee.

Alternative 5 would also affect the Continental Avenue Viaduct and UP Railroad Bridge. The Continental Avenue Viaduct would require reconstruction along the landside of the east levee to accommodate the northbound mainlanes for this alignment. The UP Railroad Bridge would require reconstruction along the landside of the west levee to accommodate the southbound mainlanes for this alignment.

No other alignment is feasible that would completely avoid impacts to these historic resources, primarily due to right-of-way and engineering constraints and additional socioeconomic and environmental impacts. Bridge impacts could be minimized by using a design consistent with the existing historic structures. With concurrence from the SHPO, it is anticipated this action would result in no adverse effect because the

overall use and historic value of these bridges will not change. Impacts to § 4(f) resources along the alignment corridor would be avoided only by not constructing this alternative.

5.6 SUMMARY

As previously described in **Chapter 2 Alternatives Considered**, a large number of alternatives have been evaluated throughout the TPC MTIS/DEIS process. This evaluation process has reduced the number of alternatives to those that are most reasonable and best meet the project objectives. In addition, this process has involved extensive public/agency coordination since the TPC MTIS began in 1996. This coordination has included meetings with community groups, agencies, developers, landowners, special-interest groups, civic groups, and the general public. The alternatives evaluated in the DEIS are those determined to best meet the purpose and need for the Trinity Parkway project, while avoiding, to the maximum extent possible, impacts to § 4(f) resources.

Impacts to cultural resources (archeological/historical) would be evaluated by the SHPO for the proposed action during review of subsequent NEPA documentation, which may include refinement of the planning concept to further avoid and minimize unavoidable impacts to historic resources. The FHWA and SHPO would make a determination of effect and recommend impact avoidance and mitigation techniques. Following this determination, the FHWA and SHPO would prepare a MOA/Programmatic Agreement (PA), with NTTA, TxDOT, and ACHP concurrence. The MOA/PA would be developed to describe the commitments made by the NTTA to offset any potential adverse effects on historic properties and agreed to by the MOA signatories. Interested parties such as preservation groups, historical societies, and Native Americans are invited to contribute to the process of developing these measures. For additional details concerning potential mitigation measures, see **Sections 7.1.2** and **7.6**.

Based on the results of this preliminary § 4(f) evaluation, Alternative 5 would require the use of the most § 4(f) resources, with potential adverse effects to six historic bridges and one historic property. Next is Alternative 2A, which would require the use of six § 4(f) resources, with potential adverse effects to four historic properties and two historic bridges. Constructive use of the Colonial Hill Historic District is possible with both Alternatives 2A and 2B. Alternatives 3A, 3B, and 4 appear to have the least effect on § 4(f) resources. These alternatives would require the use of the same four historic bridges, to varying degrees.

In the event subsequent NEPA documentation is prepared, a draft § 4(f) evaluation would accompany it. The FEIS would include a final § 4(f) evaluation detailing the § 4(f) resources associated with the preferred alternative. These evaluations would include progressively more detailed plans showing the boundaries of § 4(f) properties and conceptual right-of-way limits of the preferred alternative. The

detailed evaluation will explain more specifically the problems associated with avoiding each § 4(f) resource and will specifically discuss the measures proposed to minimize harm to each § 4(f) resource.

In accordance with § 4(f), an alternative may be rejected as not being feasible and prudent for any of the following reasons:

- Not meeting the project purpose and need;
- Excessive cost of construction;
- Severe operational or safety problems;
- Unacceptable adverse social, economic, or environmental impacts;
- Serious community disruption; or
- An accumulation of a lesser magnitude of the foregoing types of factors.

Harm to a § 4(f) resource should <u>not</u> be included in those factors which are considered in determining whether an alternative is feasible and prudent.

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Chapter 6

Financial Analysis and Evaluation

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CHAPTER 6
FINANCIAL ANALYSIS AND EVALUATION

6.0 INTRODUCTION

This chapter presents the cost estimates of the Trinity Parkway alternatives and the various sources of funding to construct the proposed project. Cost sharing opportunities are discussed as well as the estimated costs for the City of Dallas' Floodway LPP.

6.1 CITY OF DALLAS FUNDING

On May 2, 1998, the City of Dallas held a Capital Bond Program election to fund 11 propositions (City of Dallas 1998). The bond election passed in its entirety, including Proposition 11 that authorized the following:

> The issuance of $246,000,000 general obligation Trinity River Corridor Project Bonds, the Project to include floodways, levees, waterways, open space, recreational facilities, the Trinity Parkway and related street improvements, and other related, necessary, and incidental improvements to the Trinity River Corridor (City of Dallas 1998a).

The Trinity River Corridor Project Bonds fund the city's share of several projects, programmed to be implemented over 10 years and expected to leverage substantial additional funding from state, federal, and other agency sources. Proposition 11 was subdivided into the following program categories:

Dallas Floodway Extension	$ 24,700,000
Elm Fork Levee	$ 30,000,000
Transportation Improvements	$ 118,000,000
Great Trinity Forest	$ 41,800,000
Chain of Lakes	$ 31,500,000

The Transportation Improvements program category has direct application to the proposed action (Trinity Parkway) and is further described in **Section 6.2**. All of the other listed program categories, excluding the Elm Fork Levee item, have direct influence on the study corridor and are further described in other sections of the DEIS.

6.2 COST SHARING

The Trinity Parkway has been allocated $84 million of the $118 million Transportation Improvements category funds identified in Proposition 11 of the City of Dallas 1998 Capital Bond Program. The funding is available for use in preparing the EIS, schematic plans, detail design, right-of-way acquisition and relocation assistance, utility relocations and construction.

A 1998 NTTA Trinity Parkway Preliminary Financial Feasibility Report prepared by WSA (2000) concluded that the proposed project could justify the issuance of approximately $150 million of revenue bonds from tolls. This amount can be regarded as a preliminary budget amount, and would be adjusted up or down at a future date based on an Investment Grade Traffic and Revenue Analysis (see **Section 6.6**). Additional transportation funding sources that may be utilized for the Trinity Parkway include:

- TxDOT (which includes allocation of federal funding)
- Dallas County
- City of Dallas – General Transportation Improvements
- TxDOT – Revenue Bonds

The Interlocal Agreement between TxDOT, the City of Dallas, and NTTA identified certain focus areas for cost sharing. In concept, TxDOT would contribute funds to provide connections from the toll facility to the state highway system. The City of Dallas would contribute money for the roadway preliminary engineering, roadway right-of-way acquisition, utility services to the toll plazas and other construction. The NTTA would fund the construction of the tollway connecting to the construction of the state facility.

The City of Dallas Proposition 11 funding is fixed at a maximum of $84 million. The final revenue bond contribution from NTTA would be adjusted based on an Investment Grade Traffic and Revenue Study to be prepared by NTTA prior to construction (see **Section 6.6**). It is expected that TxDOT would provide the remainder of the initial construction funding, including through use of federal funding. NTTA would provide operations and maintenance for the entire facility.

6.3 TEXAS MOBILITY FUND

Funding for Texas state highway projects has historically been based on a “pay as you go” approach, with TxDOT’s capacity and authority to borrow severely restricted. In this environment, only turnpike and tollway authorities authorized by Texas State Statute were permitted to use alternative financing or issue revenue bonds in connection with highway projects. In 2001, the Texas Constitution was amended (Art. 3, sec. 49-K) to create the Texas Mobility Fund (“TMF”). Under legislation implementing the TMF passed

during the 2001 session, under certain circumstances, revenue bonds may be issued by TxDOT. Pursuant to legislation passed in 2003, the authority for the administration of the TMF is delegated to the Texas Transportation Commission ("TTC"). The TTC is currently promulgating regulations to implement TMF and alternative funding of highway projects for TxDOT.

Despite this enabling legislation, a number of unresolved issues remain concerning TxDOT's new authority for financing state highway projects. The exact sources and funding of the TMF have not yet been established or implemented. The interplay between TMF and the State and Federal Motor Fuels Tax ("MFT") Revenue Fund known as Fund 6 has not been established. The methods for the use of TMF or Fund 6 monies for TxDOT highway projects has not been determined. The feasibility of a larger scale state-bonded highway and bond-finance toll road program has not yet been determined, and the feasibility and effectiveness of new financing mechanisms has not yet been fully evaluated.

Due to funding constraints and uncertainties associated with implementation of the TMF and the exact availability, if any, of Fund 6, the proposed action is being considered for implementation as a limited access toll facility with NTTA as the local sponsor. Implementing the proposed action as an NTTA toll facility should accelerate the project's schedule by several years. This allows the project to satisfy the purpose and need, as defined in **Chapter 1 Purpose and Need for Action** of this DEIS, sooner than if implemented as a TxDOT project, regardless of the funding mechanism TxDOT might use. Both time and money will be saved. Toll financed revenue bonds will be sold to private investors at competitive rates, and by permitting construction of the proposed action under currently planned financial mechanisms, years of increased costs due to deferred completion will be avoided. Notwithstanding this approach, should TMF funding become available at some future date, this funding may be used to support the proposed action.

6.4 COST ESTIMATE FOR THE TRINITY PARKWAY ALTERNATIVES

Cost estimates for each of the Trinity Parkway build alternatives are shown in **Table 6-1**. The estimated costs include roadway construction, engineering, utility relocations, contingences, right-of-way acquisition, environmental remediation and mitigation. Costs are based on recent highway construction cost data and historical information. Estimates were refined during the conceptual plan phase as design consideration became more refined. Right-of-way costs are estimated using local real estate prices and assessed values. Remediation and mitigation costs are estimated based upon the best information available at this time in the study process and on accepted industry cost information.

TABLE 6-1. ESTIMATE OF PROBABLE COST (ULTIMATE BUILD OUT)

Category	Trinity Parkway Build Alternative					
	2A	2B	3A	3B	4	5
Earthwork	$2,213,000	$8,542,000	$37,541,000	$39,284,000	$35,158,000	$34,585,000
Paving	26,261,000	44,131,000	52,237,000	52,992,000	58,650,000	52,538,000
Bridges	545,903,000	310,052,000	204,991,000	206,718,000	205,098,000	294,393,000
I-35E Access Ramps (Ramp Alternative 1)	---	---	10,645,000	11,473,000	8,340,000	8,028,000
Walls	16,798,000	19,056,000	22,050,000	19,845,000	33,120,000	30,600,000
Toll Plazas	29,600,000	21,200,000	24,000,000	27,400,000	23,400,000	24,800,000
Drainage	12,888,000	13,348,000	16,013,000	16,359,000	21,192,000	18,048,000
Utility Relocation	42,710,000	43,636,000	13,261,000	16,582,000	19,014,000	44,701,000
Floodway Pump Station Modifications	---	---	2,250,000	2,250,000	3,750,000	35,000,000
Park Access from Arterial Streets	---	---	11,274,000	10,129,000	17,439,000	9,267,000
Landscaping & Aesthetics	9,020,000	9,000,000	7,734,000	7,822,000	10,898,000	10,695,000
Traffic Control	10,939,000	10,919,000	6,560,000	6,581,000	7,350,000	7,299,000
Mobilization, Lighting, Signage, SW3P, Misc.	96,039,000	74,354,000	70,812,000	71,714,000	80,570,000	92,812,000
Sub Total	**792,371,000**	**554,238,000**	**479,368,000**	**489,149,000**	**523,979,000**	**662,766,000**
Contingencies (20% of Construction Subtotal)	158,474,000	110,848,000	95,874,000	97,830,000	104,796,000	132,553,000
CONSTRUCTION TOTAL	**950,845,000**	**665,086,000**	**575,242,000**	**586,979,000**	**628,775,000**	**795,319,000**
Design, Testing, Inspection (15% of Const. Total)	142,627,000	99,763,000	86,286,000	88,047,000	94,316,000	119,298,000
NET CONSTRUCTION TOTAL	**1,093,472,000**	**764,849,000**	**661,528,000**	**675,026,000**	**723,091,000**	**914,617,000**
Environmental Mitigation (Noise, HazMat, Wetlands+)	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Right-Of-Way Acquisition Relocation Assistance	224,126,000	182,387,000	42,024,000	50,685,000	49,473,000	54,461,000
Total Capital Cost	***1,322,598,000***	***952,236,000***	***708,552,000***	***730,711,000***	***777,564,000***	***974,078,000***
POSSIBLE PROJECT DEDUCTIONS: *(Includes Contingencies and Engineering Costs)*						
Other Transportation Projects:						
-Sylvan Ave. Bridge Reconstruction	---	---	(11,434,000)	(11,434,000)	(15,326,000)	(16,285,000)
-Commerce/Beckley Reconstruction (City Funds)	---	---	---	---	(6,000,000)	(6,000,000)
-Interstate 35 Bridge Reconstruction (TxDOT Funds)	---	---	(7,430,000)	(7,430,000)	(9,865,000)	(11,168,000)
Possible Contribution from USACE (Levee Improvements)	---	---	(21,425,000)	(21,425,000)	(20,562,000)	(21,942,000)
Net Project Cost	***$1,322,598,00***	***$952,236,000***	***$668,263,000***	***$690,422,000***	***$725,811,000***	***$918,683,000***
POSSIBLE PROJECT ADDITIONS:						
Add for Design & Construct "Signature" Bridges	---	---	---	---	30 to 32 Million	30 to 32 Million

Notes: All costs are shown in 2003 dollars. Project costs are expected to increase in future years due to inflation. The net project costs are exclusive of the upgrades for possible “signature bridge” concepts which might be applied to Alternatives 4 and 5.

6.5 COST ESTIMATES OF THE FLOODWAY LOCALLY PREFERRED PLAN

The City of Dallas and the USACE are working on an EIS to address potential flood control, recreation, and environmental enhancements within the Dallas Floodway. The Dallas Floodway LPP may include the following components:

- Chain of Lakes and Trails;
- Levee Improvements;
- Removal of the AT&SF wooden trestle and earthen embankments; and
- Environmental Restoration (EQ Plan).

A cost estimate will be presented in the EIS documenting the details and cost sharing components of the Floodway LPP.

6.6 FUTURE TRAFFIC AND REVENUE ANALYSIS

Upon identification of a preferred alternative for the Trinity Parkway and identification of a LPP for the Dallas Floodway, the NTTA will commission an Investment Grade Traffic and Revenue Analysis by its traffic engineers and a financial analysis of the tollroad system by its financial advisors and other consultants to the NTTA. As a result of these analyses and actions of the NTTA Board of Directors, revenue bonds may be issued for the Trinity Parkway in a final amount to be determined.

6.7 BENEFIT/COST ANALYSIS

A benefit-cost analysis was not conducted for the project, as it is not a requirement under FHWA's NEPA guidelines as set forth under FHWA's Technical Advisory T 6640.8. Such an analysis is complicated by extensive financial assumptions and economic behavioral conditions implicit in the identification of costs and benefits. Direct capital costs of construction of each alternative have been estimated and are documented in the DEIS, as well as indirect costs such as lost tax revenue resulting from business displacements. Other indirect and cumulative benefits and costs are difficult to quantify and subject to wide conjecture, and have not been analyzed in this DEIS.

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Chapter 7

Mitigation Measures and Commitments

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CHAPTER 7
MITIGATION MEASURES AND COMMITMENTS

7.0 INTRODUCTION

Throughout the process of developing transportation projects, one of the chief considerations is to reduce adverse impacts to the environment. One of the methods used to reduce overall impacts is referred to as "mitigation." Federal policy on mitigation is specified in the CEQ regulations implementing NEPA. Federal agencies shall to the fullest extent possible:

> *[U]se all practicable means consistent with the Act [NEPA] and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions on the quality of the human environment [40 CFR 1500.2(f)].*

Mitigation of impacts and enhancement of resources must be considered for all impacts, whether or not the impacts are substantial. All relevant, reasonable mitigation measures that could improve the project are to be identified and included in the project. The CEQ regulations (40 CFR 1508.20) define mitigation to include:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

This ordered approach to considering possible methods of mitigating impacts is known as "mitigation sequencing" and involves understanding the affected environment and assessing the transportation project's potential impacts throughout the development of the project.

It is FHWA's policy that measures necessary to mitigate adverse impacts be incorporated into the proposed action. This policy emphasizes the identification and implementation of measures to rehabilitate, restore, or replace impacted resources. In addition, mitigation measures can be eligible for federal funding if:

1. The impact for which the mitigation was proposed actually resulted from the project; and
2. The proposed mitigation represented a reasonable public expenditure, considering, among other things, the extent to which the proposed measures would assist in complying with a federal statute, EO, or other Administration [FHWA] regulation or policy.

The mitigation recommendations presented herein are appropriate for the Trinity Parkway based on experience developing other transportation projects and on general recommendations made by various local, state, and federal agencies in response to preliminary discussions and correspondence concerning the proposed action. For those areas analyzed in **Chapter 4 Environmental Consequences** but not listed here, no mitigation is necessary.

Specific mitigation measures for the preferred alternative will be considered and discussed in greater detail in the FEIS (see **Section 4.2.7**). The FHWA/TxDOT/NTTA will continue coordination efforts with other agencies through project final design and during refinements of the mitigation and enhancement measures on this project.

7.1 SOCIAL ENVIRONMENT

7.1.1 Compliance with Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, and Other Approval Standards

Right-of-Way Acquisition

The right-of-way acquisition process follows the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. The process provides for fair and equitable treatment of those properties that would be acquired. The process includes initial property appraisal, determination of just compensation, negotiations, payment, and rights under eminent domain.

Displacements and Relocation

It is the policy of the FHWA/TxDOT/NTTA that no person would be displaced due to right-of-way acquisition until decent, safe, and sanitary replacement housing is available. The available housing must also be open to persons regardless of race, color, religion, or national origin. All relocation efforts may be consistent with the requirements of the Civil Rights Act of 1964 and 1968, the Uniform Relocation Assistance, and Real Property Acquisition Policies Act of 1970, and the Housing and Urban Development Act of 1974. Adequate replacement housing must be within the financial means of displaced families or individuals.

Residential displacements may be provided a decent, safe, and sanitary replacement dwelling that is functionally equivalent to their present dwelling. Although replacement dwellings may not be necessarily identical to their present dwellings, the replacements would have comparable attributes, including a similar number of rooms and living space and comparable size to accommodate the occupants. All replacement housing would meet the minimum requirements established by the State of Texas and conform to applicable housing and occupancy codes. If a comparable decent, safe, and sanitary dwelling is not available for all affected persons, housing of Last Resort may be provided.

The NTTA/City of Dallas would assist each displaced person in securing comparable replacement housing. The NTTA/City of Dallas would also provide assistance to displaced businesses and nonprofit organizations to aid in their satisfactory relocation with a minimum of delay of services or loss of earnings. The NTTA/City of Dallas would also maintain contact and exchange information with other agencies rendering services useful to persons and organizations that must relocate. Such agencies include social welfare agencies, redevelopment authorities, public housing authorities, the Small Business Administration, and the federal Housing and Veterans Administration.

Contact may be maintained with local sources of information on private replacement housing, including real estate brokers, real estate boards, property managers, apartment owners and operators, and home building contractors. The occupants of business establishments and nonprofit organizations are entitled to receive moving costs and related expenses incurred in relocating their personal property. These related expenses include loss of tangible property and expenses involved in searching for a replacement site.

To assure the public has adequate knowledge of the relocation program, the services and benefits available will be discussed at the public hearing to be held for the proposed action, presented in a brochure available in both English and Spanish. The public hearing date and location will be announced in the news media and through posted notices.

Qualified displacees may be provided with Relocation Assistance Program benefits intended to assist in purchasing or renting comparable replacement housing. They would also receive either an actual moving cost payment or payment of a fixed moving cost based on an eligible room count. Other payments to which they may be entitled are the costs, which are incidental to selling property to the state, costs incidental to purchasing a replacement dwelling, and an increased interest differential payment. Additional details concerning relocation assistance are provided in **Appendix C Displacement/Relocation Assistance Information**.

Construction of any segment of the mainlanes Trinity Parkway project would not be authorized by the FHWA until:

a. Right-of-way has been cleared for that segment of the project in accordance with federal regulations;
b. All individuals and families have been relocated to decent, safe, and sanitary housing or adequate replacement housing has been made available to relocates in the immediate area as required by regulation; and
c. Displaced businesses have been assisted in obtaining and becoming established in suitable replacement locations.

7.1.2 Measures to Minimize Impacts to Neighborhoods

Design details that minimize intrusion into community environments will be considered and may be incorporated into the design of the Trinity Parkway and its associated structures where possible. With respect to visual intrusion and increased noise levels, noise walls, and berms would be considered where reasonable and feasible to minimize the impacts upon local residents. The NTTA would consider spanning existing streets to minimize the amount of additional traffic on residential collector streets and local arterial roadways. The construction of sidewalks along portions of neighborhoods or across busy intersections would be considered to improve pedestrian access in and around the areas. Access/service roads would be provided for any areas affected by the discontinuation of an existing street, or where property access must be restored.

Context-Sensitive Design (CSD)

Impacts to neighborhoods would be further minimized by adherence to the concepts and principles of FHWA's CSD approach. CSD provides community benefits as it seeks to:

- Incorporate feedback from the local populace affected by proposed transportation facilities;
- Encourage collaboration between neighborhoods and local, state, and federal public officials;
- Enhance not only the roadway and transit communities, but the bicycle and pedestrian communities as well;
- Assist in the development of strategies for smart growth;
- Encourage assessments and design of alternatives consistent with local needs; and
- Help effectively merge transportation, engineering, architectural, historical, and natural environmental systems into transportation decision-making.

CSD contributes to community, safety, and mobility. It is a collaborative approach to developing and redesigning transportation facilities that fit into their physical and human environment while preserving its aesthetic, historic, community, and environmental values.

Early coordination with the affected neighborhoods will continue to take place to help identify residents with special needs (e.g., low income, single head of households, elderly, and disabled). Coordination with local planning departments to develop strategies for minimizing overall neighborhood disruptions, isolation of specific neighborhood areas, and induced land use change would take place early in the process. It is anticipated that early coordination would occur after the public hearing and after a preferred alternative is identified. The final relocation plan would include an inventory of land available in affected neighborhoods to relocate homeowners and businesses. This would help the neighborhoods retain their character by limiting loss of neighborhood facilities and reinvesting in housing and businesses within the neighborhoods. For further information on residential and business displacements, see **Section 7.1.1** of this chapter.

Noise Impacts

A noise barrier analysis was performed for the impacted areas of each alternative. Based on the analysis, noise barriers were determined to be both feasible and reasonable only at the residential neighborhoods located in the common area at the south terminus of the project. **Plates 4-16** through **4-19** in **Chapter 4** show the proposed noise barriers. In this area, from Lamar Street to the south project termini, all project alternatives are the same, and consequently, the proposed noise barriers are reasonable and feasible for all alternatives.

When a preferred alternative is identified, the noise barrier analysis would be reviewed for each traffic noise-impacted area of the preferred alternative. Any additional areas where a noise barrier is determined to be both reasonable and feasible would be reported in the FEIS.

Visual Impacts

The NTTA has developed *System-Wide Design Guidelines for the Dallas North Tollway System* (2003, as amended), which establishes a framework of aesthetic design elements. Mitigation measures to improve post-project visual quality are recommended to apply to all build alternatives. These measures may include a combination of any of the following generally recommended methods.

- Contour grading of earthen fill slopes, especially interchange areas, to reduce their massiveness and to provide a more compatible appearance with adjacent landforms. Where feasible, bottom of fill slope edges would be rounded to blend with the existing terrain.

- Reduce the vertical alignment of structures, where practicable and feasible, to the lowest height allowable.
- Native plantings, indigenous to the area, planted along the right-of-way to mitigate visual impacts of the new construction.
- A subsequent landscape contract implemented immediately following completion of tollway construction to mitigate visual impacts in remaining areas. Plantings placed within the more developed areas consisting of a mixture of container grown native and/or approved ornamental trees, shrubs, and grass species.
- Establish a general landscape palette using native plants typically found in the project area or similar species. Utilize the palette where appropriate throughout the alignment, tailored to harmonize with the surrounding landscape. The goal of this mitigation measure is to establish a coherent aesthetic landscape design for all slopes and bridge structures throughout the length of the project by using plant species possessing good survival characteristics.
- Remove all existing pavement to be abandoned and revegetate with native or approved ornamental plantings and native grasses.
- Develop a coherent building materials palette of architectural elements as part of the project development process, based on colors, textures, patterns, and materials used in the corridor area. Apply architectural elements selected from the palette to bridge over crossings and under crossings, retaining walls, drainage facilities, and sound walls. The result would be an integrated design with visual consistency, rather than a patchwork of unrelated materials.
- Use non-reflective materials for all visible metal structures and elements.

Tree removal impacts may be reduced by identifying trees that can be relocated or incorporated into a highway planting plan instead of removal. The right-of-way corridor would be professionally landscaped, with an equal or greater number of trees being replaced than removed. Trees would be monitored for a specified period (two to five years) to insure survivability. Similarly, the loss of vegetation and/or mature street landscaping may be mitigated through traditional landscaping methods. Landscaping would commence when practicable after major construction operations have been completed. Continued local input would be sought to ensure that the toll road would be as aesthetically appealing as possible.

Environmental Justice

To ensure all options applicable to the build alternatives being considered meet NEPA requirements and are in compliance with EO 12898, the NTTA would take any actions needed to ensure this project would not allow for disproportionately high adverse human health or environmental effects on minority and low-income populations. Mitigation features that are reasonable and feasible will be considered later as a preferred alternative is identified (see **Section 4.4.3** *Mitigation and Compensation Options* for more details).

7.1.3 Regional and Community Growth

The potential for the proposed action to induce regional and/or community growth can be mitigated by adhering to local land use plans and policies as implemented and in concert with the City of Dallas. Any sprawl-inducing potential of the project can be mitigated by a higher density urban form with fill-in, smaller size lot requirements, and development or redevelopment of high-density structures at designated activity centers along the corridor.

Construction of the Trinity Parkway proposal would not induce growth within the project area. This proposal is in response to growth that has already taken place. The direction and density of regional growth, particularly within the area of influence for this project, is dictated by city zoning and regional, local, and neighborhood comprehensive planning.

7.2 MEASURES TO MINIMIZE IMPACTS TO WATER QUALITY

There are several Federal, State and local regulations that protect water quality and floodplain related to development. To mitigate the effect of the proposed construction and operation of the roadway on water resources, such as surface water, floodplains, and groundwater, the following mitigation measures may be implemented based on the selected alternative, and where feasible and appropriate.

The TCEQ is the agency with primary responsibility for adopting and enforcing state water quality standards under § 401 of the CWA. The TCEQ conducts § 401 certification reviews of § 404 permit applications (see **Section 7.4**) to preserve aquatic resources and the functions they perform in maintaining human and aquatic uses of state waters. Efforts to avoid and/or minimize adverse impacts to wetlands and water bodies are taken to retain the important functions these aquatic resources provide for maintaining and improving water quality. The TCEQ has developed a tiered system of review for all § 404 permit applications based on project size and the amount of state water affected. This tiered system includes:

- **Tier I:** Generally for small projects that affect less than 3 acres of waters in the state or less than 1,500 linear feet of streams. The TCEQ has determined that incorporating certain BMPs and other requirements into the project would sufficiently address the likelihood that water quality would remain at the desired level. For those projects, no further § 401 review may be necessary if the permittee agrees to include those BMPs and requirements in their project, which makes them a part of their § 404 permit. These BMPs are designed to minimize impacts to water quality.

- **Tier II:** Any project that does not qualify for a Tier I review or for which the applicant elects not to incorporate Tier I criteria, or prefers to use alternatives may be considered a Tier II project. Tier II projects are subject to an individual certification review by the TCEQ.

The Trinity Parkway project would affect more than 3 acres of state waters and may therefore be subject to an individual § 401 review as a Tier II project. This review would occur in conjunction with the § 404 permitting process.

EPA National Pollutant Discharge Elimination System

In compliance with the provisions of the CWA, as amended (33 USC § 1251 et. seq.), operators of construction activities located in this permit area are authorized to discharge pollutants to waters of the U.S. in accordance with the conditions and requirements set forth in 63 FR 128, *Reissuance of NPDES General Permits for Stormwater Discharges from Construction Activities in Region 6*, July 6, 1998.

Texas Pollutant Discharge Elimination System

As previously described in **Section 4.12.1**, construction of the proposed project would disturb more than 5 acres of ground surface; therefore, this project requires compliance with TCEQ's TPDES General Permit for Construction Activities. A SW3P is required is required for each construction project or site covered under this permit.

Stormwater Pollution Prevention Plan (SW3P)

To comply with the TCEQ's requirements, the SW3P prepared for this project, if required, would include the following:

(1) Site Description – The project site description would include:

a. Details concerning the nature of the construction activity;

b. A description of the sequence of major activities that disturb soils for major portions of the site (e.g., grubbing, excavation, grading, utilities and infrastructure installation);

c. Estimates of the total area of the site and the total area of the site that is expected to be disturbed by excavation, grading, or other activities including off-site borrow and fill areas, an estimate of the runoff coefficient of the site for both the pre-construction and post-construction conditions and data describing the soil or the quality of any discharge form the site; and

d. Location maps and other information related to construction activities (pre-construction and post-construction conditions) and potential sources of pollutants.

Included would be:

- A site map showing drainage patterns and approximate slopes anticipated after major grading activities; areas of soil disturbance;
- Areas which would not be disturbed; locations of major structural and non-structural controls identified in the SW3P;
- Locations where stabilization or other best management practices are expected to occur; locations of off-site material, waste, borrow, or equipment storage areas; and
- Surface waters (including wetlands); and locations where storm water discharges to a surface water, etc.

The site description would also address listed or threatened species (or critical habitat) and properties listed or eligible for listing on the NRHP, which may be affected by stormwater discharges or storm water-related discharge activities.

(2) Controls – A description would be provided concerning appropriate control measures (e.g., BMPs) that may be implemented as part of the construction activity to control pollutants in storm water discharges. The SW3P would clearly describe the control measures and the general timing (or sequence) during the construction process that the measures may be implemented. These may include limiting construction access routes, stabilization of areas denuded by construction, and using sediment controls and filtration. The description and implementation of the control measures would address the following components:

Erosion and Sediment Controls. This element of the plan would incorporate both short and long-term goals and criteria for the following:

a. The design of construction-phase erosion and sediment controls to retain sediment on site to the extent practicable;
b. The proper selection, installation, and maintenance of all control measures in accordance with the manufacturers' specifications and good engineering practices;
c. The removal of off-site accumulations of sediment at a frequency sufficient to minimize off-site impacts;
d. The removal of sediment from sediment traps or sedimentation ponds when the design capacity has been reduced by 50 percent;
e. The prevention of litter, construction debris, and construction chemicals exposed to stormwater from becoming a pollutant source for stormwater discharges; and
f. Measures to address the use of off-site material storage areas (also including overburden and stockpiles of dirt, borrow areas, etc.), which are considered a part of the project.

Stabilization Practices. This element of the plan would include a description of interim and permanent stabilization practices for the site, including a schedule of when the practices may be implemented. The plan would ensure that existing vegetation is preserved where attainable and that disturbed portions of the site are stabilized. Stabilization practices may include all or a combination of:

a. Establishment of temporary vegetation;
b. Establishment of permanent vegetation;
c. Mulching;
d. Geotextiles;
e. Sod stabilization;
f. Vegetative buffer strips;
g. Protection of trees;
h. Preservation of mature vegetation; and
i. Other appropriate measures.

Structural Practices. This element of the plan would include a description of structural practices to divert flows from exposed soils, store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas to the degree attainable. Structural practices may include all or a combination of:

a. Silt fences;
b. Earth dikes;
c. Drainage swales;
d. Sediment traps;
e. Check dams;
f. Subsurface drains;
g. Pipe slope drains;
h. Level spreaders;
i. Storm drain inlet protection;
j. Rock outlet protection;
k. Reinforced soil retaining systems;
l. Gabions;
m. Temporary or permanent sediment basins; and
n. Other appropriate measures.

The placement of structural practices in floodplain areas will also comply with § 404 of the CWA, if required.

Storm Water Management. This element of the plan would provide a description of measures that may be installed during the construction process to control pollutants in storm water discharges after construction operations have been completed. These BMPs (structural and non-structural) may include all or a combination of:

a. Storm water detention structures (including wet ponds);
b. Storm water retention structures;
c. Flow attenuation by use of open vegetated swales and natural depressions;

d. Infiltration of on-site runoff; and
e. Sequential systems (which combine several practices).

As required by the TCEQ, the plan would also include an explanation of the technical basis used to select the practices to control pollution where flows exceed pre-development levels. In addition, velocity dissipation devices may be placed at discharge locations and along the length of any outfall channel to provide a non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no substantial changes in the hydrological regime of the receiving water). The installation of these devices in floodplain areas will also comply with § 404 of the CWA, if required.

Note: If required by the TCEQ, authorization under a separate TPDES General Permit would be pursued for post-construction storm water BMPs that discharge pollutants from point sources once construction is completed.

Other Controls. This element of the plan would contain a description of controls to reduce such activities as tracking sediment onto roads from off-site vehicles and measures to minimize the generation of airborne dust. Included would be a provision for the management and disposal of all wastes (including equipment maintenance waste: used oil, batteries, etc.) as required by local, state, and federal laws.

(3) Maintenance – All erosion and sediment control measures and other protective measures identified in the SW3P and used in the project will be maintained in effective operating condition.

(4) Inspections – Qualified personnel will inspect disturbed areas of the construction site in accordance with the Authority's permit, including:

a. Areas that have not been finally stabilized;
b. Areas used for storage of materials that are exposed to precipitation;
c. Areas containing structural control measures; and
d. Areas where vehicles enter or exit the site, at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater.

Sediment and erosion control measures identified in the SW3P will be inspected pursuant to the permit to ensure the measures are operating correctly.

A report summarizing the scope of the inspection and major observations relating to the implementation of the SW3P will be prepared and retained for at least 3 years from the date the site is finally stabilized. Major observations would include:

a. The location(s) of discharges of sediment or other pollutants from the site;
b. Location(s) of BMPs that need to be maintained;
c. Location(s) of BMPs that failed to operate as designed or proved inadequate for a particular location; and
d. Location(s) where additional BMPs are needed that did not exist at the time of inspection.

Such reports would identify any incidents of non-compliance. Where a report does not identify any incidents of non-compliance, it would contain a certification that the facility has been inspected and is in compliance with the SW3P and TPDES General Permit.

It should be noted that at least one SW3P should be developed for each construction project or site covered by the TPDES General Permit. The TCEQ indicates that for more effective coordination of BMPs and opportunities for cost sharing, a cooperative effort is encouraged for the different operators at a site to prepare and participate in a comprehensive SW3P. Individual operators at a site may but are not required to develop separate SW3Ps that cover only their portion of the project, provided reference is made to other operators at the site. In instances where there is more than one SW3P for a site, coordination must be conducted between the "permittee(s)" to ensure the storm water discharge controls and other measures are consistent with one another.

The minimum BMPs that would be employed for construction of the proposed project are found in FHWA's Standard Specifications. The proposed project may also consider the recommended practices included in NCTCOG's *Storm Water Quality Best Management Practices for Construction Activities* (NCTCOG, 2000). This EPA approved "Construction BMP Manual" presents a comprehensive approach to addressing regional storm water quality issues associated with construction activities. The recommended practices included in this manual are tailored to the type of conditions experienced in the north central Texas region. These controls are characterized by their effectiveness, applicability, and cost in order to define a performance-based standard for each control measure.

Both structural and non-structural BMPs would be considered to address post-construction storm water management for the proposed action. Non-structural BMPs may include some or a combination of:

a. Ponds (e.g., dry extended detention pond or wet pond);
b. Infiltration practices (e.g., infiltration basin, infiltration trench or porous pavement);

c. Filtration practices (e.g., bioretention, sand, and organic filters);
d. Vegetative practices (e.g., storm water wetland, grassed swale, or grassed filter strip);
e. Runoff pretreatment practices (e.g., catch basin or in-line storage); and
f. Better site design (e.g., buffer zones, open space design, or urban forestry).

Structural BMPs would include some or a combination of:

a. Runoff pretreatment practices (manufactured products for storm water inlets – e.g., hydrodynamic separator, modular treatment system, or water quality inlet);
b. Experimental practices (e.g., alum injection);
c. On-lot treatment; and
d. Better site design (e.g., conservation easements, infrastructure planning, eliminating curb and gutters, green parking, alternative turnarounds, or alternative pavers).

7.3 MEASURES TO MINIMIZE IMPACTS TO WILDLIFE AND VEGETATION RESOURCES

The goals of a mitigation plan are to avoid and minimize adverse affects to sensitive natural resources and to compensate for losses of these resources if impacts are unavoidable. Unavoidable impacts to sensitive habitats are mitigated by avoidance, minimization, restoration or replacement. The successful implementation of the mitigation would ensure that no net loss of aquatic resources and no cumulative loss of sensitive habitat result from the proposed action. Construction BMPs, in accordance with NCTCOG standards and as recommended by a professional Landscape Architect, would be implemented. These BMPs may include, but are not limited to, the following:

- Fencing of construction zone and access roads to limit impacts outside of the project area.
- Trees and shrubs should be fenced to avoid unnecessary impacts. Where possible, avoidance and/or pruning of trees and shrubs instead of removal.
- Where avoidance is not possible, replacement of the trees removed during construction where water requirements can be met and conflicts with maintenance requirements are minimized.
- Implementation of temporary and permanent erosion control measures such as revegetating disturbed areas with native grasses, mulching, erosion control blankets, sediment basins, erosion bales, and silt fences.
- Incremental grading and seeding to reduce soil loss during construction. Native grasses should be used in seed mixes. Native shrub species should be added to the seed mix in areas where conflicts with maintenance can be avoided.
- Rounding of ditches and slopes to prevent unnecessary erosion.

In accordance with Provision (4)(A)(ii) of the TxDOT-TPWD MOU and at the TxDOT District's discretion, habitats given consideration for non-regulatory mitigation during project planning would include:

- Habitat for Federal candidate species if mitigation would assist in the prevention of the listing of species;
- Rare vegetation series (S1, S2, or S3) that also locally provide habitat for a state-listed species;
- All vegetation communities listed as S1 or S2, regardless of whether or not the series in question provides habitat for state-listed species;
- Bottomland hardwood, native prairies, and riparian sites; and
- Any other habitat feature considered to be locally important.

Habitats within the study area that are given consideration for non-regulatory mitigation by the TxDOT-TPWD MOA include bottomland hardwoods and riparian sites. According to the publication *Plant Communities of Texas* (Series Level) (Texas Natural Heritage Program 1993), there are no imperiled or critically imperiled plant communities within or adjacent to the study area. The hackberry-elm series is designated as being secure, both globally and in the state. Therefore, non-regulatory compensatory mitigation should not be required.

Areas of known habitat would be denoted on the construction plans, and may be replaced if impacted. Revegetation and appropriate landscaping are required and would satisfy highway safety and local standards. All re-vegetation and landscaping activities would comply with EO 13112, which calls for the FHWA to prevent and control the introduction and spread of invasive (non-native) plant and animal species. Preventative measures may include the inspection and cleaning of construction equipment, commitments to ensure the use of invasive-free mulches, topsoil, and seed mixes, and eradication strategies to be deployed should invasion occur.

In consideration of the Executive Memorandum on Beneficial Landscaping (FHWA 1994b), landscaping activities would utilize techniques that complement and enhance the local environment and seek to minimize the adverse effect that the landscaping may have on it. In particular, this means using regionally native plants and employing landscaping practices and technologies that conserve water and prevent pollution. Environmentally beneficial landscaping may be limited to seeding and replanting the right-of-way with native species of plants, where cost-effective and to the extent practicable.

The most important impacts to wildlife along the Trinity Parkway are the potential for habitat fragmentation and reduction in wildlife habitat connectivity as a result of roadway construction. The following are mitigation measures that would be considered to address this impact:

- Acquisition of replacement habitat of comparable biological values;
- Protective measures for existing or acquired lands such as fencing, barriers, and signs;
- Creation of replacement habitat by conversion of less sensitive upland habitat into wetlands by excavation and planting;
- Contribution to a mitigation bank;
- Minimize the crossing of flowing streams and utilize bridge spans to the greatest extent to minimize impacts on riparian and aquatic communities;
- Bridge spans could also act as wildlife corridors, allowing unrestricted movement of wildlife;
- Particularly dangerous wildlife crossings (e.g., where culverts, bridge spans, etc. are not practicable) can be fenced to divert wildlife through wooded areas along the right-of-way to culverts or bridge spans where crossings can be more safely made;
- Limit the use of herbicides and other chemicals for right-of-way maintenance; and
- Schedule mowing for right-of-way maintenance to facilitate the natural reseeding of indigenous spring and autumnal herbaceous communities.

7.4 MEASURES TO MINIMIZE IMPACTS TO WETLANDS

Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits after notice and opportunity for public hearings, for the discharge of dredged or fill material into waters of the U.S. at specified disposal sites. Selection of such sites must be in accordance with § 404(b)(1) guidelines developed by the EPA in conjunction with the USACE. The USACE regulations are codified in 33 CFR § 320-338.

Activities requiring § 404 permits are limited to discharges of dredged or fill materials into the waters of the U.S. These discharges include return water from dredged material disposed of on the upland and generally any fill material (e.g., rock, sand, or dirt) used to construct fast land for site development, roadways, erosion protection, etc. This project would likely affect more than one-half acre of waters of the U.S. and would therefore be subject to an individual § 404 Permit. In conjunction with the § 404 permit process, permit applications are reviewed by the TCEQ for compliance with § 401 of the CWA (see **Section 7.2**).

In accordance with the CWA § 404 (b)(1) guidelines, wetland mitigation is identified as avoidance, minimization, and compensatory mitigation. These guidelines stress the avoidance of adverse impacts to wetlands with the goal of no overall net loss of wetland functions. Consideration for avoidance and minimization of impact to wetlands would be given throughout the design and construction process. However, because avoidance is not possible across an entire alignment, mitigation includes minimizing or

compensating unavoidable impacts. Compensation may include restoration, enhancement, or creation of wetlands.

The goals of a mitigation plan are to avoid and minimize adversely affecting sensitive natural resources and to compensate for losses of these resources if impacts are unavoidable. Unavoidable impacts to wetlands, waters of the U.S., and to sensitive habitats are mitigated by restoration or replacement. The successful implementation of the mitigation may ensure that no net loss of waters of the U.S. and no cumulative loss of sensitive habitat result from the proposed action. In addition, design features such as alignment shifts and construction alternatives (e.g., retaining walls and steeper side slopes) will be considered to avoid or minimize impacts to wetlands and other waters of the U.S.

Implementation of BMPs minimizes impacts to wetlands and other waters of the U.S. Specific measures to reduce erosion and maintain water quality would be identified and may include the following:

- Incremental grading and seeding to reduce soil loss during construction. Native grasses should be used in seed mixes;
- Temporary exclusion fencing of wetlands during construction;
- Use of soil stabilization practices such as rounding of ditches and slopes, erosion control blankets, reseeding with native species, and mulching impacted areas to reduce erosion;
- Installation of structural BMPs such as silt fences and erosion blankets in impacted areas to reduce off-site siltation;
- Development of an emergency spill response program and the implementation of spill-prevention practices such as locating staging areas and fuel and hazardous construction material storage sites well away from wetlands and waters of the U.S. to reduce risks from accidental spillage and leaching;
- Disposal of surplus fill in non-wetland areas;
- Timing construction in and around open water to occur in late fall and winter when water levels are low, soil compaction is minimal, and vegetation is dormant;
- Sparing existing trees in impacted wetlands when possible and fencing trees and shrubs to prevent damage;
- Restoration of existing degraded wetlands and wetland creation are two methods of compensatory mitigation. Compensatory wetland mitigation would occur as close to the site of impact as possible. Water rights issues would be considered during the final selection of mitigation sites; and
- Compensatory mitigation, as required by the § 404 process, to offset unavoidable, adverse impacts to the aquatic system.

7.5 MEASURES TO MINIMIZE IMPACTS TO FLOODPLAINS

In accordance with Executive Order 11988 and 23 CFR 650 Subpart A, practical measures to minimize harm to floodplains are incorporated in the improvement alternatives for the Trinity Parkway. Little or no change to historic drainage patterns is expected within or down gradient from the study area. Impacts to floodplains are minimized by following standard stream crossing design criteria, avoiding direct impacts on stream channels, and adjusting the alignment where possible. Bridge and roadway designs seek to minimize impacts to floodplains in compliance with FHWA requirements – including efforts to span 100-year floodplains. Final designs may adhere to FHWA drainage criteria for both minor and major hydraulic structures, as well as following all FEMA requirements. Specific measures include the following:

- Coordination with local governments concerning issues related to floodplain encroachment;
- Development and implementation of a SW3P for each phase of the project;
- Installation of detention basins, infiltration beds, or other structural controls to reduce and minimize the effects of increased runoff due to substantial increases in impervious surfaces;
- Incremental grading and seeding to reduce soil loss during construction. Native grasses should be used in seed mixes. Native shrub seed should be included in the seed mix where conflicts with maintenance may not occur;
- Rounding of ditches and slopes to prevent unnecessary erosion;
- Temporary exclusion fencing of wetlands during construction;
- Clean water diversions during construction;
- Identification and selection of appropriate concrete washout areas well away from floodplains to ensure polluted water does not leave the site;
- Use of soil stabilization practices such as erosion control blankets and mulching impacted areas to reduce erosion;
- Installation of structural BMPs such as silt fences and erosion bales down gradient from impacted areas to reduce off-site siltation;
- Development of an emergency spill response program and the implementation of spill prevention practices such as locating staging areas and fuel and hazardous construction material storage sites well away from floodplains to reduce risks from accidental spillage and leaching;
- Fencing existing shrubs and trees to avoid damage;
- Replacement of trees where maintenance and water requirements can be met; and
- Coordination with the USFWS and TPWD to develop conservation measures as elements of the final project design.

Potential Mitigation Measures

Both direct and indirect construction impacts would be avoided by use of approved bridge construction methods and temporary water quality/quantity BMPs, such as, but not limited to the following:

- Bridge superstructures would be constructed a minimum of 1 foot above the 100-year flood elevation;
- Bridge approach fills and abutments would be constructed outside the 100-year floodplain;
- Bridge piers required to fall within the Trinity River (although not anticipated) would be designed to minimize obstruction of flow and constructed during periods of low water; and
- A backwater analysis would be done before final bridge and/or roadway design (using the USACE and FEMA computer models). This would ensure that construction techniques proposed would not decrease the channel-carrying capacity, increase the 100-year floodplain elevation and/or create erosive velocities more than that allowed by the City of Dallas CDC requirements.

Other considerations may include:

- Aligning new bridge piers with nearby remaining piers;
- Employing long bridge spans (to minimize the number of piers involved);
- Increasing the channel cross-sectional area through reshaping the stream bank(s);
- Relocating levees and/or increasing levee height;
- Compensatory channel conveyance improvements (to offset floodplain conveyance loss); and
- Locating construction staging areas well away from floodplains to prevent impacts.

<u>Local Requirements</u>

Encroachment into a floodway is prohibited within the City of Dallas unless a professional registered engineer certifies that encroachment would not increase the design flood elevation and:

1. The FEMA issues a CLOMR;
2. The encroachment complies with the City of Dallas requirements governing fills in floodplains; and
3. Floodplain encroachment must not result in any increase in the elevation of the design flood within the Dallas Floodway levee system.

City of Dallas Fill Permit

Proposed projects requiring fill in the floodplain cannot proceed without a fill permit approved by the Dallas City Council. The applicant for a fill permit must submit an application to the Floodplain

Management and Erosion Control Division of Public Works and Transportation Department, and must fulfill both the city and FEMA's criteria.

The application must be accompanied by a hydraulic engineering analysis and maps prepared by a licensed professional engineer, including a landscape and erosion control plan (with a tree survey of all trees greater than 6-inch caliper in the floodplain), and also an environmental impact study, where applicable. Additionally, the applicant is required to obtain any other permits, which could include a USACE § 404 permit dealing with wetlands. Copies of the application are sent to the Director of Planning and Development and the Director of Park and Recreation for their review and approval and determination of city interest in acquiring the property proposed for fill.

The engineering analysis must prove that the proposed fill meets the city's criteria for filling in the floodplain, which include the following:

- The proposed fill must not increase the 100-year water surface elevation or the stream's erosive velocities and must preserve part of the natural ability of the stream to store portion of the floodwater (called valley storage). This can be achieved by compensating for the proposed fill with excavation of a piece of land, the size of which is determined by the mathematical computer/hydraulic models engineers use; and
- A landscape plan needs to be prepared showing which trees would be preserved and also the size, type, and location of all proposed trees, as specified in the city's floodplain ordinance.

The Public Works and Transportation Department engineers review the submitted engineering analysis and all maps and plans, and if they meet the established city criteria, the most important of which are outlined above, the fill permit application goes to the city council for approval. A public notice and a notice to adjacent municipalities are sent approximately two weeks prior to the public hearing held by the City Council.

- Signs are posted;
- Comments are solicited; and
- Where concerns are expressed, a neighborhood meeting is held prior to the public hearing.

Once the City Council has approved a fill permit, Public Works and Transportation issues authorization to the applicant. When the applicant obtains a fill permit, the fill project must be completed according to the plans submitted and then have a certified surveyor prepare an as-filled survey of the property. A copy of the as-filled survey must be submitted to the City of Dallas.

Corridor Development Certificate

Depending on the alternative selected, the proposed action may require a CDC permit, which may be processed and issued by the City of Dallas. The CDC process was developed with the coordination of the NCTCOG and the joint efforts of the participating nine cities and three counties along the Trinity River corridor to adopt a cooperative management program whereby each city retains development permit authority within its jurisdiction, but bases its permit decision on a set of common permit criteria.

In addition to all local jurisdiction requirements for fill permits, when a property is located within the 100-year floodplain of the Trinity River, the Elm Fork, and portions of Lower White Rock Creek and Lower Fivemile Creek, which is called the Regulatory Zone under the CDC Process, the applicant has to apply for technical review to the USACE, and a CDC permit must be obtained from the local jurisdiction prior to approval of a fill permit.

For property located within the Review Zone, which is the area between the 100-year and the SPF flood boundaries, although no CDC permit is required, the applicant must apply to the CDC/Floodplain Administrator(s) (Part I of the CDC application) to inform them of their plans and activities.

The CDC calls for the maximum allowable loss in valley storage for the 100-year flood and SPF discharges to be 0 percent and 5 percent, respectively. The life of the CDC permit is 5 years. If no development activities occur within this time and the applicant does not submit a written request 30 days prior to the expiration day for up to a 3-year extension, the CDC permit shall cease to be valid.

Summary

Floodplain mitigation for this project includes both avoidance and minimization. Bridges are the primary means of avoiding encroachment, while retaining walls and similar structures would be incorporated, as project design is refined. Once a preferred alternative is identified and its preliminary design completed, floodplain impacts may be quantified on a volume basis and compensatory flood storage areas would be evaluated consistent with EO 11988, *Floodplain Management*, and 23 CFR 650, Subpart A, and all other federal, state, and local regulatory requirements.

7.6 MEASURES TO MINIMIZE IMPACTS TO CULTURAL RESOURCES AND PARKLANDS

7.6.1 Cultural Resources

Following approval by FHWA of a preferred build alternative, NTTA would coordinate with the SHPO regarding additional investigations within the proposed right-of-way of the preferred alternative. These investigations would be conducted by qualified professionals. The scope of the investigations would be

developed in consultation with the THC under the terms and conditions of the Programmatic Agreement between TxDOT, THC, FHWA, and the ACHP.

The mitigation of cultural resources would be pursued, as necessary, in compliance with § 106 of the NHPA and the Texas Antiquities Code. Several mitigation elements would be considered to mitigate for adverse effects to known or potential cultural or historic resources. Following the identification of a preferred alternative, measures to avoid or minimize impacts to historic resources, including alignment modifications, may be developed. Mitigation for impacts to NRHP resources may include Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation, relocation of a historic structure, or the installation of vegetative screening to mitigate for changes in the visual setting.

7.6.2 Parks and Recreational Areas

Mitigation for impacts to public parks and recreational areas for this project initially involved the development of alternative alignments that avoided or minimized impacts to these resources. Any park/recreational use that may be affected by proximity or indirect impacts associated with the build alternatives can be planned and designed to avoid or minimize those impacts.

Mitigation for reasonable and feasible noise abatement at two impacted parks would be analyzed in detail after identification of the preferred alternative. Preliminary analysis indicates that mitigation (in the form of a noise barrier) would not be feasible for Sleepy Hollow Park (impacted by all alternatives) and Oak Cliff Founders Park (impacted by Alternatives 4 and 5) because the major source of noise at these parks is traffic on other adjacent roads and highways.

As previously mentioned, the NTTA is participating in a cooperative planning effort with all agencies involved with proposed recreational and non-recreational developments planned for the Dallas Floodway (Trinity Park) and DFE (Great Trinity Forest Park) portions of the study area. NTTA would continue to work closely with these agencies in order to maximize these multi-project planning efforts and, thereby, work to minimize any potential adverse impacts that may result from the Trinity Parkway build alternatives. Once a preferred alternative is identified, a plan for compensatory replacement of the properties and their functions and values would be developed and presented in the FEIS.

7.7 MEASURES TO MINIMIZE IMPACTS TO HAZARDOUS WASTE SITES

Avoiding hazardous waste sites would be a priority during the final design stage. Site assessments would be carried out to the degree necessary to identify the levels of contamination and, if necessary, to

evaluate the options to remediate, along with the associated costs. Resolution of any concerns associated with contamination would be coordinated with the appropriate regulatory agencies prior to right-of-way acquisition, and appropriate action would be taken.

Any required mitigation of identified hazardous material concerns would include those for proper management and disposal of hazardous wastes encountered during construction and precautions for worker health and safety. In the event hazardous materials are unexpectedly encountered during construction, a contingency plan or other health and safety procedures would be in place establishing procedures for temporary stoppage of work, securing of the area, notification of the discovery, and proper management of such materials. All procedures would be consistent with NTTA's guidelines and federal, state, and local laws and regulations.

The demolition and removal of all structures would include procedures for the identification, abatement, handling, and disposal of lead-based paint and asbestos, as well as worker health and safety. All procedures will be consistent with NTTA's guidelines and all federal, state, and local laws and regulations.

7.8 MEASURES TO MINIMIZE CONSTRUCTION IMPACTS

Construction activities may result in several impacts that may cause inconvenience. These impacts can be categorized as follows:

- Airborne dust due to clearing, grubbing, hauling, and construction activities;
- The use of local and regional arterials to haul materials to and from the construction site;
- Increase in noise levels due to construction activities;
- Temporary traffic detours; and
- Soil and water runoff.

Construction impacts are mitigated on two levels, direct intervention methods, and construction procedures that effectively lessen construction impacts below the levels that would occur if these procedures were not employed.

Direct intervention methods are typically active measures required in permits, FHWA's Standard Specifications or local ordinances pertaining to the mitigation of construction impacts. Mitigation recommendations for erosion and sedimentation, water pollution, and noise impacts are included in this chapter. Unforeseen construction impacts would be handled through a review process, BMP's, and implementation of other procedures, if necessary.

Traffic impacts during construction would be addressed by implementation of a Traffic Management Plan (TMP). TMPs include the following:

- Staging of construction activities;
- Providing detours around construction areas;
- Limiting work on arterial streets to off-peak hours;
- Confining haul routes to designated streets; and
- Providing a public relations and media campaign to inform residents and motorists of upcoming activities.

7.8.1 Pedestrian/Vehicular Safety During Construction

To ensure pedestrian safety, ample width for construction activities may be provided, properly equipped machinery may be employed, temporary or permanent fencing may be erected, and guidelines for equipment operators and supervisors would be enforced. Steps would be taken to control access to construction zones by pedestrians, especially children. Particular consideration would be given to areas likely to have the most pedestrian activity. In addition, the use of flag persons, signs, barricades, and the restriction of construction activities to daylight hours, when feasible or appropriate, should substantially reduce the risk of vehicular accidents during the construction period.

7.8.2 Construction Air Quality Impacts

Impacts to ambient air quality would occur as a result of construction activities. Fugitive dust and particulate matter, including emissions, would be generated during project excavation and filling. Construction equipment and off-site vehicles used for hauling debris and supplies would also produce emissions during construction. The pollutants of primary concern include fugitive dust, PM_{10}, reactive organic gases, NOx, CO and, to a lesser extent, sulfur dioxides. Because the variables affecting construction emissions (e.g., type of construction vehicles, timing and phasing of construction activities, haul routes, etc.) cannot be identified until the project is ready for construction, no estimate of construction emissions can be undertaken. However, project construction would be conducted in accordance with all federal, state, and local regulations that govern construction activities and emissions. Specific mitigation measures that can be utilized would be identified in a dust control plan prepared prior to project construction. These mitigation measures would comprise some or a combination of the following:

- Stabilize construction roads and dirt piles with water and/or chemicals;
- Limit speeds on unpaved construction roads;
- Remove dirt spilled onto paved roads daily;
- Cease grading and excavation activities when wind speeds exceed 25 mph and during extreme air pollution episodes;
- Require covering of all haul trucks;
- Phase grading to minimize the area of disturbed soils;
- Phase construction to minimize daily emissions;
- Ensure proper maintenance of construction vehicles to maximize efficiency and minimize emissions; and
- Revegetate road medians and slopes promptly.

While emissions from construction activities and equipment are an unavoidable consequence of project construction, an aggressive mitigation plan would serve to minimize impacts to ambient air quality and the nuisance impacts to the public in proximity to the project corridor. Other mitigation measures would include temporary drainage facilities and the use of erosion control strategies.

7.8.3 Construction Noise Impacts

Construction noise levels would be controlled by the use of one or a combination of the following general methods:

- Where noise barriers are both feasible and reasonable, such noise barriers may be constructed prior to other project-related construction. This would allow the barriers to help protect noise-sensitive areas from construction noise.
- Locate stationary equipment such as compressors, generators, and other diesel-powered equipment as far away from nearby noise sensitive properties as possible.
- Install noise reduction devices on equipment.
- Shut off idling equipment.
- Enforce sunrise to sunset operating time control in populated areas.
- If feasible, and to the extent possible, reschedule construction operations to avoid periods of noise annoyance identified in any complaints.
- Notify residents to be affected whenever extremely noisy work would be occurring.
- If feasible, use shielding or screening devices on or around equipment.
- Where possible, route construction equipment and vehicles into areas that would cause the least disturbance to nearby receptors.

Noise reduction devices consist of mufflers, intake silencers, and dampening materials. Mufflers and intake silencers can substantially reduce the noise produced by all engine-powered equipment. When the sound source is due to the interaction of the equipment's components with itself or with the material that it acts upon, the use of dampening material such as spray coatings or mats can provide some noise reduction. Proper equipment maintenance is also important in controlling excess equipment noise.

For the loud pieces of construction equipment, operating limitations can be employed, thereby reducing the exposure time and lessening the impact. Operating limitations can be particularly effective when the construction site is near such sensitive receivers as schools or churches, where a quiet environment is essential during certain hours of the day.

The use of alternative, quieter construction equipment is one of the best ways to reduce the impact of construction noise. However, because of such factors as economics, lack of research and development, and lack of applicable noise standards, alternate, quieter equipment is not readily available for present or near future use.

Shielding or screening methods using acoustic enclosures are effective for stationary equipment, impact equipment, and pneumatic tools. Noise reduction from such sources as pile drivers, concrete vibrators, detonating hammers, compressors, and pneumatic tools can be achieved by the use of sound-shielding skins, muffling aprons, engine casings, and other enclosures made of sound absorptive materials.

The construction noise reduction measures are not always feasible. Factors such as space limitation, equipment efficiency, and other particular construction problems may limit the use of any of these methods.

7.8.4 Value Engineering

Title 23 CFR Part 627 requires the application of value engineering (VE) to all federal-aid highway projects on the National Highway System (NHS) with an estimated cost of $25 million or more. FHWA defines VE as "the systematic application of recognized techniques by a multi-disciplined team to identify the function of a product or service, establish a worth for that function, generate alternatives through the use of creative thinking, and provide the needed functions to accomplish the original purpose of the project, reliably, and at the lowest life-cycle cost without sacrificing safety, necessary quality, and environmental attributes of the project" (62 FR 6869, February 14, 1997).

Accordingly, a VE analysis would be conducted during the schematic and design phase for this project. The aim would be of improving project quality, reducing project costs, fostering innovation, eliminating

unnecessary and costly design elements, and ensuring efficient investments. The results of the analysis and associated recommendations would be considered in the development of the plans, specifications, and cost estimate.

7.9 POTENTIAL MITIGATION ENHANCEMENTS

USDOT Transportation Enhancement (USDOT TE) Program

Potential mitigation measures planned for the proposed action may be eligible for funding and implementation through the USDOT TE program. The TE program was created under ISTEA and is carried forward under TEA-21. This program was setup to encourage diverse modes of travel, foster local economic development, and bring direct benefits to communities from transportation spending. The list of qualifying TE activities provided in § 1201(a)(35) of TEA-21 are potential funding categories. The following programs listed below may be utilized as TE activities.

Only those projects that are listed in one of the 12 categories are eligible for transportation enhancement funds. Possible examples of each activity are provided below. Each project activity must demonstrate a relationship to surface transportation and could be undertaken by NTTA, City of Dallas, TxDOT, and the USACE.

1. **Pedestrians and bicycle facilities** – New or reconstructed sidewalks, walkways, or curb ramps; bike lane striping, wide paved shoulders, bus parking, and bus racks; off-road trails; bike and pedestrian bridges and underpasses.
2. **Pedestrian and bicycle safety and education activities** – A new activity under TEA-21, generally expected to include programs designed to encourage walking and bicycling.
3. **Acquisition of scenic or historic easements and sites** – Acquisition of scenic land easements, vistas, and landscapes; purchase of buildings in historic districts or historic properties; preservation of farmland.
4. **Scenic or historic highway programs, including tourist and welcome centers** – Construction of turnouts and overlooks; visitor centers and viewing areas; designation signs and markers.
5. **Landscaping and scenic beautification** – Improvements such as street furniture, lighting, public art, and landscaping along streets, historic highways, trails, and interstates, waterfronts and gateways.
6. **Historic preservation** – Preservation of buildings in historic districts; restoration and reuse of historic buildings for transportation-related purposes.

7. **Rehabilitation and operation of historic transportation buildings, structures, or facilities** – Restoration of railroad depots, bus stations, and lighthouses; rehabilitation of rail trestles, tunnels, and bridges.
8. **Conversion of abandoned railway corridors to trails** – Acquiring railroad rights-of-way; planning, designing, and constructing multi-use trails; developing rail-with-trail projects; purchasing unused railroad property for reuse.
9. **Control and removal of outdoor advertising** – Billboard inventories or removal of illegal and non-conforming billboards.
10. **Archeological planning and research** – Research, preservation, planning, and interpretation.
11. **Environmental mitigation runoff pollution and provision of wildlife connectivity** – Soil erosion controls; detention and sediment basins, river clean-ups; wildlife underpasses.
12. **Establishment of transportation museums** – Construction of new museums or additions may include the conversion of railroad stations or historic properties to museums with transportation themes.

Of the 12 categories of TE activities, the following items have potential application to the Trinity Parkway and would be considered in the development and funding of the final design:

- Pedestrians and bicycle facilities;
- Landscaping and scenic beautification;
- Historic preservation;
- Rehabilitation and operation of historic transportation buildings, structures, or facilities;
- Archeological planning and research; and
- Environmental mitigation runoff pollution and provision of wildlife connectivity.

7.10 MITIGATION COMMITMENTS

FHWA/TxDOT/NTTA and the City of Dallas have the responsibility to ensure the mitigation and enhancement measures committed to in the environmental document, as well as those contained in applicable permits, are completed satisfactorily. Similarly, it is also FHWA policy that all environmental commitments be properly maintained and operated. FHWA is required to assure compliance as part of its program management responsibilities [23 CFR 771.109(b)]. This includes review of designs, plans, specifications, estimates, and construction inspections.

The mitigation measures described below are commitments made by the NTTA and City of Dallas and would be implemented as stipulations and provisions included in contracts between the NTTA and the construction contractor(s) selected. The NTTA would be responsible for overseeing the implementation

of project commitments and monitoring construction activities to ensure that impacts beyond those described in the EIS do not occur and that all mitigation measures are implemented.

The commitment to develop project specific "mitigation plans" is included in the mitigation measures discussed below. These plans would be developed after consideration of input from the communities within the Trinity Parkway study area and the various resource agencies having jurisdictional responsibilities within the project area. In some instances, the mitigation plans for specific resources overlap with measures to mitigate other impacts (e.g., mitigation of impacts to visual resources and vegetation). Thus, measures to mitigate impacts for any particular resource may be addressed within more than one perimeter mitigation plan.

It would be necessary to revise and refine the mitigation plans as additional information is collected and design details are developed. For example, on-going hydraulic investigations and park/lake design details may require refinements be made to the visual impact mitigation plan and revegetation plan. Input from the affected communities and resource agencies would be obtained before substantive revisions are made.

Mitigation Measures

1. The NTTA would develop a construction oversight and environmental monitoring program specific to the Trinity Parkway project, which is similar to the environmental oversight program implemented for the President George Bush Turnpike (Segment IV). The purpose of the oversight and monitoring program would be to outline the activities to be implemented by the NTTA during design and construction to ensure that environmental commitments are met and mitigation measures are properly implemented.

2. A visual impact mitigation plan (VIMP) would be developed by the NTTA prior to project construction. A draft of the VIMP would be prepared after additional hydraulic data has been collected and analyzed and preliminary park and lake designs have been completed. The VIMP would specify the general methods and techniques to be used in avoiding and mitigating visual impacts resulting from the construction of new cut slopes and fill embankments and from the loss of shrubs, trees, and other vegetation. The VIMP would be developed with input from the affected communities within the study area and the land/resource management agencies with jurisdictional responsibilities within the project limits. In addition to general mitigation methods and techniques, the VIMP would include the following specific provisions:

a. NTTA has developed System-Wide Design Guidelines (2003) which places emphasis on the “View From” view shed to maximize patron experience. The “View From” includes everything within the NTTA main lane view shed and includes components of color, lighting, signage, walls, bridges, fence, soils, toll plaza, and landscapes.
b. Retaining wall structures or other slope stabilization techniques would be used where a constructed cut or fill slope would result in excessive vegetation disturbance and visual impact outside of the existing highway right-of-way. For the purposes of the DEIS, “excessive” is defined as disturbance extending more than about 50 feet beyond the existing right-of-way fence. In this instance, the height of retaining walls would generally be limited to a maximum height of 15 to 25 feet. Some locations may require larger retaining walls or other slope stabilization treatments due to unstable substrate.
c. Short retaining walls (6 feet in height or less) would be used in locations where a wall would eliminate the need for a cut or fill slope or reduce the extent of disturbance to vegetation and visual impact by more than 50 percent of the existing vegetation.
d. Retaining wall structures or other slope stabilization techniques would be used to prevent fill embankments from encroaching into the Trinity River, outfall channels, or interior sumps.
e. New cut and fill slopes would be revegetated where the soil conditions and slope grade make revegetation feasible. Commercial methods and other special techniques would be used to establish root systems on slopes with a grade steeper than 3:1. Where soil conditions or grade makes slope revegetation unfeasible, alternative slope protection measures would be implemented to prevent erosion.
f. Removal of trees would be limited to only those trees that must be removed for construction. A pre-construction survey involving the NTTA and the construction team would be conducted to determine which mature trees are to be removed and which can be avoided. Trees to be avoided would be clearly marked in the field for easy identification by equipment operators. Monitoring of construction activities would be conducted to ensure that all special requirements for tree removal are followed by the contractor.
g. Depending on which alternative is identified as the preferred alternative, a tree enhancement plan would be developed that specifies the locations where trees are to be planted, and the replacement ratio, tree size, type, and planting technique that would be used to replace trees impacted by project construction. If a river alternative (Alternative 3A, 3B, 4, or 5) is identified as the preferred alternative, the planting of trees associated within the Dallas Floodway would be determined after considering input from USACE and the desires of the City of Dallas. The tree enhancement plan would be developed by the NTTA with input from the communities within the study area and state and federal land

and resource management agencies having jurisdictional authority within the project area.

3. Temporary impacts to vegetation would be minimized by limiting construction activities to the minimum area needed to complete the necessary improvements to the tollway. A pre-construction conference and field review involving NTTA staff and construction contractors would be held prior to the start of project construction to establish and review the locations and boundaries of construction. Subsequent to the pre-construction conference and field review, a report would be prepared that identifies areas to be avoided during project construction and identifies any other special provisions to be followed by the contractor. The limits of construction staging areas would be surveyed and staked in the field prior to construction.

4. A revegetation plan would be developed prior to project construction that specifies the areas to be revegetated, species of plants to be used for revegetation, and the techniques to be used to revegetate disturbed areas. The revegetation plan would also identify the special techniques to be used to establish vegetation on steep slopes (i.e. slopes with a grade steeper then 3:1) or alternative techniques and measures to prevent erosion. The revegetation plan would be developed in consultation with wildlife and land management agencies and would specify the use of plant species that are native to the project area and that would enhance the quality of habitat within the right-of-way. In addition to general mitigation methods and techniques, the revegetation plan would include the following specific provisions:
    a. Stands of riparian hardwoods affected by construction would be replaced by replanting similar species along the Trinity River.
    b. All riparian habitat lost to construction would be replaced within the general study area in accordance with the City of Dallas Vegetation Ordinance.

5. A plan to avoid and minimize effects to threatened or endangered species and to minimize impacts to wildlife would be developed prior to project construction. The plan would be developed in consultation with wildlife and land management agencies and would include, but would not be limited to, the following specific provisions:
    a. An interior least tern survey would be conducted prior to construction to document the condition and location of interior least tern populations within the study area. The surveys would also serve to determine the presence of other species that may require special treatment. The locations of nest areas and important roost sites would be discussed with the construction team and flagged for avoidance. The need for avoidance measures would be determined in collaboration with the USFWS and applicable land

management agency, depending on location. The wildlife survey would be conducted in collaboration with the USFWS.

6. A wetland mitigation plan would be prepared prior to project construction. This plan would be developed in collaboration with the USACE and the USFWS. Location of replacement wetlands and methods to restore impacted wetlands would be included in the mitigation plan. The wetland mitigation plan would document the impacts of the proposed Trinity Parkway and its mitigation requirements. The wetland mitigation plan would also evaluate the proposed lake and habitat restoration components of the *BVP*.

7. Impacts to water quality and flood plains would be avoided and/or mitigated by the following measures.
    a. A SW3P would be prepared in accordance with the NPDES/TPDES requirements. The SW3P would identify specific measures and techniques to prevent excessive silt and/or chemical contaminants from being washed into perennial streams and ephemeral drainages during storm events.
    b. Construction of new structures that involves dredging and filling in waters of the U.S. would be conducted in accordance to the requirements of § 401 and § 404 of the CWA. Coordination with the USACE and TCEQ would continue through project design to ensure the CWA BMP requirements are included in construction plans. Oversight and monitoring of project construction by the NTTA would be provided to ensure that the SW3P, § 401, and § 404 permit requirements are followed. An oversight and monitoring plan would be developed in collaboration with the USACE and TCEQ.
    c. Planning and design of all drainage structures would be coordinated with the Regulatory Branch of the USACE pursuant to § 404 of the CWA. All conditions and requirements of § 404 authorization for drainage crossings would be complied within their entirety during the final design phase of the project to ensure that floodplain capacity is not reduced and that floodplain management or development plans are not impaired.
    d. Any construction in the floodplain would be required to preserve existing valley storage and a detailed hydraulic analysis, fill permits and CDC review would take place by FEMA, City of Dallas, NCTCOG, and USACE.

8. Impacts to cultural resources would be mitigated by the following measures:
    a. Measures to avoid or mitigate impacts to archaeological sites, historic properties, and other cultural recourses would be developed in collaboration with the SHPO. The current DFE PA between the THC and the USACE would be used as a guide.

b. Retaining walls or other slope stabilization techniques would be used to prevent slope encroachment into an archaeological or historic site the SHPO determines must be preserved in place.

c. Sites used to obtain fill material and/or in construction zone areas would be surveyed for cultural resources and threatened and endangered species. These surveys would be the responsibility of the contractor and would be monitored by the NTTA.

d. A cultural resource mitigation plan would be prepared with the overall goal of preservation and protection of the archaeological and historic resources in the project area. General design guidelines for preservation consideration include:

    1. Minimize impacts to historic buildings/structures or historic districts.
    2. All efforts should be made to preserve historic resources intact and on their original site.
    3. Additions and alterations to original structures should be kept to a minimum. If additions or alterations are necessary, every effort should be made to retain historic material, setting, workmanship, and design.
    4. When new construction is required near bridges, connections, links, approaches, and access should occur at a point of least disruption to the original bridge. New construction should not compromise the views to and from the historic bridges (i.e. no flyovers, etc.).
    5. New construction or additions/alterations should be distinctive from the original historic bridge and be reflective of the original design and intent, but not mimic it. Everything should be complementary.
    6. Secondary elements associated with the bridges should be preserved or enhanced. Lighting, railing, support structures, etc. may be important architectural parts to the overall whole of the bridge. Removal or replacement of these should have inkind material and design.

9. Impacts to the individual property owners and the general communities affected by the project would be mitigated by the following measures:

    a. The acquisition of residences, structures, property, and any resulting relocations of persons and businesses would be conducted in accordance with federal and state laws including the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title VI.

    b. A community enhancement program would be developed by the NTTA in collaboration with the communities within the study area. Community enhancements may include sidewalks and access considerations, lighting, landscaping, trail/park access, and noise barriers.

c. Emergency medical service providers would be consulted during the design phase to develop an emergency response plan that would provide continuous and acceptable service during project construction.
d. Access to roadside businesses, side roads, and driveways would be maintained throughout construction.
e. A new intersection of the frontage road and US-175 immediately east of Starks Avenue would be provided to replace the intersection to be closed at Starks Avenue.

10. If necessary, a hazardous material mitigation plan would be developed to investigate and characterize the right-of-way and construction areas. The site characterization and closure plans will be overseen by the TCEQ.

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Chapter 8

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Chapter 9

Circulation of the Draft Environmental Impact Statement

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CHAPTER 9

CIRCULATION OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT

Following is a list of all entities from which comments on this DEIS are being requested. Subsequent NEPA documentation will identify those entities that submitted comments on the DEIS and those receiving a copy of the DEIS.

- City of Dallas
- Dallas County
- Federal Emergency Management Agency
- North Central Texas Council of Governments
- Texas Department of Transportation
- Texas Historical Commission
- Texas Commission on Environmental Quality
- Texas Parks and Wildlife Department
- United States Army Corps of Engineers
- United States Coast Guard
- United States Department of Agriculture, Natural Resources Conservation Service
- United States Department of Housing and Urban Development
- United States Department of Interior
- United States Environmental Protection Agency
- United States Fish and Wildlife Service

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Chapter 10

Comments and Coordination

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CHAPTER 10
COMMENTS AND COORDINATION

10.0 INTRODUCTION

Active public involvement is critical to the success of any project with the potential to impact (beneficial/adverse) the human environment. The preparation of this DEIS, therefore, involved extensive coordination and consultation with the affected public. The affected public includes not only the study area residents, including individuals, groups, clubs, and other social institutions, but also businesses and organizations operating within the study corridor, and public officials and agencies with regulatory oversight and other administrative responsibilities within the study area. This section provides a brief summary of the agency coordination and public involvement that occurred during the preparation of the DEIS. A listing by date of Agency and Public Participation Events and the Public Scoping Meeting Summary is included in **Appendix A**.

10.1 PUBLIC INVOLVEMENT

The initial public involvement opportunity occurred at the Public Scoping Meeting held on July 8, 1999. The meeting notification process included direct mailings to interested citizens, property owners, and elected officials; three legal advertisements in local newspapers; and a paid advertisement in a local newspaper. The purpose of the meeting was to initiate public involvement and identify the range of alternatives, environmental impacts, and important issues to be addressed in the EIS. The meeting opened with an approximate 1-hour technical presentation summarizing the role of NTTA, the results of the TxDOT *Trinity Parkway Corridor Major Transportation Investment Study*, and information concerning public/agency involvement, environmental issues, alternatives, and the project schedule. Exhibits were displayed showing existing and projected traffic problems, the proposed study area with the preliminary build alternatives, existing land use, and diagrams of typical sections. Each attendee was given a handout that included the meeting agenda, copies of slides used during the presentation, an information sheet, a returnable comment sheet, and the City of Dallas *Trinity River Corridor 1998 Year in Review*. After the technical presentation and a short intermission, the attendees were asked to present verbal and written comments concerning scoping issues to be addressed in the EIS.

Continuing public involvement has occurred through monthly meetings of the Community Advisory Work Group (CAWG). The CAWG is composed of members of the community who volunteer their time to stay involved in the study through regular meetings and other activities. The CAWG was intended to provide broad-based representation of the community at large, but on a smaller scale to provide a

reasonably sized working group. The group's primary role was to monitor the study process from the community perspective and to provide input, ideas, and concerns to the study team. The CAWG was composed of roughly equal representation from the following sectors of the community:

- Neighborhood Associations and places of worship;
- Business interests and land owners;
- Environmental and recreational interests;
- Civic groups and chambers of commerce;
- Local governments; and
- Local agencies.

The identification of the representatives for *Neighborhood Associations and Places of Worship* was carried out in small group meetings at recreation centers and other suitable sites within identified neighborhood clusters in the project study area. At small group meetings in these neighborhoods, members of the community were requested to volunteer as representatives for their area.

Additionally, briefings and presentations have been made to the following: NTTA Board of Directors, the Trinity River Corridor Citizens Committee, Recreation, Economic Development, and Transportation Sub-committee, Dallas Plan Conference, Richardson Church Group, Richardson Chamber of Commerce, West Dallas Business Association, T.R. Hoover (South Dallas) Neighborhood Association, Stemmons Corridor Business Association, Industrial Corridor Businesses, Oak Cliff Chamber of Commerce, New Hope Baptist Church, Water Environment Association of Texas, Greater Dallas Chamber of Commerce, Dallas City Council, Dallas Landmark Commission, American Society of Landscape Architects – DFW Section, American Institute of Architects – Dallas Chapter, North Dallas Shepard Center, Dallas County Judge Jackson, and State Representative Yvonne Davis.

10.2 AGENCY COORDINATION

An initial Interagency Scoping Meeting was held on **May 17, 1999** to introduce the project concept, review the alignment alternatives, and identify environmental resource concerns. Participants included the FHWA, TxDOT, USACE, EPA, City of Dallas, and NTTA.

On **June 16, 1999**, the NTTA, in cooperation with the FHWA, TxDOT, and the City of Dallas, published a NOI in the *Federal Register* to prepare an EIS for the proposed project.

Additional Interagency Scoping Meetings were held on **July 6**, **August 10**, and **September 8, 1999** to further identify environmental resource issues. The August and September meetings included bus tours of the project study area.
On **January 10, 2000**, a meeting with the SHPO was held to define the APEs for cultural resources. Coordination with the SHPO under §106 of the NHPA was initiated by letter, dated June 5, 2002.

On **December 12, 2000**, the FHWA issued a supplementary NOI in the *Federal Register* to include in the EIS an evaluation of the proposed City of Dallas Lake Plan (*Trinity River Corridor MIP*). The supplementary NOI was issued because additional analysis is needed to fully address the impacts of potential joint development of these projects (see **Section 3.1.1.4 Potential Joint Development Projects**).

On **January 17, 2001**, a meeting and bus tour was held with members of the THC, TxDOT, NTTA, City of Dallas, and consultant architects to categorize for potential historic significance those structures that may be displaced by each alternative alignment.

Monthly Trinity River Interagency Executive Team Meetings have provided continuing agency involvement. These meetings started on **June 29, 1999** and have occurred on a monthly basis to date. The Trinity River Interagency Executive Team includes staff from the following organizations: City of Dallas Trinity River Corridor Project Office, USACE, TCEQ, EPA, TxDOT, NCTCOG Dallas County, and NTTA.

Numerous agency coordination meetings have been conducted with the FHWA, USACE, EPA, TXDOT, City of Dallas, and NTTA to discuss various aspects of the proposed project. A listing of Agency Coordination Meetings is presented in **Appendix A**.

Once a preferred alternative is identified, future meetings will be held with citizen special interest groups neighborhood groups and business groups where impacts are anticipated.

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Chapter 11

Commonly Used Acronyms/Abbreviations

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CHAPTER 11
COMMONLY USED ACRONYMS/ABBREVIATIONS

11.0 COMMONLY USED ACRONYMS

AAA	American Automobile Association
AASHTO	American Association of State Highway and Transportation Officials
ACHP	Advisory Council on Historic Preservation
ACM	Automatic Coin Machine
ADA	American's with Disabilities Act
ADP	Automatic Data Processing
ADT	Average Daily Traffic
APE	Area of Potential Effects
AQCR	Air Quality Control Region
AST	Above Ground Storage Tank
ASTM	American Society for Testing and Materials
AT&SF	Atchison, Topeka, and Santa Fe
AVI	Automatic Vehicle Identification
AWQMP	Annual Water Quality Management Plan
BEA	Bureau of Economic Analysis
BG	Block Group
BLM	Bureau of Land Management
BMP	Best Management Practice
BN	Burlington Northern and Santa Fe
BOD	Biochemical Oxygen Demand
BRIT	Botanical Research Institute of Texas
BTU	British Thermal Units
BVP	Balanced Vision Plan
C	Celsius
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAWG	Community Advisory Work Group
CBD	Central Business District
CDC	Corridor Development Certificate
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System

CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CGP	Construction General Permit
CLI	Closed Landfill Inventory
CLOMR	Conditional Letter of Map Revision
cm	Centimeter
CMAQ	Congestion Mitigation and Air Quality
CMS	Congestion Management System
CMSA	Consolidated Metropolitan Statistical Area
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CORRACTS	Corrective Action System
CRP	Clean Rivers Program
CRWR	Center for Research in Water Resources
CSD	Context-Sensitive Design
CSJ	Control-Section-Job
CT	Census Tract
CTTC	Council Transportation and Telecommunication Committee
CVO	Commercial Vehicle Operations
CWA	Clean Water Act
CWWTP	Central Wastewater Treatment Plant
DART	Dallas Area Rapid Transit
dB	Decibel
dBA	Decibel (A-Weighed Scale)
DBH	Diameter at Breast Height
DEIS	Draft Environmental Impact Statement
DFE	Dallas Floodway Extension
DFW	Dallas-Fort Worth
DFWRTM	Dallas-Fort Worth Regional Travel Model
DGNO	Dallas Garland and Northeastern Railroad
DHA	Dallas Housing Authority
DHV	Design Hourly Volume
DISD	Dallas Independent School District
DNT	Dallas North Tollway
DO	Dissolved Oxygen
DOI	Department of Interior
DOT	Department of Transportation

DRMC	Dallas Regional Mobility Coalition
DWU	Dallas Water Utilities
e.g.,	exempli grantia (for example)
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
EQ	Environmental Quality
ER	Engineer Regulation
ESA	Endangered Species Act
ESL	English as a Second Language
et al.	et alia (and others)
ETC	Estimated Time of Completion
Etc.	et cetera (and so forth)
ETR	Employer Trip Reduction
F	Fahrenheit
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHA	Federal Highway Administration
FHBM	Flood Hazard Boundary Map
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
FP	Floodplain
FPEIS	Final Programmatic Environmental Impact Statement
FPPA	Farmland Protection Policy Act
FR	Federal Register
FTA	Federal Transit Administration
FWCA	Fish and Wildlife Coordination Act
GVW	Gross Vehicle Weight
HA	Hectare
HABS/HAER	Historic American Building Survey / Historic American Engineering Record
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HEC-RAS	Hydrologic Engineering Center - River Analysis System
HHS	U.S. Department of Health and Human Services
HOA	Home Owner's Association

HOT	High-Occupancy Toll
HOV	High-Occupancy Vehicle or High-Occupant Vehicle
HSW	Hazardous and Solid Waste
HUD	Department of Housing and Urban Development
i.e.,	id est (that is)
IH	Interstate Highway
IH-20	Interstate Highway 20
IH-30	Interstate Highway 30
IH-35 E	Interstate Highway 35 East
IH-45	Interstate Highway 45
IH-635	Interstate Highway 635
IOP	Innocent Owner/Operator Program
ISA	Initial Site Assessment
ISD	Independent School District
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITS	Intelligent Transportation Systems
KCS	Kansas City Southern Railroad
Kg	Kilogram
Km	Kilometer
KOP	Key Observation Point
L	Liter
LBP	Lead-Based Paint
L_{dn}	24-hour Equivalent Sound Level
LEP	Limited English Proficiency
L_{eq}	1-hour Steady State Equivalent Sound Level
LOS	Level of Service
LPA	Locally Preferred Alternative
LPIS	Locally Preferred Investment Strategy
LPP	Locally Preferred Plan
LQG	Large Quantity Generator
LRT	Light Rail Transit
LUP	Land Use Plan
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund Act of 1965
MBTA	Migratory Bird Treaty Act
MFT	Federal Motor Fuels Tax
mg/L	Milligrams per Liter

mg/m^3	Milligrams per Cubic Meter
mgd	Million Gallons Per Day
MIP	Master Implementation Plan
MIS	Major Investment Study
MKT	Missouri Kansas and Topeka Railroad
MLK	Martin Luther King, Jr.
MOA	Memorandum of Agreement
MOE	Measure of Effectiveness
MPA	Metropolitan Planning Area
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MSL	Mean Sea Level
MTIS	Major Transportation Investment Study
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAFTA	North American Free Trade Agreement
NCTCOG	North Central Texas Council of Governments
ND	Neighborhood District
NE	Northeast
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NHS	National Highway System
NIST	National Institute of Standards and Technology
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places

NTTA	North Texas Tollway Authority
NW	Northwest
NWI	National Wetlands Inventory
NWP	Nationwide Permit
O_3	Ozone
OU	Operable Unit
OHWM	Ordinary High Water Mark
PA	Programmatic Agreement
PARD	Park and Recreation Department
Pb	Lead
PCB	Polychlorinated Biphenyls
PDP	Project Development Plan
PE	Preliminary Engineering
PEIS	Programmatic Environmental Impact Statement
PL	Public Law
PM_{10}	Particulate Matter (Less Than 10 Microns In Diameter)
$PM_{2.5}$	Particulate Matter (Less Than 2.5 Microns In Diameter)
PMSA	Primary Metropolitan Statistical Area
PPB	Parts Per Billion
PPM	Parts Per Million
PS & E	Plans, Specifications, and Estimates
PUC	Public Utility Commission
PWA	Public Works Administration
QT	Quaternary Terrace
RAATS	RCRA Administrative Action Tracking System
RAP	Relocation Assistance Program
RCRA	Resource Conservation and Recovery Act
RCRIS	Resource Conservation and Recovery Information System
RIMS II	Regional Input-Output Modeling System II
RIS	Research and Information Services
RLT	R.L. Thornton
ROD	Record of Decision
RPO	Regional Planning Office
RST	Registered Storage Tank
RTC	Regional Transportation Council
RTP	Regional Transportation Plan
SAL	State Archeological Landmarks

SDEIS	Supplemental Draft Environmental Impact Statement
SDHPT	State Department of Highways and Public Transportation
SE	Southeast
SFEIS	Supplemental Final Environmental Impact Statement
SH	State Highway
SH-183	State Highway 183
SH-310	State Highway 310
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMSA	Standard Metropolitan Statistical Area
SMU	Southern Methodist University
SO_2	Sulfur Dioxide
SOV	Single-Occupancy Vehicle or Single-Occupant Vehicle
SP	Southern Pacific
SP-366	Spur 366
SPF	Standard Project Flood
SQG	Small Quantity Generator
SVOC	Semi-Volatile Organic Compounds
SW	Southwest
SW3P	Storm Water Pollution Prevention Plan
SWF/LF	Solid Waste Facility / Landfill
SWQM	State Water Quality Monitoring
TAC	Texas Administrative Code
TAQA	Traffic Air Quality Analysis
TCEQ	Texas Commission on Environmental Quality
TCM	Transportation Control Measures
TDA	Teas Department of Agriculture
TDH	Texas Department of Health
TDM	Travel Demand Management
TDML	Total Maximum Daily Load
TDS	Total Dissolved Solids
TE	Transportation Enhancement
TEA-21	Transportation Equity Act for the 21st Century
TEC	Texas Employment Commission
THC	Texas Historical Commission
TIF	Tax Increment Financing
TIP	Transportation Improvement Program

TMA	Transportation Management Area
TMDL	Total Maximum Daily Load
TMF	Texas Mobile Fund
TMP	Traffic Management Plan
TNHP	Texas Natural Heritage Program
TNM	Traffic Noise Model
TOC	Total Organic Carbon
TORP	Texas Outdoor Recreational Plan
TPC	Trinity Parkway Corridor
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TRA	Trinity River Authority
TRCCC	Trinity River Corridor Citizens Committee
TRE	Trinity Railway Express
TSD	Treatment, Storage, or Disposal
TSM	Transportation System Management
TSS	Total Suspended Solids
TSWQS	Texas Surface Water Quality Standards
TTA	Texas Turnpike Authority
TTAC	Trinity Trails Advisory Committee
TTC	Texas Transportation Commission
TTI	Texas Transportation Institute
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
TxDOT-ENV	Texas Department of Transportation – Environmental Affairs Division
TXI	Texas Industries
TXU	Texas Utilities
UD/TX	University of Dallas / Texas Stadium
UP	Union Pacific
U.S.	United States
US-175	United States Highway 175
US-75	United States Highway 75
USACE	United States Army Corps of Engineers
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOI	United States Department of Interior

USDOT	United States Department of Transportation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTP	Unified Transportation Plan
VIMP	Visual Impact Mitigation Plan
VCP	Voluntary Cleanup Program
VE	Value Engineering
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VPD	Vehicles Per Day
VPH	Vehicles Per Hour
WEAT	Water Environment Association of Texas
WRDA	Water Resource Development Act
WSA	Wilbur Smith Associates
$\mu g/m^3$	Micrograms per Cubic Meter
§	Section
®	Registered Trademark
°	Degree

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Chapter 12

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NOTE:

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[END OF CHAPTER 13]

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