



APRIL 2018

COTTON BELT CORRIDOR REGIONAL RAIL PROJECT **DRAFT ENVIRONMENTAL IMPACT STATEMENT**

COTTON BELT

PREPARED BY:
US DEPARTMENT OF TRANSPORTATION (USDOT)
FEDERAL TRANSIT ADMINISTRATION (FTA)
DALLAS AREA RAPID TRANSIT (DART)

IN COOPERATION WITH:
FEDERAL AVIATION ADMINISTRATION (FAA)

**COTTON BELT CORRIDOR REGIONAL RAIL PROJECT
DFW INTERNATIONAL AIRPORT TO PLANO, TEXAS
TARRANT, DALLAS & COLLIN COUNTIES, TEXAS
DRAFT ENVIRONMENTAL IMPACT STATEMENT**

**Prepared by
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION
FEDERAL AVIATION ADMINISTRATION (cooperating agency)
DALLAS AREA RAPID TRANSIT**

Applicable federal environmental laws, regulations, and executive orders during the environmental review process. These requirements include, but are not limited to: National Environmental Policy Act of 1969 (42 USC § 4321 et seq.); applicable Federal Transit Laws (49 USC § 5301 et seq.); Department of Transportation Act of 1966, Section 4(f) (49 USC § 303 and 23 USC §138); National Historic Preservation Act of 1966, Section 106 (54 USC § 306108 et seq.); Clean Water Act (33 USC § 1251 et seq.); Endangered Species Act of 1973 (16 USC § 1531 et seq.); Clean Air Act (42 USC § 7401 et seq.); Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 et seq.); the Council on Environmental Quality implementing NEPA (40 CFR Parts 1500-1508) and FTA's regulations on environmental impact and related procedures (23 CFR Parts 771 and 774); Executive Order 11988 (Floodplain Management); Executive Order 11990 (Protection of Wetlands); Executive Order 12898 (Environmental Justice); USDOT Order 561 0.2(a) Environmental Justice); Federal Aviation Administration Authorization Act, Title 49 USC 47107(a)(16); FAA Order 1050.1 F, Environmental Impacts: Policies and Procedures, and Order 5050.4B, the National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions; and all relevant laws, regulations, and procedures of the State of Texas, among others

by the
U.S. Department of Transportation, Federal Transit Administration
in cooperation with the Federal Aviation Administration
and Dallas Area Rapid Transit

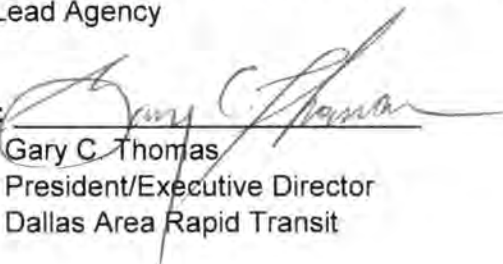
The Federal Transit Administration will issue a single document that consists of the Final Environmental Impact Statement and Record of Decision pursuant to 23 USC 139(n)(2) unless it is determined that statutory criteria or practicability considerations preclude issuance of such a combined document.

For FTA: 

Robert C. Patrick

Regional Administrator, Federal Transit Administration Region 6,
Lead Agency

Date: 4/6/18

For DART: 

Gary C. Thomas
President/Executive Director
Dallas Area Rapid Transit

Date: 4/2/2018

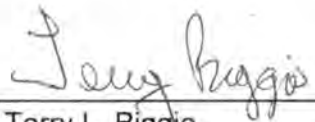
**COTTON BELT CORRIDOR REGIONAL RAIL PROJECT
DFW INTERNATIONAL AIRPORT TO PLANO, TEXAS
TARRANT, DALLAS & COLLIN COUNTIES, TEXAS
DRAFT ENVIRONMENTAL IMPACT STATEMENT**

**Prepared by
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL TRANSIT ADMINISTRATION
FEDERAL AVIATION ADMINISTRATION (cooperating agency)
DALLAS AREA RAPID TRANSIT**

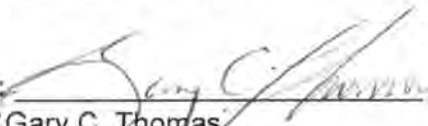
Applicable federal environmental laws, regulations, and executive orders during the environmental review process. These requirements include, but are not limited to: National Environmental Policy Act of 1969 (42 USC § 4321 et seq.); applicable Federal Transit Laws (49 USC § 5301 et seq.); Department of Transportation Act of 1966, Section 4(f) (49 USC § 303 and 23 USC §138); National Historic Preservation Act of 1966, Section 106 (54 USC § 306108 et seq.); Clean Water Act (33 USC § 1251 et seq.); Endangered Species Act of 1973 (16 USC § 1531 et seq.); Clean Air Act (42 USC § 7401 et seq.); Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (42 USC § 4601 et seq.); the Council on Environmental Quality implementing NEPA (40 CFR Parts 1500-1508) and FTA's regulations on environmental impact and related procedures (23 CFR Parts 771 and 774); Executive Order 11988 (Floodplain Management); Executive Order 11990 (Protection of Wetlands); Executive Order 12898 (Environmental Justice); USDOT Order 561 0.2(a) Environmental Justice); Federal Aviation Administration Authorization Act, Title 49 USC 47107(a)(16); FAA Order 1050.1 F, Environmental Impacts: Policies and Procedures, and Order 5050.4B, the National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions; and all relevant laws, regulations, and procedures of the State of Texas, among others

by the
U.S. Department of Transportation, Federal Transit Administration
in cooperation with the Federal Aviation Administration
and Dallas Area Rapid Transit

The Federal Transit Administration will issue a single document that consists of the Final Environmental Impact Statement and Record of Decision pursuant to 23 USC 139(n)(2) unless it is determined that statutory criteria or practicability considerations preclude issuance of such a combined document.

For FAA: 
Terry L. Biggio
Regional Administrator, Southwest Region
Federal Aviation Administration
Cooperating Agency

Date: 4/10/12

For DART: 
Gary C. Thomas
President/Executive Director
Dallas Area Rapid Transit

Date: 4/2/2015

COVER SHEET

Abstract: The Federal Transit Administration (FTA) as the federal lead agency, in cooperation with DART as the local project sponsor, provides this Draft Environmental Impact Statement (DEIS) for the Cotton Belt Corridor Regional Rail Project (Project) in Tarrant, Dallas and Collin counties, Texas. The Federal Aviation Administration (FAA) will serve as a cooperating agency for the DEIS. The DEIS for the Project has been prepared in accordance with regulations developed by the Council on Environmental Quality for the National Environmental Policy Act (NEPA) and the U.S. Department of Transportation's Federal Transit Administration (FTA) ***Environmental Impact and Related Procedures (23 CFR Parts 771 and 774)***, as well as FAA Order 1050.1F, ***Environmental Impacts: Policies and Procedures***, and FAA Order 5050.4B, the ***National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions***.

The Project would provide a new 26-mile regional rail line that extends from DFW Airport Terminal B in Tarrant County to Shiloh Road in Plano. Two alternatives are being considered in this DEIS, a No-Build Alternative and a Build Alternative. The DEIS identifies the Build Alternative as the preferred alternative. The No-Build Alternative includes transportation and transit projects that have a reasonable expectation of funding and are programmed for implementation. The No-Build Alternative is used as a basis for determining the potential environmental impacts that would be associated with the proposed Build Alternative. The Build Alternative would provide connections to major activity centers, employment centers, community resources, and other regional transit services. This DEIS identifies the Build Alternative as the preferred Alternative. FTA and DART will examine the public and agency comments received during the DEIS public circulation period, make a final decision based on the input received, and advance the selected alternative for implementation.

The potential impacts of the Build and No-Build Alternatives are identified in a broad range of environmental categories including but not limited to: land use, transportation, air quality, noise, vibration, visual and aesthetic, ecosystems, hazardous materials, cultural resources, parklands, safety and security, and neighborhoods.

The FTA will issue a single document that consists of the Final Environmental Impact Statement and Record of Decision pursuant to 23 USC 139(n)(2) unless it is determined that statutory criteria or practicability considerations preclude issuance of such a combined document.

Comments: The Draft Environmental Impact Statement will be available to the public for a 45-day review and comment period from April 20, 2018 to June 4, 2018. Public hearings will be conducted during the review and comment period at the following locations:

May 14, 2018 – 6:30 pm

Renaissance Dallas Addison
Lalique Ballroom
15201 Dallas Parkway
Addison, TX 75001

May 15, 2018 – 6:30 pm

Richardson Civic Center
Grand Ballroom
411 W. Arapaho Road
Richardson, TX 75080

May 16, 2018 – 6:30 pm

DFW Airport Marriott
8440 Freeport Parkway
Irving, TX 75063

During the 45-day review and comment period, the DEIS will be available at the following local libraries:

- Carrollton Public Library at Josey Ranch Lake – 1700 Keller Springs Road, Carrollton, TX 75006
- Cozby Library and Community Commons – 177 N. Heartz Road, Coppell, TX 75019
- Fretz Park Branch Library – 6990 Belt Line Road, Dallas, TX 75254
- Grapevine Public Library – 1201 Municipal Way, Grapevine, TX 76051
- Harrington Library – 1501 18th Street, Plano, TX 75074
- Park Forest Branch Library – 3421 Forest Lane, Dallas, TX 75234
- Richardson Public Library – 900 Civic Center Drive, Richardson, TX 75080

In addition, the Draft Environmental Impact Statement will be available for review on-line at www.DART.org/cottonbelt.

For further information concerning this document, contact the following individuals:

FTA Regional Contact

Melissa Foreman
Community Planner
Federal Transit Administration
Region 6
819 E. Taylor
Room 14A02
Fort Worth, Texas 76102

FAA Regional Contact

John MacFarlane
Environmental Protection Specialist
FAA-Southwest Regional Office
Airports Division
Texas Airports District Office
10101 Hillwood Parkway
Fort Worth, TX 76177

Local Agency Contact

John Hoppie
Project Manager
Dallas Area Rapid Transit
P.O. Box 660163
Dallas, TX 75266-7213

DART has established an email address for receiving comments on the document: CottonBelt@DART.org. Additionally, comments on this document may be made orally at the public hearings or submitted in writing to Mr. Hoppie at the above address. For additional information or special needs accommodations, visit DART.org/cottonbelt or contact DART Community Engagement at (214) 749-2522.



Table of Contents

Executive Summary	E-1
1. Purpose and Need	1-1
1.1 Introduction	1-1
1.2 Project Background and Regional Context	1-1
1.3 Corridor Study Area	1-3
1.4 Purpose and Need for the Proposed Action	1-9
1.5 Planning Context	1-12
2. Alternatives Considered	2-1
2.1 Planning History	2-1
2.2 No-Build Alternative	2-1
2.3 Proposed Build Alternative	2-2
2.3.1 Alignment	2-2
2.3.2 New Technology Rail Vehicle	2-22
2.3.3 Equipment Maintenance Facility	2-22
2.3.4 Relocation of Mercer Yard	2-25
2.4 Operating Plan	2-25
2.4.1 Service Levels	2-25
2.4.2 Train Control and Communications	2-25
2.4.3 Fare Collection System	2-27
2.4.4 Travel Time	2-27
2.4.5 Terminal Times	2-28
2.4.6 Bus Route Modifications	2-28
2.5 Alternatives Considered but Eliminated from Further Consideration	2-31
2.5.1 Railroad Only Options	2-31
2.5.2 North Dallas Profile Options	2-31
2.5.3 LRT (Orange Line) Phase II	2-33
2.6 Cotton Belt Regional Trail	2-34
2.6.1 Trail Cost Estimate and Funding	2-35
3. Affected Environment	3-1
3.1 Introduction and Study Area	3-1
3.2 Land Use and Zoning	3-1
3.3 Socioeconomic Characteristics and Cohesion	3-10
3.4 Parks and Recreation Facilities	3-24
3.5 Cultural Resources	3-31
3.6 Visual and Aesthetic Conditions	3-34
3.7 Soils and Geology	3-40
3.8 Hydrology and Floodplain	3-41
3.9 Wetlands and Other Waters of the US	3-43
3.10 Water Quality	3-45
3.11 Air Quality	3-46
3.12 Noise	3-48
3.13 Vibration	3-52
3.14 Hazardous and Regulated Materials	3-56
3.15 Biological and Natural Resources	3-58
4. Environmental Consequences and Mitigation	4-1
4.1 Introduction	4-1
4.2 Land Use	4-1
4.2.1 Impact Evaluation	4-1
4.2.2 Mitigation Measures	4-2
4.3 Socioeconomic Characteristics and Cohesion	4-2
4.3.1 Impact Evaluation	4-2
4.3.2 Mitigation Measures	4-10
4.4 Acquisitions and Displacements	4-11
4.4.1 Impact Evaluation	4-11



4.4.2	Mitigation Measures	4-15
4.5	Parks and Recreation Facilities	4-16
4.5.1	Impact Evaluation	4-16
4.5.2	Mitigation Measures	4-19
4.6	Cultural Resources	4-20
4.6.1	Impact Evaluation	4-20
4.6.2	Mitigation Measures	4-22
4.7	Visual and Aesthetic Conditions	4-24
4.7.1	Impact Evaluation	4-24
4.7.2	Mitigation Measures	4-29
4.8	Public Safety and Security	4-30
4.8.1	Impact Evaluation	4-30
4.8.2	Mitigation Measures	4-31
4.9	Environmental Justice	4-33
4.9.1	Impact Evaluation	4-34
4.9.2	Mitigation Measures	4-42
4.10	Soils and Geology	4-42
4.10.1	Impact Evaluation	4-42
4.10.2	Mitigation Measures	4-43
4.11	Hydrology and Floodplain	4-43
4.11.1	Floodplains Impact Evaluation	4-43
4.11.2	Floodplain and Hydrology Mitigation Measures	4-44
4.11.3	Surface Water Quality Impact Evaluation	4-45
4.11.4	Surface Quality Mitigation Measures	4-46
4.11.5	Groundwater Resources Impact Evaluation	4-46
4.11.6	Mitigation of Impacts to Groundwater Resources	4-46
4.12	Wetlands Resources	4-46
4.12.1	Impact Evaluation	4-47
4.12.2	Mitigation Measures	4-52
4.13	Air Quality	4-52
4.13.1	Impact Evaluation	4-52
4.14	Noise	4-54
4.14.1	Noise Impact Assessment Methodology	4-54
4.14.2	Impact Evaluation	4-56
4.14.3	Mitigation Measures	4-57
4.15	Vibration	4-72
4.15.1	Impact Evaluation	4-72
4.15.2	Mitigation Measures	4-74
4.16	Hazardous and Regulated Materials	4-79
4.16.1	Impact Evaluation	4-79
4.16.2	Mitigation Measures	4-79
4.17	Biological and Natural Resources	4-90
4.17.1	Impact Evaluation	4-90
4.17.2	Mitigation Measures	4-91
4.18	Relationship between the Short-term use of the Environment and the Maintenance and Enhancement of Long-term Productivity	4-93
4.18.1	Impact Evaluation	4-93
4.18.2	Mitigation Measures	4-93
4.19	Irreversible or Irretrievable Commitment of Resources	4-94
4.20	Indirect and Cumulative Impacts	4-94
4.21	Construction Impacts	4-101
4.21.1	Construction Scenario	4-101
4.21.2	Impact Evaluation	4-105
4.21.3	Utilities	4-111
4.21.4	Mitigation Measures	4-112
4.22	Draft Section 4(f)/6(f) Evaluation	4-113



4.22.1	Historic Resources	4-114
4.22.2	Parks and Recreational Resources.....	4-116
5.	Surface Transportation Impacts Evaluation	5-1
5.1	Transit Facilities and Services	5-1
5.2	Highway and Roadway.....	5-9
5.3	Freight Rail	5-22
5.4	Station Access and Parking	5-24
5.5	Non-Motorized Transportation	5-28
6.	Airports and Aviation	6-1
6.1	FAA Policy and Guidance	6-1
6.2	Introduction and Methodology	6-2
6.3	Airport Environment.....	6-5
6.3.1	Addison Airport.....	6-5
6.3.2	DFW International Airport.....	6-6
6.4	Environmental Impact Evaluation.....	6-27
6.4.1	DFW International Airport.....	6-28
7.	Cost and Financial Analysis	7-1
7.1	Introduction.....	7-1
7.2	Cost Estimate Methodology	7-1
7.2.1	Capital Cost Methodology	7-1
7.2.2	O&M Cost Methodology	7-1
7.3	Capital Plan	7-2
7.3.1	Capital Cost Estimate.....	7-2
7.3.2	Proposed Capital Funding Sources	7-4
7.4	Operating and Maintenance Costs.....	7-5
7.5	Cash Flow Analysis	7-5
7.6	Risks and Uncertainties.....	7-6
7.6.1	Local Funding Risks	7-6
8.	Public and Agency Consultation and Coordination	8-1
8.1	Public Involvement Plan	8-1
8.2	Methods and Tools.....	8-1
8.3	Summary of Public and Agency Participation	8-2
8.4	Agency Coordination	8-7
8.5	Public and Agency Involvement and the Draft EIS	8-7
9.	List of Preparers	9-1
9.1	Introduction.....	9-1
9.2	Public Agency Staff	9-1
9.3	Consultant Team Members	9-2
10.	Distribution List.....	10-1

Tables

Table ES-1.	Summary of Build Alternative Environmental Impacts and Mitigation	E-5
Table ES-2.	Summary of Build Alternative Surface Transportation Impacts and Mitigation	E-9
Table 1-1.	Cotton Belt Corridor Regional System Planning Documents	1-4
Table 1-2.	Population and Employment Growth Trends.....	1-5
Table 1-3.	Year 2010 to 2040 Projected Population and Employment Change	1-7
Table 1-4.	Existing and Future Transportation Conditions Within 0.5-mile of Corridor	1-8
Table 2-1.	Summary of Station Characteristics	2-10
Table 2-2.	Proposed Bus Routes to Stations.....	2-29
Table 3-1.	Cotton Belt Corridor Regional Rail Existing Land Use	3-3
Table 3-2.	Station Area Land Use and Land Use Plans	3-8
Table 3-3.	Existing Demographic Profile Within 0.5-Mile of Stations	3-11
Table 3-4.	Median Household Income and Households Without Vehicles	3-11
Table 3-5.	Hospitals Near the Study Area	3-13
Table 3-6.	Publicly-Owned Parks and Recreational Facilities Inventory	3-25



Table 3-7. Privately-Owned Recreational Facilities	3-26
Table 3-8. General Rating of Corridor Visual Assessment	3-37
Table 3-9. Evaluation Rating Definitions	3-37
Table 3-10. Summary of Potential Waters of the US Within the Right-of-Way	3-45
Table 3-11. Air Pollution Concentrations Required to Exceed the NAAQS	3-47
Table 3-12. Land Use Categories and Metrics for Transit Noise Impact Criteria	3-49
Table 3-13. Summary of Existing Ambient Long-Term Noise Measurement Results	3-54
Table 3-14. Summary of Existing Ambient Short-Term Noise Measurement Results	3-55
Table 3-15. Ground-Borne Vibration and Noise Impact Criteria for General Assessment	3-55
Table 3-16. Ground-Borne Vibration and Noise Criteria for Special Buildings	3-56
Table 4-1. Community Facilities Adjacent to Cotton Belt Corridor Build Alternative	4-3
Table 4-2. School Attendance Zones Crossing the Cotton Belt Project	4-6
Table 4-3. Summary of Proposed Cotton Belt Acquisitions and Displacements	4-12
Table 4-4. Summary of Historic and Archeological Resources Impacts and Mitigation Measures	4-23
Table 4-5. General Rating of Corridor Visual Assessment Sections	4-25
Table 4-6. EJ Populations Within the Study Area	4-36
Table 4-7. Designated and Suspected Floodplains Crossed or Bordered by Alignment	4-44
Table 4-8. Potential Impacts to Waters of the US	4-47
Table 4-9. Summary of FTA Category 3 (Institutional) Noise Impacts Without Mitigation	4-56
Table 4-10. Proposed and Existing Quiet Zone Crossings	4-57
Table 4-11. Summary of Residential Noise Impacts with Implementation of Quiet Zones	4-60
Table 4-12. Recommended Noise Barrier Locations	4-62
Table 4-13. Crossing Bell Mitigation Locations	4-62
Table 4-14. Summary of Post-Mitigation Noise Conditions	4-70
Table 4-15. Summary of Residential Ground-Borne Vibration Impacts Without Mitigation	4-73
Table 4-16. Summary of Recommended Vibration Mitigation Locations	4-75
Table 4-17. Summary of Residential Ground-Borne Vibration Impacts with Mitigation	4-75
Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites*	4-84
Table 4-19. Construction Activities and Equipment by Elevation	4-103
Table 4-20. Summary of Section 4(f) Properties	4-114
Table 5-1. Existing Bus Service Levels and Ridership	5-2
Table 5-2. 2040 Transit System Performance Measures	5-3
Table 5-3. Anticipated Station to Station Travel Times (minutes)	5-6
Table 5-4. Year 2040 Ridership and Station Mode of Access	5-7
Table 5-5. Average Daily Traffic At-Grade Crossings	5-16
Table 5-6. Recommended Mitigations At-Grade Crossings	5-17
Table 5-7. Cotton Belt Proposed Crossing Configuration	5-20
Table 5-8. Summary of Potential Impacts and Proposed Mitigation Measures at Stations	5-29
Table 6-1. EMST Vegetation Types Within the Study Area	6-11
Table 6-2. Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin Counties, Texas	6-14
Table 6-3. Streams/Drainages in the DFW Airport Study Area	6-25
Table 7-1. Capital Cost Estimate for Cotton Belt	7-3
Table 7-2. Project Funding Sources	7-4
Table 7-3. Annual Operating and Maintenance Cost Estimate	7-5
Table 8-1. Public and Agency Coordination Meetings	8-3
Table 9-1. Public Agency Staff	9-1
Table 9-2. Consultant Team Members (GPC 6 Consultant Team)	9-2

Figures

Figure ES-1 Cotton Belt Project Location	E-2
Figure 1-1 Cotton Belt Corridor Regional Rail Project	1-2
Figure 1-2 Existing and Committed Transit Network	1-6
Figure 1-3 Existing Transit Service	1-10
Figure 2-1 Cypress Waters Alignment	2-4



Figure 2-2 CityLine/Bush Alignment	2-6
Figure 2-3 Freight Operations Within and Across Cotton Belt Corridor	2-7
Figure 2-4 DFW North Station	2-11
Figure 2-5 Cypress Waters Station	2-12
Figure 2-6 Downtown Carrollton Station	2-13
Figure 2-7 Addison Station	2-14
Figure 2-8 Knoll Trail Station	2-15
Figure 2-9 Preston Road Station	2-16
Figure 2-10 Coit Road Station	2-17
Figure 2-11 UT Dallas Station	2-18
Figure 2-12 CityLine/Bush Station	2-19
Figure 2-13 12 th Street Station	2-20
Figure 2-14 Shiloh Road Station	2-21
Figure 2-15 EMF Site Option 1 – Luna Road	2-23
Figure 2-16 EMF Site Option 2 – Existing Irving Yard	2-24
Figure 2-17 Existing and Proposed Location of Mercer Yard	2-26
Figure 2-18 Cotton Belt Typical Cross Section with Trail	2-35
Figure 3-1 Cotton Belt Corridor Regional Rail Study Area	3-2
Figure 3-2 Existing Land Use	3-4
Figure 3-3 Existing Land Use	3-5
Figure 3-4 Existing Land Use	3-6
Figure 3-5 Existing Land Use	3-7
Figure 3-6 Community Facilities	3-14
Figure 3-7 Community Facilities	3-15
Figure 3-8 Community Facilities	3-16
Figure 3-9 Community Facilities	3-17
Figure 3-10 Neighborhood and Home Owner Associations along the Study Area	3-18
Figure 3-11 Schools	3-19
Figure 3-12 Major Employers	3-20
Figure 3-13 Major Employers	3-21
Figure 3-14 Major Employers	3-22
Figure 3-15 Major Employers	3-23
Figure 3-16 Parks and Recreational Facilities	3-27
Figure 3-17 Parks and Recreational Facilities	3-28
Figure 3-18 Parks and Recreational Facilities	3-29
Figure 3-19 Parks and Recreational Facilities	3-30
Figure 3-20 Cultural Resources	3-32
Figure 3-21 Visual Assessment Units	3-36
Figure 3-22 Visual Assessment Units-Existing Conditions Photos	3-38
Figure 3-23 Water Resources	3-44
Figure 3-24 FTA Noise Impact Criteria	3-50
Figure 3-25 Noise Measurement Site Locations	3-53
Figure 3-26 2017 Vibration Measurement Site Locations	3-57
Figure 4-1 Complementary Designed Structure Adjacent to Wheeler Bridge over Midway	4-27
Figure 4-2 Environmental Justice Populations within Study Area	4-38
Figure 4-3 Impacted Water Resources	4-48
Figure 4-4 Impacted Water Resources	4-49
Figure 4-5 Impacted Water Resources	4-50
Figure 4-6 Impacted Water Resources	4-51
Figure 4-7 Noise Impacts and Proposed Mitigation Locations	4-63
Figure 4-8 Noise Impacts and Proposed Mitigation Locations	4-64
Figure 4-9 Noise Impacts and Proposed Mitigation Locations	4-65
Figure 4-10 Noise Impacts and Proposed Mitigation Locations	4-66
Figure 4-11 Noise Impacts and Proposed Mitigation Locations	4-67
Figure 4-12 Noise Impacts and Proposed Mitigation Locations	4-68
Figure 4-13 Noise Impacts and Proposed Mitigation Locations	4-69



Figure 4-14 Vibration Impacts and Proposed Mitigation Locations	4-76
Figure 4-15 Vibration Impacts and Proposed Mitigation Locations	4-77
Figure 4-16 Vibration Impacts and Proposed Mitigation Locations	4-78
Figure 4-17 High, Moderate, and Indeterminate Hazardous Materials Risk Sites.....	4-80
Figure 4-18 High, Moderate, and Indeterminate Hazardous Materials Risk Sites.....	4-81
Figure 4-19 High, Moderate, and Indeterminate Hazardous Materials Risk Sites.....	4-82
Figure 4-20 High, Moderate, and Indeterminate Hazardous Materials Risk Sites.....	4-83
Figure 4-21 Potential Transmission Towers Reconfiguration at Cypress Waters	4-113
Figure 4-22 White Rock Creek Bridge Relocation	4-115
Figure 4-23 Spring Creek Trail Relocation.....	4-117
Figure 5-1 Activity Centers.....	5-5
Figure 5-2 Roadway and Other Crossings of the Cotton Belt.....	5-10
Figure 5-3 Roadway and Other Crossings of the Cotton Belt.....	5-11
Figure 5-4 Roadway and Other Crossings of the Cotton Belt.....	5-12
Figure 5-5 Roadway and Other Crossings of the Cotton Belt.....	5-13
Figure 6-1 DFW Airport Study Area	6-4
Figure 6-2 Air Monitoring Location near DFW Airport.....	6-9
Figure 6-3 EMST Vegetation Types Found Within the DFW Airport Study Area	6-13
Figure 6-4 Hazardous Material Database Inventory on DFW Airport	6-17
Figure 6-5 Land Use Within DFW Airport Study Area	6-20
Figure 6-6 Natural Gas System at DFW Airport.....	6-21
Figure 6-7 Waters of the US within DFW Airport Study Area	6-26
Figure 6-8 Surface Water Impacts of DFW Airport Proposed Action	6-40

Acronyms.....	A-1

References.....	R-1

Appendices (Provided under separate cover at www.DART.org/CottonBelt)

Appendix A: Engineering Design Plans

- A.1 Volume A, DFW Airport to Trinity River Line Section CB-1 Plans
- A.2 Volume B, Elm Fork of Trinity River to Dallas North Tollway Line Section CB-2 Plans
- A.3 Volume C, Dallas North Tollway to Shiloh Road Line Section CB-3 Plans
- A.4 DFW Airport to Shiloh Road Station Plans

Appendix B: Technical Memoranda and Reports

- B.1 Land Use Existing Conditions Technical Memorandum
- B.2 Socioeconomic Existing Conditions Technical Memorandum
- B.3 Socioeconomic Impact Assessment and Mitigation Technical Memorandum
- B.4 Existing Parks and Recreational Facilities Technical Memorandum
- B.5 Historic-age Reconnaissance Resource Survey – Station Locations
- B.6 Archeological Resource Survey
- B.7 Visual Assessment Existing Conditions Technical Memorandum
- B.8 Environmental Justice Existing Conditions Technical Memorandum
- B.9 Geology and Soils Existing Conditions Technical Memorandum
- B.10 WOTUS (Waters of the U.S.) Technical Memorandum
- B.11 Air Quality Existing Conditions Technical Memorandum
- B.12 Noise and Vibration Technical Report
- B.13 Hazardous Materials Existing Conditions Technical Memorandum
- B.14 Biological Resources Existing Conditions Technical Memorandum
- B.15 Indirect and Cumulative Impacts Assessment and Mitigation
- B.16 Determination of Effects Report
- B.17 Street At-Grade Crossing Traffic Analysis Report
- B.18 Operations Simulation Methodology and Results
- B.19 Operations and Maintenance Plan
- B.20 Property Acquisitions and Displacements Technical Memorandum
- B.21 Capital Cost Estimating Methodology Technical Memorandum



Appendix C: DFW Airport Layout Plan/Land Use Plan
Appendix D: Cotton Belt Regional Rail Project through Addison Airport Runway Protection Zone/FAA Correspondence
Appendix E: DART Cotton Belt Preferred Alternative Report
Appendix F: Alternatives and Environmental Considerations Report (AECR) - April 2014
Appendix G: Agency Coordination and Consultation (August 2016 through January 2018)
Appendix H: DART Cotton Belt Public Involvement Plan
Appendix I: White Rock Creek Bridge Memorandum of Agreement between FTA, DART, and THC



Executive Summary

The subject of this Draft Environmental Impact Statement (DEIS) is the Cotton Belt Corridor Regional Rail Project (Cotton Belt Project or Project) from Terminal B at Dallas/Fort Worth International Airport (DFW Airport) to Shiloh Road in Plano, Texas. The proposed 26-mile double-track alignment is identified in the current Dallas Area Rapid Transit (DART) Transit System Plan (TSP) and the North Central Texas Council of Governments (NCTCOG) Mobility 2040 Metropolitan Transportation Plan (MTP). The Project traverses through three counties in Texas: Tarrant, Dallas, and Collin; and seven cities: Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson and Plano.

The National Environmental Policy Act of 1969 (NEPA) (42 USC § 4321 et seq.) requires that federal agencies prepare an EIS for any major federal action that may have a significant impact on the environment. This DEIS has been prepared by DART under its responsibilities as the local lead agency to implement the Project. This document has been submitted in coordination with the Federal Transit Administration (FTA), the lead federal agency, and in cooperation with the Federal Aviation Administration (FAA). The Federal Railroad Administration (FRA) has elected to be a participating agency.

The EIS serves as documentation for the NEPA process and thoroughly analyzes the Build Alternative for potential impacts on the human and natural environment as compared to a No-Build Alternative. The Build Alternative was identified during alternatives development and evaluation to be the preferred from among the other Build Alternatives studied (see **Section 2.5** in **Chapter 2** for more details on other alternatives considered). The EIS is the primary document to facilitate review of the Project by federal, state and local agencies, and the public.

This DEIS document will be circulated for public and agency comment over a 45-day review period. During this time, public hearings will be held to present the results of this DEIS and formally record all comments received. In order to complete the environmental review process, a combined Final EIS (FEIS) and Record of Decision (ROD) would be prepared by FTA, FAA and DART. The combined FEIS/ROD will respond to the substantive comments received on this DEIS, and state the proposed action, environmental findings, and mitigation requirements. In accordance with the Fixing America's Surface Transportation (FAST) Act and 23 United States Code (USC) § 139(n), the FTA intends to issue a single document that consists of the FEIS and ROD unless it is determined that circumstances, such as changes to the proposed action, anticipated impacts, or other new information, preclude issuance of such a combined document. After circulation of the DEIS, preliminary engineering and environmental analyses will be completed. Additional analyses may be required upon receipt of DEIS comments. Mitigation commitments will be developed and responses to comments received during the comment period will be prepared and incorporated as appropriate.

Once the FEIS/ROD is issued, DART can continue advancing the Project. The FEIS/ROD will include a Mitigation Monitoring Program (MMP) to ensure that mitigation commitments are carried through final design and construction.

This Executive Summary describes the purpose and need of the Project, alternatives considered in this DEIS, the affected environment, potential impacts and recommended mitigation measures, public and agency involvement, and key issues to be resolved.

Purpose and Need

The Cotton Belt Project lies within the North Crosstown Corridor, which has long been identified as a heavily congested area in need of additional capacity and mobility solutions. Congestion has reduced mobility and the quality of life in the northern portions of Tarrant, Dallas, and Collin

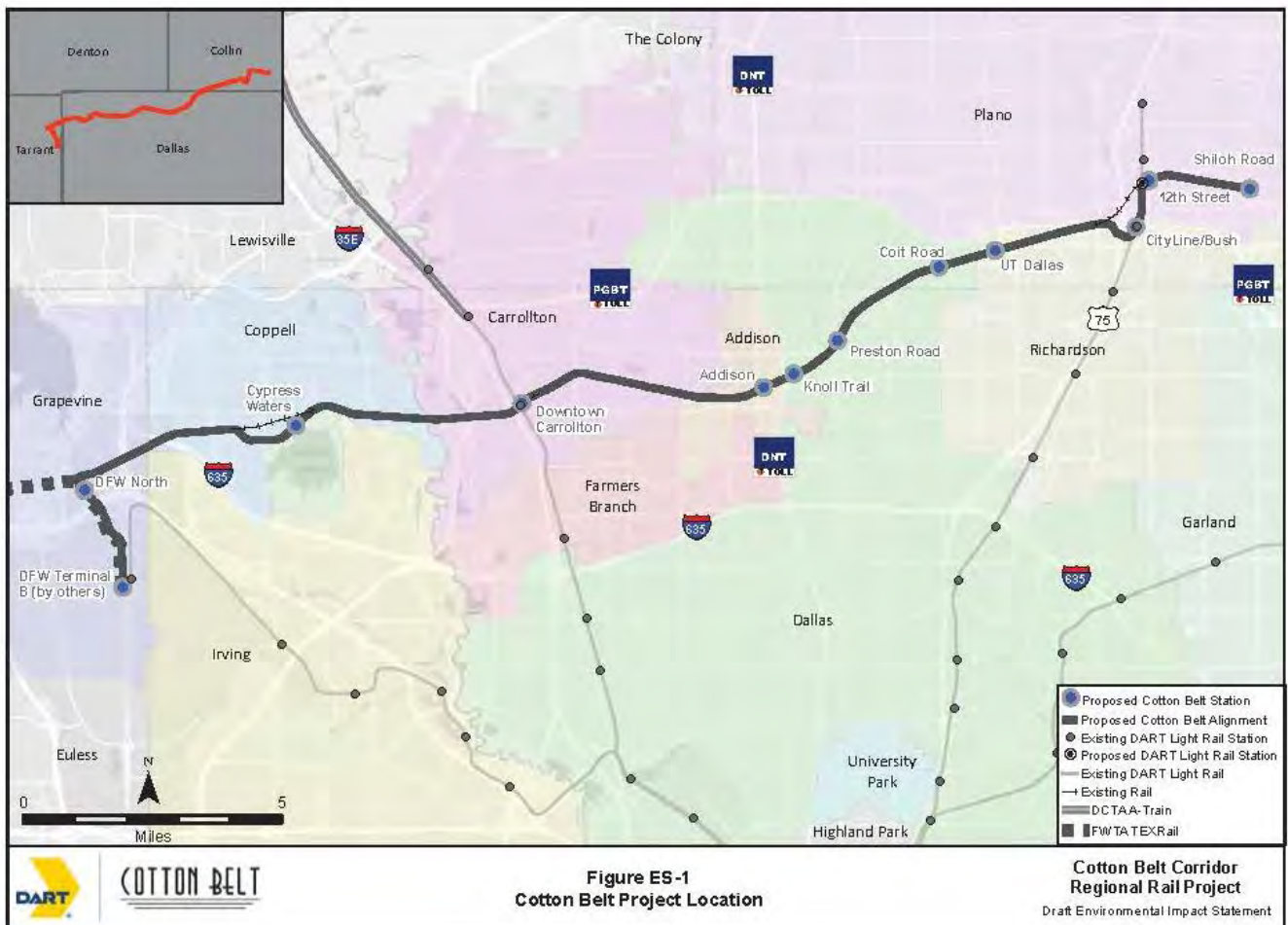
counties and surrounding communities. Interstate Highway (IH) 635 is one of Texas' most congested highway corridors. The Project is needed because population growth in the area has increased roadway congestion, which causes a decreased level of service and an increase in travel time throughout the North Crosstown Corridor. The primary purpose of the Project is to provide passenger rail connections that would improve mobility, accessibility and system linkages to major employment, population and activity centers in the northern part of the DART Service Area, and support sustainable growth, local and regional land-use visions, and economic development. Over the next 20 years, the Cotton Belt Project is projected to attract new employment and population that would continue to impact and strain the transportation network. The accessibility of the corridor would decline as congestion and travel delay increases.

The following goals for the Cotton Belt Project have been identified:

- Enhance corridor mobility and accessibility
- Reduce Vehicle Miles of Travel (VMT)
- Promote economic development and sustainable land use patterns
- Provide an environmentally-sensitive transit investment

See **Section 1.0** in the DEIS for a more detailed discussion of the Project's purpose and need. **Figure ES-1** shows the Cotton Belt Project location.

Figure ES-1 Cotton Belt Project Location





Alternatives Considered in this DEIS

Two alternatives are considered in this DEIS, a No-Build Alternative and a Regional Rail Build Alternative (Build Alternative). The No-Build Alternative includes transportation and transit projects that have a reasonable expectation of funding and are programmed for implementation. The Cotton Belt Project will not be in operation and the existing freight service conditions will continue to exist as it does today and will continue to have standard, routine maintenance over the next 30 years. Travel times will increase over what they are today as congestion increases, and safety and mobility will continue to decline in the area as population increases. Although it does not meet the need and purpose of the Project, the No-Build Alternative allows for the environmental impact analysis to assess the impacts of no action as a comparison to the Build Alternative.

The Build Alternative includes all the programmed transportation and transit projects contained in the No-Build Alternative, plus the Cotton Belt Project. The Project consists of a 26-mile regional rail corridor from Terminal B at DFW Airport to Shiloh Road in Plano. A passenger rail corridor concept from the DART Red Line in the Richardson/Plano area to the Green Line in Carrollton was included in the original 1983 DART Service Plan. In 1989, the DART TSP recommended the purchase and preservation of the Cotton Belt Corridor right-of-way (ROW) from Wylie, Texas to north Fort Worth, Texas; the 52-mile corridor purchase was completed in 1990. In addition to being in the NCTCOG MTP, the Project is included in the DART Transit System Plan. In 2010, a notice of intent (NOI) was published in both the Texas and Federal Registers announcing the FTA's and DART's intent to prepare an EIS for the Cotton Belt Project.

The Project is located primarily within the existing DART-owned Cotton Belt Corridor railroad right-of-way. There are four areas where the Project alignment deviates from the railroad corridor: 1) at DFW Airport where the rail would connect to DFW Terminal B and share right-of-way and stations with the Fort Worth Transportation Authority (FWTA) TEXRail Project, which is under construction (DFW Airport Connection); 2) in the Coppell/Dallas area near North Lake to serve the growing Cypress Waters development (Cypress Waters Alignment); 3) near downtown Carrollton, where portions of the existing Cotton Belt Corridor, the existing Madill Sub, and the Dallas Garland Northeastern (DGNO) track are realigned to facilitate grade separation of the two rail corridors and maintain connections through this area for freight operations (Downtown Carrollton Reconfiguration); and 4) near the President George Bush Turnpike (PGBT) in Richardson and Plano to serve the growing mixed-use CityLine development (CityLine/Bush Alignment).

At DFW Airport, DART has coordinated the Project with the FWTA TEXRail Project and DFW Airport. Portions of the Project corridor would be co-located with the TEXRail track in a corridor that has previously been environmentally cleared. On September 29, 2014, both FTA and FAA issued a ROD for the TEXRail Project. On April 16, 2015, FTA issued an amended ROD for project changes off airport property. Each agency is constructing tracks within this corridor and the two projects would share infrastructure currently being constructed. This infrastructure includes: portions of two stations, a culvert over a creek, a bridge over a creek, two roadway bridges over the tracks, and a railroad bridge over a freeway.

Twelve new potential station locations have been identified for the Cotton Belt Project including DFW Airport (under construction as part of TEXRail), DFW North (under construction as part of TEXRail), including a future "through" platform that would allow direct east-west movements across the corridor, Cypress Waters, Downtown Carrollton, Addison, Knoll Trail, Preston Road, Coit Road, University of Texas (UT) Dallas, CityLine/Bush, 12th Street (which includes a proposed new infill LRT Station on the existing DART Red Line), and Shiloh Road.



The Cotton Belt Project would operate on tracks that are shared with freight for nearly the entire route. FRA-compliant diesel multiple unit (DMU) technology is proposed for the corridor, and a fleet of at least seven vehicles would be procured. The new fleet would require an Equipment Maintenance Facility (EMF) to be constructed as part the Cotton Belt Project to store and maintain vehicles. Several potential sites were identified along the corridor. This DEIS includes two options. Site Option 1 is at 1650 West Belt Line Road in Carrollton at the northeast corner of Luna Road and West Belt Line Road. Site Option 2 would be to use the existing Trinity Railway Express (TRE) Irving Yard at 4801 Rock Island Road in Irving. The Project also includes the relocation of Mercer Yard, a small freight yard in downtown Carrollton, to a new location to the east near Kelly Boulevard in Carrollton.

The 2022 operating plan (initial year of operations) assumes that the Project would operate seven days a week, with 30-minute peak headways and 60-minute off-peak headways. The 2040 operating plan assumes service level increases to 20-minute peak headways.

Cotton Belt Regional Trail

The Project includes identification of a 12-foot wide envelope for the proposed Cotton Belt Regional Trail, a multi-use trail identified in the NCTCOG Regional Veloweb Plan. This trail envelope is identified within the DART right-of-way along approximately 16 miles of the project corridor where it is feasible. Cities and counties within the region are responsible for the planning and implementation of bicycle and pedestrian infrastructure and amenities. While the trail envelope is included in this DEIS, additional environmental clearance may be required depending on the project funding source and final trail design. In areas where DART right-of-way is not sufficient for a trail, connectivity recommendations would be developed by the local municipality.

Affected Environment

Existing conditions of the social, natural and built environment were documented as part of this DEIS for a range of impact assessment categories. The existing conditions formed the basis of impact evaluations within each category. Detailed information on the affected environment is contained in **Chapter 3** and in **Appendix B**.

Environmental Consequences and Proposed Mitigation

The following is a summary of environmental consequences and proposed mitigation for the No-Build Alternative and the Build Alternative. Detailed information is contained in **Chapter 4**. Surface Transportation and Airports and Aviation impacts are also summarized below and contained in **Chapters 5** and **6**. The Study Area referenced in the following sections refers to a 0.25-mile buffer of the alignment and a 0.5-mile buffer around the proposed station locations.

No-Build Alternative

Under the No-Build Alternative, growth in this part of the DART Service Area will continue to occur in a manner that primarily responds to automobile access. The No-Build Alternative will not be consistent with local and regional land use plans, which have been developed over the years to take advantage of the Build Alternative to support sustainable growth patterns and achieve transit-oriented development plans. The No-Build Alternative pattern of growth will not support a decrease in overall vehicle miles of travel (VMT) and congestion delay, exacerbating the region's air quality issues.

The No-Build Alternative will not require the acquisition or displacement of any property. There would be no changes or impacts to existing neighborhoods. However, neighborhoods and community facilities within the Study Area could be negatively affected over time. As the region continues to grow, more modes of transportation may be necessary to help mitigate congestion



and aide in mobility for those who live and work within the Study Area, as well as those commuting through it. DART implemented service improvements to improve headways and restructure some routes in March 2018, of which a limited number enhanced services in the corridor. Transit and transportation improvements will continue to be made incrementally. Increasing traffic congestion will result in more delay and impacts to travel and transit reliability. This alternative will not offer any new direct east-west routes to enhance access to employment and activity centers in the Study Area, and will not enhance access for residents, including environmental justice populations, of the Study Area to access other parts of the region.

Build Alternative

Table ES-1 provides a summary of the potential impacts and proposed mitigation for environmental resources under the Build Alternative. Since the majority of the Build Alternative is located within an existing railroad right-of-way, there are limited environmental impacts along much of the corridor. The exception to this is where there are sensitive land uses or where the project deviates from the existing corridor on new alignment.

The Cotton Belt Project is not expected to increase growth or development within the larger DFW region. Rather, the Project would serve to redistribute future land use growth patterns by supporting sustainable development around proposed stations, which is consistent with local and regional land use plans. Providing an alternative mode for direct and reliable east-west access to corridor activity and employment centers is forecast to reduce VMT and congestion delay, which in turn benefits air quality.

The Build Alternative would require acquisition of property for alignment deviations, stations and facilities. One trail (Spring Creek Trail) would be realigned as part of the Project. The Project would also accommodate implementation of the Cotton Belt Regional Trail along some sections, and would shift the historic White Rock Creek Bridge by 30 feet.

The Build Alternative would result in some noise and vibration impacts and introduce new physical features through the Study Area in neighborhoods. These impacts will be mitigated through a variety of measures including quiet zones, noise barrier walls, crossing bell mitigation, and visual landscaping enhancements. To address safety concerns, fencing will be provided in residential areas, near schools and other high activity areas. **Table ES-1** provides more information on anticipated impacts and mitigation.

Table ES-1. Summary of Build Alternative Environmental Impacts and Mitigation

Impact Category	Impacts	Proposed Mitigation Measure(s)
Land Use	No Impacts. The Project is consistent with regional and local land use plans.	Not Applicable
Socioeconomic Characteristics and Cohesion	Potential safety and access impacts adjacent to Fairhill School.	Provide safety fencing along corridor adjacent to Fairhill School.
	Potential impacts to North Dallas Eruv.	Coordinate with City of Dallas to minimize effects on the Eruv and existing city ordinance.
	Potential safety impacts at street crossings near school attendance zones.	Provide enhanced safety features near nine schools where attendance zones are crossed by the Project; conduct DART Transit Education sessions with schools and organizations prior to revenue service.



Table ES-1. Summary of Build Alternative Environmental Impacts and Mitigation (continued)

Impact Category	Impacts	Proposed Mitigation Measure(s)
Acquisitions and Displacements	Alignment Deviations (up to 73 acres) One residential displacement on commercial property. Seven business displacements.	Follow federal policies and procedures related to acquisition and relocation assistance. Obtain Mass Transit Easement from DFW Airport for use of airport land.
	Stations (up to 34 acres) Two business displacements	
	EMF Site Option 1 (Luna Road)/Mercer Yard Relocation (up to 56 acres). No displacements.	
Parks and Recreation Facilities	Partial relocation of Spring Creek Trail.	Reconstruction of portion of Spring Creek Trail (see Section 4(f) evaluation). Trail will remain open during construction to the greatest extent possible.
	Potential visual and safety impacts to Preston Green	Safety fencing and continuation of residential landscaping adjacent to Preston Green Park.
Cultural Resources (Historic)	"Adverse effect" to White Rock Creek Bridge. "No effect" on other resources.	Relocation of the bridge within the DART right-of-way for use as part of Cotton Belt Regional Trail; continued coordination with Texas Historical Commission (THC) through Memorandum of Agreement (MOA) to outline mitigation.
Cultural Resources (Archeological)	No Impact	Continued coordination with THC if alignment or design changes occur.
Visual and Aesthetic Resources	Potential impacts of new bridge adjacent to Wheeler Bridge at Midway Road.	Complementary structure for Wheeler Bridge.
	Potential visual impacts at station areas where sensitive land uses are present.	DART Station Art & Design Program to blend station into community context; indirect lighting to reduce glare at adjacent properties; landscaping at Knoll Trail Station if needed for adjacent residential units.
	Potential visual impacts along the alignment where sensitive land uses are present.	Landscaping at 120 to 150 foot intervals along residential areas in corridor cities where no natural buffer exists, as well as at Fairhill School and Preston Green Park; preserve existing vegetation to greatest extent possible; coordination with DFW Airport to ensure compliance with guidelines.
Public Safety and Security	Potential impacts to emergency vehicle response times at rail crossings.	Coordination of potential emergency vehicle routes with Fire/Life Safety Committee during final design; new at-grade crossing for DFW Airport Fire Station 6; Positive Train Control (PTC) will also enhance operational safety of system.
	Potential pedestrian safety impacts at street crossings near school attendance zones.	Pedestrian crossings will occur at designated street crossings (see also socioeconomic section for schools); corridor safety fencing will be installed along the project corridor near residential areas, schools, and high pedestrian activity areas.



Table ES-1. Summary of Build Alternative Environmental Impacts and Mitigation (continued)

Impact Category	Impacts	Proposed Mitigation Measure(s)
Public Safety and Security (cont'd)	Potential vehicle conflicts at street crossings.	Five new grade separations and 36 quiet zones with enhanced safety features will minimize vehicle safety conflicts.
	Potential for increased conflicts between rail vehicles, automobiles, bicycles, passengers, and pedestrians in station areas.	Pedestrian connection enhancements between platforms at Downtown Carrollton and 12 th Street Stations.
	Potential for crime at stations and associated parking facilities.	Crime Prevention through Environmental Design (CPTED) to enhance station safety and security.
Environmental Justice (EJ)	No disproportionately high and adverse effect to EJ populations as project impacts would be experienced by both EJ and non-EJ population groups.	Not Applicable
Soils and Geology	Potential impacts to soil due to vegetation removal or increased erosion during construction.	Establish protective vegetation and use of Best Management Practices (BMP) during construction.
Hydrology/ Floodplains	Minor fill amounts would be required for bridges at nine floodplain locations.	Conduct detailed hydrologic/hydraulic analysis during final design to determine impacts; obtain Trinity River Corridor Development Certificate (CDC); coordinate with US Army Corps of Engineers (USACE), DFW Airport, and corridor cities during final design to determine permits and associated mitigation.
Water/Wetland Resources	Approximately 1.32 acres of potential waters of the US would be impacted by addition of fill at 17 locations.	Exact fill types and amounts will be determined once design is finalized and, if necessary, would be permitted with a nationwide permit from USACE in coordination with NCTCOG and the Section 214 Program.
Air Quality	No impact; the Project is projected to reduce Vehicles Miles of Travel (VMT) and congestion delay.	Not Applicable
Noise	5,362 residential impacts.	Implementation of quiet zones to eliminate 96 percent of the residential impacts due to train horn noise; installation of 20,300 feet of noise barrier walls at 19 locations; crossing bell mitigation at eight locations; consider mitigation during final design at two residences in Carrollton due to special trackwork.
	19 institutional impacts.	Implementation of quiet zones to eliminate all institutional impacts due to train horn noise.
Vibration	Nine residential impacts.	Installation of 2,800 feet of tire-derived aggregate (TDA) at five locations.
	Potential impacts at three institutional sites.	Detailed vibration studies at institutional sites during final design (UT Southwestern Medical Center Clinic, the Qorvo semiconductor facility and the Texas Instruments semiconductor facility).



Table ES-1. Summary of Build Alternative Environmental Impacts and Mitigation (continued)

Impact Category	Impacts	Proposed Mitigation Measure(s)
Hazardous and Regulated Materials	Potential impacts associated with nine high risk, 19 moderate risk, and 18 indeterminate risks sites along the corridor. Potential to uncover or disturb existing hazardous and toxic materials, as well as fill from unknown sources.	If unanticipated sources of hazardous or regulated materials are suspected or encountered during construction, DART Environmental Compliance division shall be notified immediately; further investigation is recommended at sites based on their proximity to subsurface construction; compliance with all applicable federal and state regulations; phase I Environmental Site Assessments (ESA) are recommended for all property acquired for Project.
	Potential hazardous materials present at existing Mercer Yard.	Phase I ESA will be conducted during final design.
	One high risk site in Plano near 12 th Street Station is proposed as Municipal Settings District (MSD).	Enact precautions in the Plano MSD zone.
Biological and Natural Resources	Potential vegetation impacts at stations and along rail right-of-way for construction.	Compliance with local tree and landscaping ordinances, including tree replacement, if needed; conduct tree survey during final design; site planning and construction techniques will be designed to avoid and preserve existing mature native trees and shrubs; use of native vegetation; avoid soil disturbances by using nearby roadways and bridges when crossing drainages, wetlands, and creeks.
	Removal of vegetation would have minimal effect on wildlife species. Threatened and endangered species or subspecies have a low to moderate potential of occurring within the Study Area.	Ongoing coordination with the Texas Parks and Wildlife Department (TPWD) and US Fish and Wildlife Service during construction; replacement vegetation will utilize native species; use recommended vegetation on DFW Airport to avoid attracting hazardous wildlife.
Construction Impacts	Temporary construction impacts would occur for a limited duration.	A variety of environmental protection measures will be used to minimize construction impacts to the natural environment, traffic, access, and sensitive land uses. See Section 4.21 for impacts and typical mitigation.
	Subsurface utilities may be impacted during construction.	Verify utility information during final design and coordinate relocations with utilities.
	Two ONCOR towers would be relocated for the Cypress Waters alignment.	Finalize ONCOR tower relocation plan and conduct additional archeological testing in coordination with THC at new sites.
Section 4(f) Use	4(f) Exception under 23 CFR 774.13 (g) for White Rock Creek Bridge.	Reuse White Rock Creek Bridge within DART right-of-way for future Cotton Belt Regional Trail at White Rock Creek. Ongoing coordination with THC to relocate bridge through MOA.
	<i>de minimis</i> impact to Spring Creek Trail	Spring Creek Trail will be relocated south of alignment. Ongoing coordination with TPWD under Chapter 26.

Source: GPC6; DART Capital Planning



Surface Transportation Impacts

Travel conditions through the corridor are projected to improve under the Build Alternative. Bus routes in the corridor will be restructured when Cotton Belt service begins. Since there is no competing express bus service, route modifications would be minor to reroute buses to serve new stations.

During final design, DART will conduct a detailed traffic study based on final configuration of roadways and feeder bus plans for stations if required by the local jurisdiction. These studies may recommend turn lanes, traffic control, signal improvements, pedestrian markings/signals, bus stop relocations, or other improvements to ensure safe access for autos, buses and pedestrians. DART will coordinate with each city during final design to conduct these analyses and develop appropriate mitigation.

The Build Alternative includes opportunities for bicycle and pedestrian facilities within the right-of-way. This is consistent with planning entities in the Study Area, which are anticipating additional growth and are planning for it in terms of multimodal transportation improvements.

Table ES-2 provides a summary of the potential impacts and mitigation for surface transportation.

Table ES-2. Summary of Build Alternative Surface Transportation Impacts and Mitigation

Impact Category	Impacts	Proposed Mitigation Measure(s)
Transit Facilities and Services	Overall benefit: capacity, service levels, ridership, reliability and geographic coverage would be improved.	None required
Highway and Roadway	Benefit: would reduce Vehicle Miles Traveled (VMT) and hours of congestion delay.	None required
	Eleven street crossings would experience queuing or Level Of Service (LOS) impacts	Grade Separations: South Belt Line Road, Midway Road, Coit Road, Custer Parkway, and Plano Parkway; Signal timing and signal phasing improvements: MacArthur Boulevard and Belt Line Road, Luna Road and East Belt Line Road, Marsh Lane and Arapaho Road, Addison Road and Arapaho Road, Hillcrest Road and McCallum, Alma Road, and SH 190 Frontage Roads. Signal systems at grade crossings will include all signs, signals, and warning devices.
	Three at-grade crossings at DFW Airport would experience queuing or LOS impacts.	Continue coordination with DFW Airport, including signal timing improvements at North Employee Road/International Service Road.
	Traffic re-routings and detours would be required along discrete alignment sections during construction.	Coordination with DFW Airport and cities; Provide notifications of road and sidewalk closures and detours during construction.
	Impact to utility access road at EMF Site Option 1 (Luna Road), and driveway to Dallas Water Utilities (DWU) facility near Coit Road.	Relocation of utility access road at EMF Luna Road site. Relocation of DWU driveway, including modified access easement.
Freight Rail	Limited windows of opportunities for freight providers to operate.	Existing single-track rail corridor will be double-tracked and upgraded to Class 4 track standards.



Table ES-2. Summary of Build Alternative Surface Transportation Impacts and Mitigation (continued)

Impact Category	Impacts	Proposed Mitigation Measure(s)
Freight Rail (cont'd)	Potential conflicts with railroad crossings of Madill Subdivision.	Project will be grade-separated over the Madill Subdivision to avoid any conflicts between freight activity and passenger rail.
	Impact to Mercer Yard in Downtown Carrollton	Mercer Yard will be relocated for local freight service providers. DART will dispatch trains and coordinate service opportunities.
Station Access and Parking	Potential for additional parking demand.	Preserve opportunities for parking expansion where available.
	Potential pedestrian access impacts.	Include pedestrian access with traffic studies.
	Potential traffic impacts associated with park-and-ride traffic and bus operations with combined traffic from proposed development	Conduct traffic studies based on final configuration of roadways and feeder bus plans for stations (if required by the local jurisdiction). Studies may recommend turn lanes, traffic control, signal improvements, pedestrian markings/signals, bus stop relocations, or other improvements to ensure safe access for autos, buses and pedestrians.
	Potential impacts to business and residential areas from hide-and-ride overflow parking near two station locations: Knoll Station and Preston Road Station.	Monitor parking demand and potential overflow, and develop mitigation plan if issues arise.
Non-Motorized Transportation	Potential temporary impacts to pedestrian and on-street bicycle facilities that cross the corridor	Minimize closures as crossings are rebuilt; where warranted, install safety equipment: enhanced traffic signals, crosswalks, and striping, and signage; provide notifications of road and sidewalk closures and detours during construction; and coordinate with NCTCOG and cities on future facilities to not preclude them.

Source: GPC6; DART Capital Planning

Airport and Aviation Impacts

The Cotton Belt Project crosses northern portions of DFW Airport and would join with the TEXRail Project at a shared station. The existing Cotton Belt railroad right-of-way and the Project traverses south of the southern property line of Addison Airport. Because portions of the Project are located on DFW Airport and near Addison Airport properties, the FAA has an interest in the Project. Therefore, the FAA has been invited to participate in the EIS process as a Cooperating Agency. With joint approval authority, the FAA's signed approval of this DEIS is required. An Airspace Study (FAA Form 7460-1, Notice of Proposed Construction or Alteration) will be completed and provided for FAA approval during the design/build phase of the Project.

DFW Airport

Due to the sensitivity of equipment located at the Airfield Surveillance Radar (ASR) site at DFW Airport, the ASR has been added as a vibration-sensitive receptor for the Cotton Belt Project.

Due to FAA concerns, DART will participate in vibration testing when TEXRail begins testing in October 2018. As part of its study and evaluation, the FAA will utilize the Radar Analysis Support System tool to measure the vibration or "jitter" in the antenna pedestal group. The FAA will also study and evaluate the operational system software and perform data recordings to



ensure the radar is performing within its operational tolerance and at an operational capability equal to or better than before the installation of TEXRail and the operations thereon. DART will coordinate with FAA to conduct similar analysis on the Cotton Belt operations. DART will also coordinate with FAA to study, evaluate, and as necessary, conduct further vibration testing once test rail operations have commenced on the Cotton Belt Project.

A determination of potential mitigation measures that may be required will be made during the regional rail testing period (as requested by the FAA). DART will participate with the testing to determine if an additional track and increased frequency would result in impacts.

Addison Airport

As the rail line will remain within the existing rail right-of-way south of Addison Airport, revisions to the Addison Airport Layout Plan (ALP) would not be required. The FAA made a final determination on October 18, 2017 that a Runway Protection Zone (RPZ) alternative analysis is not required at Addison Airport since the majority of the alignment would not be altered and a land use change was not occurring. No additional mitigation is necessary for Addison Airport.

Cost and Financial Analysis

In 2016, DART advanced implementation of the Cotton Belt Corridor to the year 2022 and reflected this new revenue service date in its FY2017 Twenty-Year Financial Plan. The Cotton Belt Project is proposed to be financed through a federal loan program called Railroad Rehabilitation and Improvement Financing (RRIF), along with a combination of other federal, regional and local sources. Proposed funding sources total \$1,135.0 million in the FY18 20-Year Financial Plan. The preliminary cost estimate is in line with the current FY18 Financial Plan budget. Annual operating and maintenance costs are estimated to be \$17.8 million per year.

The RRIF program provides direct loans and loan guarantees to finance development of railroad infrastructure. DART submitted a pre-application to the FRA with project information and the anticipated loan request amount of \$908 million. A complete application will be submitted concurrent with the completion of the NEPA process and issuance of a FEIS/ROD. More detailed information on project cost estimates and funding sources is in **Chapter 7**.

Public and Agency Coordination and Consultation

The Project has included a comprehensive public participation and agency consultation program. A Public Involvement Plan (PIP) was developed to proactively and effectively communicate the project scope, issues, and potential impacts and benefits while collecting valuable public, agency and stakeholder input for the project and this DEIS.

Public and agency involvement activities officially started with the publication of the NOI to prepare an EIS for the Cotton Belt Project. The NOI was issued in the Federal Register by the FTA on July 8, 2010. Early planning on alternatives and environmental considerations was conducted through 2013. In August 2016, DART relaunched the Project and EIS documentation efforts. There have been four rounds of public meetings, and several Area Focus Group (AFG) meetings. The AFGs, which consist of residents, property owners, schools, and other community leaders representing a variety of interests, reviewed the recommendations relative to the environmental analysis and preliminary design of the Project. Numerous other briefings and meetings were held and are documented in **Chapter 8**. Both the initial scoping effort and more recent activities provided the basis for identification of issues important to project definition and the DEIS.

In addition, DART has coordinated with agencies to ensure the review of potential environmental impacts and obtain comments or concurrence on proposed approach to mitigate impacts.



The DEIS acts as a public decision-making document, in accordance with applicable state and federal regulations, by presenting the anticipated environmental consequences of the Build and No-Build Alternatives with appropriate mitigation measures. This DEIS has been approved for public circulation by the FTA and cooperating agency, FAA. Copies have been made available to the public, stakeholder organizations, and local, regional, state and federal agencies for their review and comment. Its availability for review and comment has been officially advertised in the Federal Register, as well as through the local media and press.

Formal public hearings will be held to give interested parties the opportunity to formally submit comments on the DEIS. Additional or subsequent written comments may be received at DART headquarters via written or email form.

Public hearing transcripts and all correspondence will be reviewed at the close of the DEIS public and agency review period. Substantive comments will be catalogued and recorded into appropriate subject areas. All comments will be reviewed, will receive responses, and will be documented in the FEIS/ROD.

Evaluation of Alternatives

As described in **Section 1.4**, the Project's primary purpose is to provide passenger rail connections that would improve mobility, accessibility and system linkages to major employment, population and activity centers in the northern part of the DART Service Area and support sustainable growth, local and regional land use visions, and economic development. Specific transportation needs identified for the Cotton Belt Corridor are to improve transit travel times by providing an alternative to congested roadway networks, provide reliable connections between the existing and proposed transit systems, improve accessibility to employment, activity centers and residential areas in the corridor, and promote sustainable development patterns in the Study Area.

In addition to the above purpose and need, the following goals for the Cotton Belt Project have been identified:

- Enhance corridor mobility and accessibility
- Reduce Vehicle Miles of Travel (VMT)
- Promote economic development and sustainable land use patterns
- Provide an environmentally-sensitive transit investment

The information in this DEIS provides the basis for the public, agencies and decision-makers to assess the potential environmental consequences, benefits, and costs of the alternatives against the project goals.

No-Build Alternative

The No-Build Alternative will not achieve the purpose or needs identified in the corridor, and will not fulfill the project goals. The No-Build Alternative will not provide a reliable transit alternative to congested roadway travel, and scheduled transit connections may not be met due to worsening traffic conditions. Corridor mobility and accessibility will not be enhanced through connectivity with existing and future transit facilities or improved access to Study Area activity centers, employment hubs, and DFW Airport. Transit ridership will not increase under the No-Build, and VMT will not be reduced. Existing travel and transit modes will continue to be subject to increasing congestion and less reliable travel times. The No-Build Alternative is also not consistent with the goal to promote economic development and sustainable land use patterns, and is not consistent with land use and station area transit-oriented development plans that were created around a future rail project. It will not enhance access to employment centers in this part of the Service Area or enhance mobility for EJ populations. Lastly, the No-Build Alternative will not implement transit investment in the Study Area. Rather, the communities



along the Study Area will continue to be subject to continued growth and congestion that could affect overall long-term natural, social and economic health of the area.

Build Alternative

The Build Alternative would meet the purpose and needs identified in the corridor. The Project would be designed to provide a high-speed, reliable transit option for residents and commuters in the corridor with convenient connections to existing and planned transit systems. The Build Alternative would create an east-west connection of three LRT lines, a major bus transit center, and one regional rail line (TEXRail), thus enhancing regional connectivity and providing an improvement over east-west transit travel times in the corridor. These connections would improve mobility, accessibility and system linkages to major employment, population and activity centers in this part of the DART Service Area. The Build Alternative would also offer opportunities to connect with the proposed future BNSF regional rail corridor between Frisco and Irving, and a potential southern extension of the DCTA A-Train, with connections in downtown Carrollton. This alternative would support sustainable growth, local and regional land use visions, and economic development opportunities around station areas, which is consistent with local and station area land use plans.

The Build Alternative would fulfill each of the Project goals. Corridor mobility and accessibility would be improved through direct connections to key transit facilities, including the Orange Line and future TEXRail at DFW Airport, the Green Line in downtown Carrollton, Addison Transit Center, and the Red/Orange Lines at both CityLine/Bush and 12th Street. These connections would enhance mobility options for residents of the region to access activity and employment centers with the Study Area, and would provide more direct linkages for Study Area residents to access other areas for entertainment, education or jobs. DFW Airport would have a direct connection for this growing area of the region. More than 12,000 riders per day would use the Project. Transit ridership would increase on both the bus and rail system, with 7,400 added trips regionally. Numerous special events held in the Study Area would have an option to reduce parking and event congestion.

Compared to a No-Build condition, the Build Alternative would also reduce VMT by nearly 80,000 miles per day within the DART Service Area. Hours of congestion delay would be reduced by 3,800 hours per day. Both factors contribute positively to air quality. Transit capacity would be improved by adding regular service seven days a week. Compared to auto and bus travel, the Build Alternative would operate on an exclusive guideway that would not be subject to incidents and traffic congestion.

The Build Alternative would promote economic development and sustainable land use patterns. The Project would be consistent with both local and regional station area and comprehensive plans, which focus on new development around stations to enhance access to jobs, a more sustainable development pattern and livable communities. The Project would continue to provide opportunities for DART and local and regional agencies to coordinate economic and transit-oriented development.

Lastly, the Build Alternative would support the goal of providing an environmentally-sensitive transit investment. The Project would be developed to minimize negative impacts to the community through sensitive design. Where impacts are identified, mitigation would be implemented to ensure the Project would be implemented in a manner sensitive to the neighborhoods. The Project would also have minimal impacts to the natural environment, as it would be located primarily within an existing rail right-of-way. There would be some vegetation removal for construction and limited amounts of fill for bridges.



Next Steps and Issues to be Resolved

This DEIS identifies the Build Alternative as the preferred Alternative. FTA and DART will examine the public and agency comments received during the DEIS public circulation period, make a final decision based on the input received, and advance the selected alternative for implementation. The comments and continued public and agency input will also assist in resolving issues. Specific issues that will require resolution include:

- Location of the EMF site –Two site options are identified in this DEIS. A preferred site will be identified in the FEIS/ROD.
- Mitigation Measures – Proposed mitigation measures are identified in this DEIS. Mitigation commitments will be determined following the public circulation period. Final mitigation commitments will be included in the FEIS/ROD and documented in an MMP. Some mitigation measures may not be finalized until final design pending additional studies.



1. Purpose and Need

1.1 Introduction

The Cotton Belt Corridor Regional Rail Project (Cotton Belt Project or Project) is a proposed 26-mile passenger rail alignment extending from Dallas-Fort Worth International Airport (DFW Airport) eastward to Shiloh Road in Plano, connecting with the existing Dallas Area Rapid Transit (DART) Orange Line at DFW Airport, the Green Line in Carrollton, and the Red Line in the Plano/Richardson area (**Figure 1-1**). The Project traverses through three Counties in Texas: Tarrant, Dallas, and Collin; and seven cities: Grapevine, Coppell, Dallas, Carrollton, Addison, Richardson and Plano.

1.2 Project Background and Regional Context

A passenger rail corridor concept from the DART Red Line in the Richardson/Plano area to the Green Line in Carrollton was included in the original 1983 DART Service Plan. In 1989, the DART Transit System Plan (TSP) recommended the purchase and preservation of the Cotton Belt Corridor right-of-way from Wylie, Texas, to north Fort Worth, Texas, and the 52-mile corridor purchase was completed in 1990. During the development of the 1995 DART TSP, this corridor was combined with others as alternatives for further study to serve an expanded North Crosstown Corridor.

DART conducted a high-level alternatives analysis and completed an existing conditions report on the North Crosstown Corridor as part of its 2030 TSP. The 2030 TSP identified the Cotton Belt Corridor as a focus area and concluded that by 2030, the North Crosstown Corridor area would experience notable insufficient roadway capacity equivalent to more than 10 freeway lanes. The report indicated that “express” passenger rail service on the Cotton Belt Corridor (from DFW Airport to the DART Red Line), using 20-minute peak and 60-minute off-peak service, was the most cost-effective and direct route to serve this east-west crosstown corridor. The 2030 TSP identified an implementation timeframe of 2025-2030 when the TSP was adopted in 2006. Following the recession of 2008-2009, the Cotton Belt, as well as several other projects, were deferred to post-2035.

The Cotton Belt Corridor has also been recognized on a regional level, and has been included in the Dallas-Fort Worth Metropolitan Planning Organization (MPO) and the North Central Texas Council of Government’s (NCTCOG) Metropolitan Transportation Plan (MTP) since 1986.

In October 2008, the Fort Worth Transportation Authority (FWTA) completed a Draft Environmental Impact Statement (DEIS) for the section of the Cotton Belt from DFW Airport to Fort Worth as part of their Southwest-to-Northwest (SW2NE) project (now known as TEXRail). The FEIS was completed in September 2014. Construction began in August 2016 and the project is scheduled for operation in late 2018.

In May 2010, a Memorandum of Understanding (MOU) between DART and the Regional Transportation Council (RTC) was executed concerning the identification of funding sources to implement rail service on the Cotton Belt Corridor. The MOU established DART’s role to advance the preliminary engineering and conduct an EIS for the Project, and the NCTCOG was to develop a financial plan sufficient to design, build, and implement regional rail service on the Cotton Belt Corridor.

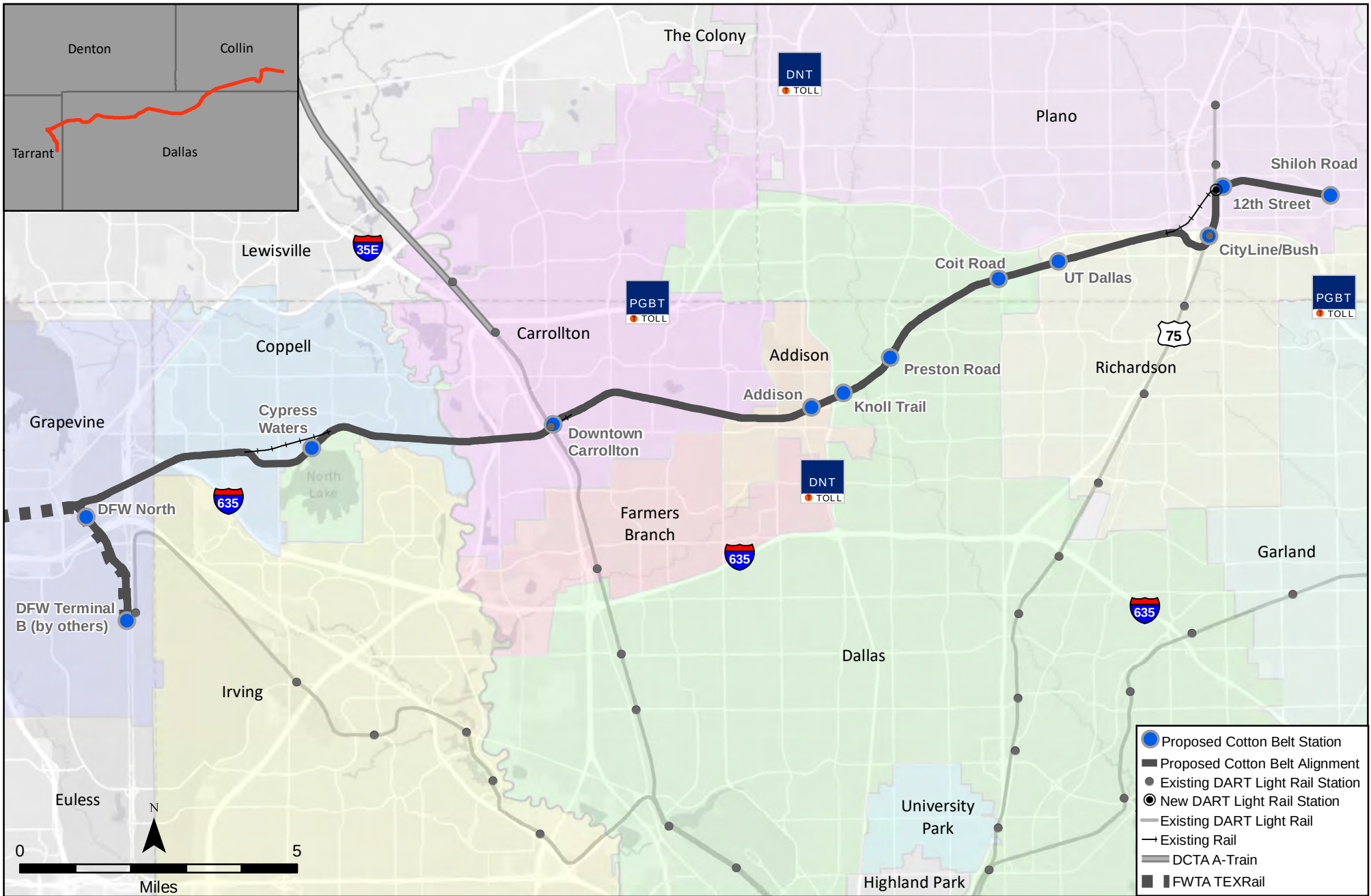


Figure 1-1
Cotton Belt Corridor Regional Rail Project

**Cotton Belt Corridor
Regional Rail Project**
Draft Environmental Impact Statement





On July 8, 2010, a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the Cotton Belt Project was published in the Federal Register. The Federal Transit Agency (FTA) was identified as the lead agency and the Federal Railroad Agency (FRA) and the Federal Aviation Agency (FAA) were invited to be cooperating agencies. Scoping meetings were held in July 2010. DART continued to advance the EIS effort while the RTC finance initiative was underway.

The funding MOU with the RTC expired on September 30, 2012, without a substantive financial plan. The RTC/NCTCOG efforts to identify funding did not result in any financial proposals. As a result, DART suspended the NEPA process in late 2012.

In April 2014, DART compiled the data collected and analysis completed during the EIS effort and assembled this information into an *Alternatives and Environmental Considerations Report* (AECR). The AECR documented the 5 percent design for the Cotton Belt Regional Rail Project and identified existing environmental conditions and potential impacts along the length of the corridor.

In 2015, DART included the Cotton Belt Corridor in the FY2016 DART Twenty-Year Financial Plan for implementation in year 2035. DART and regional stakeholders continued to discuss methods to accelerate or phase the Project earlier than 2035.

In 2016, DART moved the project schedule forward by more than 10 years as part of its FY2017 Twenty-Year Financial Plan by proposing a phased approach to implementation that would initially include a mostly single-track project and by taking advantage of a new federal loan program called Railroad Rehabilitation and Improvement Financing (RRIF). Under this program, DART plans to obtain a low-interest federal loan that is specific for regional rail and freight projects. The DART 2040 TSP, which is under development, will reflect this change to the project schedule and outline plans to enhance corridor infrastructure and service in the future.

To support the new project schedule, DART has re-started the preliminary engineering and is preparing an EIS under the original NOI, which includes the identification of environmental impacts, design considerations and cost estimates. DART and the FTA, in cooperation with the FAA, and participation with the FRA, are conducting the EIS in accordance with the National Environmental Policy Act (NEPA: 42 USC 4321 et seq.) of 1969 and the regulations implementing NEPA set forth in 40 CFR Parts 1500-1508 and 23 CFR Parts 771 and 774; and FAA Orders 1050.1F and 5050.4B.

Relevant System Planning Activities

The Cotton Belt Corridor has been studied and included in numerous transportation improvement plans since 1983. **Table 1-1** summarizes the plans that have included the Cotton Belt Corridor.

1.3 Corridor Study Area

The Study Area for the Cotton Belt Project (herein after referred to as "Study Area") is generally a 0.25-mile buffer on either side of the alignment and a 0.5-mile buffer around proposed station locations. In certain sections of the DEIS, the Study Area is different depending on the type of resource and extent of potential impacts. The Study Area is served by or intersects a variety of transportation systems including: DFW International Airport, Addison Airport, roadways, rail and bus transit facilities, and freight corridors. The Cotton Belt Corridor intersects several major freeways including, State Highway (SH) 121, IH 635, the President George Bush Turnpike (PGBT), IH 35E, the Dallas North Tollway (DNT) and US 75 (North Central Expressway).



Table 1-1. Cotton Belt Corridor Regional System Planning Documents

Document	Key Information
DART Final Service Plan, 1983	Identified at-grade passenger rail service from downtown Carrollton (Green Line) to the North Central Corridor (Red Line).
Mobility 2000 – The Regional Transportation Plan for North Central Texas, May 1986	Preserved right-of-way for the Cotton Belt Corridor from downtown Fort Worth to Plano.
DART Transit System Plan, June 1989	Cotton Belt Corridor right-of-way preservation and purchase. Completed purchase of 52 miles of right-of-way from Wylie, Texas to north Fort Worth, Texas in 1990.
2010 DART Transit System Plan, November 1995	Identified North Crosstown Corridor [Cotton Belt, Kansas City Southern (KCS), IH 635 and Burlington Northern Santa Fe (BNSF) railroad corridor alignments].
Mobility 2020 – The Metropolitan Transportation Plan, December 1996	Identified commuter rail on the Cotton Belt Corridor from Parker Road or Addison Transit Center to DFW Airport and light rail from Addison Transit Center to IH 635/US 75.
Mobility 2025 – The Metropolitan Transportation Plan, January 2000	Evaluated options for the North Crosstown Study Area: passenger rail along KCS/BNSF, Cotton Belt Corridor from Parker Road to DFW Airport, Addison Transit Center to DFW Airport, and light rail from Addison Transit Center to IH 635/US 75.
Mobility 2025 Update – The Metropolitan Transportation Plan, May 2001	Updated the MTP identifying an eastern transition to light rail along IH 635 near Addison Transit Center.
Mobility 2025 – The Metropolitan Transportation Plan – 2004 Update, January 2004	Updated the MTP including options for light rail from Addison Transit Center to Forest Lane Station on the DART Red Line.
Mobility 2025 – The Metropolitan Transportation Plan – April 2005 Amendment, April 2005	Updated the MTP including options for passenger rail service along BNSF and KCS corridors from Carrollton to Richardson.
DART 2030 Transit System Plan, October 2006	Evaluated and recommended express rail on the Cotton Belt Corridor from the DART Red Line to DFW Airport.
Mobility 2030 – The Metropolitan Transportation Plan, June 2007	Updated MTP with light rail/new technology for the Cotton Belt Corridor from DFW Airport to downtown Plano or Bush Turnpike Station.
Mobility 2030 – The Metropolitan Transportation Plan – 2009 Amendment, April 2009	Updated MTP.
Cotton Belt Corridor Conceptual Engineering and Funding Study, April 2010	NCTCOG study provided background information on the existing environment, and compared various combinations of interlining with the western portion of the corridor, Red Line termini, minor alignment deviations, and station locations on the Cotton Belt Corridor.
Mobility 2035 – The Metropolitan Transportation Plan March 10, 2011	Updated MTP with light rail/new technology for the Cotton Belt Corridor from DFW Airport to downtown Plano or Bush Turnpike Station.
Alternatives and Environmental Considerations Report (AECR), April 2014	Advanced a 5 percent design for the Cotton Belt Regional Rail Project and identified existing environmental conditions and potential impacts along the length of the Cotton Belt Corridor.
Mobility 2040 – The Metropolitan Transportation Plan for North Central Texas, March 2016	Latest iteration of the MTP, which is consistent with Mobility 2030's position on transit implementation in the Cotton Belt Corridor.
DART 2040 Transit System Plan, in development	TSP includes DART's plans for developing the Cotton Belt Corridor.

Source: DART Capital Planning

A combination of local, express, suburban, crosstown and shuttle buses serve the corridor. There are currently 33 DART bus routes operating in the Study Area and one transit center is directly on the corridor, the Addison Transit Center.

As an east-west corridor, the Project would connect with several existing and future rail lines, including the existing Orange Line and future FUTA TEXRail Project at DFW Airport Terminals



A and B, the Green Line at the Downtown Carrollton station, the Red/Orange Lines at the CityLine/Bush Station in Richardson, and the proposed infill 12th Street light rail station in Plano. **Figure 1-2** illustrates the Cotton Belt Corridor in relation to the existing and committed transit network in the DART Service Area.

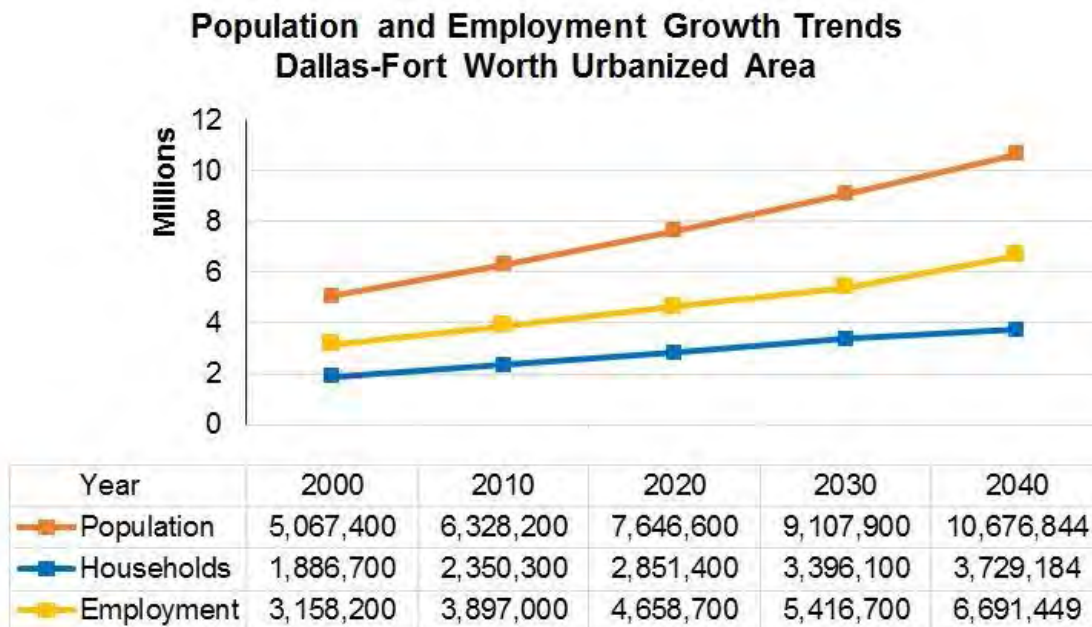
Two future transit corridors have been identified in the NCTCOG Mobility 2040 MTP that could connect to the Cotton Belt Corridor but they do not have funding. These include the Frisco Corridor, a potential alignment using an existing railroad corridor between Irving and Frisco that would connect in downtown Carrollton, and a potential transit corridor (bus or rail) north to McKinney within the DART-owned railroad corridor north of Parker Road.

Three freight companies operate on sections of the Cotton Belt tracks through agreements with DART: The Fort Worth and Western Railroad (FWWR), the KCS Railroad, and the Dallas Garland Northeastern (DGNO) short-line freight rail service. The Union Pacific (UP) Railroad has overhead rights but does not currently operate within the corridor. On January 22, 2010, the Surface Transportation Board (STB) approved freight abandonment in the north Dallas area from Knoll Trail in Dallas to Renner Junction in Richardson. In addition, the BNSF operates freight on the Madill subdivision line from the north through downtown Carrollton toward Irving.

Population and Employment

Population has increased considerably in the Dallas-Fort Worth region over the past two decades. Population increased by 25 percent to 6,328,200 between 2000 and 2010. By 2040, the region's population is expected to increase by approximately four million persons. **Table 1-2** provides the NCTCOG regional projections for population, households, and employment for the Dallas-Fort Worth urbanized area which includes: Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise Counties. However, the majority of growth in population within the Study Area is projected in the Dallas, Collin and Tarrant Counties.

Table 1-2. Population and Employment Growth Trends



Source: NCTCOG Demographic 2030 and 2040 Forecasts (Jan. 24, 2007; Jan. 22, 2015); US Census Bureau

DART Current and Future Rail Services

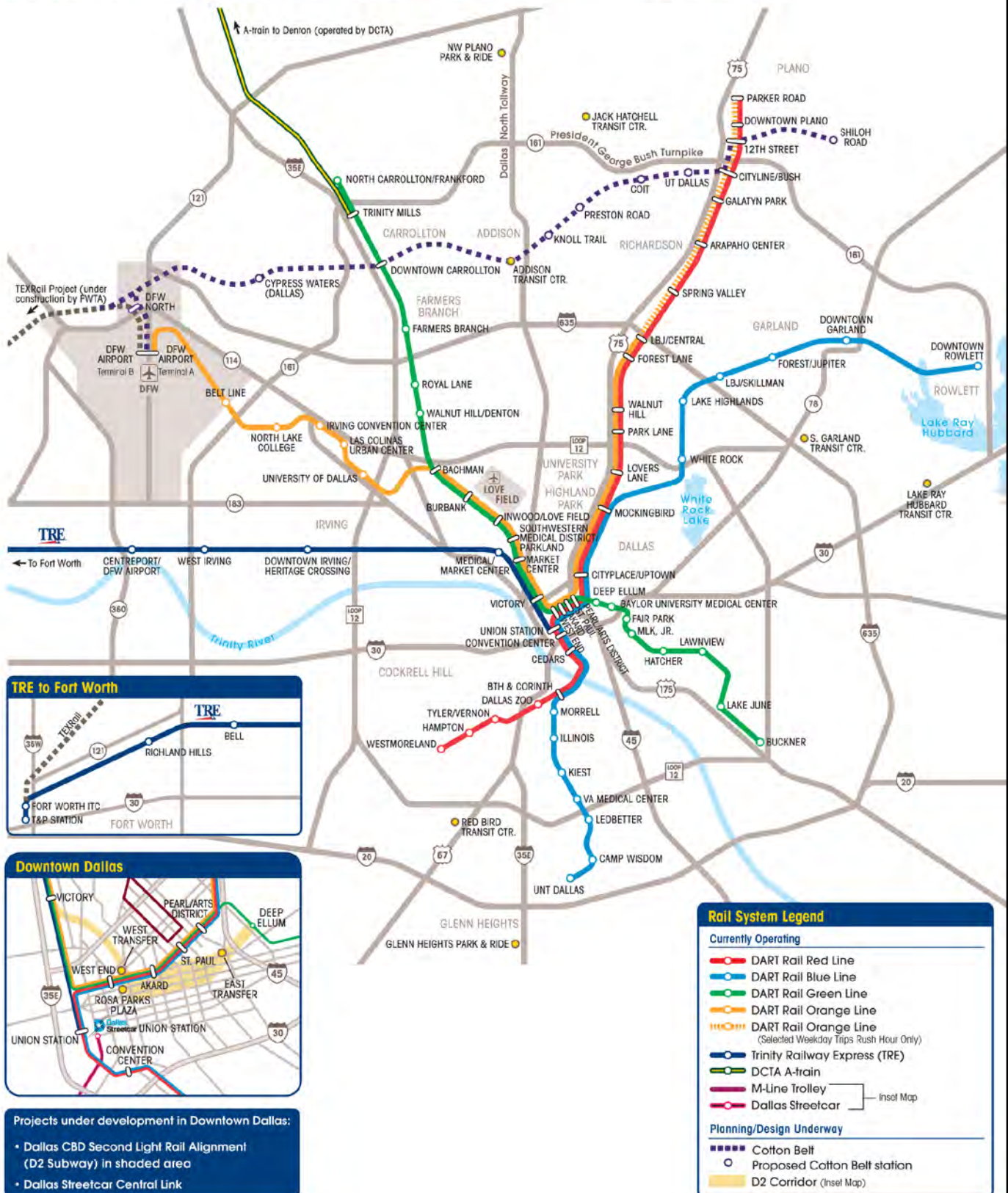


Figure 1-2
Existing and Committed Transit Network
Data Source: www.DART.org

Cotton Belt Corridor
Regional Rail Project
Draft Environmental Impact Statement



COTTON BELT



The Dallas-Fort Worth region has also experienced considerable growth in employment over the past several decades which can be attributed to a favorable business climate, attractive tax policies and plenty of available land.

The Study Area hosts a number of large employers including 34 with 500 or more employees and over 90 employment centers with more than 250 people. The largest employment center within the Study Area is DFW Airport where approximately 60,000 airport, airline, cargo and additional employees are located. Additional major employers include State Farm Insurance and Raytheon at CityLine with approximately 12,800 employees. The University of Texas at Dallas (UTD) has 3,592 employees (2,406 staff and 1,186 faculty) in addition to an enrollment of 26,797 students. The Town of Addison is one of several communities along the corridor that has more employment than population. This 4.4 square-mile community located near the mid-point of the Cotton Belt Corridor had employment of 45,649 in 2010. By 2040, this is expected to increase to 70,847.

Table 1-3 provides the projected population and employment for municipalities along the Cotton Belt Corridor between 2010 and 2040. The Study Area is projected to increase 35 percent in both population and employment.

Table 1-3. Year 2010 to 2040 Projected Population and Employment Change

Location	Population			Employment		
	2010	2040	Percent Change	2010	2040	Percent Change
Addison	14,454	16,871	14%	45,649	70,847	36%
Carrollton	109,364	127,163	14%	68,199	138,093	51%
Coppell	36,191	42,697	15%	18,401	52,616	65%
Dallas	1,202,592	1,646,773	26%	1,038,314	1,791,041	42%
Farmers Branch	28,028	29,711	6%	75,013	139,964	46%
Grapevine	41,909	51,786	19%	49,565	107,791	54%
Irving	196,632	394,876	50%	165,435	420,456	60%
Plano	222,498	302,086	26%	115,048	321,911	64%
Richardson	92,577	132,083	30%	94,792	199,993	53%
Total	1,944,245	2,744,006	29%	1,670,416	2,514,472	34%
Study Area	118,960	184,055	35%	208,134	281,094	35%

Source: DART and NCTCOG 2040 Demographic Forecast

This increase in employment and population has negatively impacted the region's transportation network and created a need for a more developed and efficient transportation system.

Travel Patterns and Congestion

The Study Area's employment and population centers are primarily accessible by automobile, and also by the radially-oriented DART Rail system and bus connections. While much of the corridor is characterized by suburban, low-density, auto-oriented land use patterns, there are increasingly dense, mixed use developments occurring around existing rail and proposed Cotton Belt station areas. The Dallas-Fort Worth area, like many areas around the country, has experienced the decentralization of the urban core. Employment centers have largely shifted away from the region's core and developed along major freeways and arterials in the northern part of the DART Service Area. This trend has produced a strain on the region's transportation network and inability for the region to build sufficient roadway capacity.

The Study Area includes numerous roadway facilities that intersect the corridor both north-south and east-west. The north-south roadways include IH 35E, Dallas North Tollway (DNT) and US 75 (North Central Expressway). The east-west facilities include IH 635, Belt Line Road and President George Bush Turnpike (PGBT).



- IH 635 is the seventh most congested highway in the State of Texas.¹ The highway was recently reconstructed, and the improvements included two travel lanes and six managed lanes that replaced the two existing HOV lanes.
- Belt Line Road is a six-lane regional arterial running east-west through the Study Area. In 2017, traffic was over 38,000 vehicles per day (vpd) and is projected to increase to over 45,000 vpd by 2040.
- The PGBT is a six-lane roadway that carried 84,590 vehicles per day in 2017 and is projected to carry over 90,000 vehicles per day by 2040 in the Study Area.

The roadway network within the Study Area currently has moderate to severe traffic congestion. Congestion levels are measured by level of service (LOS). LOS is a rating system used to evaluate roadway performance. Performance is ranked “A” through “F”, with “A” operating at free flow acceptable conditions and “F” operating with breakdown flows or unacceptable conditions. The evaluation is based on a combination of speed, delay and roadway design. **Table 1-4** indicates that vehicle miles of travel (VMT) per day, vehicle hours traveled (VHT) per day, and vehicle hours of congestion delay per day are all projected to increase by 2040 within the 0.5-mile Study Area. Hours of congestion delay are forecasted to increase by approximately twice the rate of VMT and VHT.

In addition, **Table 1-4** shows that 23 percent of the roadway network in the Study Area operates at a LOS D or E and 37 percent operates at a LOS F as of 2017. Conditions are projected to worsen by 2040 with 23 percent operating at LOS D or E and 41 percent operating at LOS F. This would begin to shift traffic away from the congested arterials onto the minor arterials and collector road system.

Table 1-4. Existing and Future Transportation Conditions Within 0.5-mile of Corridor

Performance Measure	2017	2040	Percent Change
Vehicle Miles of Travel per Day	6,377,069	7,733,452	17.5%
Vehicle Hours of Travel per Day	197,800	261,812	24.4%
Vehicle Hours of Congestion Delay per Day	46,658	78,632	41%
Lane Miles in Study Area	2,434	2,618	7%
Percent Lane Miles at LOS D, E	2017	2040	Percent Change
Freeway/Toll Road	31%	40%	23%
Principal Arterial	9%	8%	-10%
Minor Arterial	27%	18%	-47%
Collectors	12%	14%	17%
Freeway Ramps	6%	4%	-34%
Frontage Roads	10%	11%	8%
HOV	5%	3%	-52%
Total Roadway Network	23%	23%	0.0%
Percent Lane Miles at LOS F	2017	2040	Percent Change
Freeway/Toll Road	22%	20%	-9%
Principal Arterial	18%	16%	-16%
Minor Arterial	37%	40%	6%
Collectors	8%	11%	26%
Freeway Ramps	5%	5.4%	7.4%
Frontage Roads	5%	7%	29%
HOV	1.8%	1%	-82%
Total Roadway Network	37%	41%	9%

Source: NCTCOG, DART, 2017

¹ <http://www.txdot.gov/inside-txdot/projects/100-congested-roadways.html>



Existing Transit Conditions

The Study Area is served by light rail and local and express bus service that spans three transit service areas including DART, Denton County Transportation Authority (DCTA) and FWTa.

Figure 1-3 illustrates the existing transit network in this part of the DART Service Area. As shown, DART provides the majority of transit service to the corridor with both bus and light rail. Most of the service consists of north-south and radial service with east-west services mostly limited to shorter local and feeder bus routes. The Red, Orange and Green Lines are radial in nature and all interface with the corridor, operating at 15/20 peak/off-peak headways. During FY2016, weekly average ridership ranged from 22,400 to 26,800 on the three lines. The Cotton Belt Project would interface with light rail at three existing stations, DFW Airport, Downtown Carrollton, and CityLine/Bush. FY2016 average daily station ridership ranged from 640 at Downtown Carrollton to 1,350 at CityLine/Bush. Ridership is expected to increase with new developments and connections to the Cotton Belt Project.

DART also operates 33 bus routes in the Study Area including five local routes, three express routes, 10 feeder routes, six cross-town routes, and nine special or shuttle routes, including those that serve DFW Airport. Route 400, (split into Routes 402 and 403 on March 26, 2018) is the only east-west route through the northern portion of the DART Service Area, serving a similar pattern as the Cotton Belt Project, but terminating in the Irving/Las Colinas area. This route runs east-west through the northern portion of the DART Service Area, and has the highest average weekday ridership of buses in the corridor with approximately 2,000 passenger trips. Routes 463 and 488 also average approximately 1,800 weekday passenger boardings. There is no direct east-west transit service to DFW Airport.

The Addison Transit Center is a proposed station location, and provides 300 parking spaces and connections for 14 local and express routes. The Addison Transit Center is the most heavily utilized of DART's bus transit facilities, serving between 2,000 and 2,500 passengers a day, with most passengers transferring among routes to access area employment centers. The corridor is also served by DCTA which provides regional rail service between Denton County and the DART Green Line Trinity Mills Station. DART and the FWTa jointly own and operate the TRE Commuter Rail service between downtown Fort Worth and downtown Dallas. TRE serves DFW Airport at the Centre Port/DFW Airport Station with a shuttle service that runs between the station and DFW Airport terminals.

1.4 Purpose and Need for the Proposed Action

Purpose of the Proposed Action

The Project's primary purpose is to provide passenger rail connections that would improve mobility, accessibility and system linkages to major employment, population and activity centers in the northern part of the DART Service Area and support sustainable growth, local and regional land use visions, and economic development. Travel patterns within the Cotton Belt Corridor are largely east to west, suburb to suburb and longer distance than the traditional suburb to central business district trip.

The Cotton Belt Project would be designed to provide a high-speed, reliable transit option for residents and commuters with connections to the existing and planned transit systems. The implementation of passenger rail within the Cotton Belt Corridor would provide an alternative mode of transportation within the Study Area. The connection of three LRT lines, a major bus transit center, and one regional rail line (TEXRail) makes regional connectivity a key component of the Project. The Project also offers opportunities to connect with the proposed future BNSF regional rail corridor between Frisco and Irving, and a potential southern extension of the DCTA A-Train, with connections in downtown Carrollton.



**Cotton Belt Corridor
Regional Rail Project**
Draft Environmental Impact Statement



Need for the Proposed Action

The Cotton Belt Study Area (Study Area) encompasses a number of employment centers, major corporate headquarters and jobs. As a result, traffic within the Study Area has been increasing. Congestion and travel delays on the existing roadway network are at moderate to severe levels. Current land use patterns in many parts of the corridor lack direct connectivity to high capacity transit. However, some areas, such as Addison and CityLine in Richardson, have medium to high density developments focused on existing transit facilities and future regional rail stations. Over the next twenty years, the Study Area is projected to attract new employment and population, continuing to impact and strain the transportation network. The accessibility of the corridor would decline as congestion and travel delay increases. Even with the planned transportation improvements for the corridor, congestion and travel delays are expected to worsen. There is no route providing east-west transit service through the length of the corridor, or to DFW Airport. Surveys done in 2016 as part of the Transit System Plan indicate that east-west transit improvements in this part of the DART Service Area is the highest priority for the public.

In order to meet the growing demands of the corridor, transportation improvements are needed to improve accessibility and connectivity. The following transportation needs have been identified for the Cotton Belt Corridor.

- Improve transit travel times by providing an alternative to congested roadway networks.
- Provide reliable connections between the existing and proposed local and regional transit systems.
- Improve accessibility to employment, activity centers and residential areas in the corridor.
- Promote sustainable development patterns in the Study Area.

Regional demand for travel in the Study Area is projected to increase along with congestion. Implementation of the Project would improve transit performance in the Study Area by offering a new, more reliable service. **Chapter 5** provides information on the transit service and coverage benefits of the Cotton Belt Project.

Goals and Objectives

The Project's primary purpose is to provide passenger rail connections that would improve mobility, accessibility and system linkages to major employment, population and activity centers in the northern portion of the DART Service Area and support sustainable growth, local and regional land use visions, and economic development. Goals and objectives have been identified as follows:

- Enhance corridor mobility and accessibility
 - Provide connectivity to existing and planned passenger rail facilities
 - Provide transportation investments serving future population and employment growth
 - Improve access to existing and emerging major activity centers, including connectivity to DFW Airport
 - Increase transit usage for existing and new riders
 - Improve access to transit
 - Provide cost-effective options
- Reduce VMT
 - Increase transit capacity and improve travel times through more reliable transit
 - Reduce air quality impacts
- Promote economic development and sustainable land use patterns
 - Enhance employment opportunities
 - Encourage economic development opportunities



- Promote sustainable and livable development opportunities
- Promote consistency with regional and local transportation and comprehensive plans
- Coordinate initiatives for land use development and redevelopment
- Provide an environmentally-sensitive transit investment
 - Minimize negative impacts to the community
 - Minimize negative impacts to the environment
 - Minimize negative impacts to natural, social and economic environments

1.5 Planning Context

Decision Framework

Since 1983, the Cotton Belt Corridor has been included in several transportation service plans and the NCTCOG MTP. In 1995 DART identified a broad North Crosstown Corridor which included the Cotton Belt line as a key transportation corridor. NCTCOG also included the Cotton Belt Corridor in the region's long-range transportation plans. Without a firm financing plan, DART documented the efforts to date in the AECR and advanced a 5 percent design for the Cotton Belt Project which identified existing environmental conditions and potential impacts along the length of the Cotton Belt Corridor. The AECR and 5 percent design were the starting point for completing this DEIS.

The Role of the EIS in Project Development

The EIS is being prepared by DART, in cooperation with FTA, and will follow the legislation set forth in the National Environmental Policy Act (NEPA) of 1969 and FTA regulations set in 23 CFR 771. In addition, FAA is a cooperating agency as it has jurisdiction of DFW International Airport and Addison Airport located within the Study Area. FRA is a participating agency due to the proposed RRIF funding.

The Project would require FAA approval of a revision to the DFW Airport's *Airport Layout Plan* (ALP) (see **Appendix C**). Pursuant to 49 USC Section 47107(a)(16), the FAA Administrator, under authority delegated from the Secretary of Transportation, must review any revision or modification to an ALP and ensure that the alteration does not adversely affect the safety, utility, or efficiency of the airport. Any FAA determination to approve revision of the ALP to accommodate the Project must take these factors into consideration. As the regional rail line would remain within the existing rail right-of-way south of Addison Airport, revisions to the Addison Airport ALP would not be required (see **Appendix D**).

The EIS is prepared to inform the public of potential environmental, social and economic impacts associated with the Project compared to a No-Build Alternative. The No-Build Alternative provides a baseline condition for identifying changes that would occur with the Project in place.

A comprehensive Public Involvement Program (PIP) was developed and has been implemented as part of the DEIS development. The PIP builds on the 2010 scoping effort and includes: agency meetings; community-wide public information meetings; public hearings; informational briefings to stakeholder groups, elected officials, and other local and regional officials; area focus groups; and information dissemination via a project website and newsletters.

Public and area focus group meetings have provided the public an opportunity to comment on the scope of the EIS, specifically on the Project's purpose and need, and the regional rail project being evaluated.

This DEIS will be available for a 45-day public and agency review and comment period. During this time, public hearings will be held to present the findings of this DEIS and formally receive comments. Written comments may be submitted throughout the full comment period as well.



After circulation of the DEIS, preliminary engineering and environmental analyses will be completed. Additional analyses may be required upon receipt of DEIS comments. Mitigation commitments will be developed and responses to comments received during the comment period will be prepared and incorporated as appropriate.

In order to complete the environmental review process, a combined FEIS and ROD would be prepared by FTA, FAA, and DART. The FEIS/ROD will incorporate the above elements, state the proposed action, and be made available to the public. A FEIS/ROD, in accordance with the Fixing America's Surface Transportation (FAST) Act and 23 United State Code (USC) Section 139(n), and is anticipated to be issued by FTA and FAA unless it is determined that circumstances, such as changes to the proposed action, anticipated impacts, or other new information, preclude issuance of such a combined document. Issuance of a ROD provides the clearance to begin final design and construction. The FEIS/ROD will include a Mitigation Monitoring Program to ensure that mitigation commitments are carried through final design and construction.



2. Alternatives Considered

This chapter focuses on the definition of the No-Build Alternative and Build Alternative. These two alternatives are evaluated and compared in subsequent sections of this document in accordance with NEPA. The Federal Highway Administration (FHWA) and FTA regulations dictate that “The DEIS shall evaluate all reasonable alternatives to the action and discuss the reason why other alternatives which may have been considered were eliminated from detailed study” (23 CFR 771.123). The Council on Environmental Quality (CEQ), the federal commission responsible for coordinating federal environmental efforts, further addresses reasonable alternatives as “those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant” (46 Fed. Reg. 18026, question 2a). Background information on decision-making supporting the Build Alternative as the preferred alternative is discussed in **Section 2.1** and **Appendix F. Section 2.5** of this DEIS documents alternatives considered but eliminated for further consideration.

2.1 Planning History

The Cotton Belt Project has been included in various DART and NCTCOG planning documents since 1983 as an alignment alternative for passenger rail. The Cotton Belt Project was initially included in the 1983 Service Plan from IH 35E to US 75. This Service Plan was the basis of the vote which created DART. DART designated the Cotton Belt Corridor for right-of-way preservation in the 1989 TSP, and purchased the corridor in 1990. In 2006, the DART 2030 TSP identified the corridor as the most direct and cost-effective route to provide an east-west connection in the northern part of the DART Service Area and connect with DFW Airport. At that time, it was added to the DART 20-Year Financial Plan for implementation during the 2025-2030 timeframe. While the 2008-2009 recession deferred the project schedule, subsequent economic growth and the RRIF loan program allowed the DART Board to advance the Project with a year 2022 service date in the FY2017 20-Year Financial Plan.

Since 2006, several additional studies and actions have occurred to continue to advance the Project to this phase. The Build Alternative was identified during alternatives development and evaluation to be the preferred from among the other Build Alternatives studied.

2.2 No-Build Alternative

The No-Build Alternative assumes a 2040 condition of land use and demographics. It includes transit capital and service improvements that are programmed to be implemented by DART and other transit providers in the Study Area, as well as all other planned, programmed, and funded transportation projects for the planning year 2040. This includes projects contained in the *2017-2020 Transportation Improvement Plan* (TIP). No-Build Alternative is not a no impact alternative, as it includes actions by DART or other agencies that have been or will be addressed in separate environmental reviews. The No-Build Alternative is included as a benchmark against which the potentially significant environmental benefits and impacts of the proposed Build Alternative will be measured. A summary of substantial projects programmed and funded and part of the No-Build Alternative definition include:

Transit Service and Capital Projects

- DART March 2018 Transit Service Improvements – service changes to modify and improve service on many DART bus routes, focused on midday and weekend improvements. The most prominent route upgrade involves the central portion of route 400, DART's longest route. Overlapping routes 402 and 403 will replace the single route, doubling the frequency between Spring Valley and Downtown Carrollton stations.



- DART Red/Blue Line Platform Extensions – modifications to 28 of the original Red/Blue Line light rail platforms to accommodate three-car trains, improving system capacity and reducing crowding during peak travel times. This project is in final design with implementation complete by 2022.
- DART D2 Subway – implementation of a second light rail alignment in downtown Dallas, primarily in a subway configuration. This project is in the Project Development phase and will increase system capacity, improve reliability and operational flexibility, and serve new markets. The anticipated revenue service date is 2024.
- FWTa TEXRail Project - A 27-mile commuter rail project from downtown Fort Worth, through North Richland Hills and Grapevine to the northern entrance of DFW Airport, ending at Terminal B of the Airport. This project is under construction and is scheduled to open for revenue service in late 2018.

Roadway Projects

The two major east-west freeway facilities in the area include IH 635 and President George Bush Turnpike (PGBT). Capacity improvements on both facilities were recently completed through 2018, with minor reconstruction and enhancements planned beyond this date. No additional major capacity improvements are programmed.

2.3 Proposed Build Alternative

The Cotton Belt Project is defined as the Build Alternative (see **Figure 1-1**). The Project would be located primarily within the existing Cotton Belt Corridor railroad right-of-way. There would be four areas where the Project alignment deviates from the railroad corridor: 1) at DFW Airport where the rail would connect to DFW Terminal B and share right-of-way and stations with the Fort Worth Transportation Authority (FWTA) TEXRail Project, which is under construction (DFW Airport Connection); 2) in the Coppell/Dallas area near North Lake to serve the growing Cypress Waters development (Cypress Waters Alignment); 3) near downtown Carrollton, where portions of the existing Cotton Belt Corridor, the existing Madill Sub, and the Dallas Garland Northeastern (DGNO) track are realigned to facilitate grade separation of the two rail corridors and maintain connections through this area for freight operations (Downtown Carrollton Reconfiguration); and 4) near the President George Bush Turnpike (PGBT) in Richardson and Plano to serve the growing mixed-use CityLine development (CityLine/Bush Alignment). The alignment is described below from west to east starting on DFW Airport property to the end of the line at Shiloh Road in Plano. The 10 percent design plans are located in **Appendix A**.

2.3.1 Alignment

The Project begins at its connection with the future TEXRail Project which is under construction. TEXRail will extend from Fort Worth to Terminal B at DFW Airport. The Project would utilize the portion of the TEXRail Project that extends northwest, on new right-of-way, from the DFW Terminal B Station to the DFW North Station located just south of the Cotton Belt Corridor. DART has coordinated the Project with the TEXRail Project and DFW Airport. Portions of the Project corridor would be co-located with the TEXRail track in a corridor that has previously been environmentally cleared. On September 29, 2014, both FTA and FAA issued a ROD for the TEXRail Project. On April 16, 2015, FTA issued an amended ROD for project changes off airport property. DFW Airport is currently constructing the DFW Terminal B Station, a dual-track station that would be shared by both transit agencies, north of the Terminal B Station. FWTA is constructing a single-track rail alignment extending 10,000 feet to the TEXRail DFW North Platform. DART would construct a second track and a 1900-foot siding in this corridor. Much of the infrastructure being constructed by TEXRail will accommodate the TEXRail and Cotton Belt tracks. This infrastructure includes: a culvert over Grapevine Creek, a bridge over Cottonwood Branch, two roadway bridges over the tracks (Southbound International Parkway frontage road



and North Airfield Drive), and a railroad bridge over SH 121/SH 114. The two tracks would also share two at-grade roadway crossings (Crossunder # 2 and North Employee Road).

At the DFW North Station, the two projects diverge. DART would construct separate platforms and dual tracks in new right-of-way to spur to the northeast and rejoin the existing Cotton Belt railroad right-of-way. The two projects would share the DFW Station parking, bus lanes and station access being constructed for the TEXRail Project. DART would add additional pedestrian connections. At the DFW North Station, the TEXRail Project turns west onto the existing railroad corridor right-of-way, while the Cotton Belt Project turns east. As described below, almost all major road crossings within the corridor are at-grade crossings, with exceptions noted below and detailed in **Chapter 5. Section 5.2** discusses roadway crossings of the Project. **Table 5-7** lists the proposed configuration of all roadways and other crossings of the Cotton Belt alignment. **Figures 5-2** through **5-5** show the location of these crossings.

The Project proceeds northeast and would connect to the existing Cotton Belt railroad track. It then would head east and cross the Cottonwood Branch and its floodplain on an aerial structure and continues under International Parkway, under IH 635 and then cross Royal Lane and Freeport Parkway at grade. It would continue east and cross South Coppel Road at grade. As the Project passes through the City of Coppell, the Cypress Waters alignment would deviate from the existing railroad and veer to the southeast in a new location to serve the Cypress Waters mixed-use development. It would then cross over Grapevine Creek and be grade separated over South Belt Line Road. The alignment then would descend to an at-grade profile and turn northeast to the Cypress Waters Station. The alignment would continue northeast crossing East Belt Line Road at grade before rejoining the existing Cotton Belt Corridor right-of-way at Moore Road. **Figure 2-1** shows the existing railroad corridor and alignment deviation for Cypress Waters. Freight would continue to operate on the existing corridor and only passenger service would run through Cypress Waters.

After rejoining the Cotton Belt, the alignment would run parallel to Belt Line Road and cross Moore Road, Mockingbird Lane, MacArthur Boulevard and Fairway Drive at grade. The profile would gradually ascend on retained fill to a low aerial structure over two floodplain areas just west of the Elm Fork Branch of the Trinity River.

This portion includes the DFW Terminal B Station (under construction by DFW Airport and shared by TEXRail and the Cotton Belt Project), DFW North Station (portions of which would be constructed by both transit agencies) and the Cypress Waters Station.

After the alignment crosses the Elm Fork Branch of the Trinity River, it would continue just north of Belt Line Road and under the PGBT crossing Luna Road at grade. The alignment would continue east, cross the Hutton Branch of the Trinity River, then travel under IH 35E aerial bridges and the existing elevated DART Green Line. A station in downtown Carrollton would serve as the interface with the DART Green Line. East of the station, the alignment would rise to cross over BNSF freight tracks (Madill Sub). In downtown Carrollton, portions of the existing Cotton Belt Corridor and the existing Madill Sub would be realigned to facilitate grade separation of the two rail corridors. Passenger rail would operate on the aerial alignment to avoid service delays associated with freight operations. Freight would continue to operate at-grade. Mercer Yard, currently located southeast of the proposed station would be relocated (see **Section 2.3.4**). TxDOT is currently completing the rebuild of IH 35E, its frontage roads and Belt Line Road in downtown Carrollton. The Cotton Belt Project design has been coordinated with these projects.



Figure 2-1
Cypress Waters Alignment





The alignment would continue east toward Addison crossing the intersecting streets at grade except for Midway Road, which would be grade separated along with the freight on an elevated structure. In Addison, the station would be located at the Addison Transit Center. The alignment would remain grade separated over the DNT main lanes and continues as double track. The alignment would cross Knoll Trail Drive at grade, and cross over White Rock Creek on a new structure as it traverses slightly to the northeast at grade through the North Dallas area.

The alignment would operate at grade through North Dallas and would include new bridges at the three creek crossings locally known as McKamy Branch, Osage Branch Crossing #1 and Osage Branch Crossing #2. The alignment would cross the roadways of Davenport Road (twice), Campbell Road, Hillcrest Road, McCallum Boulevard and Meandering Way at grade.

The alignment would pass under grade-separated Coit Road by lowering the rail profile slightly and rebuilding Coit Road on a bridge structure. The alignment continues east and would cross Waterview Parkway at grade and then cross under already grade-separated KCS Railway, Synergy Park Boulevard, and Renner Road, and then over a new grade separation at Custer Parkway. The section includes the Knoll Trail Station, Preston Road Station, Coit Road Station and UT Dallas Station.

At Alma Road, the alignment would cross Alma at grade and deviates from the existing railroad alignment, veering southerly away from the PGBT for the CityLine/Bush alignment. It would cross the floodplain of Spring Creek and US 75 on an aerial structure, then turn north and descend to the CityLine/Bush Station to provide a side-by-side platform transfer with existing DART light rail service. From this station, the alignment would travel north and parallel to the DART light rail corridor. The alignment would pass under PGBT then cross Plano Parkway on a grade-separated structure and 10th Street at grade. Near 12th Street, the alignment would turn right at grade under the LRT structure and into the proposed 12th Street Station. The 12th Street Station would include a pedestrian connection to a proposed infill LRT station on the elevated LRT guideway. In this area, the existing freight track would be at grade. **Figure 2-2** shows the existing freight alignment and the proposed CityLine/Bush alignment. The remainder of the alignment would travel east on the existing Cotton Belt Corridor and cross N Avenue, Jupiter Road and Shiloh Road at grade before terminating just past Shiloh Road.

To accommodate freight and transit rail operations in both directions, it is proposed that one track would primarily be dedicated to passenger operations, while the other track would share both passenger and freight services. There may be opportunities for some sections to have a single shared track to minimize construction costs and impacts.

As shown in **Figure 2-3**, the current freight service providers are: the FWWR, the DGNO, and the KCS. Freight operates on the Cotton Belt Corridor except for the area between the DNT and the KCS Crossing at Renner Junction. There are typically 27 freight-rail train trips per week along various sections of the Cotton Belt Corridor and typically 12 trains per week on any section. The FWWR, which provides local freight service from Fort. Worth to west of downtown Carrollton, operates three trains per week with switching activity within the corridor. The DGNO provides local freight service from the UP in downtown Carrollton east to Addison. The DGNO operates Mercer Yard in downtown Carrollton. The DGNO currently operates 12 trains per week, with extensive switching operations at Mercer Yard. The KCS provides local freight service from Renner Junction east to Plano. The KCS typically operates 12 trains per week. The Madill Subdivision, intersects the Cotton Belt Corridor at grade in downtown Carrollton. BNSF operates several trains per day with train lengths as long as 8,000 feet and conducts limited switching in downtown Carrollton.

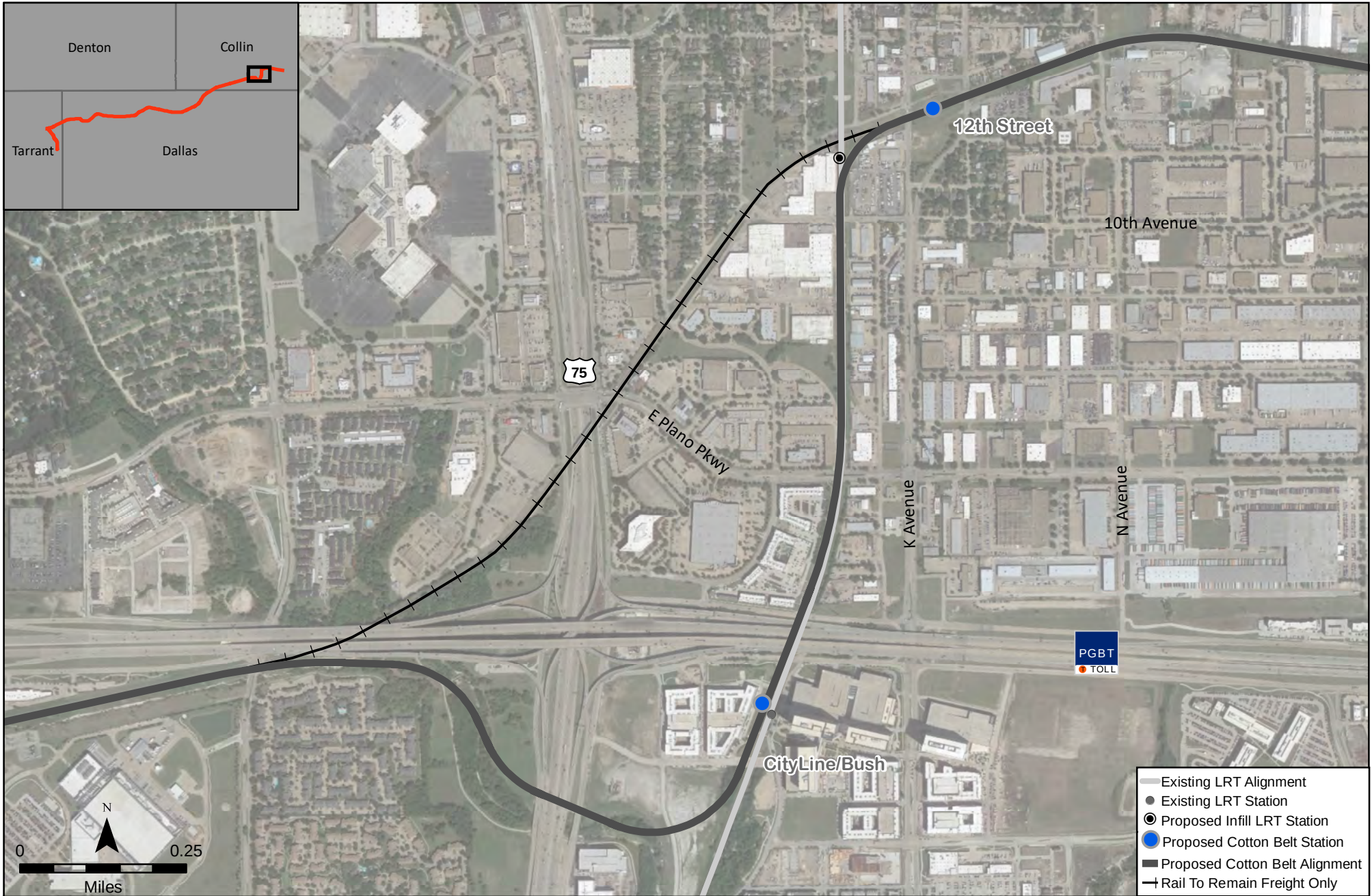


Figure 2-2
CityLine/Bush Alignment

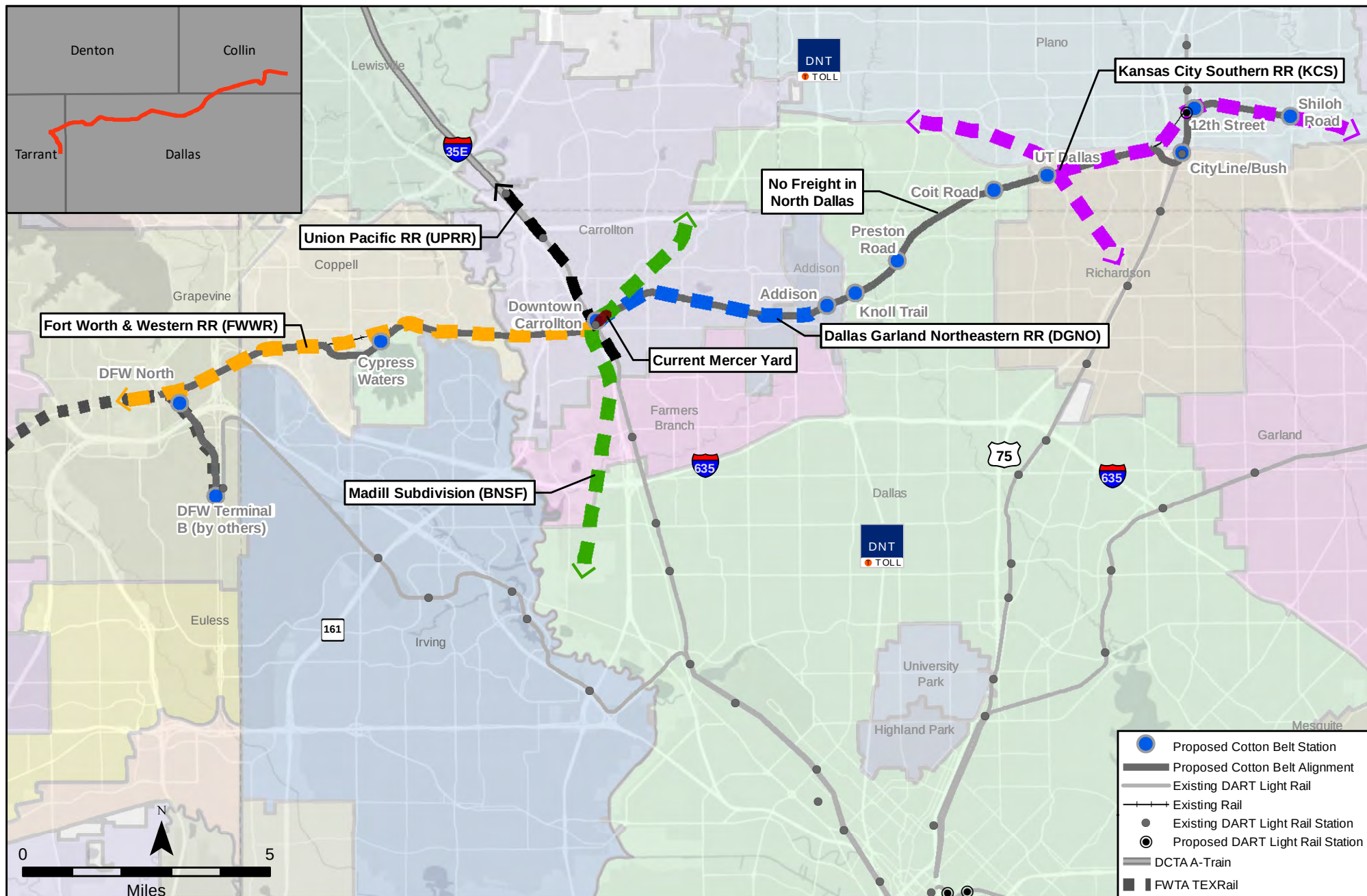


Figure 2-3
Freight Operations Within and Across Cotton Belt Corridor
 Source: North Central Texas Council of Governments and DART



Twelve new potential stations locations have been identified within the Cotton Belt Project Corridor and are shown on **Figures 2-4** through **2-14**. Stations would be designed to include components essential for safety and security, as well as amenities for passenger comfort and convenience, and compliance with the Americans with Disabilities Act (ADA). Primary elements include platform, shelter, wheelchair ramps and station amenities such as lighting, benches, security systems and informational displays. The platforms would be compatible with low-floor DMU vehicles, typically requiring a 23-inch station platform height (see **Section 2.3.2** for vehicle information). Platform length would be approximately 350 feet based on vehicle length and space available for each transit station. Platform width would typically range from 18 feet for single-sided platforms to 27 feet for double-sided platforms. Accommodation would need to be made for loading space at the ramp ends and access ramps. Station shelters would be designed to protect passengers from the elements and to fit visually within each station's setting.

Brief descriptions of each of the 12 proposed stations are provided below. Planning-level station layouts for each of the stations are provided in the *Final 10% Design Plans* in **Appendix A**.

DFW Terminal B Station

DFW Airport is currently constructing the DFW Airport Station for the TEXRail Project at Terminal B. This station would be shared with the Cotton Belt Project. The station would include side platforms for each of the two rail lines. It serves as the connection between the Cotton Belt Project and DFW Airport, via the DFW Airport's Skylink people-mover system in the Terminal A/B area. It also provides a pedestrian connection to DART's Orange Line DFW Station at Terminal A.

DFW North Station

FWTA is currently constructing the rail platforms that would serve the TEXRail Project at DFW North. DART would construct additional platforms to serve the Cotton Belt Project. The station would include a center platform, a shared parking area with TEXRail, bus bays and a new access road from the station to State Highway 26 (Texan Trail), located west of the station. The complex would also include a future pass-through platform to allow for east-west "through" service to Fort Worth via the TEXRail Corridor (see **Figure 2-4**).

Cypress Waters Station

The Cypress Waters Station would be located on the south side of East Belt Line Road between South Belt Line Road and Moore Road, just north of North Lake (see **Figure 2-5**). Cypress Waters is a planned, mixed-use development presently under phased construction. When completed, Cypress Waters will contain 4.5 million square feet of retail and commercial space and 10,000 residential units. This station would be integrated into the development. It would include side platforms for the Cotton Belt Project, a parking area and bus bays. Access to the parking area would be provided by a double-access driveway onto Belt Line Road. The bus bay area would be accessed by a separate driveway and a one-way circulating drive with full movement access (left and right turn-outs) at the exit.

Downtown Carrollton Station

This station would be located north of Belt Line Road between Broadway Street and Denton Drive in downtown Carrollton, immediately adjacent to the existing DART Green Line Station (see **Figure 2-6**). The station would be located on realigned section of the Cotton Belt Corridor. This station would include side platforms for the Cotton Belt Project and a pedestrian connection via stairs and an elevator to the Green Line Station at the end of the Cotton Belt Project platforms.



Two additional parking areas would be added with two full-access driveways onto Denton Drive. An area for a potential future platform for regional rail on the BNSF corridor would also be preserved as part of the station layout.

Addison Station

This station would be placed on the north side of the existing Addison Transit Center, currently located on the north side of Arapaho Road between Addison Road and Quorum Drive in Addison (see **Figure 2-7**). The station would include side platforms for the Cotton Belt Project and a pedestrian connection to the Addison Transit Center facilities at the west end of the platforms. No new parking or site circulation driveways would be constructed as part of the Cotton Belt Project, as new traffic and rail users would be accommodated by the existing facilities at the Addison Transit Center. The station would eventually be incorporated into Addison's station area plan that may include a shared garage with the Town of Addison.

Knoll Trail Station

This station would be located less than one-quarter mile north of Arapaho Road just east of Knoll Trail Drive in Dallas (see **Figure 2-8**). The station would include side platforms for the Cotton Belt Project, but dedicated parking or drop-off areas are not currently planned given space constraints. Riders would access this station on foot, by bicycle, or from existing transit services in the area.

Preston Road Station

This station would be located south of Keller Springs Road just east of the Preston Road grade separation in Dallas (see **Figure 2-9**). The station would include side platforms for the Cotton Belt Project, but would not have any dedicated parking or drop-off areas due to space constraints. Riders would access this station on foot, by bicycle, or from existing transit services along Preston Road.

Coit Road Station

The Coit Road Station would be located just west of Coit Road approximately one-half mile south of PGBT in Dallas (see **Figure 2-10**). The station would include side platforms, a new parking area and bus bays with a single full-access driveway onto Coit Road.

UT Dallas Station

This station would be located south of Waterview Parkway between the Frankford Road and Renner Road intersections, on the north side of the UTD campus in Richardson (see **Figure 2-11**). The station would include side platforms and bus bays. DART would construct temporary parking until the area north of the platform is developed by the University. Future development may include a shared parking structure to be developed by the University. Access to the parking area and the bus bays would be provided by new access driveways onto Waterview Parkway. DART would extend Rutford Avenue across the rail line from the south to provide additional access.

CityLine/Bush Station (Red Line Interface)

This station would be located immediately adjacent to the existing DART CityLine/Bush LRT station, which is south of PGBT and east of US 75 in Richardson (see **Figure 2-12**). This station would include side platforms for the Cotton Belt Project, and would require reconfiguration of the PGBT circulation area, but would not add any additional parking for the CityLine/Bush Station. This station would provide a connection between the Cotton Belt Project and the DART Red and Orange (peak only) Lines.



12th Street Station

This station would be at 12th Street in Plano, between K Avenue and Municipal Avenue (see **Figure 2-13**). The at-grade station would include side platforms, bus bays and a kiss-and-ride area on the north side of the Cotton Belt alignment and a new parking area on the south side of the alignment. Access to the parking area and the bus bays would be provided by two driveways on K Avenue. The complex would provide an alternative connection to the DART Red and Orange Lines via a new aerial infill LRT station on the Red Line at this location.

Shiloh Road Station

This station would be located on the west side of Shiloh Road between Plano Parkway and 14th Street in Plano (see **Figure 2-14**). This station would include a center platform for the Cotton Belt Project, a parking area and bus bays. The parking area would be accessible by a full-access driveway and a right-in/right-out driveway onto Shiloh Road. Bus stops would remain on the street with pedestrian connections to the platform.

A summary of the station characteristics, including platform types and available parking, is provided in **Table 2-1**. **Chapter 5** discusses station access and major transit interface including bus and rail transfers.

Table 2-1. Summary of Station Characteristics

Station	City	Platform Type	Bus Bays	Kiss-and-Ride	Estimated Parking Spaces
DFW Terminal B (by others)	Grapevine	Side	Existing	No	0
DFW North	Grapevine	Center	4	Yes	362 (shared with TEXRail)
Cypress Waters	Dallas	Side	4	Yes	192
Downtown Carrollton	Carrollton	Side	Existing	Existing	230 additional
Addison	Addison	Side	Existing	Existing	Existing
Knoll Trail	Dallas	Side	No (on-street)	No	0
Preston Road	Dallas	Side	No (on-street)	No	0
Coit Road	Dallas	Side	5	Yes	198
UT-Dallas	Richardson	Side	5	Yes	249
CityLine/Bush	Richardson	Side	Existing	Existing	Existing
12th Street	Plano	Side	5	Yes	313
Shiloh Road	Plano	Center	2	Yes	672

Source: GPC6, DART; 10% Engineering (**Appendix A**)

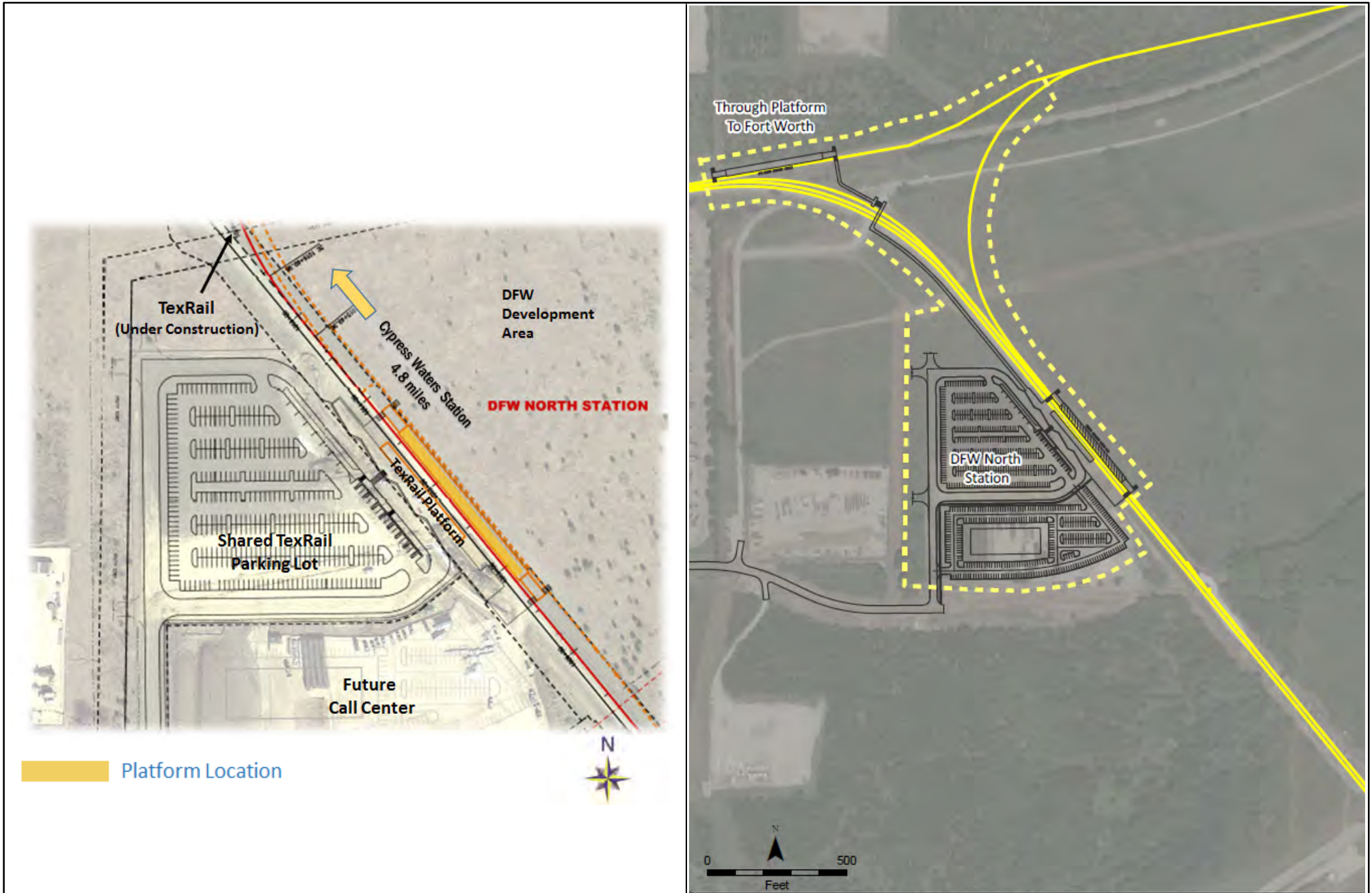


Figure 2-4
DFW North Station

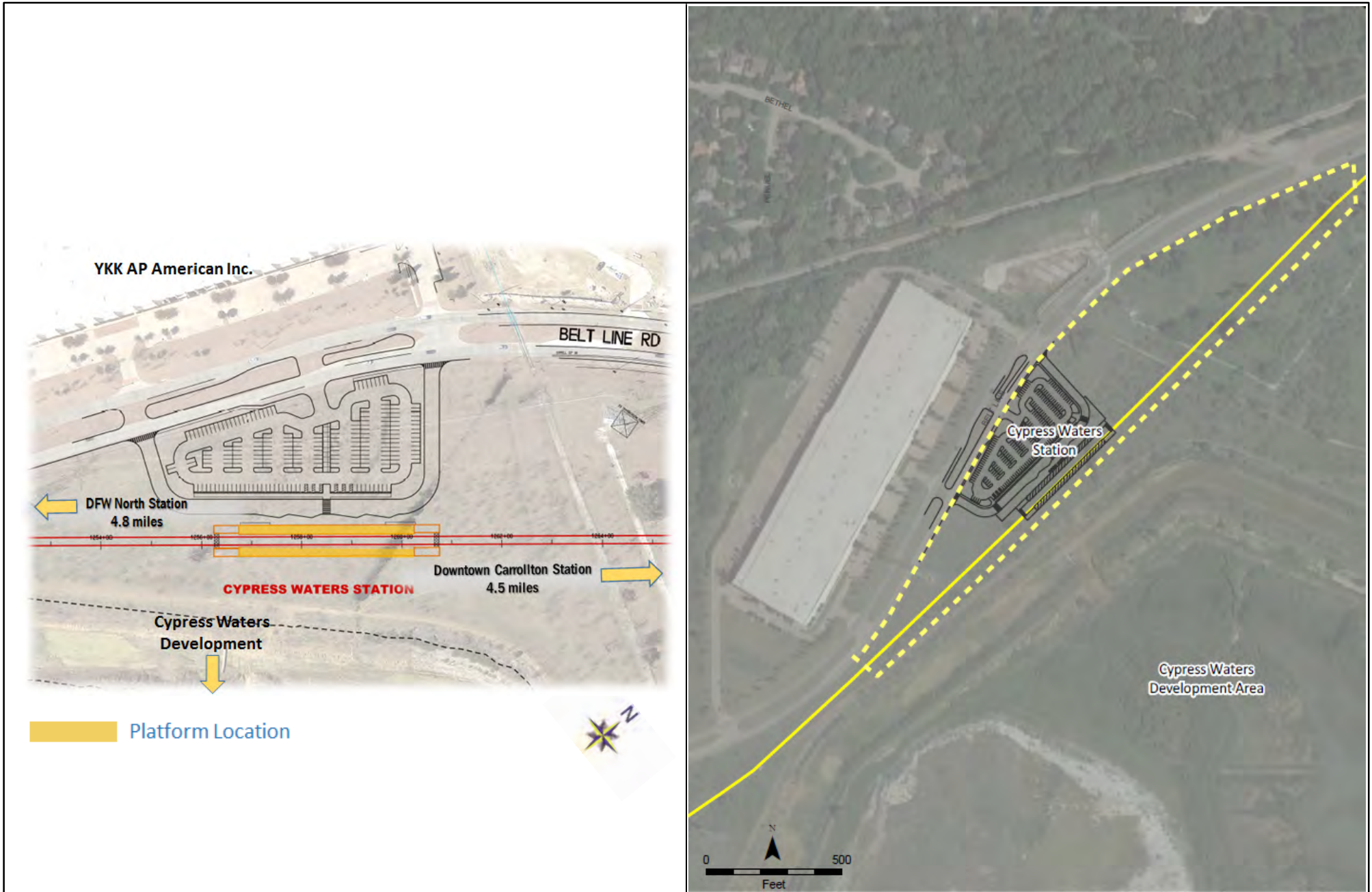


**Figure 2-5
Cypress Waters Station**

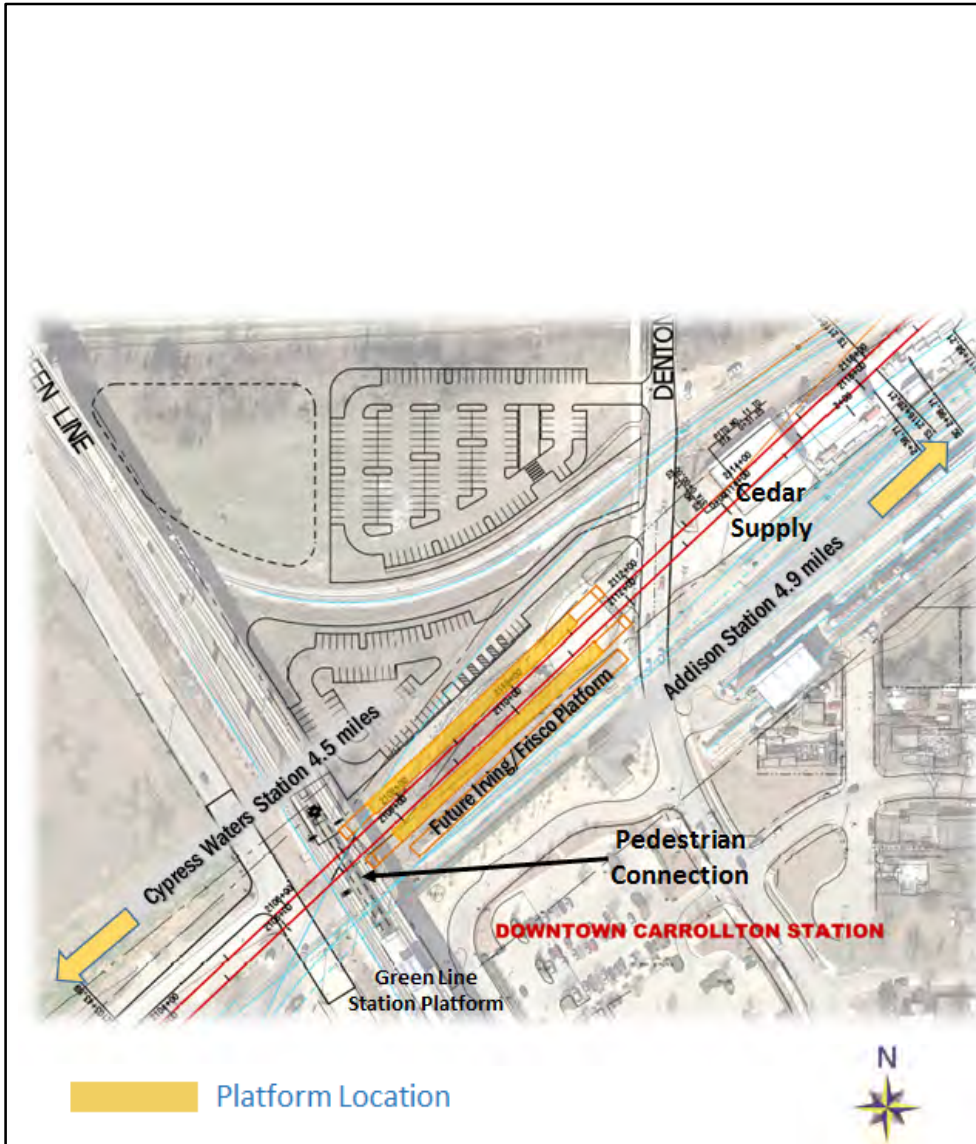
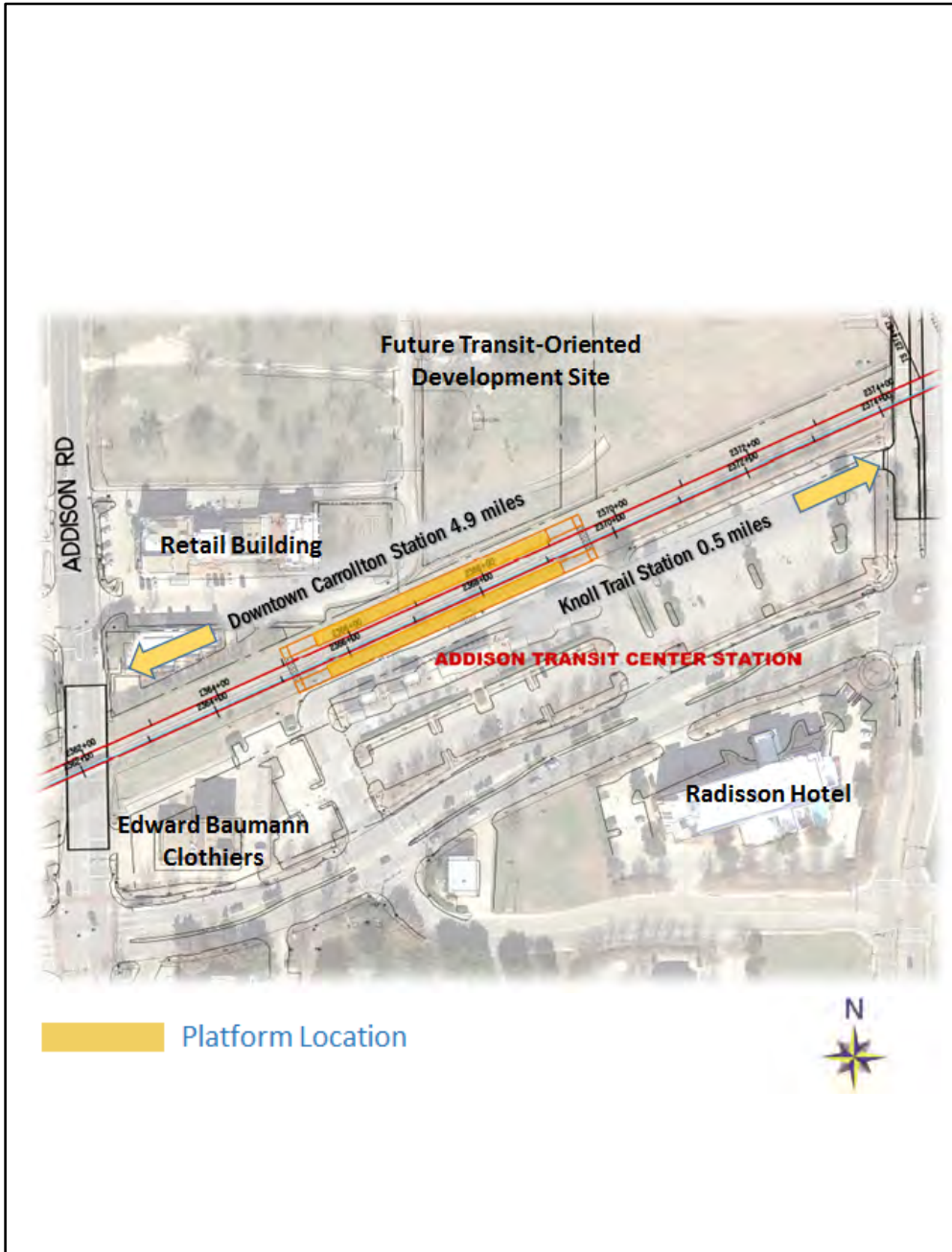
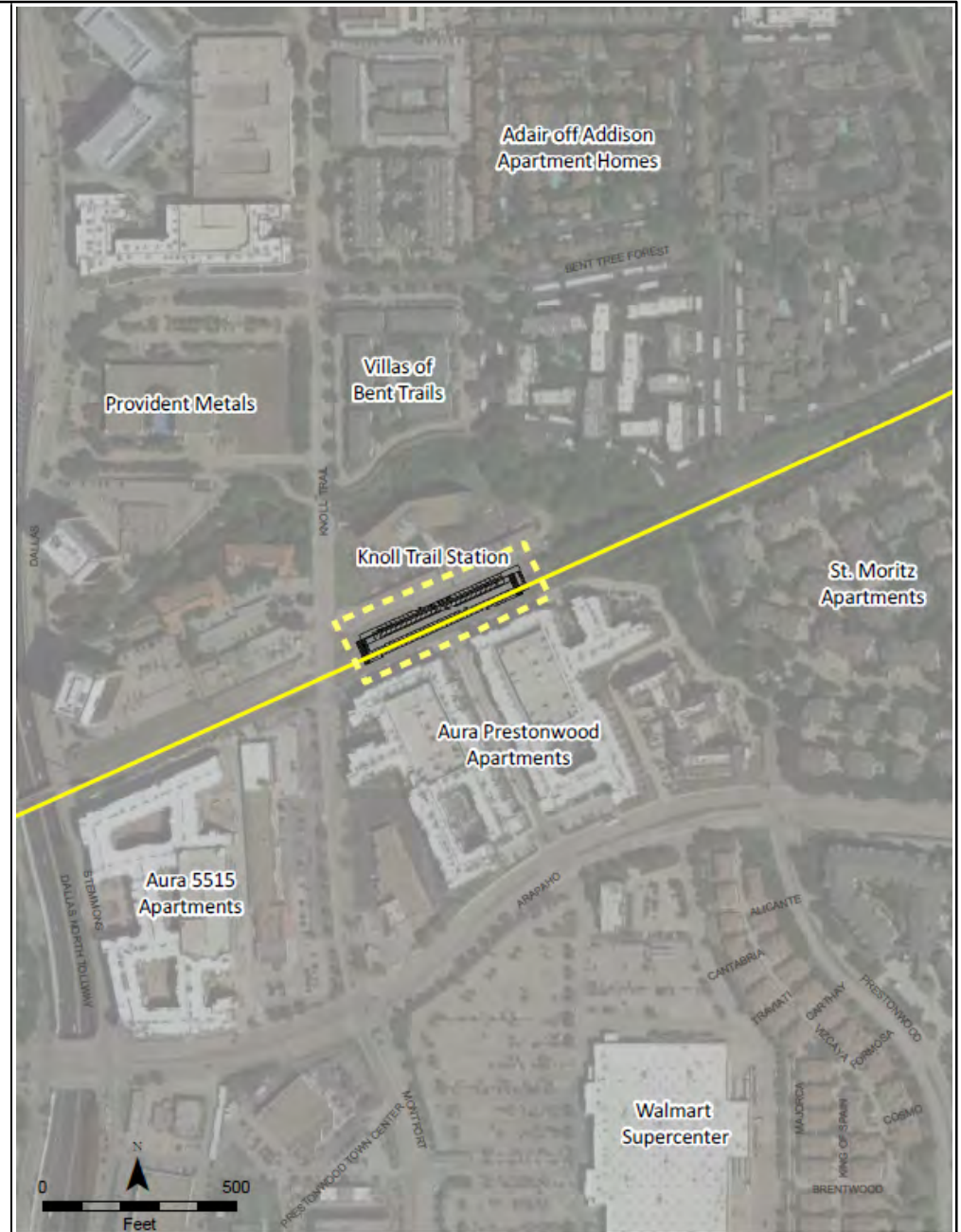
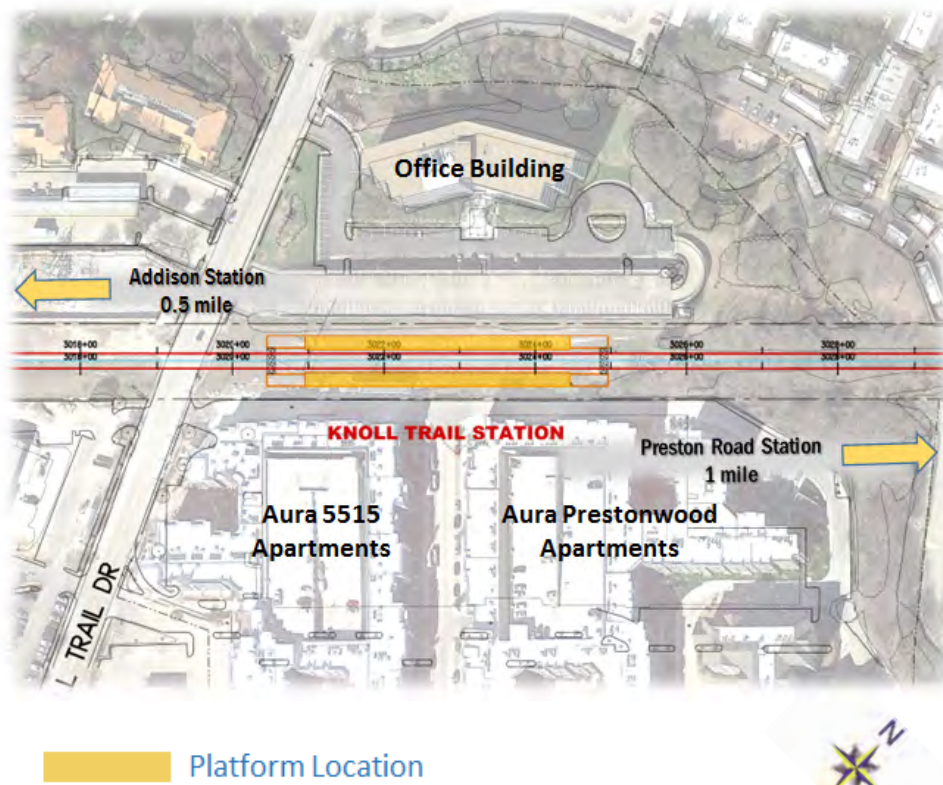
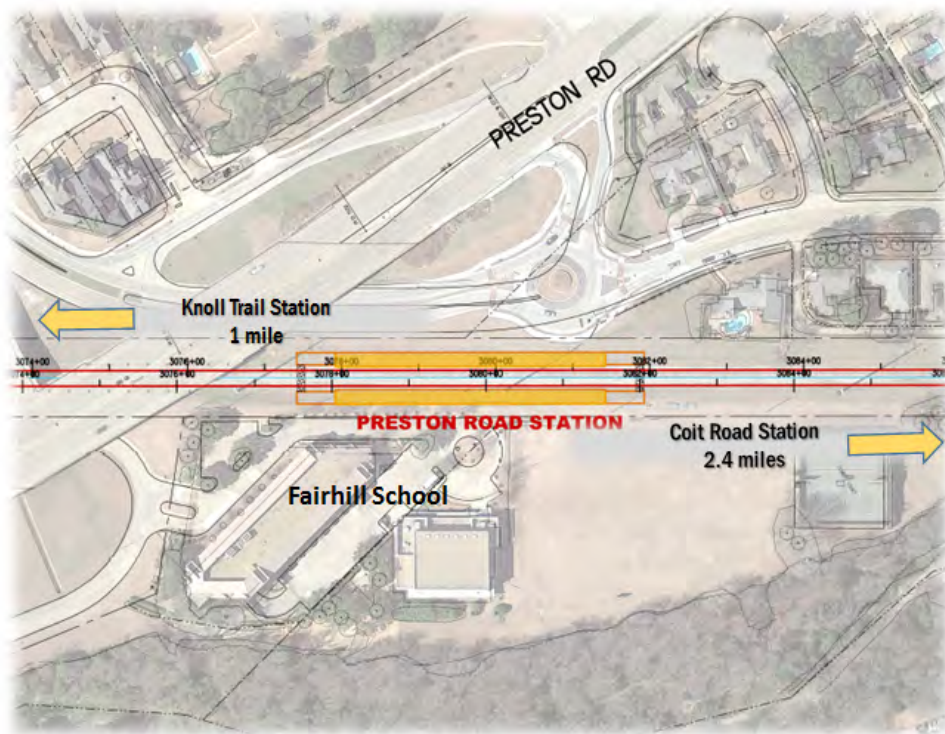


Figure 2-6
Downtown Carrollton Station







Platform Location

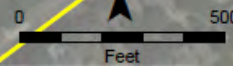
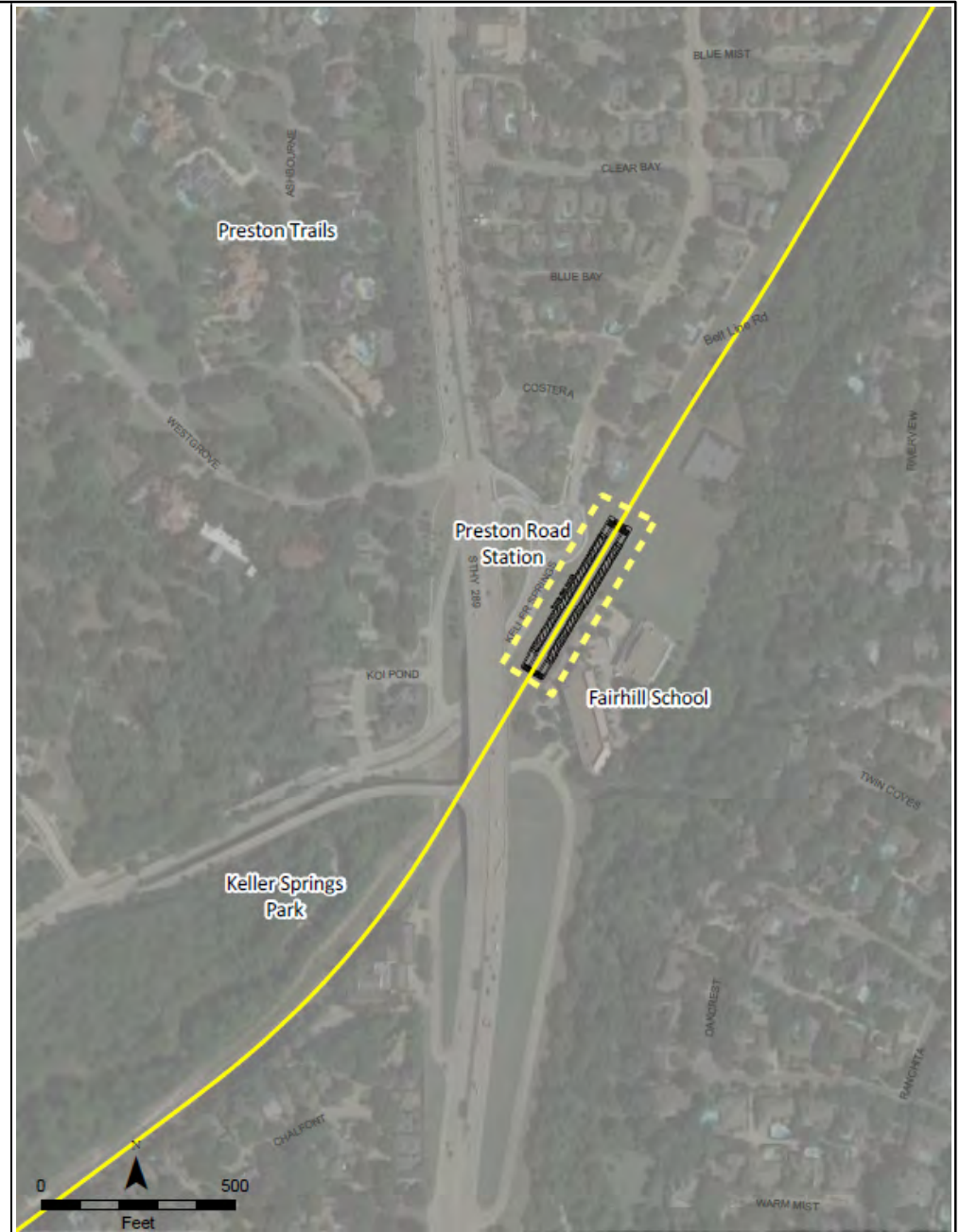


Figure 2-9
Preston Road Station

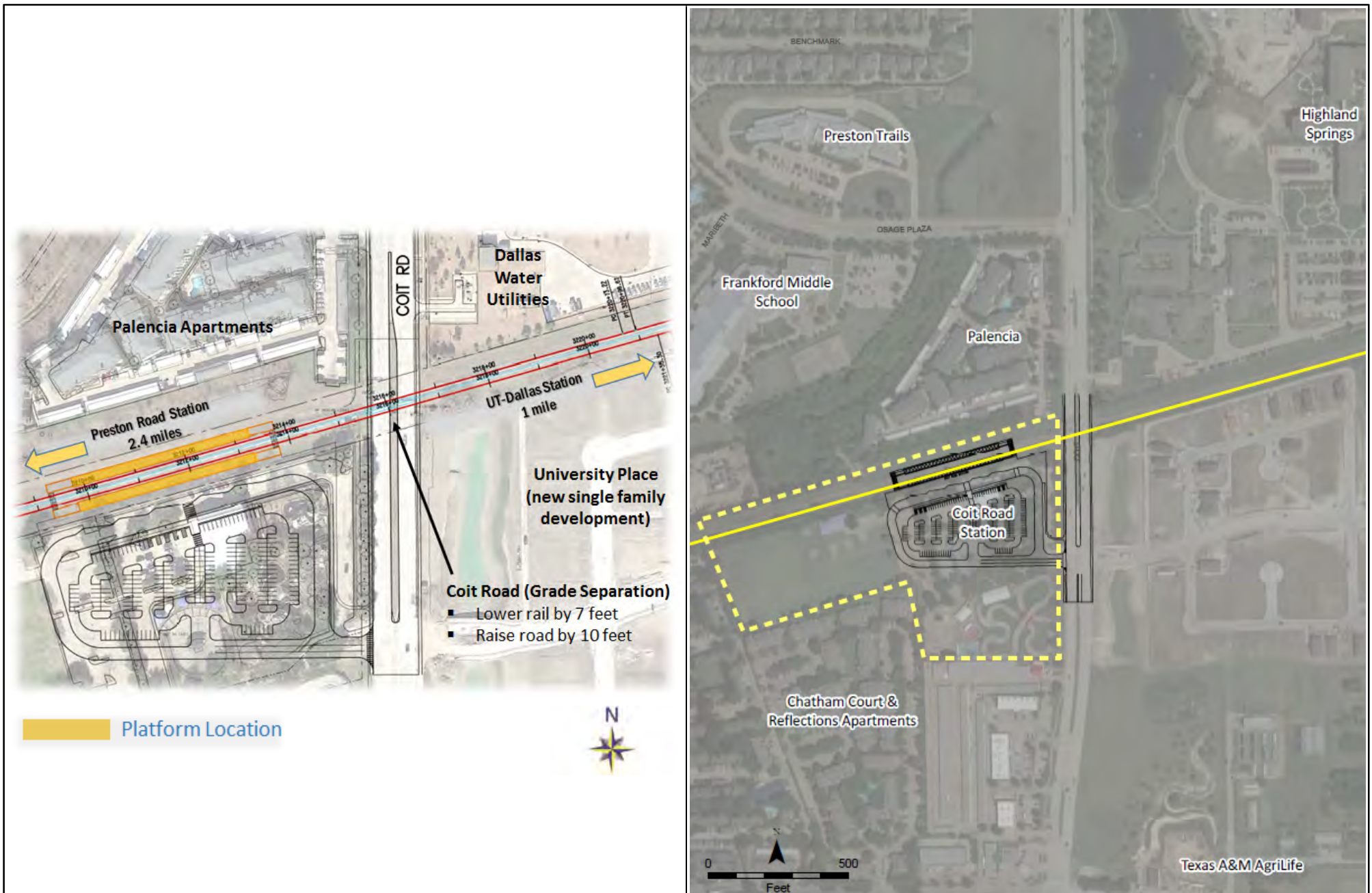
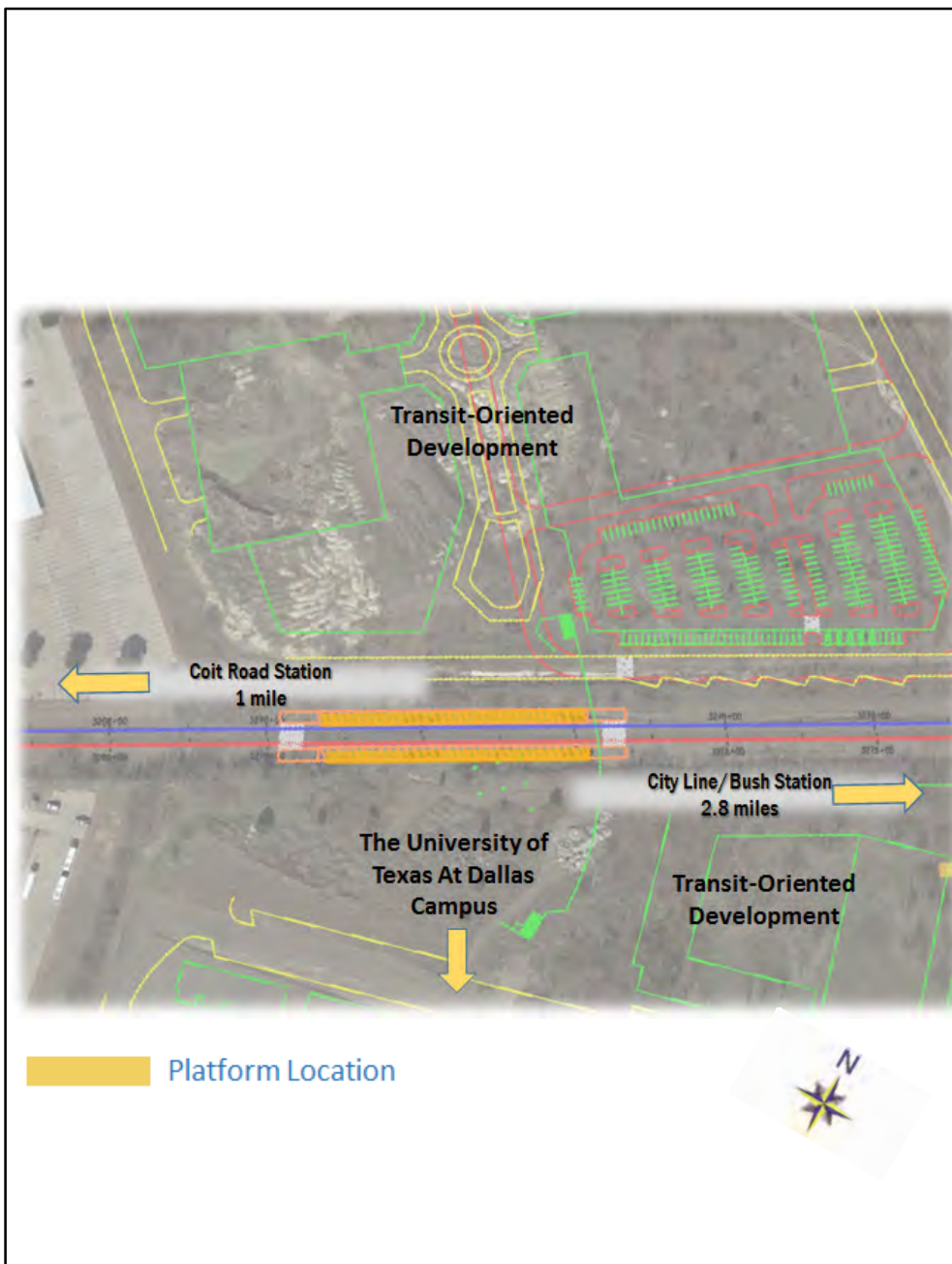


**Figure 2-10
Coit Road Station**



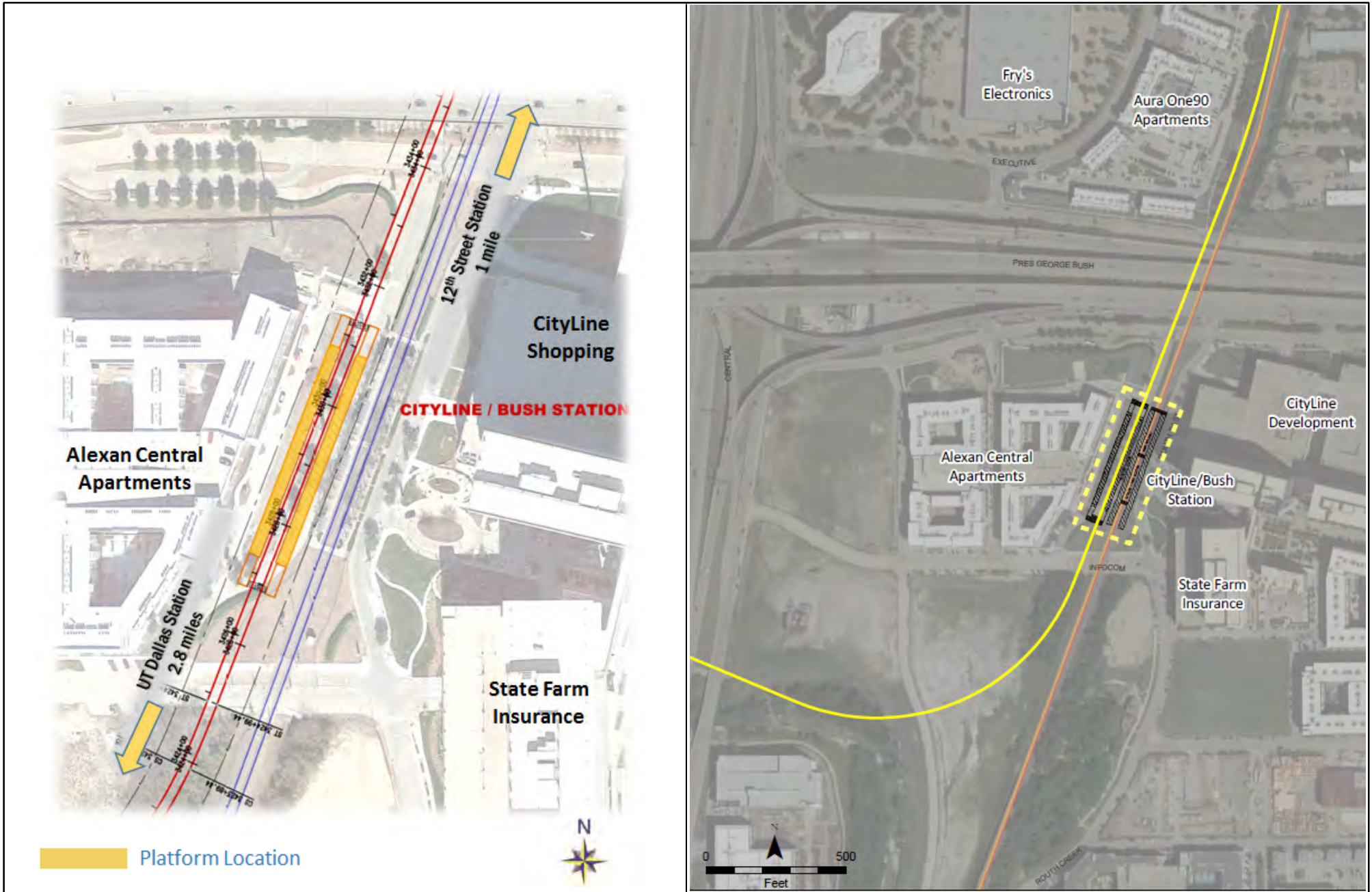
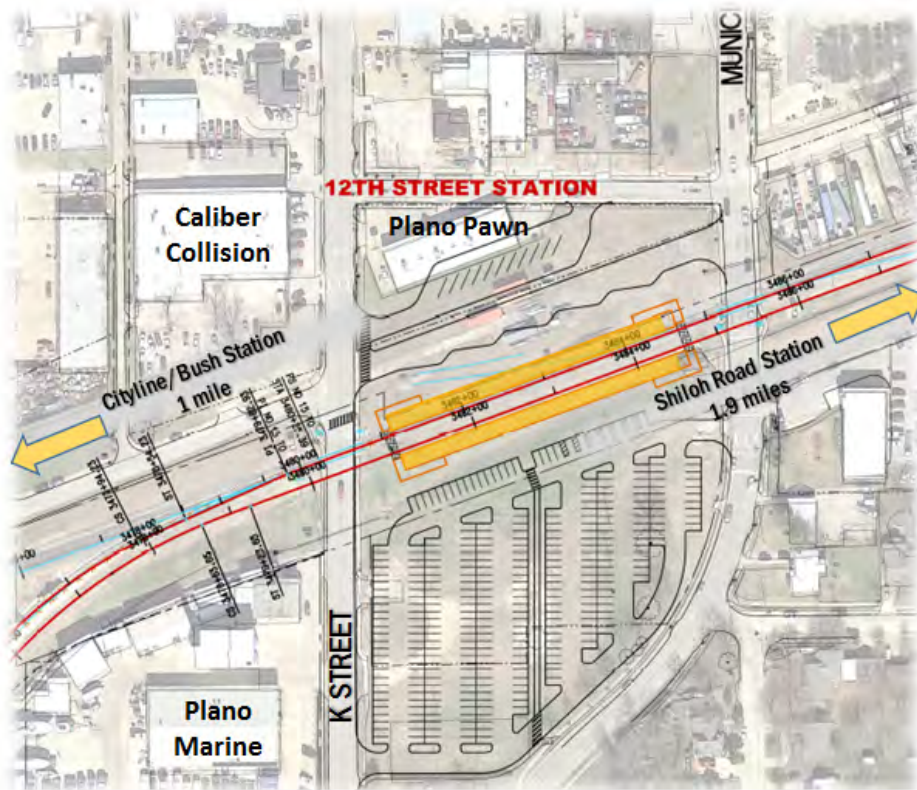
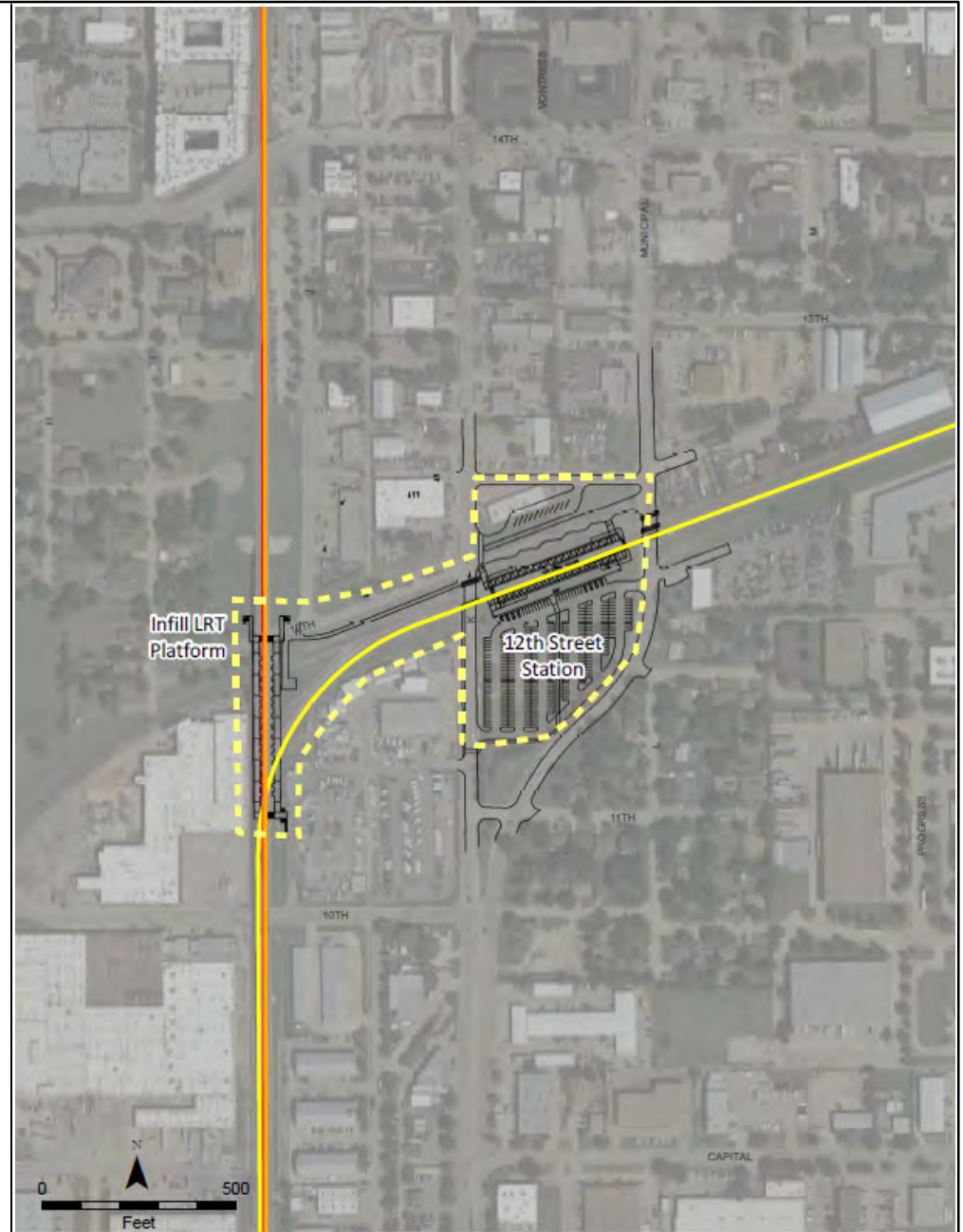


Figure 2-12
CityLine/Bush Station



Platform Location



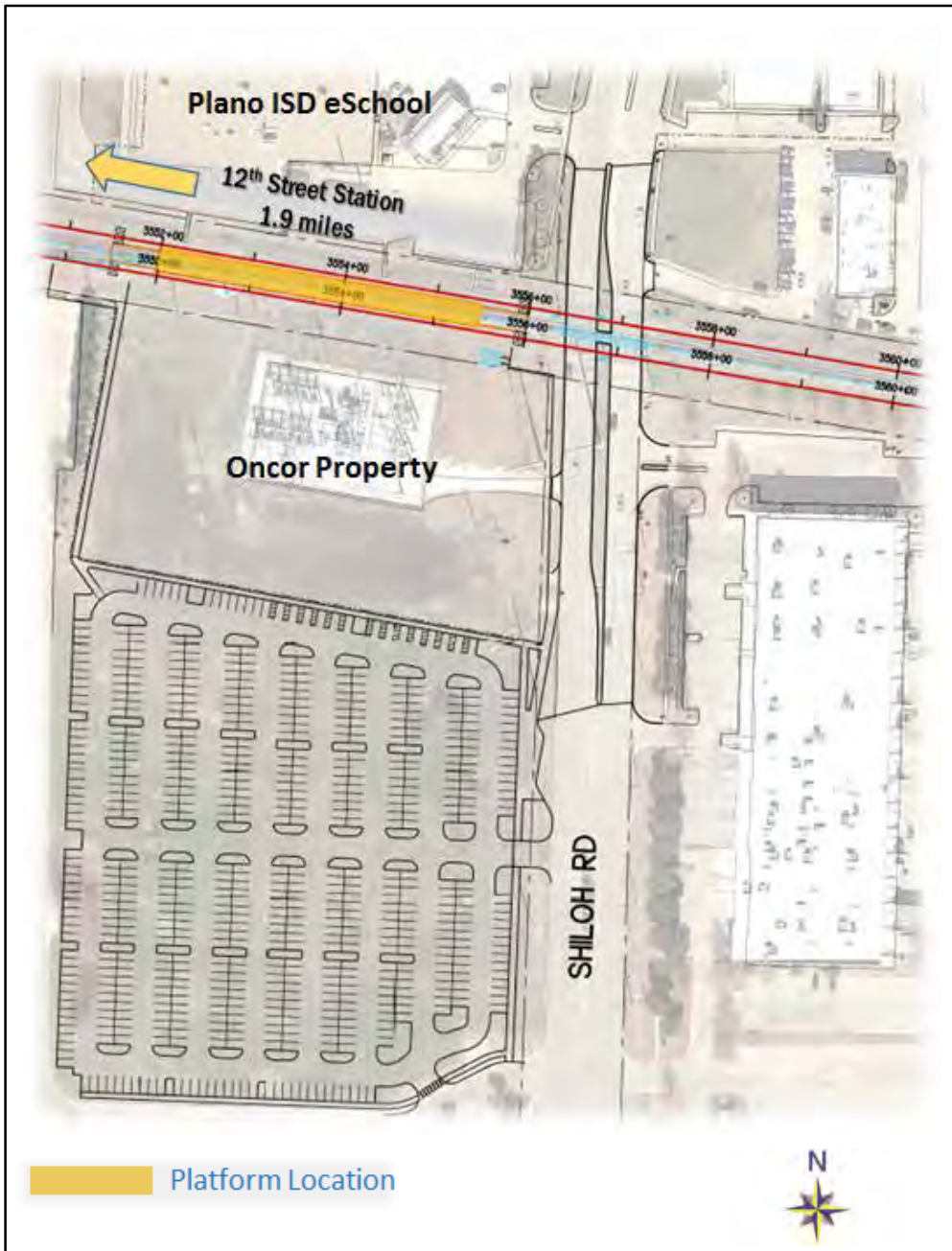


Figure 2-14
Shiloh Road Station

2.3.2 New Technology Rail Vehicle

The DART Board Resolution dictates that the vehicle to be used for the Cotton Belt Project would be Environmental Protection Agency (EPA) Tier IV compliant and look similar to light rail vehicles. In addition, the vehicles operated in the Cotton Belt Corridor must



Proposed Cotton Belt Vehicle

be compliant with FRA requirements since the Project would share the corridor with freight service. DART has developed vehicle specifications to be used within the design criteria for the Cotton Belt Project. The vehicle procurement process has been initiated with specifications based on the Stadler FLIRT vehicle being manufactured for the FWTa. Matching these specifications would allow for potential cross corridor operations with one common vehicle type.

DART proposes using one train consisting of four coach cars with a central power pack including four powered axles and eight unpowered axles. The train would be approximately 267 feet long with 224 seats and room for up to 254 standees. Ultimately, it is anticipated that an additional coach section would be added to the train, extending the total train length to 318 feet. For DART light rail vehicles, the DART peak hour load factor is 1.75. This translates to 392 seated and standing passengers per regional rail vehicle if the same policy is applied; however, for longer regional rail trips, the policy goal may be to provide a seat for every passenger.

2.3.3 Equipment Maintenance Facility

An Equipment Maintenance Facility (EMF) would be constructed as part the Cotton Belt Project to store and maintain vehicles. Several potential sites were identified along the corridor. Key criteria include approximately 30 acres of available land to store and maintain Cotton Belt vehicles and additional fleet as Cotton Belt and other proposed regional rail services increase. The site layout would also accommodate associated facilities such as office space, vehicle wash, materials storage, inspection/maintenance building and equipment, and parking/site improvements. The site criteria also called for a location in a commercial/industrial zoned area, central to the corridor to minimize deadhead operations and cost, and proximity to potential future regional rail corridor such as the BNSF for shared operations.

Other regional rail projects that may use this facility have not been defined in detail and are not funded; thus, their potential impacts are not addressed in this DEIS. If future regional rail projects use the EMF, the environmental review of those projects would be done at that time.

This DEIS assumes two possible EMF location options, one of which would be chosen as design progresses. Site Option 1 is at 1650 West Belt Line Road in Carrollton at the northeast corner of Luna Road and West Belt Line Road (see **Figure 2-15**). Site Option 2 is at the existing TRE Irving Yard, accessible by the DART-owned Madill Subdivision Corridor (see **Figure 2-16**). The ultimate location would be included in the FEIS/ROD. A conceptual track layout for Site Option 1 (Luna Road) is included in **Appendix A**. Site Option 2 (Irving Yard) is currently under design and will be presented in the FEIS/ROD. The final layout for either option would be determined as the Project is advanced.

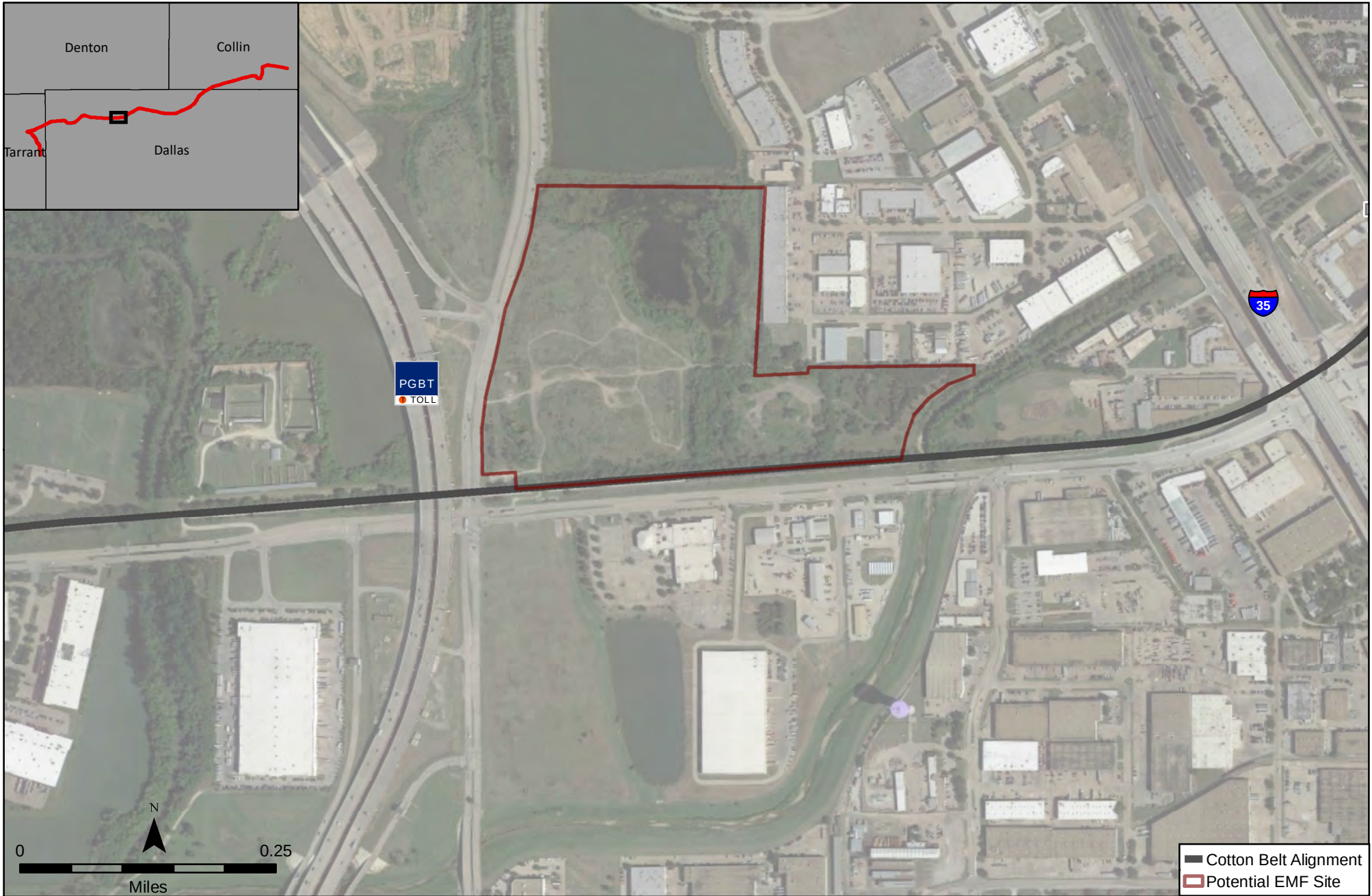


Figure 2-15
EMF Site Option 1 - Luna Road

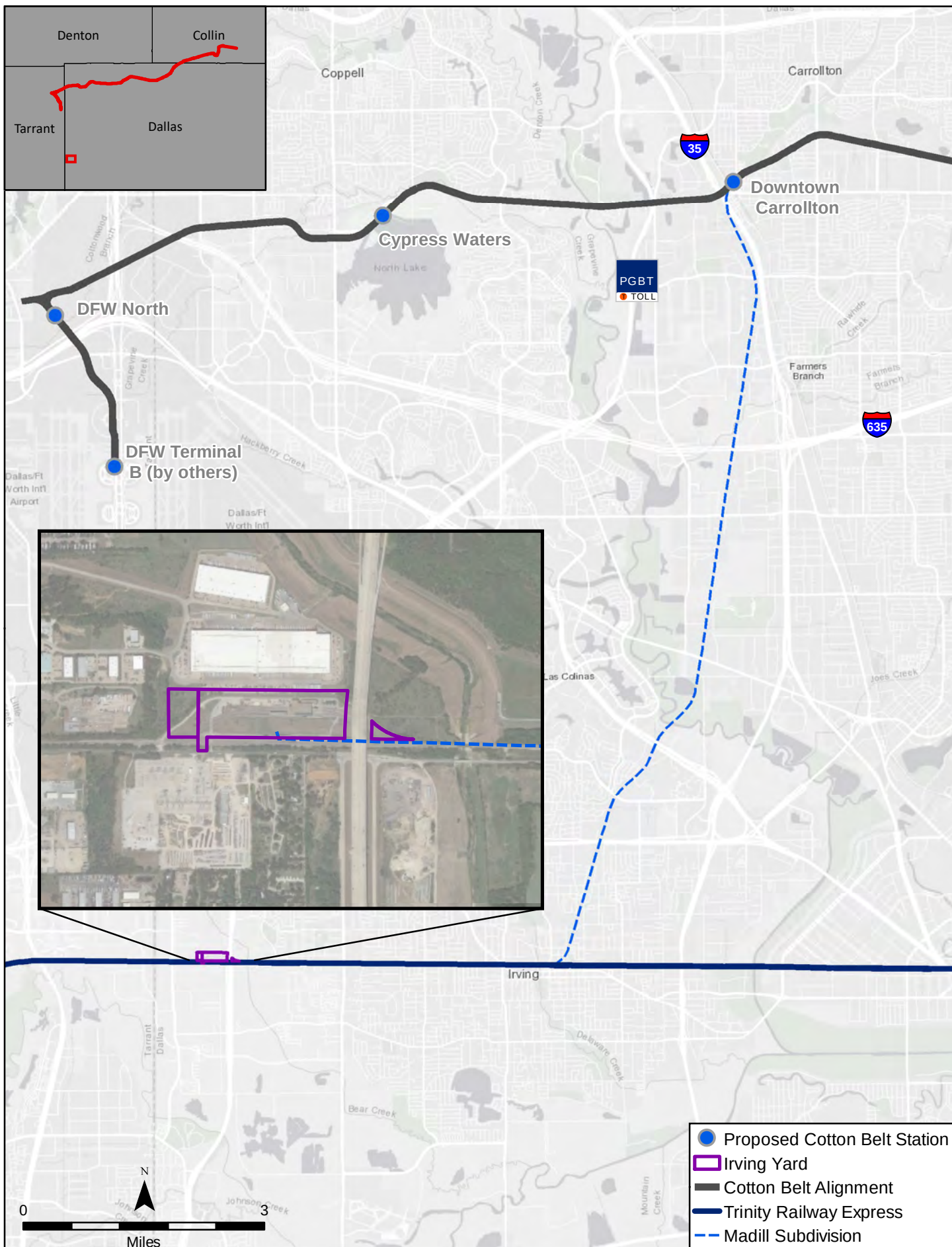


Figure 2-16
EMF Site Option 2- Existing Irving Yard

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



COTTON BELT



2.3.4 Relocation of Mercer Yard

The Project would include the relocation of Mercer Yard, a small freight yard located just east of the Green Line/Union Pacific and Cotton Belt intersection in downtown Carrollton. Mercer Yard serves as a hub for the DGNO operations and local service in the northwest part of Dallas County. The Cotton Belt Project would include significant track alignment and operational modifications at Mercer Yard, which supports the need for relocation. Operational functions would be relocated to the east near Kelly Boulevard in Carrollton (see **Figure 2-17**). This new yard would be built as part of the Cotton Belt Project, and would add three track sidings to the existing storage track at this location, as well as include operational facilities. Maintenance functions would be relocated to the existing DGNO Mockingbird Yard in Dallas near the SH 183/IH 35E junction.

2.4 Operating Plan

This section summarizes the proposed operating plan for the Build Alternative.

2.4.1 Service Levels

Service would be offered seven days per week, with more frequent service during weekday morning and evening peak periods.

- During initial operations, weekday span of service would generally be from 6:00 am to 9:00 pm. The service hours for some stations could be as early as 5:15 am or as late as 10:15 pm as trains come in and out of revenue service from the EMF.
- Trains would operate in both directions every 30 minutes during the peak travel periods of 6:00 am - 9:00 am and 3:00 pm - 7:00 pm.
- Trains would operate in both directions every 60 minutes during the non-peak travel periods of 9:00 am - 3:00 pm and after 7:00 pm.
- Service on Saturday, Sunday, and major holidays would be from 8:00 am to 8:00 pm operating in both directions every 60 minutes throughout the day.
- In the future (date to be determined), trains would operate during the peak periods at an increased service level of every 20 minutes in both directions, and service hours may be extended to 12:15 am.

The ridership forecasts and the impact analyses documented in this DEIS assume the higher service levels of every 20/60-minutes to reflect the long-term operating scenario.

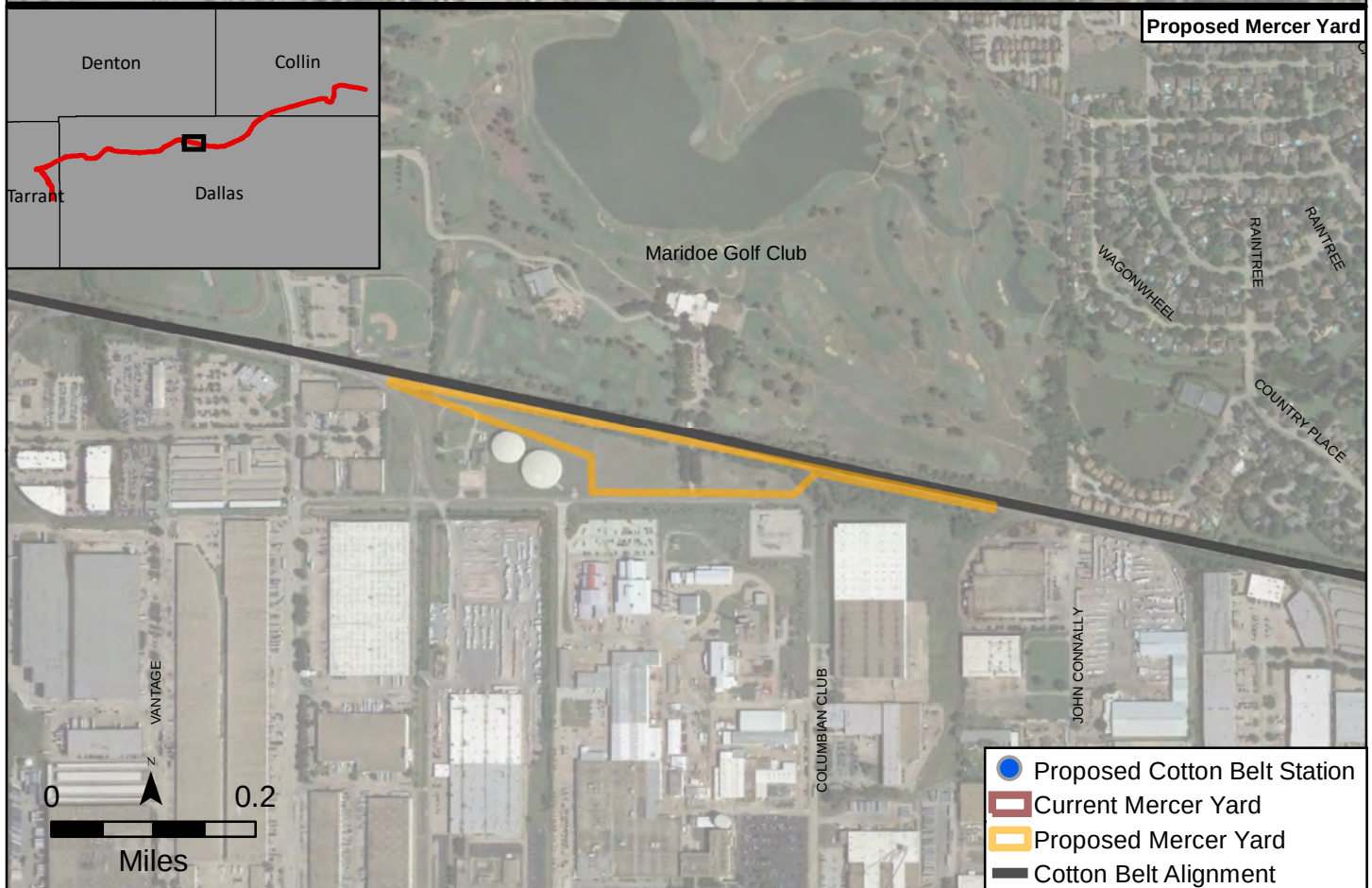
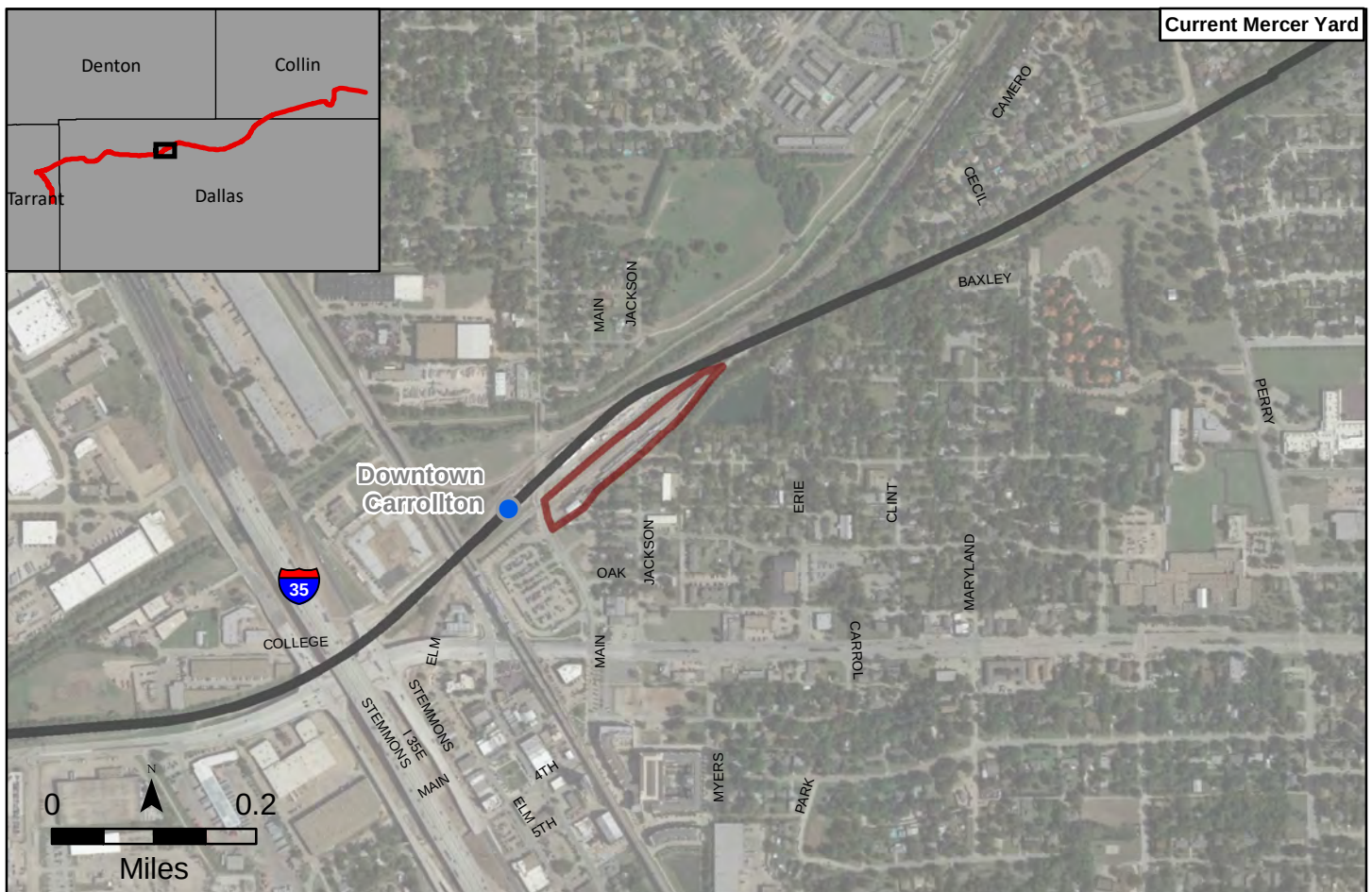
The operating plan indicates five DMUs trains are needed to provide 30-minute service frequencies in the peak period. Fewer trains are required when operating at 60-minute service frequencies in the midday, evening and weekend time periods. The overall fleet, including spares, would be seven. The *DART Cotton Belt Operations and Maintenance Plan* is located in **Appendix B**.

2.4.2 Train Control and Communications

The Cotton Belt train control system would consist of two coordinated but distinct components:

- A Positive Train Control (PTC) system; and
- A Centralized Traffic Control (CTC) system, which remotely sets powered track switches and way signals governing them, either automatically or through action taken by the dispatcher.

Passenger and freight movements on the Cotton Belt, TRE, and TEXRail lines would be monitored, authorized and controlled by dispatchers located at the TEXRail yard, with TRE having a dedicated desk and Cotton Belt/TEXRail sharing a desk.



- Proposed Cotton Belt Station
- Current Mercer Yard
- Proposed Mercer Yard
- Cotton Belt Alignment



Train operations on the Cotton Belt are currently, and would continue to be governed by the General Code of Operating Rules (GCOR) and the DART System Employees' Timetable and Special Instructions, to be prepared by DART. The timetable and special instructions, as well as GCOR, govern the operations of freight operators when using Cotton Belt tracks. These would be revised and amplified by staff as required to accommodate regional rail service staff.

All passenger and freight trains operating along the corridor would be dispatched on DART's behalf. On the Cotton Belt's mainline, all tracks would be signaled for bi-directional running utilizing CTC. In general, the CTC system would be designed to function automatically, with pre-programmed scheduled meets occurring at specified passing locations when trains leave originating terminals on time. Dispatchers would constantly monitor system operations and intervene on an exception basis when delays require dispatcher intervention and the application of recovery strategies. During normal operational windows, the dispatcher would control train movements at terminal locations to ensure on-time departures. During freight operational windows, the DART Dispatcher would control all traffic flow, including work trains and other on-track equipment such as hi-rail vehicles and maintenance equipment.

To meet the PTC requirements of the Railroad Safety Improvement Act of 2008, Cotton Belt would employ PTC based on I-ETMS (Interoperable Electronic Train Management System) technology, consistent with the system used by BNSF and UPRR (as well as TEXRail and TRE). All signals and switches at control points can be controlled remotely by the dispatcher, with auto-routing employed at control points to optimize efficiency and alleviate the burden on the dispatcher.

A two-way radio system will provide voice communication between the dispatcher, train crews and other personnel on the right-of-way. Separate channels would be available for each of the major operation and maintenance (O&M) functions: operations control, vehicle maintenance, maintenance-of-way, security, and emergency backup.

2.4.3 Fare Collection System

Regional fare integration is a vital part of providing a seamless and understandable transit system to passengers. DART is in the process of implementing a Comprehensive Payment System (CPS). The mobile ticketing application, *GoPass* was the first phase, and is widely used. The second phase of the CPS will introduce a new state-of-the-art, integrated, electronic fare payment system. The Cotton Belt will be part of this system. This new system is being accomplished by creating an electronic payment infrastructure for transportation and other services that is ultimately capable of being deployed region-wide, using prepaid cards and contactless devices. This system is scheduled to be in place when the Cotton Belt would open. The Cotton Belt fare has yet to be determined; however, it is likely that local and regional fare options would be available similar to the existing TRE fare structure.

It is anticipated that conductors and/or fare enforcement personnel would be empowered to check for valid tickets, although currently only DART police and fare enforcement officers may issue citations. Conductors and fare enforcement officers can use radios to communicate to DART staff to inform them of non-compliant or unruly passengers, requesting a police presence at the next station.

Fare collection equipment can be maintained in an electronics shop at the EMF, or at a shared site with DART for increased efficiency if all the equipment is interchangeable.

2.4.4 Travel Time

The estimated one-direction travel time for the Build Alternative from Shiloh Road to the DFW Terminal B Station is 60 minutes (and 59 minutes in the opposite direction). These run times



include station dwell times of 30 seconds at all stations except for Downtown Carrollton, Addison Transit Center, CityLine/Bush, and 12th Street Station, where dwell times are one minute.

During peak travel times, comparable automobile travel time ranges from 35 to 55 minutes, or more if there is an incident. Use of PGBT or LBJ TEXpress Lanes also require tolls. Use of the current DART Rail system from CityLine/Bush Station to DFW Terminal A via the Orange Line is approximately 1.75 hours as it requires travel through downtown Dallas. Use of DART's bus travel system from Shiloh Road and Plano Parkway to DFW Airport South Remote Parking Lot (with transfers) is almost three hours.

2.4.5 Terminal Times

At terminals, under normal, planned operation, no train would be scheduled to depart for its next trip less than 10 minutes after arriving. This minimum turn time allows for the discharge/boarding of passengers, operator and conductor rest, and performance of a federally-mandated brake test. If the turn time is less than 15 minutes, a "drop-back crew" would be assumed to be in place.

During initial operations, layovers of 14 minutes at the DFW Terminal B Station and 17 minutes at the Shiloh Road Station would be provided. DART policy calls for a drop-back crew whenever turns are shorter than 15 minutes, so a drop-back crew would be in place at DFW Terminal B during peak periods. This allows for the absorption of short delays and for engineers to change cabs, perform brake tests, obtain dispatch authority, and leave on time. Layover times fall as they do (skewed initially to the Shiloh Road Station) to allow for a consistent 6-minute TEXRail transfer in both directions at the DFW North station.

2.4.6 Bus Route Modifications

The Cotton Belt Project would result in some bus route modifications. Modifications may be associated with the Project or planned by DART. These changes include improving peak period frequencies, extending or modifying, and adding new routes. **Table 2-2** provides a summary of bus routes anticipated to serve proposed stations. These bus route modifications include planned changes based on a recommended bus service plan from a 2015 Comprehensive Operations Analysis (COA) completed by DART. These COA bus service plan recommendations would be phased in over time. The near-term focus for recent March 2018 service changes is on off-peak and weekend frequency improvements, along with some route modifications. New routes such as Rapid Ride and Airport Express corridor are longer term recommendations that are not yet funded and may be further refined after Cotton Belt service is initiated.

Several stations including Downtown Carrollton, Addison Transit Center, and CityLine/Bush are already served by bus and changes would be minimal at these locations with the Project in operation. At other stations, routes in the area would stop near station platforms using existing or relocated bus stops, or be rerouted into the station area bus bays. Bus service changes would be refined prior to revenue service through the development of a detailed feeder bus plan. This plan would be subject to the DART Service Change process, which includes public hearings on proposed route changes prior to DART Board review, approval and implementation.



Table 2-2. Proposed Bus Routes to Stations

Station	Currently Serves Area or Existing Facility?	Proposed Bus Routes to Cotton Belt Station	Proposed Weekday Headway	Change from Existing or Planned Route
DFW Airport	Yes	DFW Shuttles 801,802, 804		
	No	500	30/30	Proposed route modification per COA Bus Plan
DFW North	No	None; FWTa routes would serve station	N/A	N/A
Cypress Waters	No	401	30/30	Route 400 was split into Routes 402 and 403 in March 2018; Proposed modification to service station
	No	511	30/60	Extended route to serve station
Downtown Carrollton	Yes - 400	402	30/30	Route 400 was split into Routes 402 and 403 in March 2018
	Yes - 400	403	30/30	Route 400 was split into Routes 402 and 403 in March 2018
	No	525	30/30	Proposed new route per COA Bus Plan
	No	Rapid Ride 900 Belt Line	30/30	Proposed new route per COA Bus Plan
	No	Rapid Ride 901 Belt Line	30/30	Proposed new route per COA Bus Plan
Addison	Yes	36	30/30	Improved off-peak headways per COA Bus Plan
	Yes	350	30/30	Improved off-peak headways per COA Bus Plan and northern route modified to connect with Legacy Business Area in Plano
	Yes	361	30/30	Improved midday headways per COA Bus Plan
	Yes	362	30/30	Improved midday headways per COA Bus Plan
	Yes - 400	402	30/30	Route 400 was split into Routes 402 and 403 in March 2018
	No	403	30/30	Route 400 was split into Routes 402 and 403 in March 2018
	Yes	488	30/30	Improved midday headways per COA Bus Plan
	Yes	534	30/30	None - Existing/planned
	No	900	30/30	Proposed new route per COA Bus Plan
	No	901	30/30	Proposed new route per COA Bus Plan
	Yes	183	30/45	Improved midday headways per COA Bus Plan
	Yes	205	15/30	None; COA bus plan modifies downtown/uptown Dallas routing
	Yes	463	15/30	Improved peak/off-peak headways per COA Bus Plan
	No	290 Airport Express from Northwest Plano park-and-ride	60/60	New route per COA Bus Plan
	Yes	347	30/60	Minor route changes per COA Bus Plan
	Yes	536	30/60	Addition of midday and evening service per COA Bus Plan



Table 2-2. Proposed Bus Routes to Stations (continued)

Station	Currently Serves Area or Existing Facility?	Proposed Bus Routes to Cotton Belt Station	Proposed Weekday Headway	Change from Existing or Planned Route
	No	Rapid Ride 936 Preston Road	15/20	Proposed new route per COA Bus Plan
Knoll Trail	Yes	347	30/60	None; potential On-Street bus stop location modifications
Preston Road	Yes	350	30/60	None; potential On-Street bus stop location modifications
	Yes	362	30/30	Improved midday headways per COA Bus Plan; potential on-Street bus stop location modifications
Coit Road	Yes	362	30/30	Route extended to serve station; improved midday headways per COA Bus Plan
	Yes	451	30/30	Improved midday headways per COA Bus Plan
	Yes	883 UTD Comet Cruiser	20-30 all day	Proposed route deviation to serve station
UT Dallas	No	434	30/30	Proposed new route per COA Bus Plan
	No	802	15/30	New route for this station
	No	803	15/30	New route for this station
	Yes	883 UTD Comet Cruiser	20-30 all day	Proposed route deviation to serve station
CityLine/Bush	No	371	30/60	Proposed new route per COA Bus Plan
	Yes	883 UTD Comet Cruiser	20-30 all day	None
	Yes	841	60/--	Minor route modifications per COA Bus Plan
	Yes	843	30/--	Minor route modifications per COA Bus Plan
	No	434	30/30	Proposed new route per COA Bus Plan
	No	551	30/60	Route extended to this station per COA Bus Plan
12 th Street	Yes	410	30/60	Route deviated to feed station
Shiloh Road	Yes	843	30/--	Minor route modifications per COA Bus Plan
	Yes	870	30/30	Route deviation to serve station; new On-Street bus stops

Source: DART Capital Planning; Service Planning



2.5 Alternatives Considered but Eliminated from Further Consideration

In addition to the Build Alternative, other alignment and profile alternatives were considered but were eliminated from further consideration for a variety of factors. Three alternatives had technical problems or resulted in additional impacts to the community and natural environment, including drainage issues related to trenching or tunneling through the White Rock Creek Watershed. Two alternatives bypassed mixed-use developments and would not connect activity centers which is one of the purposes of the Project. Others were not cost-effective mitigation options. A discussion of the other alternatives considered is provided below.

2.5.1 Railroad Only Options

As described in **Section 2.3.1**, the Project alignment would deviate from the existing Cotton Belt Railroad Corridor to serve DFW Airport, Cypress Waters and CityLine/Bush. The DFW Airport connection would utilize a new connection being advanced by the TEXRail Project, and no other alternatives were considered for this location as direct access to DFW Airport is a key project element. “Railroad only” options were considered for the locations near Cypress Waters and CityLine/Bush, in which the Project would have remained on the Cotton Belt Corridor and not deviate outside of the existing right-of-way. Although these options would shorten the length of the Project, they would eliminate stations that would serve mixed-use developments as described below.

Railroad Alignment North of Cypress Waters

Remaining on the existing railroad corridor north of Cypress Waters would prohibit placing a station in this vicinity since the rail corridor traverses Coppell, which is not a DART Service Area city. Diverting to the Cypress Waters development in the city of Dallas allows the placement of a station within the DART Service Area and at the midpoint of an approximately 10-mile section that otherwise would not have a station. It also avoids residential adjacency in Coppell, minimizing potential impacts. Remaining on the railroad corridor was not supported by the City of Dallas, the City of Coppell, or the Cypress Waters development. Cypress Waters will eventually contain 4.5 million square feet of retail and commercial space and 10,000 residential units, and is focusing higher density transit-oriented development around the station area.

Railroad Alignment North of CityLine/Bush

Remaining on the existing railroad corridor north of CityLine/Bush would prohibit placing a regional rail station directly adjacent to the CityLine/Bush Station and directly serving the CityLine development. The CityLine development includes State Farm Headquarters and will ultimately include up to three million square feet of office space and 4,000 residential units. The railroad only option in this area also has the potential to impact a cemetery adjacent to the existing rail corridor. A recent discovery indicates that the cemetery encroaches into the Cotton Belt right-of-way. The CityLine/Bush alternative, which is supported by the cities of Richardson and Plano, avoids any potential impact to this cemetery.

2.5.2 North Dallas Profile Options

During the development of the *DART 2030 TSP*, the Dallas City Council passed a resolution with their plan recommendations. In the resolution, the City recommended the proposed Cotton Belt Project be below-grade from at least 1,500 feet east of Meandering Way to 2,000 feet west of Preston Road in North Dallas. In adopting the *DART 2030 TSP* in October 2006, the DART Board of Directors acknowledged the City's preference for a trench, but approved an at-grade concept. Based on this input, three below-grade profile options were examined for this portion of the alignment during early planning efforts: deep trench, shallow trench, and tunnel. The desire



for a below-grade option was based on public perception that an at-grade alignment would have environmental and quality of life impacts.

DART policy requires that the potential impacts of any proposed project be assessed, and if adverse effects are found, that these impacts be avoided, or minimized and mitigated. Proposed mitigations are required to be consistent with DART's *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*. Generally, below-grade options are considered only in areas where right-of-way availability is limited or identified impacts cannot be mitigated with a surface alignment.

In North Dallas, there is sufficient right-of-way for surface running rail since DART owns the generally 100-foot wide Cotton Belt Corridor that is unencumbered by freight activity. DART facilitated a January 22, 2010 action by the Surface Transportation Board (STB) to abandon freight in the North Dallas section of the Cotton Belt Corridor.

Potential impacts in North Dallas include traffic, safety, noise, vibration, community cohesion and visual intrusion. As outlined in this DEIS, these potential impacts can be mitigated by means consistent with DART's *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects* without constructing an approximately 2.5-mile below-grade section. Below grade concepts may introduce additional environmental impacts that could not be adequately mitigated and are also more expensive. A discussion of each profile concept is provided below.

Deep Trench Profile

A deep trench concept that would depress the rail alignment at least 15 feet below grade, crossing three waterways, was originally suggested as a below-grade profile option. One of the essential requirements of the deep trench profile option was to conserve the 100-year floodplain water surface elevations in order to avoid adding new inundation areas or structures to the existing floodplain. Stormwater velocities within the creeks must also be controlled to avoid erosion and prevent compromising the integrity of the creek banks. Because of these environmental constraints, implementation of the deep trench option would require that water in three creeks be pumped past the trench. The three creek crossings between Hillcrest Road on the east and Preston Road on the west that would be affected are as follows:

- Osage Branch Crossing 1, located just east of Davenport Drive
- Osage Branch Crossing 2, located just south of Duffield Drive
- McKamy Branch Crossing, approximately 300 feet north of Davenport Drive

The drainage concept developed for the deep trench profile option consisted of capturing the water upstream of the alignment and pumping it under the tracks, to the downstream side of the tracks. The assessment of the deep trench profile option included options for pumping stations, types of pumps, and use of submersible electric motors. It also included an analysis of each creek crossing, including design considerations, power needs, probable annual operating costs, and a summary of estimated capital costs.

It was estimated that three pump stations for the deep trench profile option would cost over \$280 million in capital costs and over \$2.5 million in annual operating costs. These estimates did not include construction of the alignment in the trench or annual operating costs of the rail service. In addition to the substantial costs associated with the pump stations, adverse impacts to several resources would occur. Potential impacts would include loss of vegetation and wildlife habitat, displacement of residents, the use of public parkland, increased noise levels, and impacts to water resources.

Of primary concern was the liability associated with the three pump stations. Pumps could fail to function due to power outages, which typically occur during major storm events. Failure of the pumps could result in flooding of upstream properties and DART infrastructure. Public safety



and life protection could be undermined. DART cannot assume the liability associated with a catastrophic failure of the pump stations.

DART determined that the deep trench profile option was cost-prohibitive, would result in adverse environmental impacts and could be a threat to public safety.

Shallow Trench Profile

The shallow trench profile option was developed as an alternative to the deep trench profile option because the shallow trench would not require the use of pumping stations. This option combined a maximum trench depth with walls and berms to maintain a top of wall height of 15 feet over the rail with the use of culverts instead of bridges at the creek crossings of McKamy Branch, Osage Branch Crossing #1 and Osage Branch Crossing #2. The roadways of Davenport Road (two locations), Campbell Road, Hillcrest Road, McCallum Boulevard and Meandering Way would be elevated over the rail alignment. This alternative profile met the spirit of the City of Dallas resolution without the creek impacts of the deep trench option; however, the construction of roadway grade separations over the trench would require the purchase of additional right-of-way including publicly-owned parcels. The shallow trench option would add \$123 million to the cost of the Project. It would also require modifying the access to several single family and multi-family residential units. At least one single family home would potentially be displaced.

DART determined that the shallow trench profile option would not sufficiently address public concerns and only represented a minimal improvement in traffic, safety and noise. The six elevated roadways would increase visual concerns and create property access issues. Additional environmental concerns associated the trench profile option include potential impacts to adjacent water/floodplains and increased property acquisitions including residential property and publicly owned recreational property. These added impacts with only minimal improvements did not justify the added cost of the shallow trench.

Tunnel Profile

This option proposed a 2.6-mile tunnel section that starts west of Preston Road and ends west of Coit Road. It includes a 0.7-mile west portal, a 0.3-mile east portal and a 1.6- mile tunnel. The tunnel would be located entirely within the limestone rock formation. Generally, the tunnel would run parallel to and below an unnamed tributary to White Rock Creek, which splits into the McKamy Branch and the Osage Branch. The tunnel crosses under the creek three times at McKamy Branch, Osage Branch Crossing #1 and Osage Branch Crossing #2. The depth of overburden above the tunnel crown would be between 20 and 40 feet. The shallow cover areas are near the portal structures and below the creek crossings.

DART determined that the tunnel profile option, which added \$511 million to the cost of the project was cost-prohibitive. Potential impacts can be mitigated through less expensive means that are consistent with DART guidelines and policies.

2.5.3 LRT (Orange Line) Phase II

During the planning of the Orange Line into DFW, a two-phased approach to the LRT alignment into DFW Airport was advanced. Phase I was constructed and currently operates as the Orange Line. Phase II would have been implemented with the Cotton Belt Project, with the assumption that the Cotton Belt Project would terminate at a DFW North Station instead of at DFW Airport Terminal B. Under this concept, Phase II of the LRT alignment would spur from the existing Orange Line near Freeport Parkway to extend north along SH 114 and SH 121 to the Cotton Belt Corridor. It would then extend west to a DFW North Station and then turn south along the TEXRail right-of-way before rejoining the Phase I LRT alignment north of the DFW Airport



terminals. Cotton Belt passengers would have been required to transfer to LRT at the DFW North Station to continue their trip into the airport.

Since the conceptual development of the phased approach, several projects have been constructed that severely restrict implementation of the Phase II alignment. The TxDOT DFW Connector Project greatly expanded SH 114 and SH 121. This eliminated much of the right-of-way envisioned for the Phase II LRT alignment. This right-of-way was further constrained by new development within the DFW International Commerce Park adjacent to the highways. South of the DFW North Station, the TEXRail design was modified from its original concept to avoid impacts to sensitive equipment and to accommodate new and future DFW Airport infrastructure. The project is in a narrow corridor that is currently being constructed to accommodate two regional rail tracks. The Cotton Belt Project can operate on these tracks shared with TEXRail. LRT has different infrastructure requirements and would be precluded from operating in this narrow corridor.

The envisioned LRT Phase II Orange Line is infeasible due to right-of-way constraints. As such, the Cotton Belt Project is being advanced to DFW Airport Terminal B.

2.6 Cotton Belt Regional Trail

The NCTCOG has a Regional Veloweb Plan that identifies a network of off-street trails in the region to enhance mobility and access. A key trail corridor in this plan is the Cotton Belt Regional Trail. The Cotton Belt Regional Trail currently exists within DART-owned right-of-way in several locations west of DFW Airport. Expansion of the Cotton Belt Regional Trail system within the DART Cotton Belt Project Corridor is part of the plan. According to NCTCOG, corridors identified on the Veloweb as “planned” may be prioritized for future funding.

The DART Hike and Bike Trail Policy III.09 states that DART-owned rights-of-way may be available to other governmental entities for utilization as hike, bike transportation, or recreational use. Trails have been implemented within DART right-of-way in several locations in accordance with this policy and under license agreements with local jurisdictions.

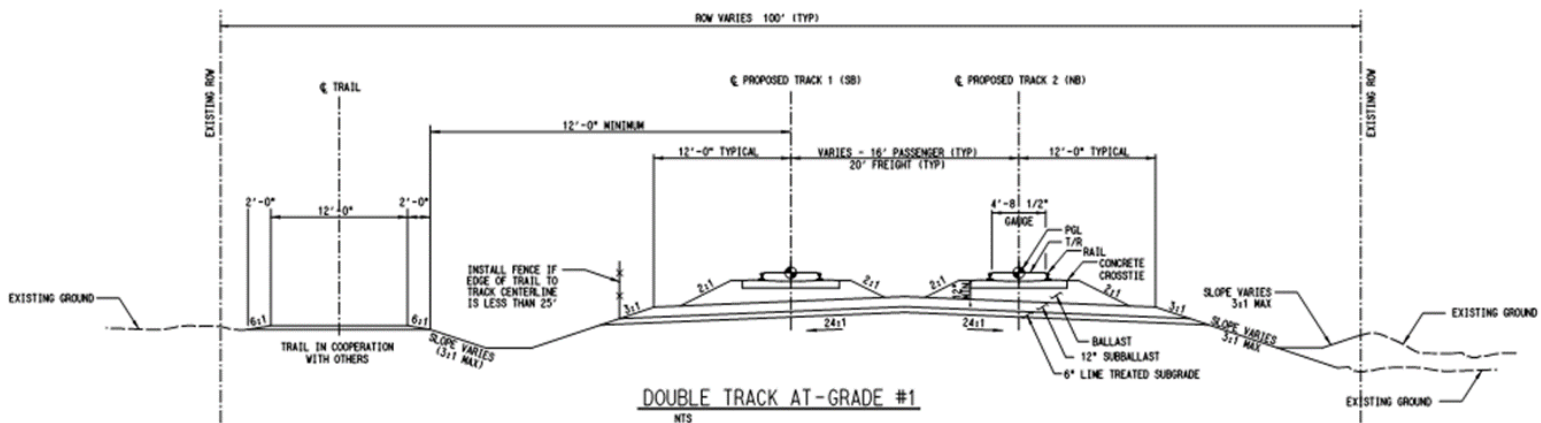
As part of the Cotton Belt Project, DART is coordinating with the NCTCOG and communities along the corridor to preserve an envelope for the Cotton Belt Trail within the DART right-of-way, where feasible. The following objectives were used to develop the preliminary trail alignment along the Cotton Belt Project:

1. Pedestrian bridges would be used as required at creeks, but not at grade separations
2. Trails can and would go off DART right-of-way onto an adjacent path or sidewalks, existing or proposed, especially where right-of-way constraints are present or where transition to nearby trails is convenient and feasible
3. Crossings of industrial spurs should be limited as much as possible
4. The Cotton Belt Trail would not extend into DFW Airport

The guideway plan and profile drawings in **Appendix A** identify the trail envelope for the portions within the DART right-of-way, which is labeled as “In cooperation with others”. The trail would only be located on one side of the track. In locations where there are planned or existing nearby trail facilities, or where right-of-way constraints are present, the Cotton Belt Trail would transition out of the DART right-of-way and into street right-of-way or connect with another trail. The trail is primarily located north of the tracks but does transition to the south side in some areas.

Typical sections were also developed to illustrate the 12-foot trail within the cross section (see **Figure 2-18**). The trail would be located as close to the outside edge of DART right-of-way as possible, but with a minimum distance of 12 feet from the closest track center to the edge of the trail. The preferred distance is 25 feet from the edge of trail to track center. A fence would be required to separate pedestrians and tracks if a trail is less than 20 feet from the track centerline to the edge of the trail shoulder. In general, a fence would be provided between the trail and tracks to ensure trails users do not enter the operating corridor. All trails are assumed to be at-grade along the adjacent mainline track alignment unless otherwise noted on the plans. The only pedestrian bridges shown are to enable crossing of defined channels. There are no pedestrian bridges over roadways. Mid-block crossings would be parallel and adjacent to the railroad crossing of roadways.

Figure 2-18 Cotton Belt Typical Cross Section with Trail



The cross-sections are conceptual only and do not delineate the trail at this time as no trail design has been completed. The trail would likely be outside of the proposed drainage ditches in most situations. As planned, the trail envelope crosses only two industry track leads at PPG Paints, in Carrollton, and Kuehne & Nagel, in Coppell.

Since this DEIS includes the trail envelope in the design plans and the environmental analysis was conducted for the corridor, which includes the trail concept, it can be used as a basis for future environmental clearance of the trail. Once detailed trail design is completed and funding sources agency requirements are known, additional environmental analysis may be required. Construction of the trail is assumed to be done by local jurisdictions. Each jurisdiction would operate and maintain the trail within their jurisdictional boundary.

2.6.1 Trail Cost Estimate and Funding

DART will develop a rough order of magnitude cost for the trail sections located within the DART right-of-way as identified in the design plans. The trail cost is not part of the Cotton Belt Project costs. The only trail costs included in the project are those associated with a direct impact of the Project which are at Spring Creek Trail in Richardson. The Cotton Belt Trail cost estimate will be provided to NCTCOG so that a funding and implementation plan can be developed in cooperation with other governmental entities. DART would cooperate with other public and private entities to find funding per DART policy but is not obligated to provide funding unless the DART Board of Directors chooses to allocate funding to it separate from the Cotton Belt Project. Should funding be identified at the time of final design and construction of the Cotton Belt Project, it may be feasible to conduct design and construction concurrently.



3. Affected Environment

3.1 Introduction and Study Area

This chapter documents the existing natural and built environmental conditions within the Cotton Belt Project. This affected environment is the baseline against which the potential impacts of the project can be measured. As shown in **Figure 3-1**, the Study Area is generally a 0.25-mile buffer of the alignment and a 0.5-mile buffer around proposed station locations. Some resource areas have different Study Areas and are documented where appropriate. The methodology for each resource area analysis is summarized in the following sections and discussed in full in **Appendix B**.

This document has been prepared in accordance with FTA guidance but includes elements required for compliance with *FAA Order 1050.1F* and *FAA Order 5050.4B*. As a cooperating agency, the FAA assumes responsibility to independently review the environmental documents prepared for the proposed project. FAA focuses its efforts on those issues and subject areas pertaining to airport planning and potential effects on airports. The impact evaluation and mitigation measures in accordance with FTA guidance are summarized in **Chapter 4**. **Chapter 6** focuses on the impacts to the airports and utilizes the FAA resource categories.

3.2 Land Use and Zoning

Introduction and Regulatory Setting

An assessment of the existing and future land use along the mostly DART-owned Cotton Belt Corridor provides insight into development trends in the Study Area. Land use types include, but are not limited to, residential, office, light industrial, industrial, commercial/retail, transportation, and institutional. Examining existing land use provides a sense of the general character of the areas through which the alignment passes.

Zoning ordinances of local municipal jurisdictions form the framework for regulating land uses within city limits. The basis for this regulatory power at the local level comes from Chapter 211, Municipal Zoning Authority, of the Texas Local Government Code.

Methodology

For the purposes of the land use review, the Study Area for land use includes 0.25-mile on either side of the Cotton Belt Project alignment and 0.5-mile radius around each proposed station location. The most recent land use data from North Central Council of Governments (NCTCOG) (2015) was used for the existing land use. Municipalities were utilized as primary sources for future land use plans and zoning.

Affected Environment

The majority of the proposed Cotton Belt Project would follow the existing railroad corridor. The Cotton Belt Corridor predates much of the surrounding development and freight operations that have been in existence for decades, such that the introduction of transit service as envisioned for the Cotton Belt Project would be a similar and compatible transportation use.

Passenger and freight movements on the Cotton Belt, TRE, and TEXRail lines would be monitored, authorized and controlled by dispatchers located at the TEXRail yard, with TRE having a dedicated desk and Cotton Belt/TEXRail sharing a desk. Since most development along the corridor occurred after the existing rail was constructed, several industrial and warehouse areas have direct access to the rail for the transportation of goods. This history is apparent in the many rail spurs extending from the main line to connect nearby businesses.

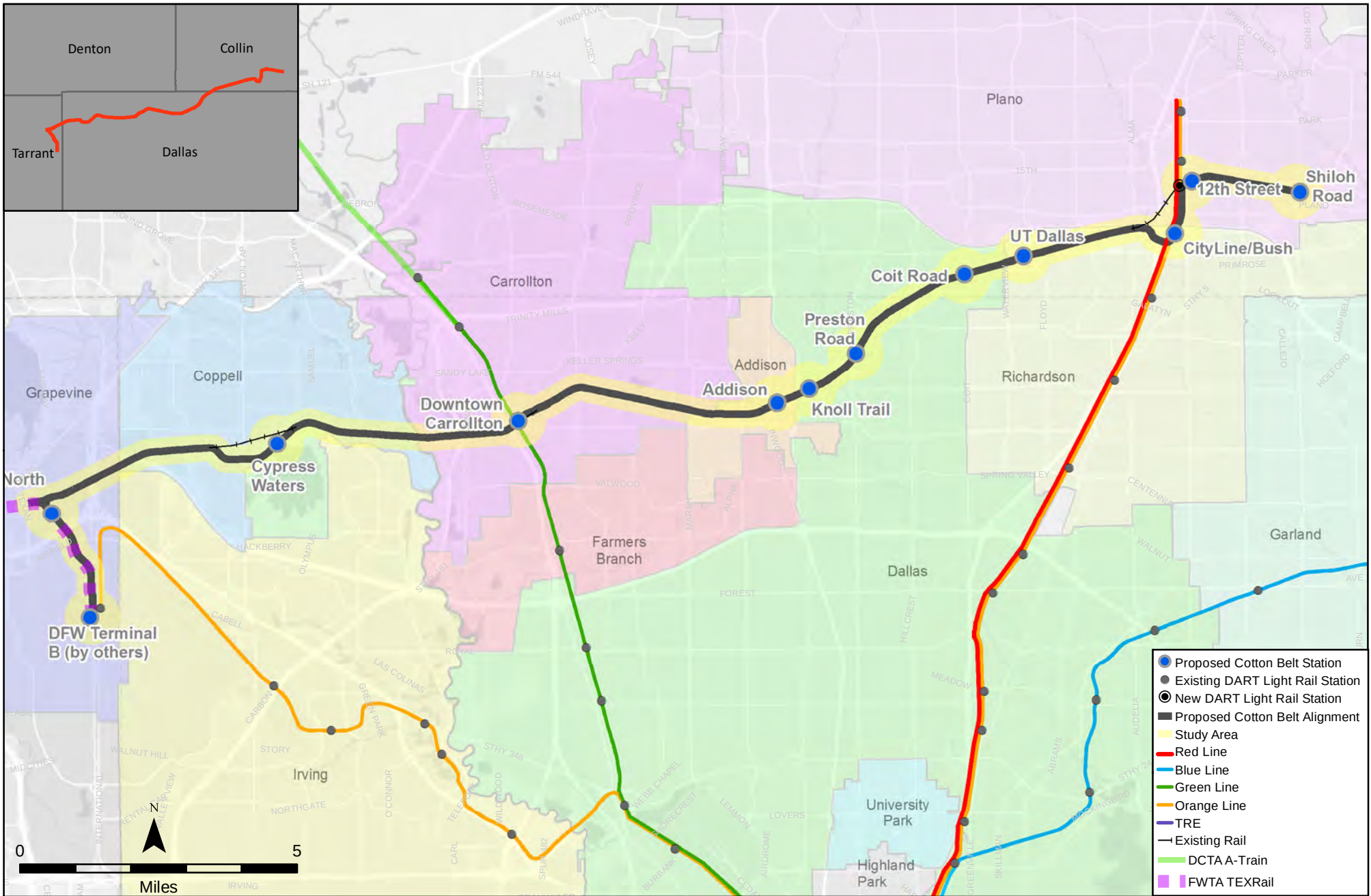


Figure 3-1
Cotton Belt Corridor Regional Rail Study Area



Table 3-1 lists the existing land use types within the Study Area, while **Figures 3-2** through **3-5** illustrate the land use types. In addition to industrial uses, other primary land uses include residential, commercial and mixed-use developments, and undeveloped park/open space. The *Land Use Existing Conditions Technical Memorandum* in **Appendix B** provides additional details on the land use types within the corridor.

Table 3-1. Cotton Belt Corridor Regional Rail Existing Land Use

Land Use Type	Acres Within Corridor*	Percent of Corridor
Vacant	1,832.8	19.5%
Industrial	1,291.38	13.8%
Single family	1,242.7	13.2%
Commercial	1,204.7	12.8%
Parks/recreation	965.55	10.3%
Multi-family	784.	8.4%
Runway	318.8	3.4%
Railroad	216.9	2.3%
Airport	185.7	2%
Institutional/semi-public	184.8	2%
Education	174.2	1.9%
Utilities	158.2	1.7%
Transit	147.7	1.6%
Retail	116.6	1.2%
Water	79.9	0.9%
Small water bodies	54.5	0.6%
Office	47.6	0.5%
Hotel/motel	47.4	0.5%
Cemeteries	13.7	0.2%
Flood control	5.0	0.1%
Other (Group quarters, farmland, ranch land, under construction, timberland, parking, residential acreage, improved acreage, communication, mobile home)	313.2	3.3%
TOTAL	9,385.2	100.00%

Source: NCTCOG Land Use Data, 2015

While there is a large amount of industrial and vacant land, the Cotton Belt Project stations would primarily be located near or within well-developed areas that serve as population and employment centers. **Table 3-2** summarizes existing land use around each proposed station location as well as highlights local land use plans, policies, and codes that will influence future development around the station. As shown in **Table 3-2**, every station area has an associated land use plan and/or station specific plan to support land use decisions and promote transit-oriented development.

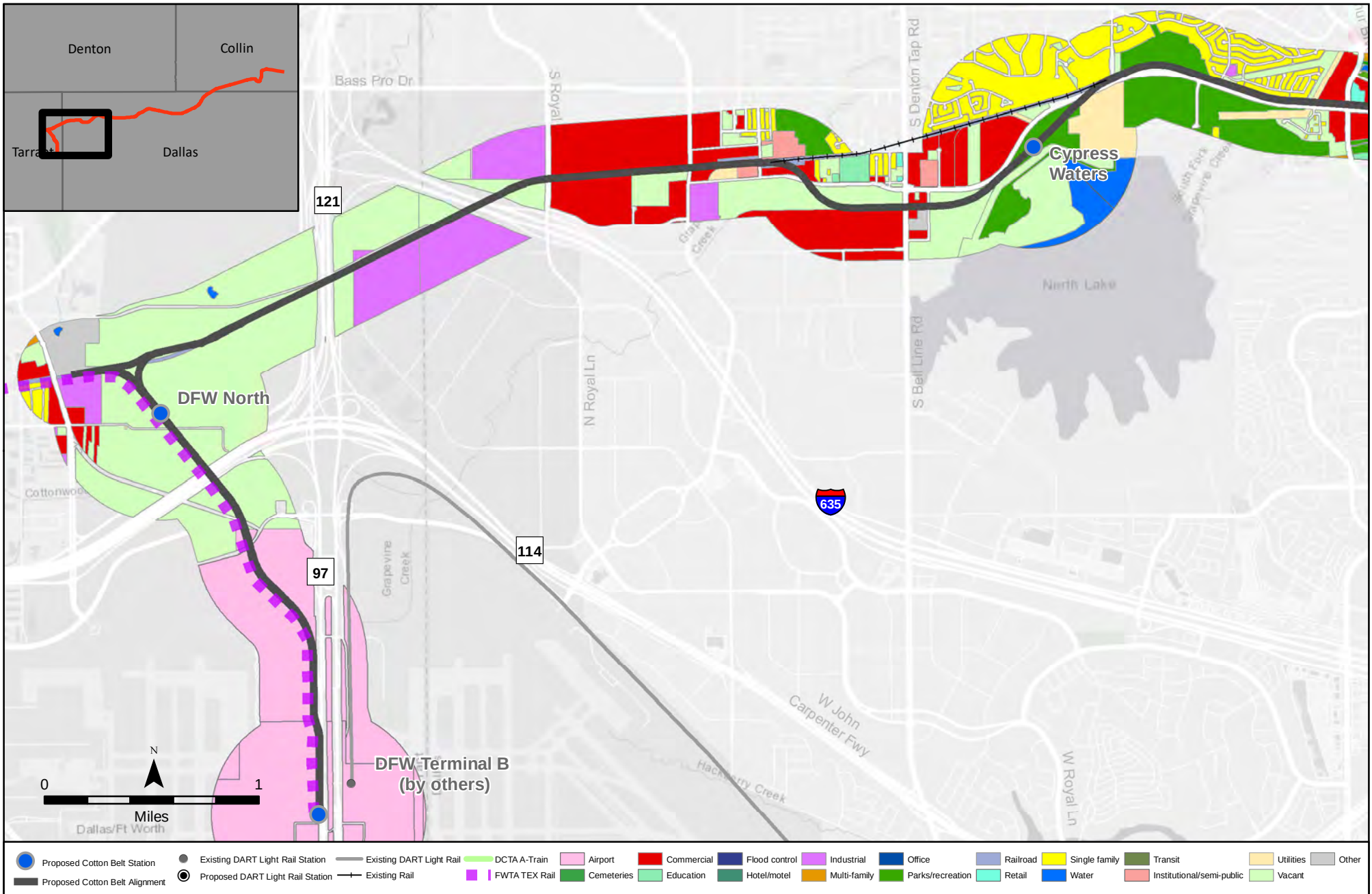


**Figure 3-2
Existing Land Use**

Data Source: North Central Texas Council of Governments, 2015

**Cotton Belt Corridor
Regional Rail Project**
Draft Environmental Impact Statement

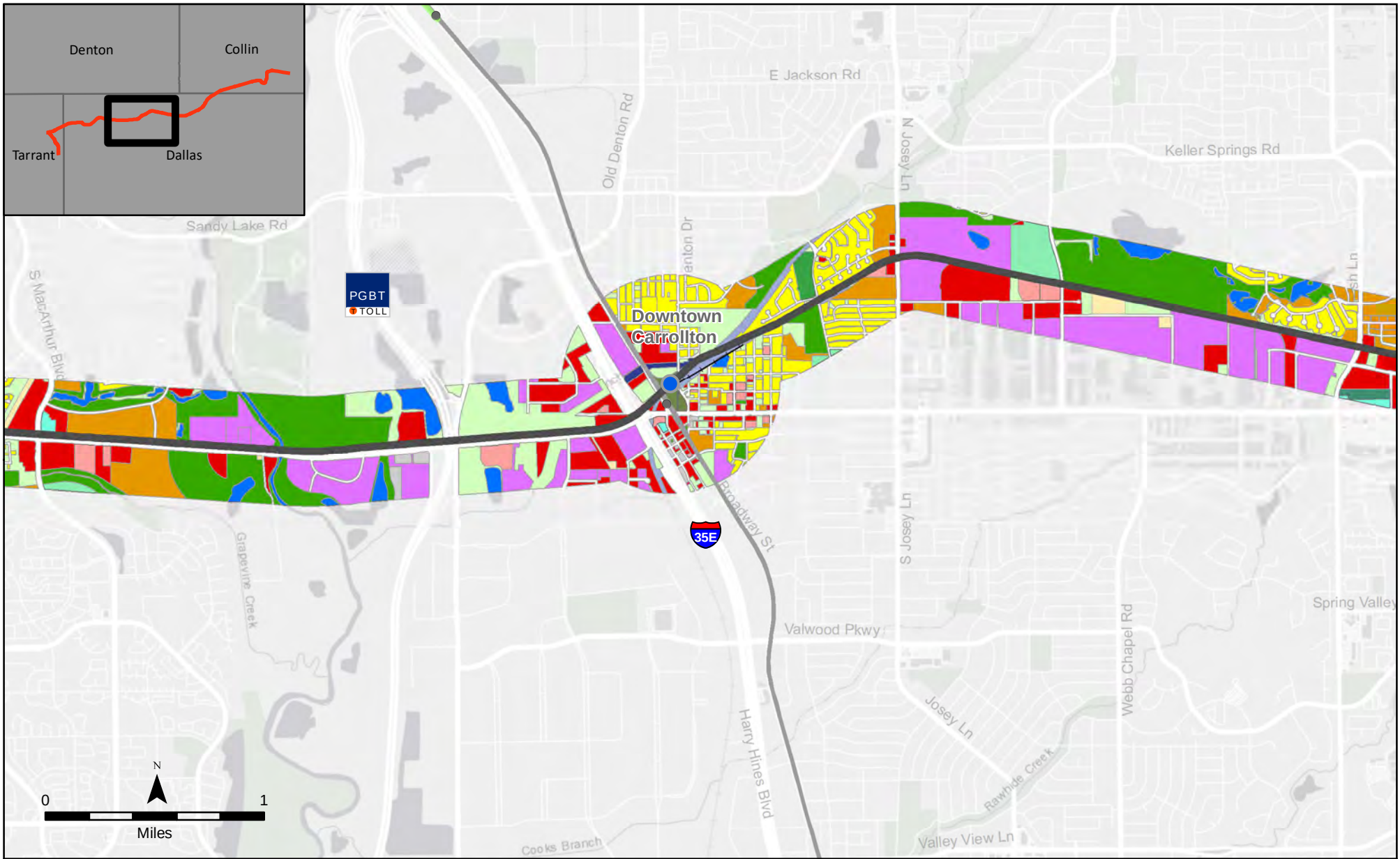


Figure 3-3
Existing Land Use
 Data Source: North Central Texas Council of Governments, 2015

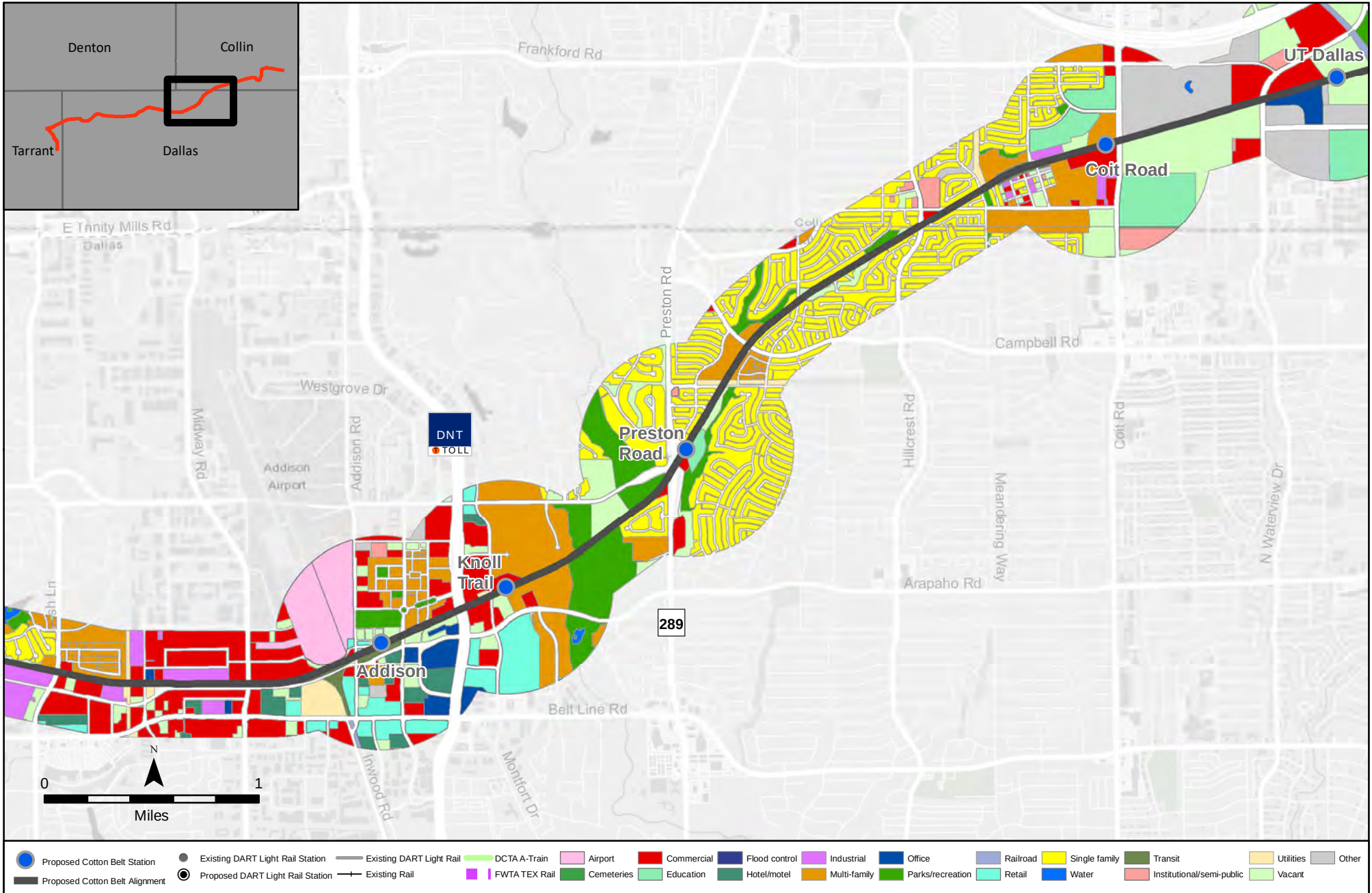


Figure 3-4
Existing Land Use

Data Source: North Central Texas Council of Governments, 2015

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



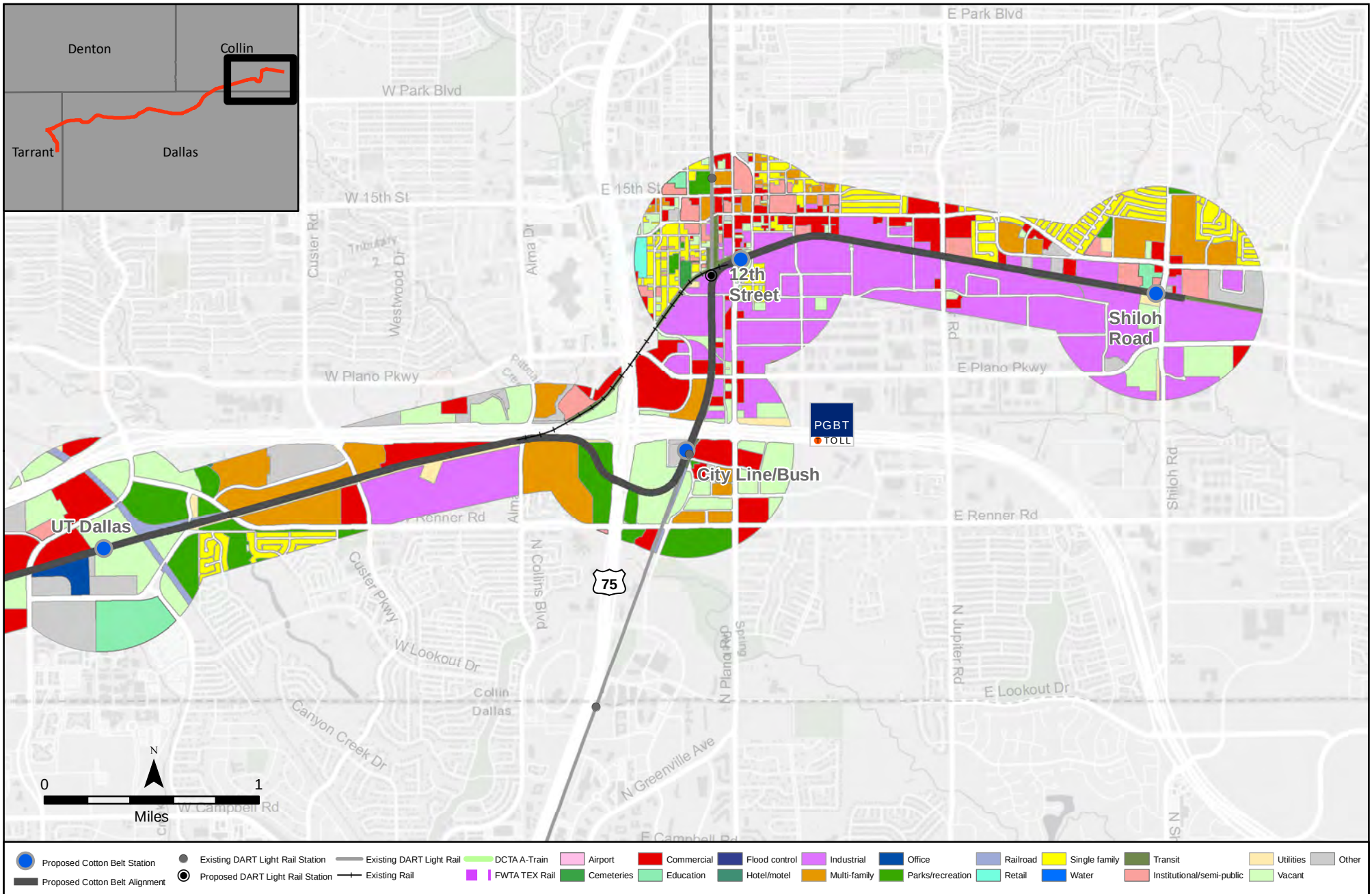


Figure 3-5
Existing Land Use

Data Source: North Central Texas Council of Governments, 2015

Cotton Belt Corridor
Regional Rail Project
Draft Environmental Impact Statement



Table 3-2. Station Area Land Use and Land Use Plans

Station	Predominant Land Use	Local Land Use Plans and Policies
DFW Terminal B	Airport uses	DFW Land Use Plan (2014)
DFW North	Vacant, industrial	DFW Land Use Plan (future mixed-use commercial)
Cypress Waters	Residential, commercial, industrial, vacant (development in progress)	<i>ForwardDallas!</i> Comprehensive Plan (2006) Cypress Waters Master Developer Agreement (2010) City of Dallas Cypress Waters TIF District Coppel 2030 – A Comprehensive Master Plan
Downtown Carrollton	Residential, industrial, office, retail	City of Carrollton Comprehensive Plan Downtown Carrollton TOD Plan (2008)
Addison	Mixed-use TOD, MF residential, office, medical, retail, aviation	Town of Addison Comprehensive Plan (2013) Master Transportation Plan (2016)
Knoll Trail	Office, MF residential, Retail	<i>ForwardDallas!</i> Comprehensive Plan (2006) designated as transit center/urban neighborhood
Preston Road	SF residential, education, flood control	<i>ForwardDallas!</i> Comprehensive Plan (2006) designated as transit center/residential neighborhood
Coit Road	SF residential, MF residential, commercial, education	<i>ForwardDallas!</i> Comprehensive Plan (2006) designated as transit center/commercial, urban and residential neighborhood
UT Dallas	Institutional (education), undeveloped, office, SF residential	UTD Master Plan 2013 (future mixed-use development) UTD North Campus TOD Plan (2009) City of Richardson Comprehensive Plan (2009)
CityLine/Bush	Mixed-use TOD, office, MF residential, retail, vacant (development in progress)	Caruth Properties Transit Oriented Planned Development Code (2011)
12 th Street	SF residential, vacant, industrial, government, office, and retail	Downtown Plano Vision and Strategy Update (2017)
Shiloh Road	Industrial, SF and MF residential, and vacant	Plano Tomorrow Comprehensive Plan (2015)
Key: MF- Multi-family, SF- Single Family, TOD- Transit Oriented Development, UTD- University of Texas, Dallas		

Source: GPC6, 2017

The following provides more details and summarizes the development plans for the Study Area.

DFW Airport - The *Dallas/Ft. Worth International Airport Land Use Plan*, last updated in 2014, calls for mixed-use development along the Cotton Belt Corridor and within 0.5-mile of the proposed DFW North station location. The mix of uses desired in these areas includes local retail, garden office, and restaurant. To the north of the alignment, DFW Airport is planning for hospitality, entertainment, and related commercial uses.

City of Coppel- The City of Coppel has created two redevelopment concepts for the Denton Tap Road/Belt Line Road area, which is near the proposed Cypress Waters Station along the Cotton Belt Corridor. One scenario proposes high-quality office space, parks, open space, and a cohesive architectural design throughout the area to complement the Cypress Waters development plans laid out by the Billingsley Company for a portion of land adjacent to North



Lake in the City of Dallas. The Cypress Waters development plan encompasses 1,000 acres and will include approximately 10,000 single- and multi-family residential units, a workplace/office campus, and some mixed-use areas.

City of Carrollton – The City of Carrollton plans have established a vision for this hub of future rail service. The plans outline recommendations encompassing the downtown area, which would also be home to the proposed Cotton Belt Downtown Carrollton Station. The City of Carrollton's future land use map (as amended by the City Council on December 6, 2007) depicts a large area of transit land use that encompasses the entire downtown area, as well as extending west of IH 35E.

Town of Addison - The Town of Addison currently has three capital improvement projects planned in the Study Area. *The Town of Addison Comprehensive Plan (2013)* identifies city-owned property on the north side of the Addison Station as well as 5.6 acres northeast of Quorum Drive and Arapaho Road that is being held for TOD. The Town of Addison also has a Belt Line Road redevelopment plan called *The Blueprint* (2006). A portion of Belt Line Road, from just east of Surveyor Boulevard to just east of Inwood Road, falls within 0.5 mile of the Addison Station location.

City of Dallas - The City of Dallas has documented their interest in fostering TOD and revitalization opportunities that could be realized if Cotton Belt Project stations were to be constructed in the far North Dallas area. The *ForwardDallas! Comprehensive Plan* adopted in June 2006, provides a work outline for the development of a Coit Road/McCallum Boulevard area plan. The Coit Road/McCallum Boulevard intersection falls within 0.5 mile of the proposed Coit Station location, and this area is also in proximity to UTD. The area plan, once developed, will include a vision for the area, recommended zoning, a strategic infrastructure investment program, and targeted economic development incentives. The comprehensive plan states that the City of Dallas plans to move away from planned development zoning for mixed-use projects in favor of form-based zoning codes. All three proposed Dallas stations are shown in the City's plan as transit centers.

City of Richardson - The City of Richardson's comprehensive plan, adopted by the City Council in January 2009, recommends that future land use along the City of Richardson portion of the alignment includes regional employment, transit village, public/semi-public/school, parks and open space, neighborhood residential, multi-family residential, neighborhood service, community commercial, and office/industry. The City, in collaboration with UTD and DART, also published a master plan for the UTD North Campus area (Land Use Technical Memorandum 14) including a proposed UTD Station along the Cotton Belt Corridor in June 2009. The station area master plan includes a mixture of land uses, higher-density development, and pedestrian-friendly design concepts to create a TOD around a proposed UTD Station.

City of Plano - The City of Plano's comprehensive plan was adopted in October 2015. The plan includes TOD aspects to proactively encourage development within walking distance of existing and future rail stations or bus transit centers to create an integrated mix of uses including residential, employment, retail, and civic spaces. Also included is a commitment to develop plans to address redevelopment of retail and multifamily sites and to encourage new development around transit stations. The City of Plano published a vision and strategy update for encompassing the proposed 12th Street Station in January 2017. This document acknowledges the 12th Street Station as an important feature for the south side of downtown Plano that will act as a magnet for new development. The 12th Street Station area is described as offering many development opportunities and is well suited for infill projects, including townhomes, live/work space and small offices and studios. The City has purchased approximately three acres of land for 12th Street Station parking.



3.3 Socioeconomic Characteristics and Cohesion

Legal Requirements and Regulatory Setting

Adverse effects on environmental resources from a proposed federally funded project must be identified and avoided or minimized, including potential impacts to the human environment and social interactions. Executive Order (EO) 13045, Protection of Children from Environmental Health and Safety Risks mandates that federal agencies identify and assess environmental safety risks that may disproportionately affect children as a result of implementation of federal policies, programs, activities and standards.

DART policies also require that the potential impacts of any proposed project (whether federally or locally funded) be assessed, and if adverse effects are found, that these impacts be avoided, or minimized and mitigated. As described in DART's *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*, DART's three main objectives regarding a proposed transit project's impact on the human environment, particularly on community character and cohesion, are as follows:

- contribute to community cohesion,
- contribute to the local economy, where possible, and avoid negative economic impacts, and
- provide for an equitable distribution of costs and benefits and ensure that the project does not have a disproportionately high and adverse impact on low-income or minority populations.

Methodology

The socioeconomic Study Area consists of approximately 0.25-mile on either side of the proposed alignment and a 0.5-mile radius around each proposed rail station. The following socioeconomic characteristics were documented: community facilities; community cohesion, including neighborhoods and schools; population demographics; and employment and economic conditions. The most recent community data for each city and independent school district (ISD) were used as a basis for the existing socioeconomic characteristics, and supplemented with data acquired during field reconnaissance and information gathered throughout the planning process.

The socioeconomic analysis methodology for the project is consistent with DART, FTA, and FHWA guidance regarding social resources and community impact assessments.

Affected Environment

Population Demographics

Demographic data was gathered for the U.S. Census Bureau (USCB) 2010 Census geographies, city and county limits either wholly or partially within the Study Area, using the USCB's 2011-2015 American Community Survey (ACS) 5-year estimates data. Demographic data analyzed include total population, total number of households, and population percentages by age, gender, disability status, income, vehicle access, race and ethnicity. **Table 3-3** provides existing demographic data within 0.5 mile of the stations.

More detailed project-area information regarding race, ethnicity, income and English language proficiency can be found in the *Environmental Justice Existing Conditions Technical Memorandum* in **Appendix B**, as well as in **Section 4.9** of this document.



Table 3-3. Existing Demographic Profile Within 0.5-Mile of Stations

Station	Employment	Population	Households	Population Below Poverty	Minority Population	Population Over 65	Population 19 & Under
DFW North	500	421	176	19%	66%	11%	21%
Cypress Waters	1,128	5,359	2,122	7%	77%	8%	26%
Downtown Carrollton	12,108	4,479	1,388	17%	66%	19%	25%
Addison	48,636	9,041	5,636	7%	61%	11%	11%
Knoll Trail	32,579	12,786	7,765	7%	59%	15%	9%
Preston	7,668	13,782	7,021	16%	62%	18%	13%
Coit	8,409	11,844	5,727	18%	71%	14%	16%
UT Dallas	20,823	6,485	2,897	15%	68%	29%	16%
CityLine	20,586	4,981	2,089	14%	70%	27%	22%
12 th Street	10,074	2,953	1,329	27%	73%	37%	24%
Shiloh	23,172	9,218	3,061	16%	75%	53%	26%

Source: NCTCOG, 2015

Table 3-4 presents population information relative to median household income and the percent of households with no vehicle available for the counties, cities, and Study Area. Overall, the Study Area has a total number of 71,853 households; the median household income is \$70,366; and 5 percent of the households have no vehicle available. The City of Dallas has the lowest median household income of the cities located within the Study Area and has the highest percentage of households with no vehicle available that rely on transit services for their mobility. According to the 2010 Census, almost 10 percent of all occupied housing units in Dallas had no vehicle available in their household.

Table 3-4. Median Household Income and Households Without Vehicles

Census Unit	Total Number of Households	Median Household Income	Percent Households with No Vehicle Available
Collin County	305,827	\$84,735	3%
Dallas County	881,279	\$50,270	7%
Tarrant County	673,737	\$58,711	5%
Cities and Towns			
Town of Addison	8,353	\$67,695	2%
City of Carrollton	45,263	\$69,368	2%
City of Coppell	14,620	\$111,817	2%
City of Dallas	477,249	\$43,781	10%
City of Grapevine	19,366	\$79,083	2%
City of Irving	83,649	\$52,154	5%
City of Plano	103,937	\$83,793	3%
City of Richardson	40,020	\$72,427	4%
Corridor Study Area			
Corridor Study Area	71,853	\$70,366	5%

Source: USCB 2011-2015 ACS 5-Year Estimates, Tables S1903 and B25044

Additional demographics, including the racial and ethnic breakdown of the counties, cities and census tracts (CT); the median household income and proportion of household without vehicles for the counties, cities and CTs; and the percentages for gender, age distribution and disability



status for the counties, cities and CTs in the Study Area are also included in the *Socioeconomics Existing Conditions Technical Memorandum* in **Appendix B**.

Community Facilities

Existing community facilities assessed within the Study Area include community centers, places of worship, daycare centers, public service and government locations, medical facilities, and other areas of community importance. Field reconnaissance to verify sites and locations was performed in April and May 2017. One hundred and ten community facilities were identified within the Study Area. **Figures 3-6** through **3-9** illustrate the location of community facilities within the Study Area. Each map includes a list and address with map ID number.

Community Cohesion and Neighborhoods

Community cohesion refers to the level of social interaction experienced within and across neighborhoods. There are many registered neighborhood associations and homeowners' associations (HOAs) in the Study Area. **Figure 3-10** illustrates the neighborhood and HOAs along the Study Area. These and similar organizations serve to bind neighbors to one another under a common identity or set of ideals, and create more meaningful social interactions.

The majority of neighborhoods surrounding the Cotton Belt Corridor developed around the railroad, since the corridor pre-dates modern residential developments. As a result, the corridor serves as a logical physical boundary line for many neighborhoods.

DART has identified several registered or formally-organized homeowners' and neighborhood associations along the corridor, as well as other identified subdivisions and neighborhoods lacking a formal association. Several of these groups have provided important feedback on the project. General characterizations of the neighborhoods and communities within the Study Area are included in the *Socioeconomic Characteristics Existing Conditions Technical Memorandum* in **Appendix B**.

Schools

When a new transportation corridor is under consideration, whether along an existing corridor or in a new location, it is important to not only inventory the locations of schools, but also their respective attendance zones. By examining the relationship of the location of the schools to the residential areas within each attendance zone, it can be determined whether school children would have to cross the Cotton Belt Corridor to reach their school on foot or by bicycle. The Project aims to preserve or improve upon the existing levels of safety for school children crossing the Cotton Belt Corridor. There are 26 schools and one university within the Study Area (**Figure 3-11**). School attendance zones within the Study Area and their proximity to the Cotton Belt Corridor are identified and described in the *Socioeconomic Existing Conditions Technical Memorandum* in **Appendix B**.

Police Stations

There are seven police stations with jurisdictions near or inside the Study Area. These facilities represent the primary police response capabilities along the Cotton Belt Project. Police stations in Addison (4799 Airport Parkway), Dallas (6969 McCallum Boulevard B), and Plano (909 14th Street and 1520 Avenue K Suite 010) are physically located inside the Study Area, and are shown in **Figures 3-6** through **3-9**. Police facilities and patrols located outside of the Study Area could respond to a large incident within the Study Area if additional support was necessary.

Each of the seven cities along the Cotton Belt Project has their own police and fire departments. In all seven cities, the fire departments provide both fire and emergency medical services. In addition to local police departments, DFW Airport has a police department responsible for



maintaining security at the airport in conjunction with the Transportation Security Administration (TSA). Additionally, UTD has an internal police department.

The DART Police Department is an independent police department with responsibilities for ensuring security and safety on DART property and vehicles. DART police officers are vested with all the rights, privileges, obligations, and duties of peace officers in the state of Texas. DART police work in coordination with local law enforcement agencies in investigations and ensuring a safe transit system.

Fire and Emergency Services Stations

There are 14 fire stations with jurisdiction nearby or within the Study Area. Fire Station No. 1 in Coppell (520 Southwestern Blvd), Fire Station No. 1 in Addison (4798 Airport Parkway), and Fire Station No. 7 in Dallas (6010 Davenport Road) are physically located in the Study Area. The locations are shown in **Figures 3-6** through **Figure 3-9**.

Hospital Medical Services

There are seven major hospitals close to the Study Area; however, none of the hospitals are within the Study Area. **Table 3-5** lists the hospitals with service areas located near the Study Area. The listed hospitals represent the locations where emergency medical services could be provided to residents or workers in the Study Area and vehicles could deliver patients.

Table 3-5. Hospitals Near the Study Area

Name	Address	City
Baylor Scott & White Medical Center	1650 West College Street	Grapevine
Legacy ER & Urgent Care	330 South Denton Tap Road	Coppell
Texas Health Hospital	1401 East Trinity Mills Road	Carrollton
Methodist Hospital for Surgery	17101 Dallas Parkway	Addison
Baylor Scott & White Medical Center	4700 Alliance Boulevard	Plano
Texas Presbyterian Hospital	2800 West 15th Street	Plano
Plano Children's Medical Clinic	7601 Preston Road	Plano

Source: GPC6, 2017

Employment

The NCTCOG defines "major employer" as a single location of a business, which employs 250 or more individuals. Major employers near the Cotton Belt Corridor and station locations would likely generate considerable activity in those areas; thus, it is important to identify major employment centers in addition to residential populations. Sixty-five major employers were identified within the Study Area. Additionally, State Farm Insurance has its headquarters currently located in Richardson, a 1.5-million square foot facility adjacent to the existing City Line/Bush Station. Major employers contained in the NCTCOG database and/or identified by city staff within their city limits, and their locations are shown in **Figures 3-12** through **3-15**.

The Study Area also hosts a number of large employers including 34 with 500 or more employees, and over 90 employment centers, which employ more than 250 people. The largest employment center within the Study Area is DFW Airport where approximately 60,000 airport, airline, cargo and ancillary employees are located. Additional major employers include State Farm Insurance and Raytheon at CityLine with approximately 12,800 employees, and UTD, which hosts nearly 27,000 students. Several communities along the corridor have more employment than population. The Dallas-Fort Worth region has experienced considerable growth in employment over the past several decades which can be attributed to a favorable business climate, attractive tax policies and plenty of available land.

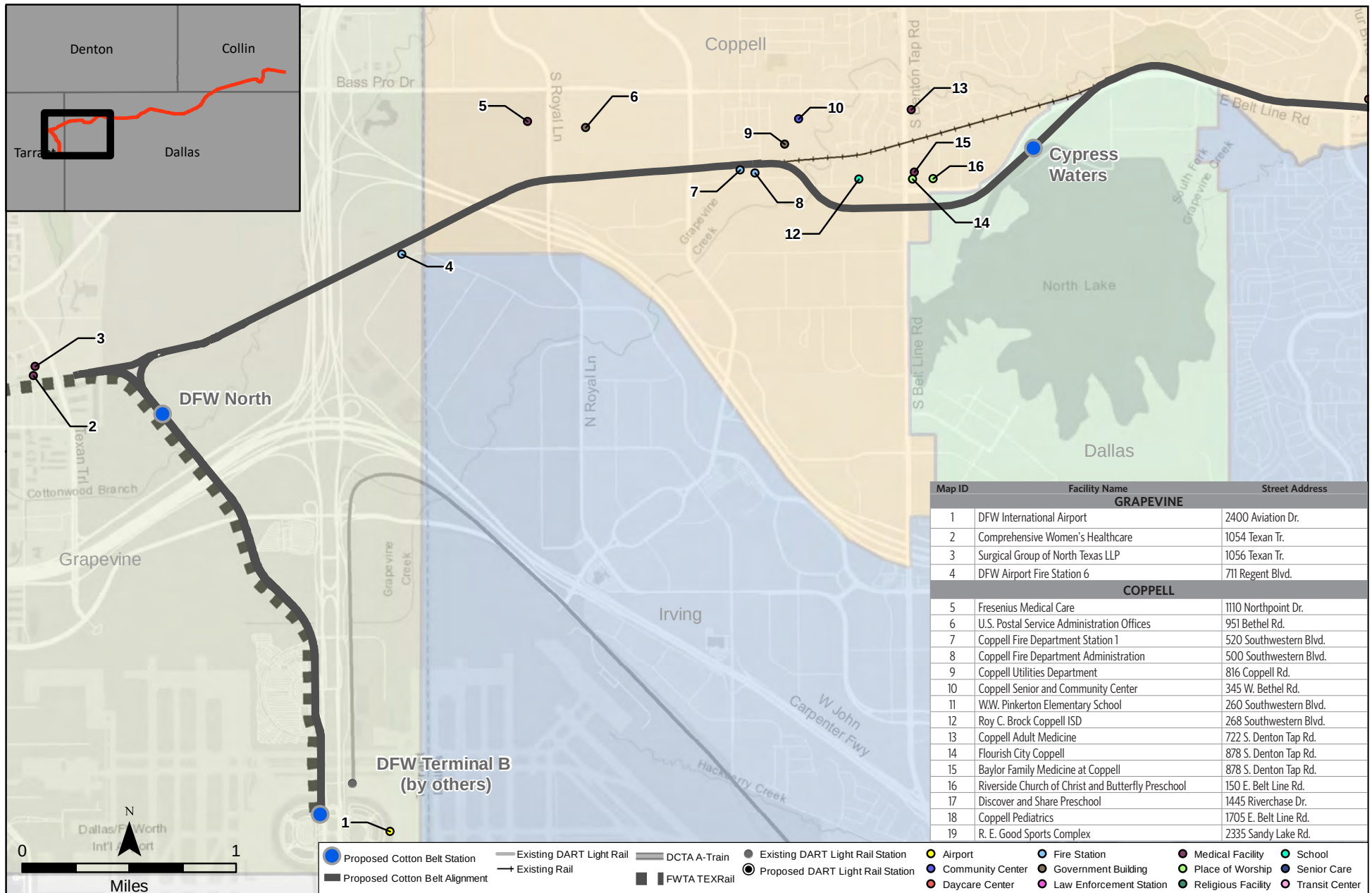


Figure 3-6
Community Facilities

Data Source: North Central Texas Council of Governments

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



COTTON BELT

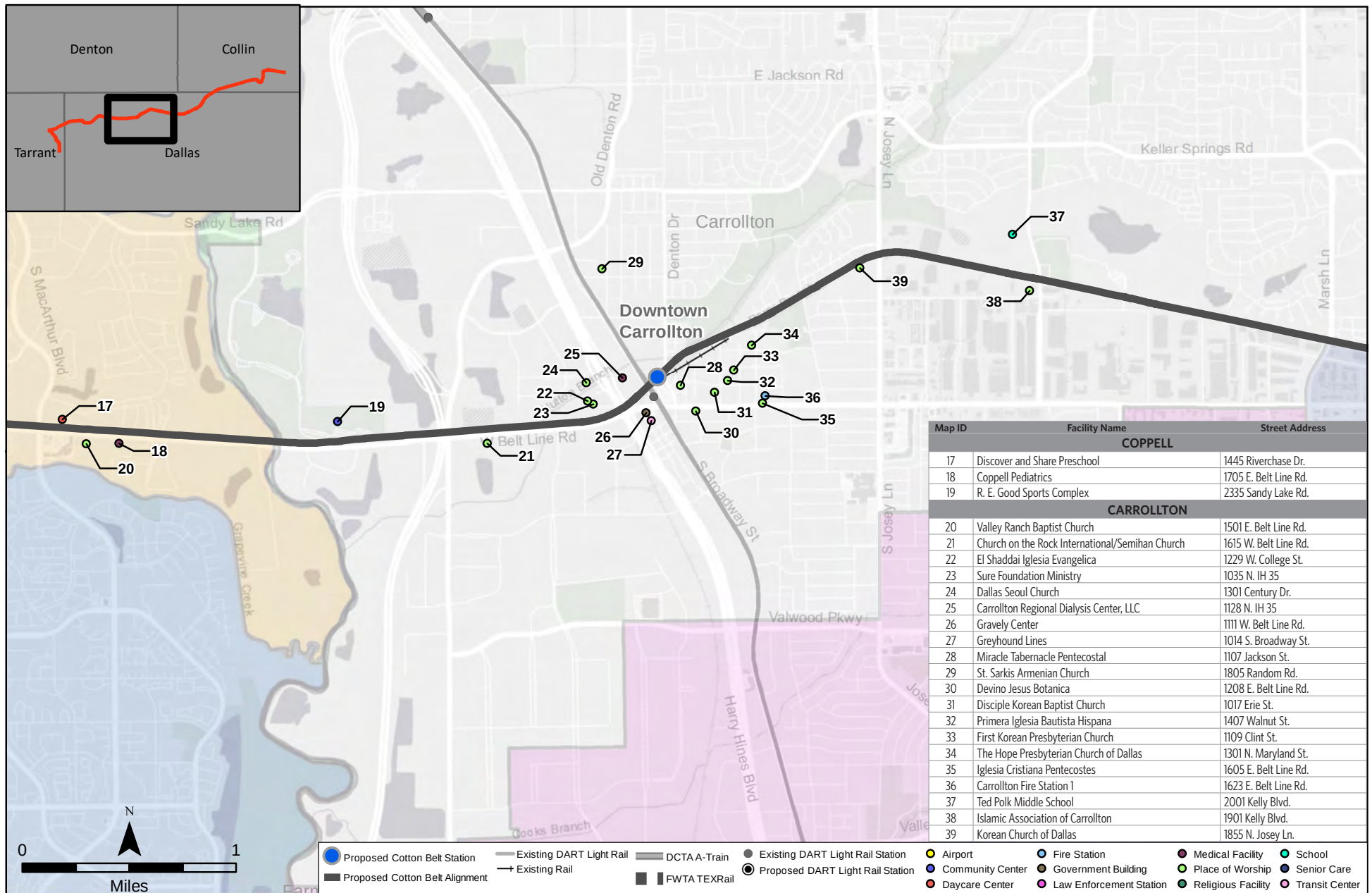


Figure 3-7
Community Facilities

Data Source: North Central Texas Council of Governments

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



COTTON BELT

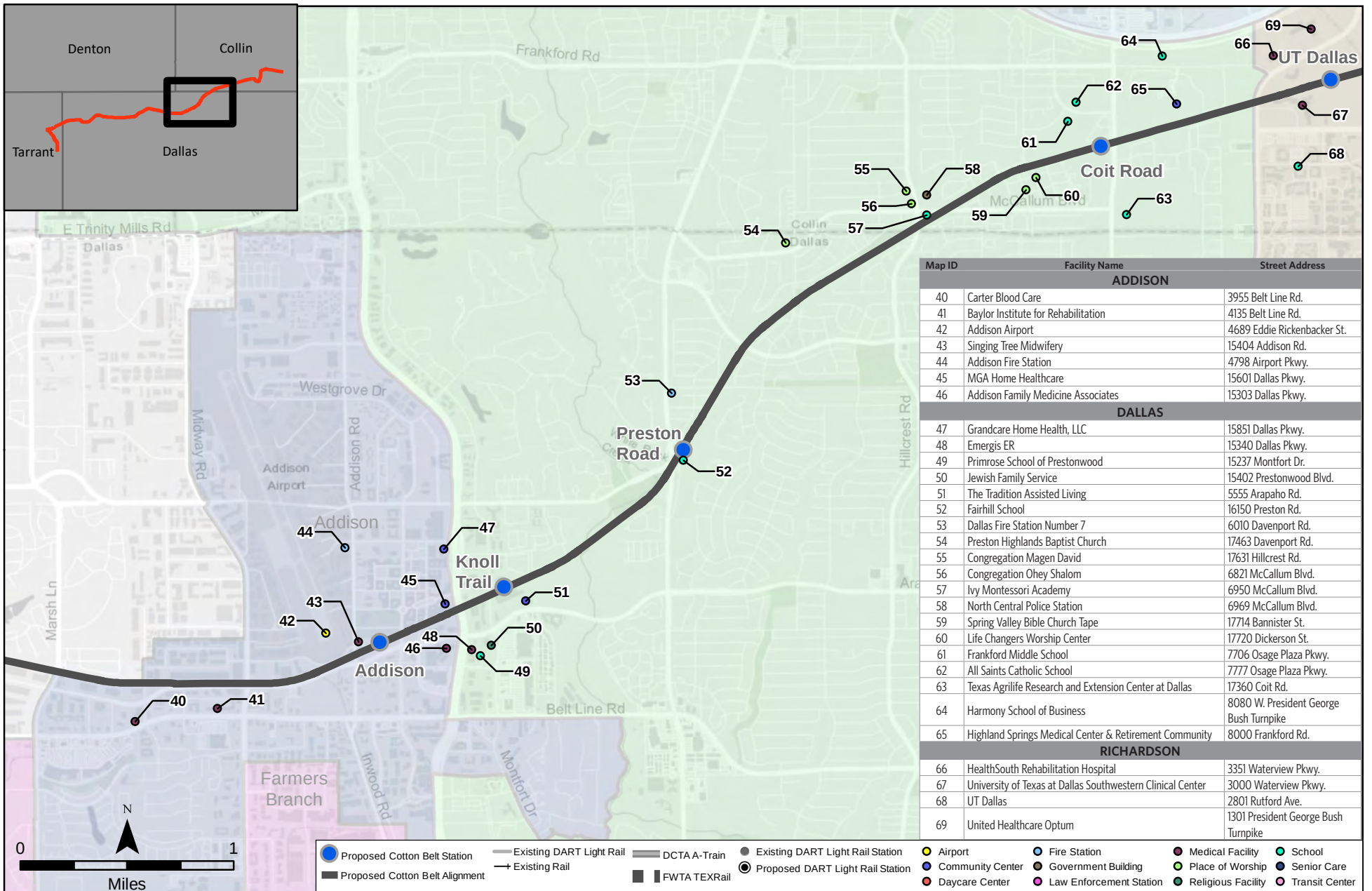


Figure 3-8
Community Facilities

Data Source: North Central Texas Council of Governments

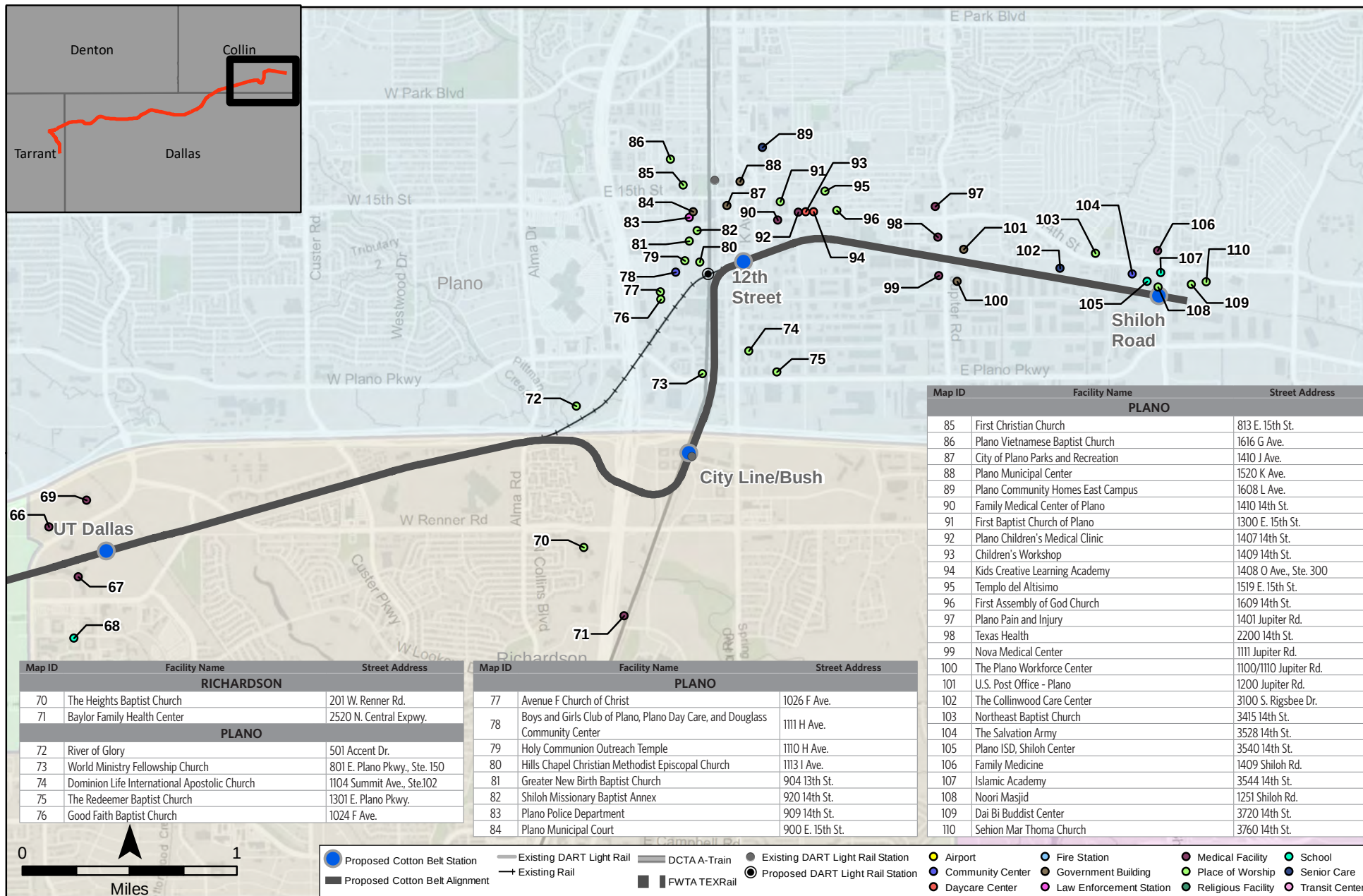


Figure 3-9
Community Facilities

Data Source: North Central Texas Council of Governments

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



COTTON BELT

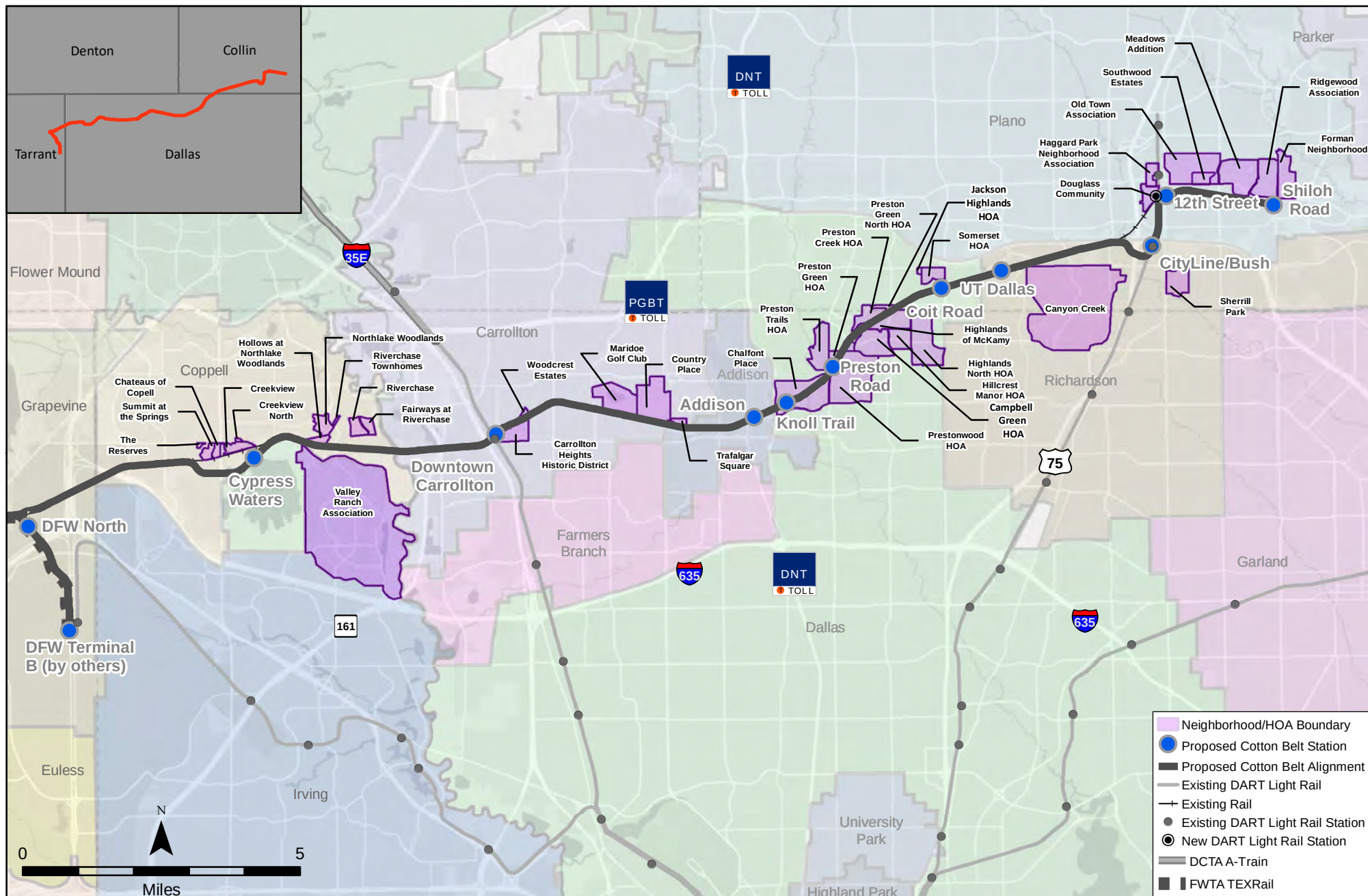


Figure 3-10
Neighborhood and Home Owners
Associations Along the Study Area
 Data Source: Local Municipalities and Neighborhood Websites

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement

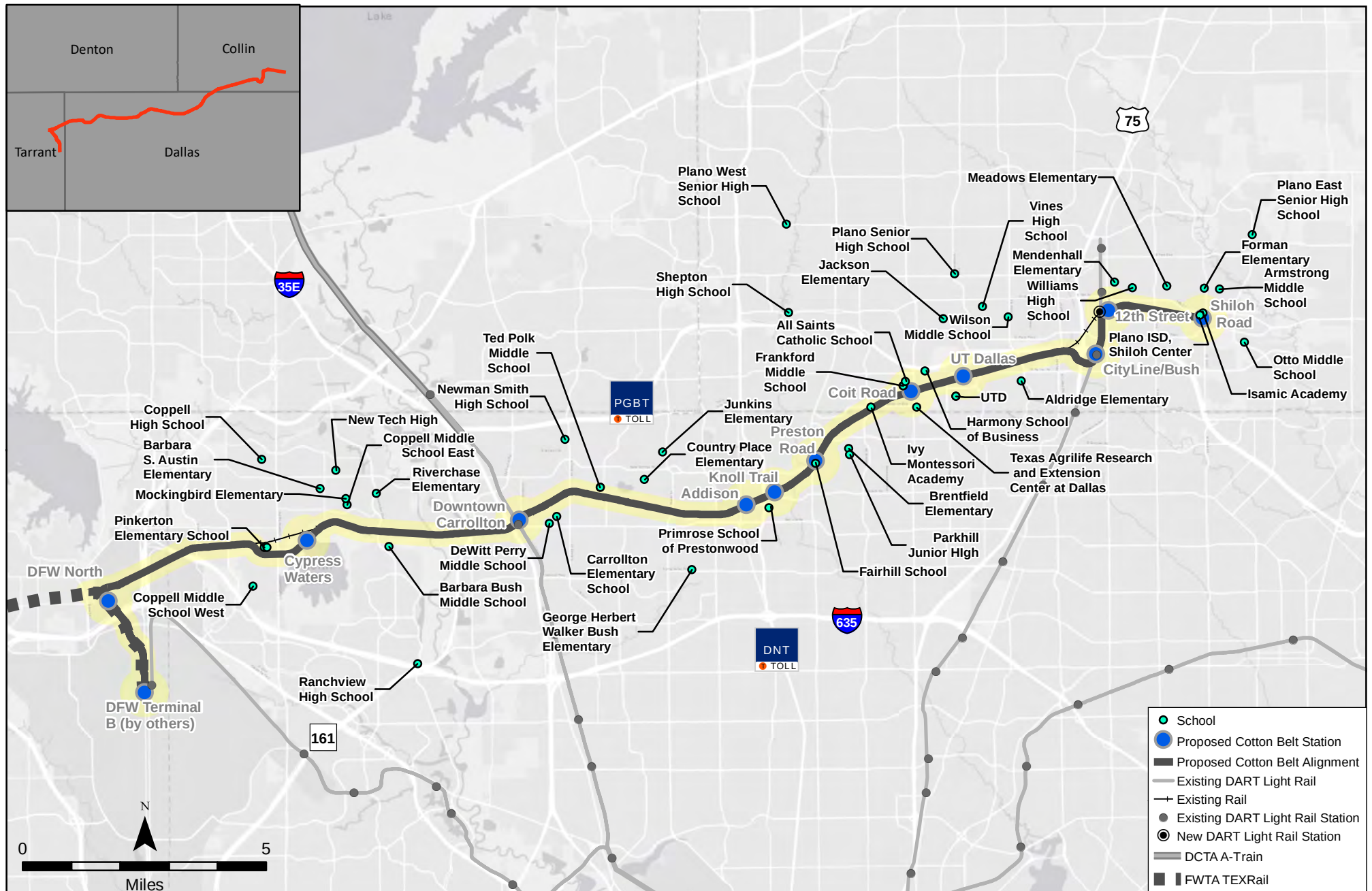
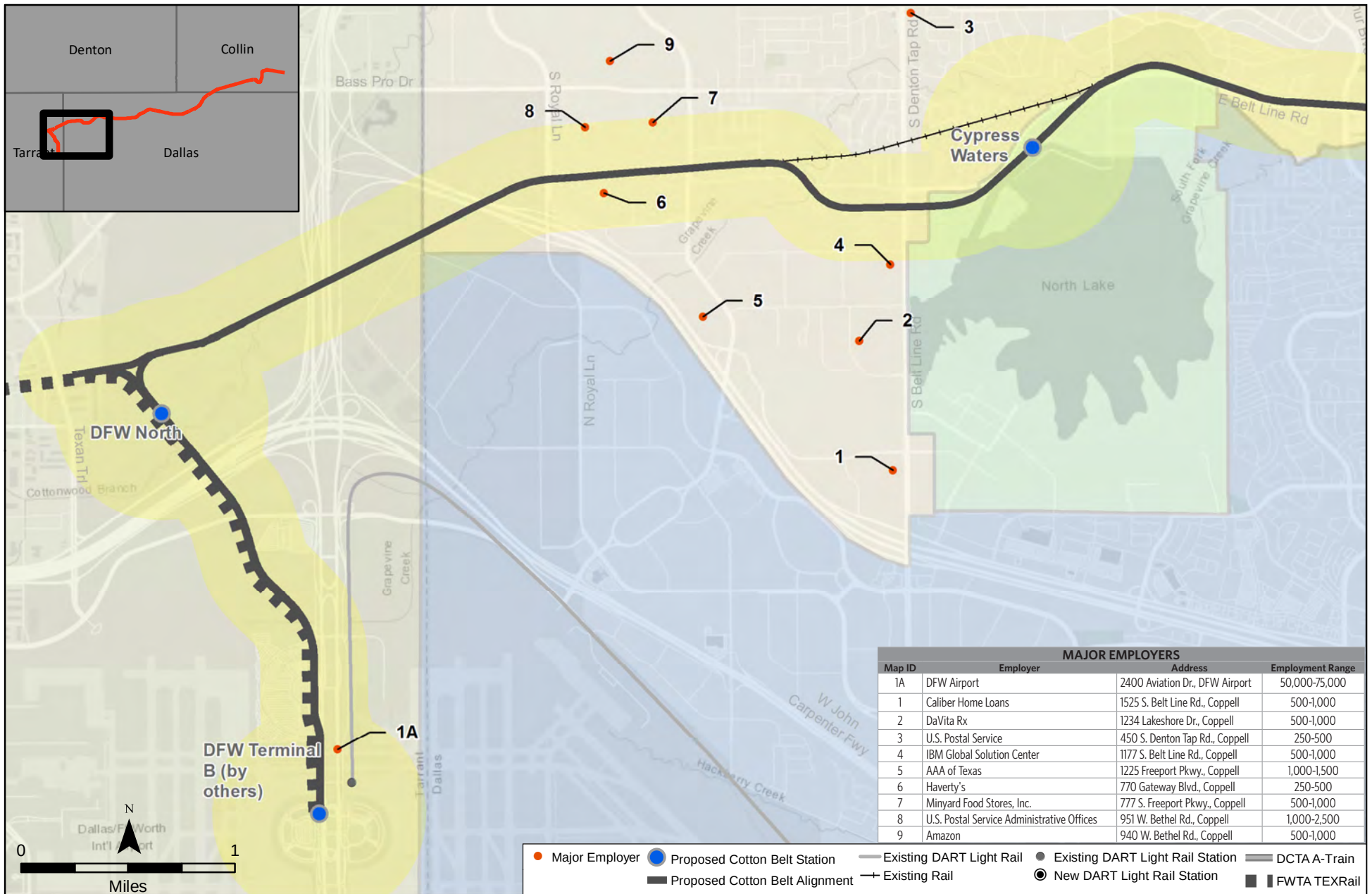


**Figure 3-11
Schools**

Data Source: North Central Texas Council of Governments, Texas Education Agency Public Open Data Site

**Cotton Belt Corridor
Regional Rail Project**

Draft Environmental Impact Statement



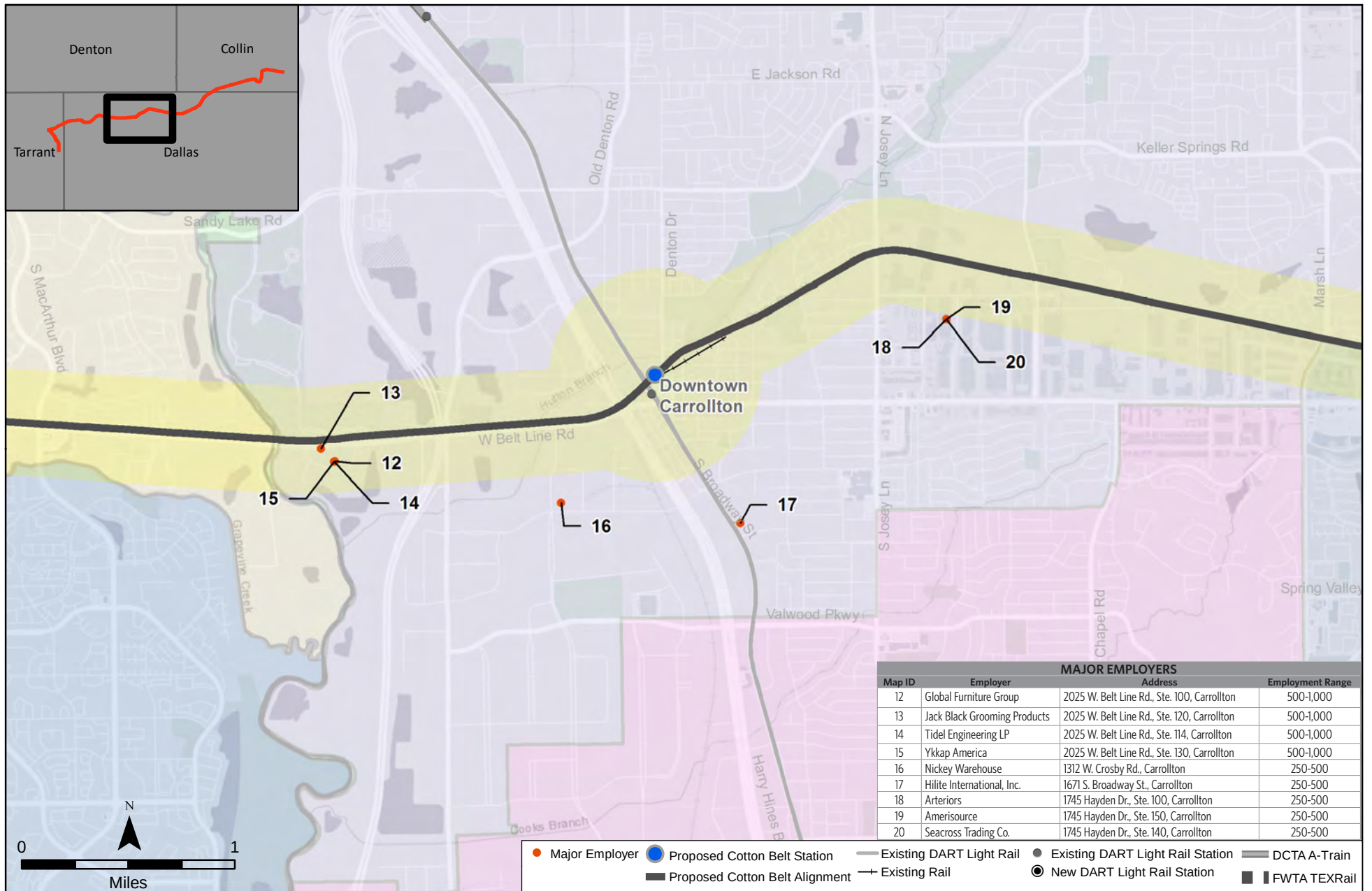


Figure 3-13
Major Employers Along the Cotton Belt Corridor

Data Source: North Central Texas Council of Governments, Texas Education Agency Public Open Data Site

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement

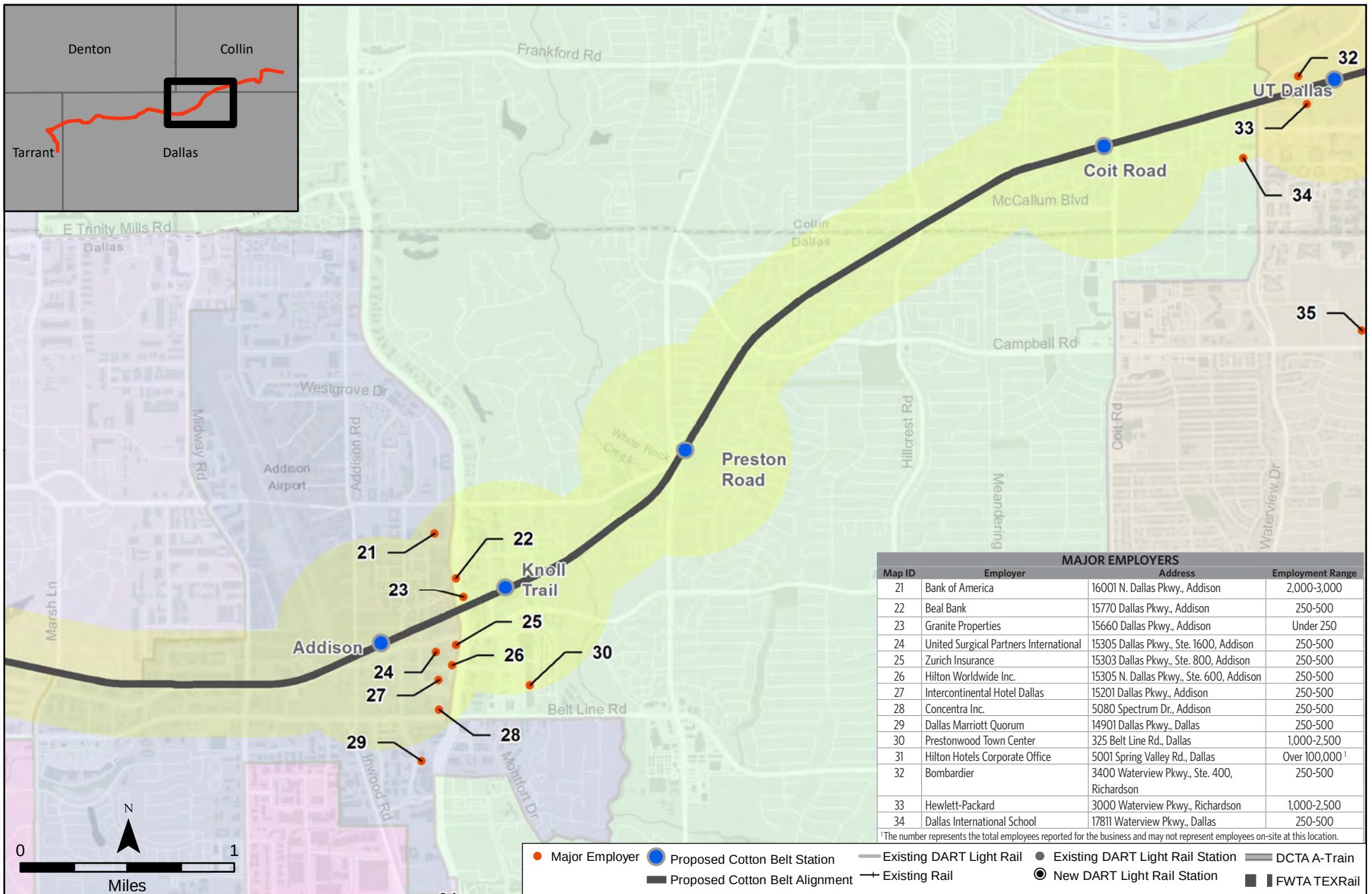


Figure 3-14

Major Employers Along the Cotton Belt Corridor

Data Source: North Central Texas Council of Governments, Texas Education Agency Public Open Data Site

**Cotton Belt Corridor
Regional Rail Project**

Draft Environmental Impact Statement



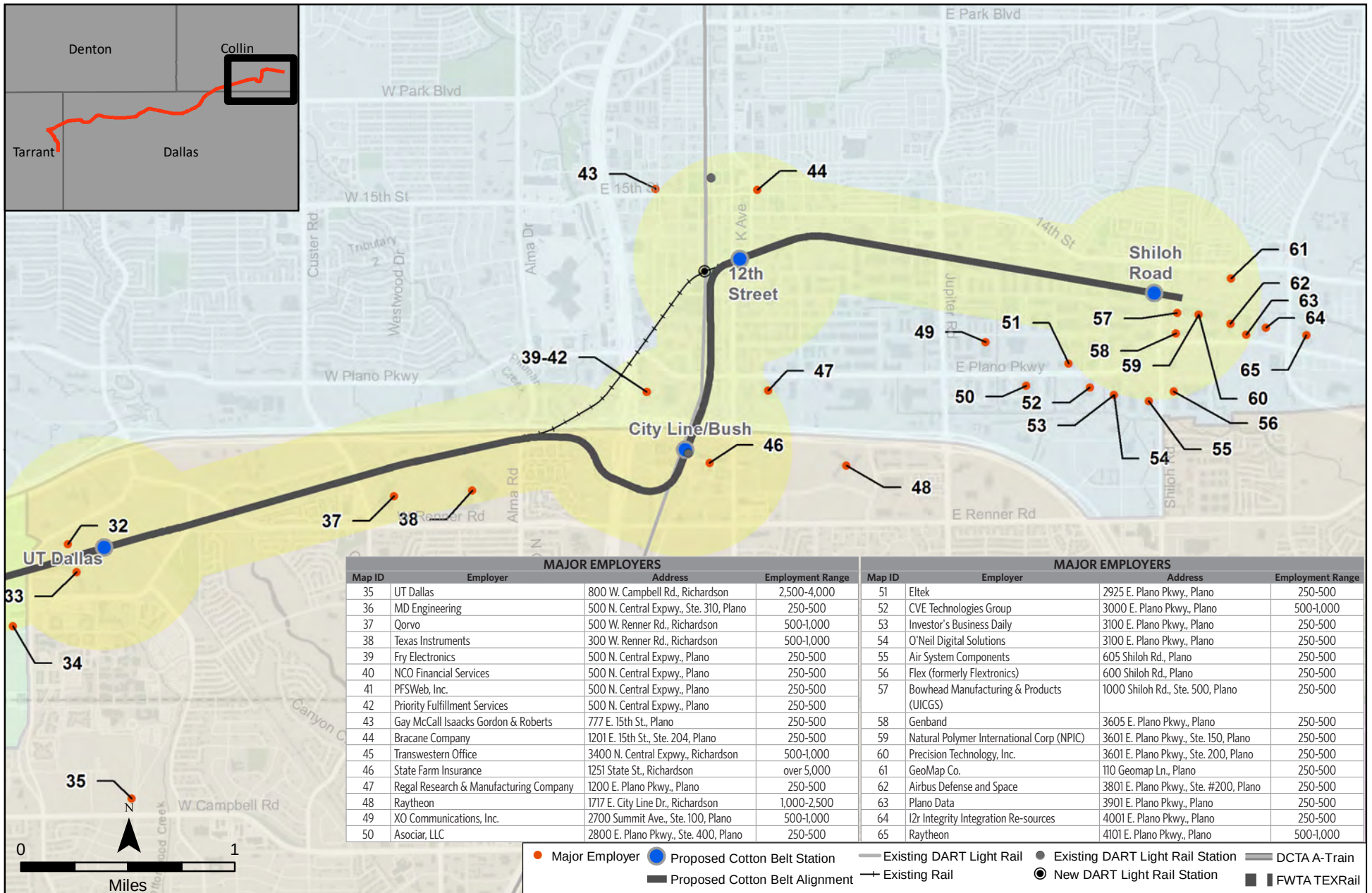


Figure 3-15
Major Employers Along the Cotton Belt Corridor

Data Source: North Central Texas Council of Governments, Texas Education Agency Public Open Data Site

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



Employment projections show continued strong growth in the region and in this part of the DART Service Area. National forecasts of population and economic growth indicate that this region will continue to add residents and jobs well into the future (NCTCOG, 2017). The *Socioeconomic Existing Conditions Technical Memorandum* provides additional information and is located in **Appendix B**.

Economic Conditions

Employment and economic conditions were evaluated using data gathered from the U.S. Bureau of Economic Analysis (BEA) and the Bureau of Labor Statistics (BLS). According to data released by the BLS for November 2017, the largest over-the-year employment increases occurred in the Dallas-Fort Worth-Arlington, Texas Metropolitan Statistical Area (MSA) compared to other MSAs in the U.S. In addition, the largest over-the-year increase in employment among the metropolitan divisions occurred in the Dallas-Plano-Irving, Texas division that consisted of a 2.9 percent increase.

The BEA produces information for the state, county and MSA levels². BEA data for the U.S., the State of Texas, the counties, and MSA within the Study Area are included in the *Socioeconomic Existing Conditions Technical Memorandum* in **Appendix B**. Data summarized include the Per Capita Personal Income (PCPI), the latest unemployment rate available (March 2017), and the 2005-2015 compound annual growth of the PCPI.

3.4 Parks and Recreation Facilities

Legal Requirements and Regulatory Setting

This section inventories the parks and recreational facilities within the Study Area. Identifying these important community resources will help ensure that adverse impacts are avoided or minimized and efforts are made to integrate the Cotton Belt Project into the surrounding environment in a manner sensitive to the natural setting.

Several regulations pertain to the use of parks and recreational facilities. Section 4(f) of the United States Department of Transportation (USDOT) Act of 1966, as amended (49 USC 303), declares it a national policy to make a special effort to preserve the national beauty of the countryside, including parks, recreation land, wildlife and waterfowl refuges, and historic sites, and that the use of Section 4(f) protected resources should be avoided when planning transportation projects, unless no other feasible and prudent alternatives exist. Section 6(f) of the Land and Water Conservation Fund (LWCF) Act states that parks developed or improved using LWCF grant monies cannot be acquired unless no other reasonable and feasible alternatives exist and any acquisition must be in coordination with the National Park Service (NPS). Chapter 26 of the Texas Parks and Wildlife Department (TPWD) Code states that a state agency, county, or municipality cannot approve a project that would require the use or taking of a public park or recreational land unless it is determined that no feasible or prudent alternative exists, adverse impacts have been minimized through the planning process, and a public hearing is held regarding the proposed use.

Methodology

For the environmental review, the Study Area for park and recreational facilities includes 0.25-mile on either side of the proposed Cotton Belt Project alignment and a 0.5-mile radius around each proposed station location. Park and recreational trails data was gathered through coordination with affected municipalities in conjunction with a review of city maps, parks and

² Source: <https://bea.gov/regional/bearfacts/action.cfm?geoType=5&fips=19100&areatype=MSA>.



trails master plans, and GIS shapefiles from NCTCOG. Any park or trail within the Study Area buffer was included in the analysis.

Affected Environment

There are 64 parks, trails, and recreational facilities within the Study Area. **Table 3-6** lists publicly-owned parks and recreational facilities that may be subject to Section 4(f) regulations. **Table 3-7** lists privately-owned recreational facilities within the Study Area. **Figures 3-16** through **3-19** show the location of each inventoried facility along the Cotton Belt Corridor. The figures also show a green-shaded overlay of the NCTCOG 2015 land use category “Dedicated, Parks.” As defined by the NCTCOG, land use examples in this category could include public and private parks, golf courses, cemeteries, public and private tennis courts and swimming pools, and amusement parks.

For the environmental review, all publicly-owned and privately-owned parks and recreational areas have been identified. Dependent on the significance of public use, not all publicly-owned parks and recreational facilities qualify as Section 4(f) protected resources. Publicly-owned properties that do not qualify include school properties and floodways.

Table 3-6. Publicly-Owned Parks and Recreational Facilities Inventory

Facility Name	Description
Future Cotton Belt Trail	Parallel to existing Cotton Belt corridor (exact location unknown at this time); Regional Veloweb Plan
Grapevine Springs Park Preserve and Trail	Nature preserve, passive use green space and trail
Grapevine Creek Park	Passive use green space
R. J. McInnish Park Sports Complex	Active park with sports fields (27 sports fields located inside of McInnish Park, with 12 soccer fields, 10 baseball fields, and 5 adult softball fields)
R. J. McInnish Park Trail	Trail
R.E. Good Sports Complex	Active park with sports fields
Dimension Tract	Passive use park
Elm Fork Nature Preserve	Passive use green space
Elm Fork Nature Preserve Trail	Trail
Downtown City Square Park and Gazebo	Active use park with historical features
Pioneer Park	Active use park in downtown Carrollton with historical features
Francis Perry Park	Tennis court and playground
Gravley Park	Adjacent to the A.W. Perry Museum; passive use
Gravley Park Loop	Adjacent to the A.W. Perry Museum; Trail
A.W. Perry Homestead Museum	Park/museum
W. J. Thomas Park Sports Fields, and Municipal Pool	Active use park with sports fields and pool
Josey Ranch Greenbelt	Greenbelt park/trail
Keller Springs Park	Passive use green space
Hutton Branch Green Trail and Purple Trail	Trail
Addison Circle Park	Active use park
Beckert Park	Passive green space
Bosque Park	Passive green space
Parkview Park	Passive green space
Spruill Park	Passive green space
Wagging Tail Dog Park	Dog park
Preston Green Park	Active use, playground
Community Pool	Public pool
City of Dallas Public Use Area	Public use area



Table 3-6. Publicly-Owned Parks and Recreational Facilities Inventory (continued)

Facility Name	Description
Preston Ridge Trail and Expansion	Trail at Haymeadow Drive/Coit Road north to Frankford Road. Parallel to Meandering Way at Cotton Belt crossing; Regional Veloweb Plan
Douglass Playground	Community Park
Haggard Park	Gazebo, playground and restrooms; home of Interurban Railway Museum
Haggard Park Trail	Trail; Regional Veloweb Plan
Shoshoni Park	Playground with open sports fields
Boys and Girls Club of Collin County	Community center/park
15 th Street Station	Trail along Avenue I from Haggard Park to near 18 th Street
Plano Central Link	Trail from 12 th Street to 18 th Street through Haggard Park; Regional Veloweb Plan
CityLine Park	Park
City Park	Adjacent to Spring Creek Nature Area
Bush Central Barkway Dog Park	Dog park
Spring Creek Nature Area	Park/trail between Routh Creek Parkway and North Plano Road; south of East Renner Road
Spring Creek Nature Trail (Phase 2)	Trail from East Renner Road (near Central Expressway) to Routh Creek Parkway
Point North Park and Trail	Public green space with trail/play areas plus fields for baseball and other sports
Custer Park and Trail	Picnic and playground equipment, shelter, one baseball field, athletic field, and two lighted tennis courts
University of Texas At Dallas Trail	Trail follows the property boundary of UTD and connects with Renner Trail on Renner Road
Unknown Existing Off-Street	Trail extends from Woods Park to Shiloh Road
Unknown Existing Off-Street	Trail extends from Springbranch Drive to Global Lane and Parallel to Shiloh Road
Renner West Linear Park	Trail from Renner Road at Point North Parkway to Central Expressway

Source: NCTCOG, GPC6

Table 3-7. Privately-Owned Recreational Facilities

Facility Name	Open to Public or Private
Future Carter Phase III Addition common area	HOA Common Area
Riverchase Golf Club	Open to Public
Sports Garden DFW	Open to Public
Dallas Pistol Club	Members Only
Honors Golf Club (Maridoe Golf Club)	Members Only
Trafalgar Square Park	HOA Common Area
Hilltop Memorial Park	Open to Public
The Clubs of Prestonwood (Golf Club)	Open to Public
Preston Trails Homeowners Association	Residential Common Areas
Fairhill School	Green Space Associated with Private School
Adventure Landing	Open to Public
Somerset Amenity Center	HOA Common Area
The Practice Tee Golf Center	Open to Public
Canyon Creek Country Club	Open to Public

Source: NCTCOG, GPC6

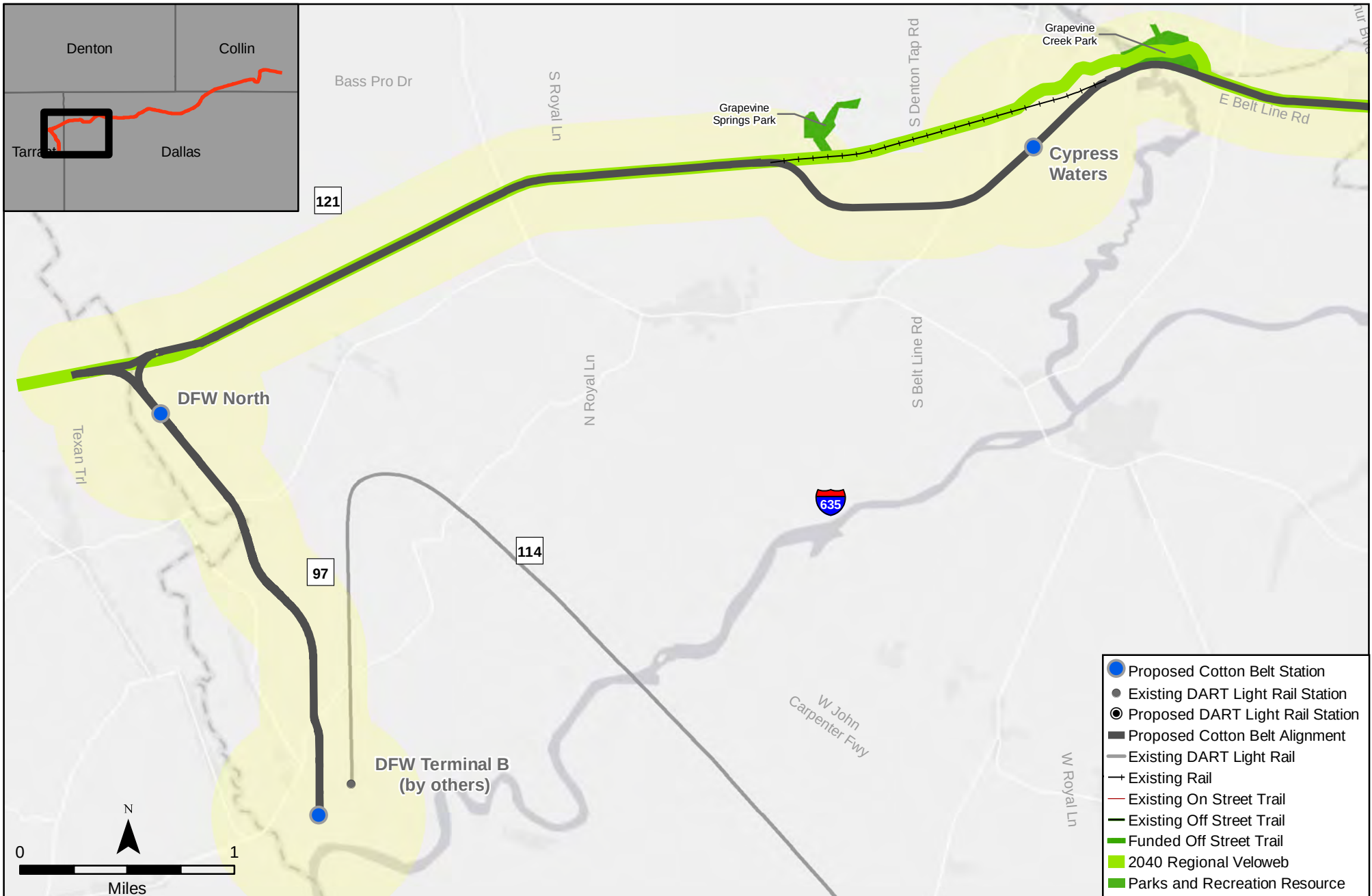


Figure 3-16
Parks and Recreational Facilities
 Data Source: North Central Texas Council of Governments, Local Municipalities

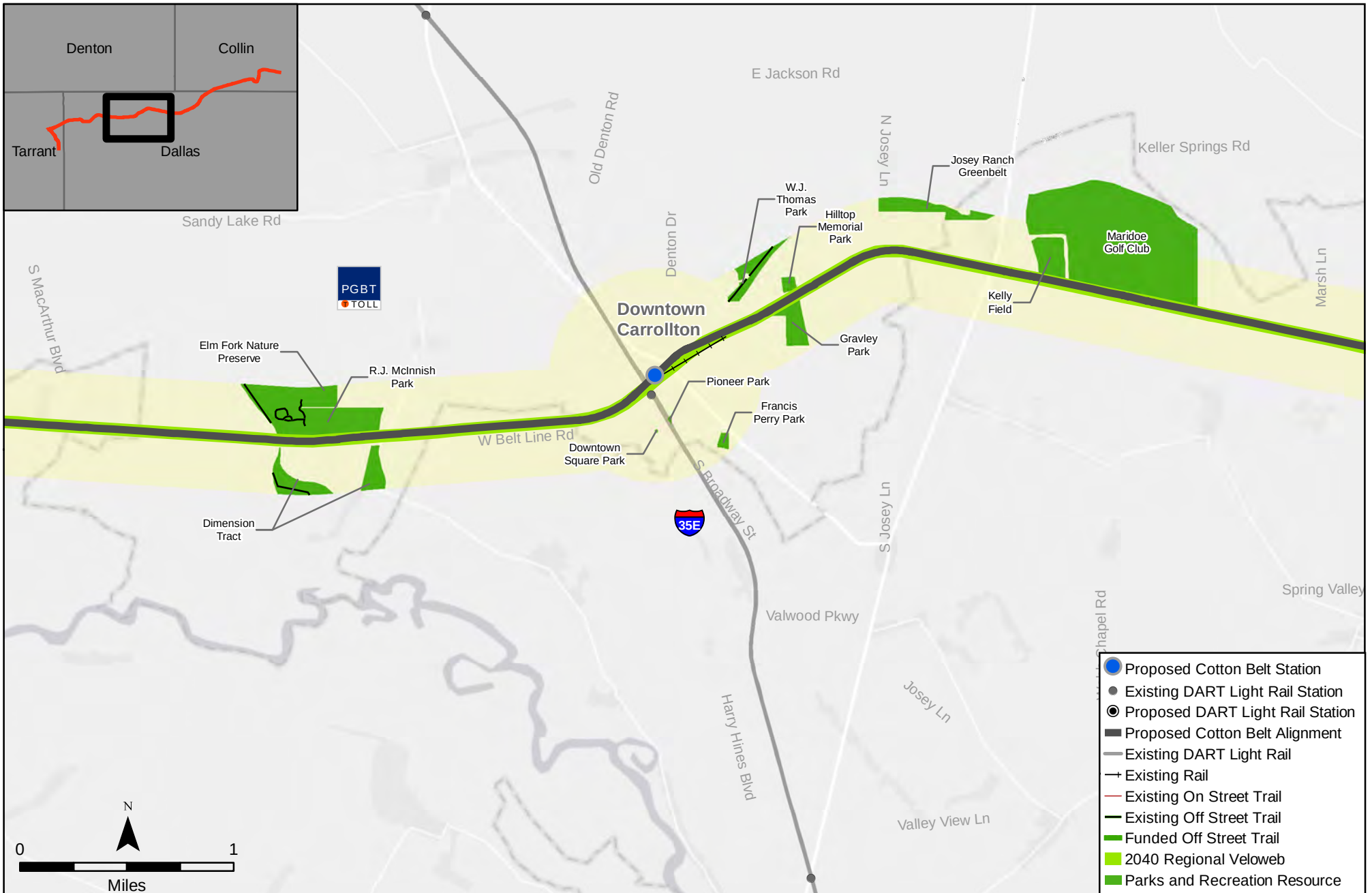


Figure 3-17
Parks and Recreational Facilities

Data Source: North Central Texas Council of Governments, Local Municipalities

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement

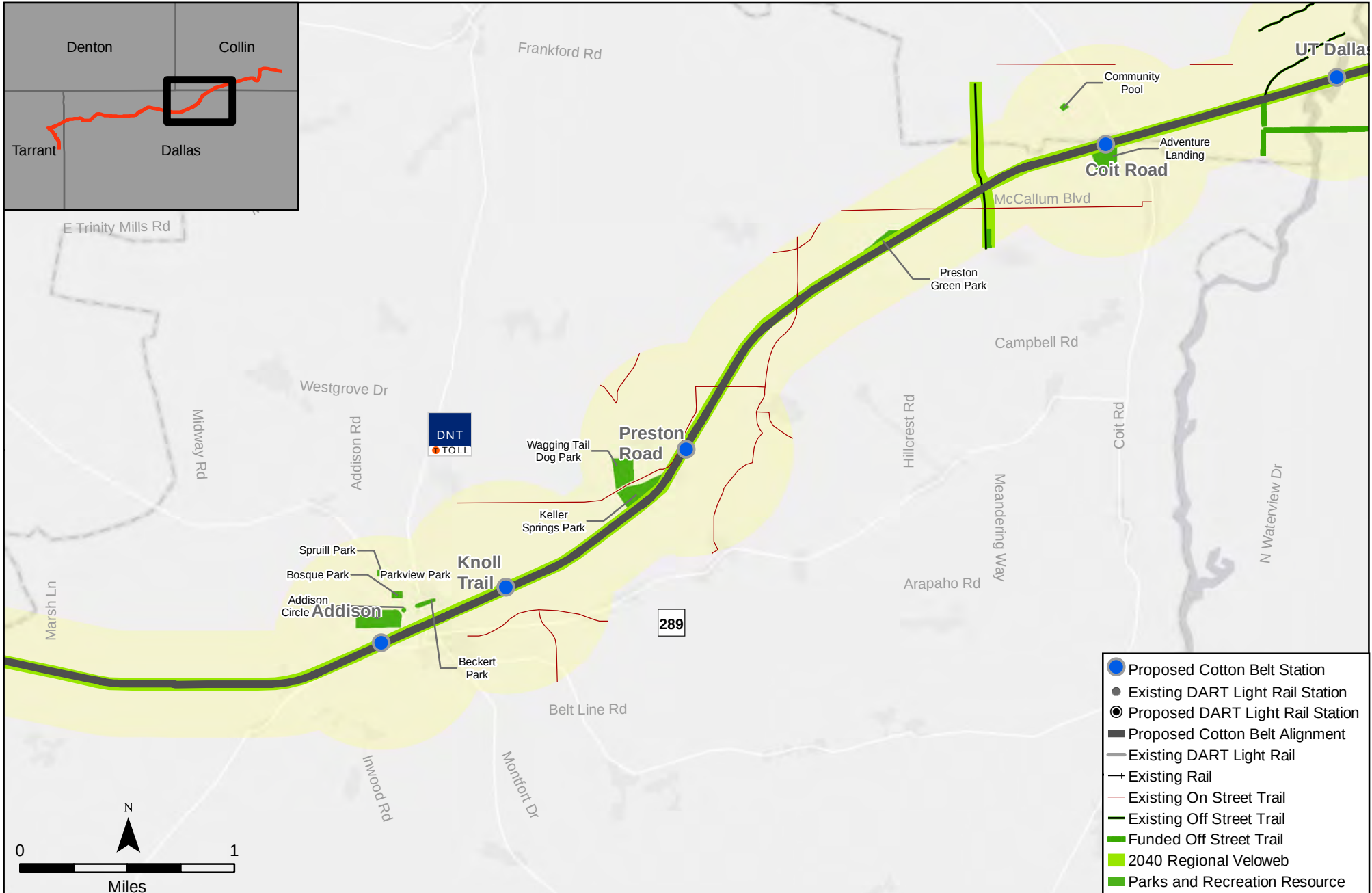


Figure 3-18
Parks and Recreational Facilities
 Data Source: North Central Texas Council of Governments, Local Municipalities

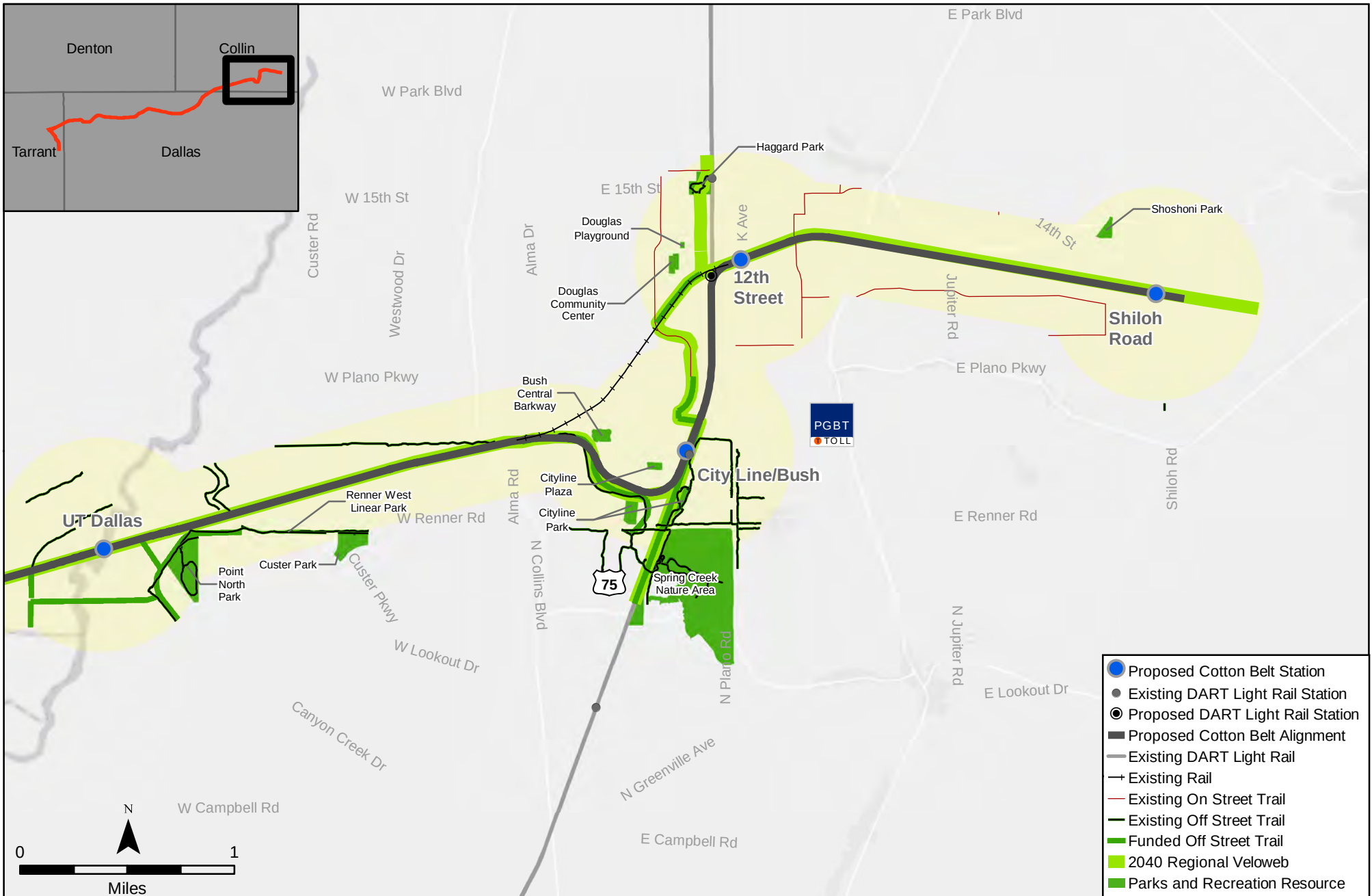


Figure 3-19
Parks and Recreational Facilities
 Data Source: North Central Texas Council of Governments, Local Municipalities



3.5 Cultural Resources

Legal Requirements and Regulatory Setting

The Cotton Belt Project is subject to compliance with the National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.) and its implementing regulations (36 CFR 800). Specifically, Section 106 of the NHPA requires that the responsible federal agency consider the effects of its actions on historic properties, which are properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking.

Methodology

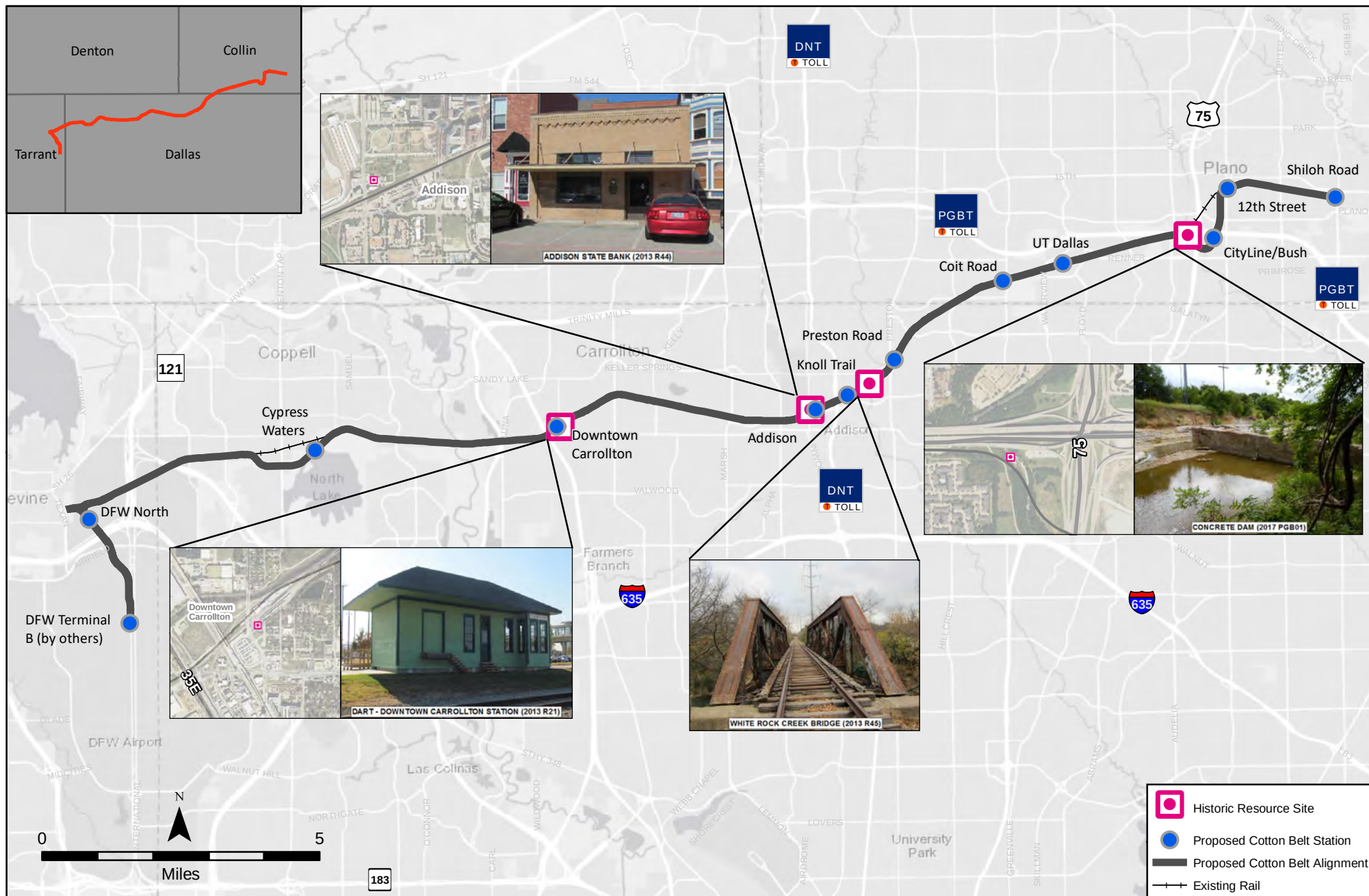
Per Section 106 requirements, the lead federal agency, in consultation with the State Historic Preservation Officer (SHPO), develops the area of potential effects (APE), identifies historic properties (i.e., NRHP-listed and NRHP-eligible properties) in the APE, and makes determinations of the proposed project's effects on historic properties in the APE. Section 106 regulations require that the lead federal agency consult with the SHPO and identified parties with an interest in historic resources during planning and development of the Project.

FTA, in consultation with the SHPO, determined the APE for identification of built resources. The SHPO concurred with the APE in February 2017. Route deviations where the project leaves the existing right-of-way, and areas where the APE was adjusted later are also included in SHPO concurrence (SHPO correspondence is included in the *Historic-age Resource Reconnaissance Survey – Station Locations* in **Appendix B**). The APE is 175 feet on each side of the track centerline. It includes where the Project would be located, properties adjacent to alignment, and select areas of expansion, including properties surrounding the potential EMF Site Option 1 (Luna Road) site. Select properties near but not adjacent to the alignment for which proposed facilities were determined to be a significant visual element were also included in the APE; these properties were typically within 250 feet of the deviation from the alignment, stations, EMF Site Option 1 (Luna Road), and proposed new Mercer Yard. EMF Site Option 2 (Irving Yard) was not included in the APE as it is an existing facility and contains no significant historic properties.

Historic Resources in the APE

The 2013 and 2017 field surveys identified a total of 68 historic resources (building, structure, or object built in 1971 or earlier) that were recorded within 175 feet from the centerline of the Project corridor and 250 feet from the centerline of new right-of-way for the proposed alignment deviations, stations, and rail facilities. In addition, one NRHP district, the Plano Downtown Historic District, was identified within or near the Study Area. Five resources were recommended eligible or were previously found to be eligible for listing in the NRHP: Carrollton Depot, Addison State Bank, White Rock Creek Bridge, Hayes Dam and Old City Cemetery/LA Davis Cemetery. The cemetery was removed from the APE during further assessment because the Project is proposed to follow the CityLine route deviation alignment south of the existing corridor which avoids the cemetery. See **Figure 3-20** for the four historic resources located within the APE of the Project corridor.

The Carrollton Depot is located on Denton Drive at the railroad tracks in the DART station parking area (**Figure 3-20**). The Carrollton Crossing Depot was constructed in 1925 and served the three railroads that came through Carrollton (City of Carrollton, 2017). The building is an L-shaped structure with wood siding and a hipped roof with deep overhanging eaves and 6/6 windows. As part of a Memorandum of Agreement (MOA) between DART and the THC, the Carrollton Depot was relocated to its current site and rehabilitated by DART (DART, 2013).





The Addison State Bank, located at 4803 Broadway in Addison, Texas, was previously designated a Registered Texas Historical Landmark (RTHL) in 1984 (**Figure 3-20**). The building was constructed in 1913 to house the Addison State Bank, which had been organized the previous year to serve the new railroad community of Addison. The Addison State Bank is one of the few remaining structures from the original town (THC, 1984).

White Rock Creek Bridge is located northeast of the proposed station at Knoll Trail. It was constructed in 1917 (**Figure 3-20**). The bridge is a single span Warren with vertical pony truss manufactured by the American Bridge Company. The American Bridge Company was organized by J.P. Morgan and Company and was incorporated in New Jersey in 1900.

The Hayes Dam is in Richardson at Spring Creek (**Figure 3-20**). The function of the dam is unknown, but it is mentioned in several deeds as a parcel boundary and transferred property. While the dam is heavily eroded, it once had two eight-foot tall wing walls on either side of an eight-foot spill way.

These eligibility determinations were submitted to the SHPO for review and concurrence. SHPO concurred with the determinations on December 21, 2017.

Detailed documentation and evaluation of historic properties for NRHP eligibility are provided in the *Historic-age Resource Reconnaissance Survey – Station Locations* in **Appendix B**. Agency coordination and consultation are provided in **Appendix G**.

Archeological Resources in the APE

The Cotton Belt Project is located entirely within the Northern Blackland Prairie ecoregion, an area defined by deep expansive clay soils, level to gently rolling land dominated by grasses, and punctuated by hardwood forests along stream valleys and floodplains (EPA, 2013). Prior to Anglo-American settlement, this region was a tallgrass prairie, which supported herds of bison, pronghorn antelope, and elk (Weniger, 1997). However, intensive farming, livestock grazing, and urbanization has altered nearly all the blackland prairies throughout Texas. Elevation within the APE ranges from 410 feet at the Elm Fork of the Trinity River to 730 feet between Coit Road and Waterview Parkway.

Archeological investigations, conducted under Texas Antiquities Permit No. 7996, consisted of a pedestrian survey, manual excavation of 154 shovel tests, and excavation of eight backhoe trenches within the APE. The existing rail right-of-way was found to be entirely disturbed and bridge replacements are unlikely to impact undocumented archeological sites. Therefore, only new rail alignment locations, stations, and support facility rights-of-way were subject to intensive survey.

Three newly documented archeological sites were discovered during field investigations. A railroad section foreman house most likely constructed by the St. Louis, Arkansas, and Texas Railway in the late 1880s, was discovered adjacent to the proposed 12th Street Station footprint in Plano. The site consists of apparently intact deposits along with stacked creosote plank footings for the building. In addition, an historic-age farmstead site is located in the vicinity of the proposed Cypress Waters alignment. This site consisted of three features, displaced concrete pads, and an infilled trash dump containing debris dating to the early twentieth century. Archival research found that the site was most likely the family farm of J. B Harrison, a prominent local businessman in Coppell during the late 1800s. However, the site is minor to the original farmhouse location and was likely not used as part of the farm's operation until the 1940s or 50s.

The survey encountered and unintentionally removed human remains within existing DART right-of-way south of the L.A. Davis Cemetery in East Plano where additional rail was proposed north of the existing tracks. Immediately after the removal, the archeologists followed the



Inadvertent Human Remains Discovery Protocol as part of the Antiquities Permit for this survey. The L.A. Davis Cemetery is adjacent to the existing Cotton Belt line. As noted previously, this resource was removed from the APE as the cemetery area would be bypassed by the proposed CityLine route deviation alignment to the south. No modification to the rail south of the L.A. Davis Cemetery is proposed. Detailed documentation and evaluation of archeological properties for NRHP eligibility are provided in the *Archeological Resource Survey* in **Appendix B**.

3.6 Visual and Aesthetic Conditions

Legal Requirements and Regulatory Setting

NEPA states the need to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.” While there are no specific regulations, major transportation projects take into consideration visual and aesthetics resources in defining and evaluating projects to determine if mitigation may be needed.

Methodology

Guidelines established by the American Association of State Highway Officials (1991) were followed to define the Study Area’s visual setting, identify areas of differing visual character, and define landscape units and visual quality. Visual resources were inventoried during site visits and field observations of the Study Area, along with photographs, and online aerial imagery. Visual resources are components of the natural and built environment that are capable of being seen. Viewers are neighbors who could see the Project and travelers who would use the proposed transit facility. Neighbors are defined as civic neighbors and adjacent land uses including: residential, retail, commercial, industrial, agricultural, and recreational. Travelers are defined as transit system users, commuters, haulers, tourists, and pedestrians.

For visual analyses, the width of the Study Area extends approximately 300 feet (the nominal length of a common city block) on either side of the Cotton Belt Project. To accommodate freight and transit rail operations in both directions, it is proposed that one track would primarily be dedicated to passenger operations, while the other track would share both passenger and freight services. There may be opportunities for sections to have a single shared track to minimize construction costs and impacts. For this analysis, a double-track configuration is assumed along the entire corridor.

Each visual assessment unit has its own visual character and visual quality. The units are typically defined by the limits of a particular viewshed with perceivable boundaries. These boundaries are generally created by landforms, edges defined by vegetation, buildings, and fencing. They typically have similar form, scale, materials, and character and visual quality that help define these boundaries. Decisions about low, moderate and high visual quality and sensitivity were determined by distinguishing the units into three categories: high, where introduction of new elements could significantly impact the aesthetic quality of the inventory unit as observed by the primary viewers (for example, a new bridge next to a signature bridge structure); moderate, where introduction of new elements may impact the aesthetic quality of the inventory unit or a portion thereof as observed by the primary viewers (for example, introduction of new rail or aerial structure); or low, where introduction of new elements is not likely to have an impact on the aesthetic quality of the inventory unit as observed by the primary viewers (for example, change in frequency of passing trains).

For the purpose of describing the visual resources of the existing rail alignment, the Study Area has been divided into three main units (Units 1, 2, and 3) and then further subdivided and identified as “A” and “B” within each unit. The limits of each unit are shown in **Figure 3-21**.



Affected Environment

The foremost visual element in the Study Area is the existing freight rail corridor itself with many of the features associated with freight rail operations, such as railroad crossings and signals. Almost all major road crossings within the corridor are at-grade crossings, with exceptions noted in **Chapter 5. Section 5.2** discusses roadway crossings of the Project. **Table 5-7** lists the proposed configuration of all roadways and other crossings of the Cotton Belt alignment. **Figures 5-2** through **5-5** show the location of these crossings. Though the composition of the scenes along the Cotton Belt Project may change in terms of vista and panorama, most views, framed by existing developments on both sides of the Cotton Belt Project, are linear views along the railroad tracks. Many of the areas along the Project are industrial in nature, and there are major visual features such as electrical power station and towers, elevated freeway systems, and DART light facilities.

Developments along the Project range from parks and recreational facilities such as golf courses, to low-density single-family residences and small commercial/retail malls; high-density, multi-storied, housing, commercial, and institutional buildings, many in urban park-like settings; and airports. Pockets of light and heavy industry, as well as vacant and underutilized parcels can be seen. Proposed developments include most notably an expanded university campus master plan near the proposed UT Dallas Station area; a mixed-use project, including office and corporate research facilities and entertainment/retail facilities surrounding the DFW North Station area; and the Cypress Waters Master Plan, including low and medium-density neighborhoods, a community center, commercial/retail areas, and office “campuses” surrounding North Lake and near the Cypress Waters Station area. The CityLine/State Farm mixed-use development continues to grow around the CityLine/Bush Station.

Following is a description of the general visual character of the corridor from west to east, including proposed station locations or new facilities within each section. Each section was assessed as to the existing nature of the visual quality and visual sensitivity to the dominant or highly sensitive type of land uses within the section. An inventory of the sensitive receptors and visual assets, if any, was also collected. **Table 3-8** provides a general rating of each Cotton Belt Corridor section and **Table 3-9** provides the evaluation definitions.

Unit 1 – DFW North Station to Elm Fork (Coppell/Carrollton City Limits)

Section 1A, extending from the DFW Airport to South Belt Line Tap Road in the City of Coppell, begins as primarily agricultural in character, becoming more developed with single-story light industrial developments as the track alignment continues east under SH 121 and then IH 635. The DFW North Station would be located in this section, and can be seen from SH 114 to the south, SH 121/International Parkway to the east, and the existing freight rail line to the north. Given the industrial nature and lack of sensitive receptors, overall visual quality and sensitivity is low.

Section 1B, extending from South Belt Line Road to the Coppell and Carrollton city limits, is characterized as primarily low to medium-density residential, with large single-family residential developments, then multi-story, multi-family developments seen along the north side of the track alignment.

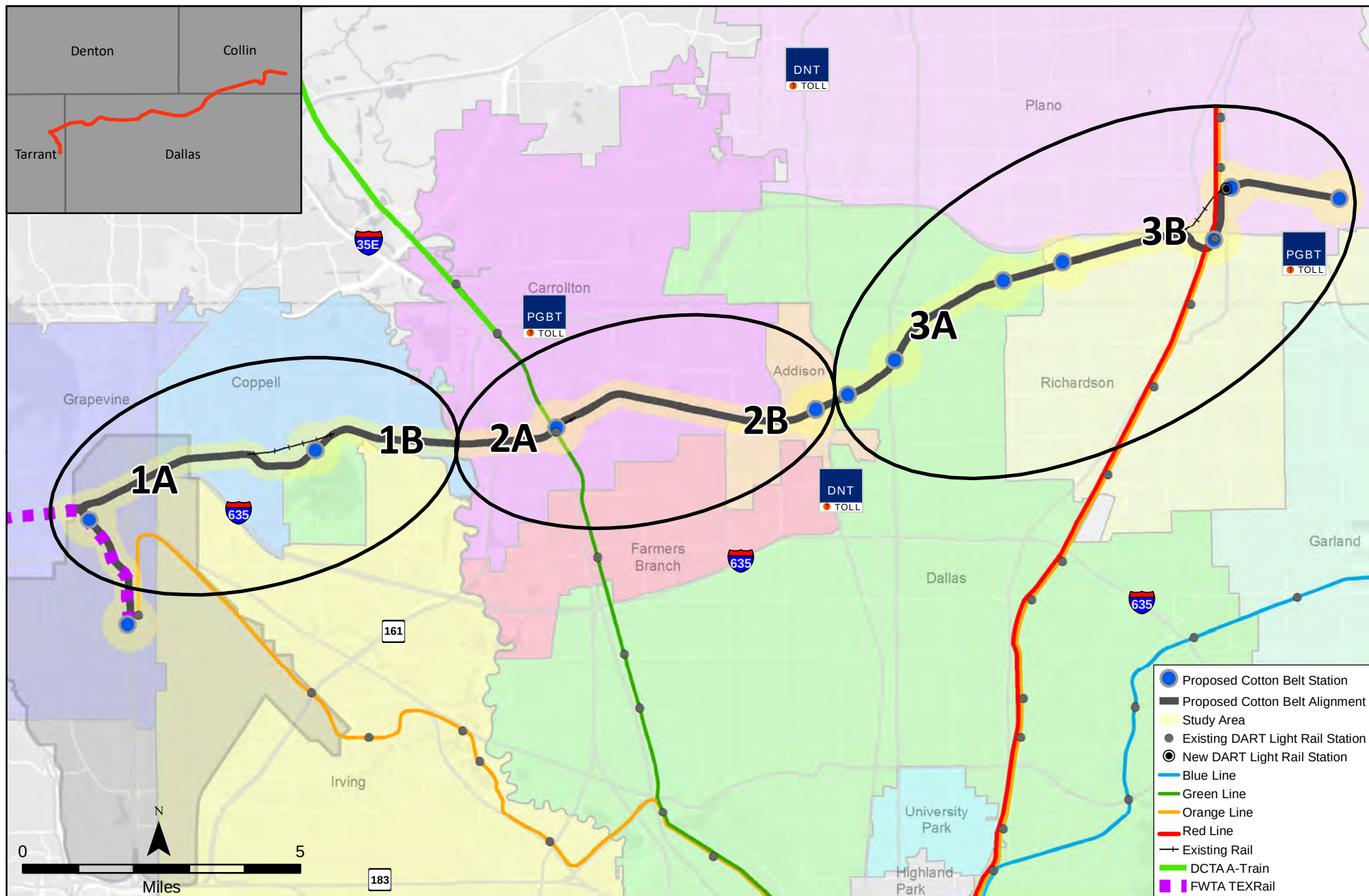




Table 3-8. General Rating of Corridor Visual Assessment

Unit	Name	Primary Viewers*	Visual Quality*	Visual Sensitivity*	Sensitive Receptors/Assets
1A	DFW Airport to South Belt Line Road	A, E, H	Low	Low	None
1B	South Belt Line Road to Coppell/ Carrollton city limits	A, C, D, F	Low	Low	Riverchase Golf Course, RJ McInnish Park, and residences
2A	Coppell/Carrollton city limits to Kelly Boulevard	A, B, C, E, F, G	Moderate	Low	Carrollton Heights Historic District and residences
2B	Kelly Road to Dallas North Tollway	A, B, C, D, E, G	Moderate to High	Low to Moderate	Addison Circle Park, Wheeler Bridge, and residences
3A	Dallas North Tollway to Dallas/Richardson city limits	A, B, C, D, E, G	Moderate to High	Moderate to High	Keller Springs Park and Prestonwood County Club, Fairhill School/playgrounds, and residences
3B	Dallas/Richardson city limits to Shiloh Road	A, C, E, F, G, H	Low to Moderate	Moderate	Spring Creek, green space, and residences

*Refer to Table 3-9 for the definitions of the primary viewers, visual quality and visual sensitivity.

Source: GPC6, 2017.

Table 3-9. Evaluation Rating Definitions

Primary Viewers	Visual Quality	Visual Sensitivity
A = Motorist B = Single-Family Resident C = Multi-Family Resident D = Recreational Users E = Commercial/Office Tenants F = Industrial Tenants G = Pedestrians H = Others	High = section or portions thereof is of significant visual quality to the primary viewers Moderate = section is of average visual quality to the primary viewers Low = section is of low visual quality to the primary viewers	High = Introduction of new elements could significantly impact the aesthetic quality of the section as observed by the primary viewers Moderate = Introduction of new elements may impact the aesthetic quality of the section or a portion thereof as observed by the primary viewers Low = Introduction of new elements is not likely to have an impact on the aesthetic quality of the section as observed by the primary viewers

Source: GPC6, 2017.

The Cypress Waters Station would be located along proposed new track between the northwest shore of North Lake and East Belt Line Road at the Beltline Trade Center, within the City of Dallas (**Figure 3-22**). The environs of Grapevine Creek and East Belt Line Road, primarily north of the track alignment, are heavily wooded and the trees block from view the single-family residences to the north. This area is comparatively flat, with little natural spatial and visual variation, and the prominent features are utility lines and power poles. While there is

some residential and parkland in this section, overall visual quality and sensitivity is low given the existing rail corridor and major arterials adjacent to those sensitive receptors.

Unit 2 – Elm Fork to Dallas North Tollway

Unit 2 encompasses downtown Carrollton and the Addison Circle area.

Section 2A generally features light industrial development as it passes under PGBT, IH 35E, and the DART Green Line to the proposed Downtown Carrollton Station (**Figure 3-22**). East of the station consists of single-family residential developments, including the Carrollton Heights Historic District. To the north are Thomas Park and the Hutton Branch Creek. The residential developments extend to Josey Lane where they transition to medium-scale industrial developments south of the alignment.

Unit 1B- Mockingbird Lane/Belt Line Road



Unit 2A- Old Downtown Carrollton Depot



Unit 2B- Wheeler Bridge Over Midway Road



Unit 3A- Multi-Family Complex at Knoll Trail Drive



Unit 3A- Area near Preston Road Station



Unit 3B- Area near CityLine/Bush Station



Unit 3B- Area near 12th Street Station



Unit 3B- Area near Shiloh Road Station



COTTON BELT

Figure 3-22
Visual Assessment Units
Existing Conditions Photos

Cotton Belt Corridor
Regional Rail Project
Draft Environmental Impact Statement



North of the Cotton Belt Corridor are several light industrial developments, a large green space, and a high school abutting the west side of Kelly Boulevard. The City of Carrollton has a “small town” atmosphere with a discernible downtown district. Given the historic district and its associated architecture, as well as nearby green space, visual quality is moderate. Visual sensitivity is low given the existing rail corridor and nearby elevated transportation infrastructure.

Section 2B, extending from Kelly Boulevard to the DNT, primarily features large-scale industry along the south side of the track alignment to the Carrollton and Addison city limits. Along the north side of the track alignment, east of Kelly Boulevard, are the Maridoe Golf Club and single-family and multi-family residential developments. The landscape changes abruptly east of the Addison Airport and Addison Road with a dense urban center comprised of upscale, high-rise, residential, commercial, and office buildings, as well as hotels, eateries, entertainment venues and parks. A signature arch bridge on Arapaho Road over Midway Road (Wheeler Bridge, shown in **Figure 3-22**) is a local landmark immediately to the south of the track alignment and viewed by DNT, as the area transitions visually to multi-story office buildings.

The Addison Station would be located adjacent to the existing Addison Transit Center, between Addison Road and Quorum Drive. The station area is surrounded by mixed-use developments—notably Addison Circle and Addison Circle Park, immediately north of the track alignment. This area is characterized by an extensive plaza, walking trails, interactive water features (**Figure 3-22**), streetscaping, the Water Tower Theatre, as well as high-rise, red brick residential buildings, office buildings, and hotels. Both Addison Circle and the signature Wheeler Bridge contribute to moderate to high visual quality, although sensitivity is lower given the existing rail corridor.

Unit 3 – Dallas North Tollway to Shiloh Road

Unit 3 encompasses north Dallas residential areas, UTD, the CityLine area, transitioning areas south of downtown Plano and industrial/commercial areas further east.

Section 3A, extending from the DNT to the Dallas and Richardson city limits transitions from multi-story office and commercial buildings and an electrical substation near the DNT, to multi-family residential developments north and south of the track. This area is urban in nature with lower visual quality and sensitivity as compared to areas to the east described below.

The Knoll Trail Station would be in this area (**Figure 3-22**). There is dense vegetation until the Cotton Belt Corridor reaches Keller Springs Park and the Prestonwood Country Club (and crosses White Rock Creek) where vistas open to broad panoramas on both sides.

From this point, the corridor is primarily bordered by single-family residences and/or dense vegetation associated with creeks, as well as Preston Green Park and the Fairhill School buildings and grounds (**Figure 3-22**). The proximity of parks, schools and sensitive residential receptors contributes to moderate to high visual quality and sensitivity.

The Preston Road Station would be visible from Keller Springs Road, nearby residences and Fairhill School. As the project nears the Coit Road Station area, the visual character changes and includes commercial uses, Adventure Landing, an assisted living facility, multi-family residential developments, and developing single family areas southeast of the Coit Road intersection (**Figure 3-22**).

Section 3B visual features are dominated by the freeways, the elevated DART Red Line LRT guideway, power lines, multi-story office and industrial buildings, and the KCS Railway. East of Waterview Parkway consists of office and industrial park developments alternating with large tracts of vacant space to Alma Drive. The vacant land will be developed as part of the UTD master plan. The UTD Station would be located near Waterview office development and the existing Kansas City Southern (KCS) Railway. The station area is north of the UTD campus, in



Richardson. Because of the open, flat terrain surrounding the proposed station, until redevelopment occurs, it may be readily visible from as far away as Synergy Park Boulevard to the south and the PGBT to the north (**Figure 3-22**).

From West Renner Road to Alma Road, the Cotton Belt Corridor is between a cluster of multi-family residential units, while east of Custer Parkway are several large-scale industrial facilities and a large electrical power station. South of the Cotton Belt Corridor and west of US 75, is a large multi-family residential development. The Project roughly follows the Spring Creek 100-year floodplain through vacant open space and riparian over story vegetation along the creek, crossing over US 75 on a new bridge structure to the new platform area adjacent to the LRT station. Multi-family and large-scale office development surrounds this area (**Figure 3-22**).

Near 12th Street, the existing LRT guideway is a dominant visual feature (**Figure 3-22**), and an aerial side platform infill LRT station is proposed. Immediately west of the 12th Street Station in Plano, development changes to higher density mixed uses with smaller office parks, multi-family residences, and then large industrial buildings. Primarily medium-scale industrial developments are visible along both sides from the proposed 12th Street Station area to Shiloh Road. The Shiloh Station is largely light industrial/commercial with open space and a large City of Dallas electrical substation adjacent to the existing track (**Figure 3-22**). To the north of the proposed Shiloh Road Station is a mosque and various commercial buildings.

While there are pockets of sensitive receptors and assets in Section 3B, the overall visual quality is low to moderate given the urban development and transportation infrastructure. Visual sensitivity is moderate given the creeks, trails and new developments.

More detailed information regarding the existing conditions of each section is available in the *Visual Assessment Resources Existing Conditions Technical Memorandum* in **Appendix B**.

3.7 Soils and Geology

Legal Requirements and Regulatory Setting

The Farmland Protection Policy Act (FPPA), as detailed in Subtitle I of Title XV of the Agricultural and Food Act of 1981, provides protection to the following: 1) prime farmland; 2) unique farmland; and 3) farmland of local or statewide importance. FPPA defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also available for these uses (not urban built-up land or water). It has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops when treated and managed, including water management (irrigation), according to acceptable farming methods. Unique farmland is farmland that is used for production of specific high value food, feed, and fiber crops. Farmland of local or statewide importance is determined by the appropriate state or local government agency or agencies.

Methodology

The Study Area used for the assessment of potential impacts includes a 0.25-mile corridor centered on the project centerline and 0.5 mile around the station locations. Existing literature and mapping were reviewed for the Study Area to assess geology and soils. Maps examined include Aerials Express Dallas 2010 Aerial Imagery, the Geologic Atlas of Texas Dallas Sheet (UT-BEG, 1987), and U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soil Surveys for Dallas County (NRCS, 1980), Collin County (NRCS, 1969) and Tarrant County (NRCS, 1981).



Affected Environment

Geology

Four geologic types underlie the Study Area – the shale rock of the Eagle Ford Formation, sediments formed alongside waterways, and Austin Chalk. These are discussed in more detail in the *Geology and Soils Existing Conditions Technical Memorandum* in **Appendix B**.

Soils

Seven soil associations are found within the Study Area. These include (from west to east):

- Houston Black-Navo-Heiden association – gently sloping, deep, clayey and loamy soils of uplands
- Houston Black-Heiden association – deep, nearly level to strongly sloping, clayey soils of uplands
- Wilson-Rader-Axtell association – deep, nearly level to gently sloping, loamy soils of uplands
- Trinity-Frio association – deep, nearly level, clayey soils of floodplains
- Eddy-Stephen-Austin association – very shallow, shallow, and moderately deep, gently sloping to moderately steep, loamy and clayey soils of uplands
- Austin-Houston Black association – moderately deep and deep, nearly level to sloping, clayey soils of uplands
- Houston Black-Austin associations – gently sloping to sloping, clayey soils of uplands that are over deep marl and chalk

Detailed descriptions and locations of each of these are available in the *Geology and Soils Existing Conditions Technical Memorandum* in **Appendix B**. Fourteen prime farmland soil series, comprising approximately 1,550 acres were identified in the Study Area. No unique farmlands or farmlands of local or statewide importance were found within the Study Area.

3.8 Hydrology and Floodplain

This section provides an introduction and regulatory setting for water resources, including surface water quality, waters of the U.S., groundwater, and floodplains within and adjacent to the Study Area. The applicability of the various laws and regulations cited in this section is assessed prior to determining potential project impacts and mitigation strategies.

Legal Requirements and Regulatory Setting

The Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Clean Water Act (CWA) (33 USC § 1251 et seq.), controls water pollution by regulating point sources that discharge pollutants into waters of the U.S. In Texas, the NPDES program is administered by the Texas Commission on Environmental Quality (TCEQ), as part of the Texas Pollutant Discharge Elimination System (TPDES). Stormwater runoff resulting from the Project would be addressed through compliance with the TPDES Construction General Permit (CGP).

Impacts to waters of the U.S. resulting from the discharge of dredged or fill material are regulated by the United States Army Corps of Engineers (USACE) under Section 404 of the CWA. If a linear transportation project places less than 0.5 acre of fill into waters of the U.S., it would typically be authorized under Nationwide Permit (NWP) 14; impacts of more than 0.5 acre require an Individual Permit. Impacts authorized under a NWP for Linear Transportation Projects which equal or exceed 0.1 acre require Pre-Construction Notification (PCN) to the USACE; impacts to wetlands (of any amount) would also require a PCN.



EO 11990 Protection of Wetlands (issued in 1977) requires federal agencies to minimize the destruction or modification of wetlands.

The *Rivers and Harbors Act of 1899* sets forth regulations related to navigable waters of the U.S., which are defined as “waters subject to the ebb and flow of the tide and/or are presently being used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce” (33 CFR 329.4).

EO 11988, Floodplain Management, requires federal agencies to avoid actions, to the extent practicable, which will result in the location of facilities in floodplains and/or affect floodplain values.

A Trinity River Corridor Development Certificate (CDC) is required for projects located within the Trinity River Regulatory Zone and is intended to minimize flood risk by regulating development within the Trinity River Corridor in North Central Texas. The Trinity River Regulatory Zone is consistent with the 100-year floodplain for the Trinity River, of which the Elm Fork of the Trinity River is crossed by the Project. Under the CDC process, local governments retain ultimate control over floodplain permitting decisions, but other communities along the Trinity River Corridor are given the opportunity to review and comment on projects in their neighbor’s jurisdiction.

Section 408 of the CWA requires that projects which would take possession of, use, or cause injury to harbor or river improvements be reviewed and approved by the USACE.

Methodology

The Study Area for water resources used for the assessment of potential impacts includes a 0.25-mile corridor centered on the project centerline and 0.5 mile around the stations. Existing literature and mapping were reviewed for the Study Area to assess groundwater, surface waters, floodplains, and soils. Maps examined include: Aerials Express Dallas 2010 Aerial Imagery; United States Geological Survey (USGS) topographic maps (USGS, 1981); FEMA floodplain maps (FEMA, 2001); Texas Water Development Board (TWDB) Groundwater Database (TWDB, 2009); Rail Road Commission (RRC) Public Map Viewer for Oil, Gas, and Pipeline Data (RRC, 2011); United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps (USGS, 1989); USGS National Hydrography Dataset (NHD) (USGS, 2009); and U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) Soil Survey for Dallas County (NRCS, 1980), Collin County (NRCS, 1969) and Tarrant County (NRCS, 1981).

Affected Environment

FEMA floodplain maps were consulted for the Study Area (Map ID 48439C0115K, 48439C0120K, 48439C0110K, 48113C0135J and 48113C0345J, 48113C0155J, 48113C0160J, 48113C0180J, 48113C0185J, 48085C0485J, 48085C0505J, 48113C0065J, 48085C0390J, and 48085C0395J). According to the maps, there are four 100-year floodplains within the Study Area. They are associated with Cottonwood Branch, Grapevine Creek, Elm Fork of the Trinity River and White Rock Creek. According to the floodplain maps, the Project crosses the floodplain of several of the streams. There are 1,344 acres of 100-year floodplain, 387 acres of 500-year floodplain, and 33 acres of 0.2 percent chance flood hazard within the Study Area. See **Figure 3-23** for the floodplains, streams and creeks within the Study Area.

The Study Area does not contain sole source aquifers or wild and scenic rivers.



3.9 Wetlands and Other Waters of the US

Legal Requirements and Regulatory Setting

EO 11990 Protection of Wetlands (issued in 1977) requires federal agencies to minimize the destruction or modification of wetlands. Impacts to waters of the U.S. resulting from the discharge of dredged or fill material are regulated by the USACE under Section 404 of the CWA.

A jurisdictional wetland is defined as having all the following three criteria: hydrophilic vegetation, hydric soils, and wetland hydrology. Ditches were classified as being potentially jurisdictional if they were constructed within existing jurisdictional waters of the US, which would extend the ordinary high-water mark (OHWM), or are connected to existing jurisdictional waters. An OHWM is the normal full bank flow usually where vegetation stops growing and a bed/bank are delineated. The OHWM is the lateral extent for the USACE jurisdiction.

Methodology

Recent aerial photography, US Geological Survey (USGS) National Hydrography Dataset (NHD), US Fish and Wildlife Service (USFWS) National Wetlands Inventory, and USGS topographic maps (7.5-minute series) of the Study Area were used to identify potential locations for waters of the US and areas prone to wetland development before going into the field. Potential waters of the US identified, including wetlands, were delineated and evaluated using routine on-site methods on May 25 and 26, 2017 by GPC6 environmental scientists. The surveys were conducted in accordance with the USACE 1987 Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement for the Great Plains Region (USACE, 2010). The delineations were also performed to reflect current guidance, Rapanos Guidance, from the USACE and EPA on jurisdictional determination in accordance with U.S. Supreme Court rulings.

The delineations were recorded using a Trimble® sub-meter Geo XT Global Positioning System unit and mapped as a data layer using ArcGIS 10.4. GPC6 biologists collected GPS data or verified previous data collected for the OHWM of all streams, boundaries of all wetlands, and data points in wetlands and uplands.

Affected Environment

Data obtained from the NHD and NWI reflects the Study Area crossing the Cottonwood Branch, Grapevine Creek, Elm Fork Trinity River, Hutton Branch, two unnamed tributaries to Hutton Branch, Perry Branch, White Rock Creek, an unnamed tributary to White Rock Creek, Pittman Creek, and Spring Creek. In addition, North Lake is approximately 0.25 mile south of the Cotton Belt Project centerline and immediately adjacent to the proposed location of the Cypress Waters Station. See **Figure 3-23** for a map of these locations and **Table 3-10** for a summary of the potential waters of the US within the Cotton Belt proposed alignment.

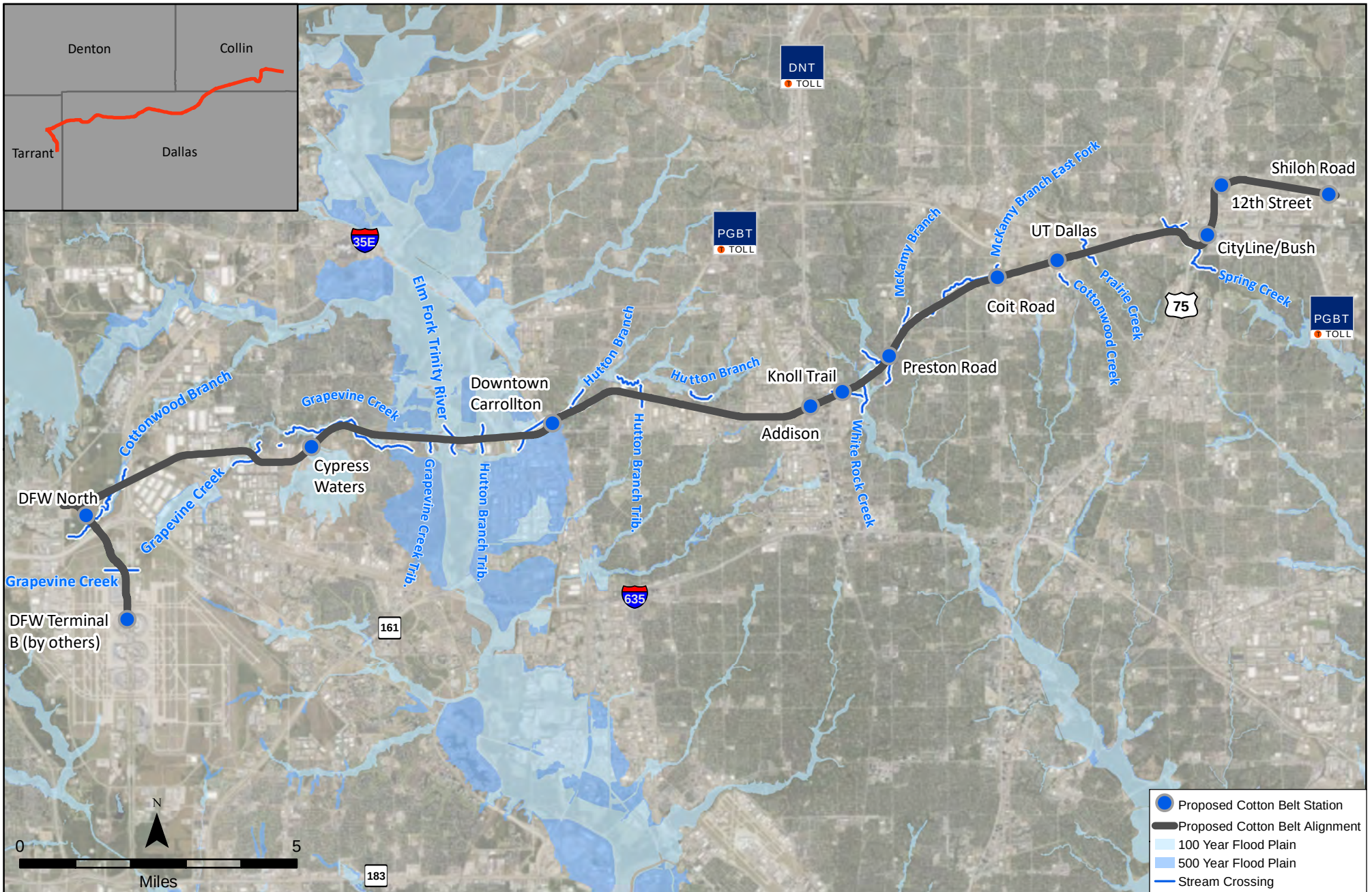




Table 3-10. Summary of Potential Waters of the US Within the Right-of-Way

Label	Name	Type	Average OHWM	Linear Feet w/in ROW	Acres within ROW
S-1a	Grapevine Creek Crossing 1	Perennial Stream	30	212	0.15
S-1b	Grapevine Creek Crossing 2	Perennial Stream	15	115	0.04
S-1c	Grapevine Creek Crossing 3	Perennial Stream	15	103	0.04
S-2a	Cottonwood Branch Crossing 1	Perennial Stream	10	167	0.04
S-2b	Cottonwood Branch Crossing 2	Perennial Stream	10	348	0.08
S-3	Unnamed tributary to Cottonwood Branch	Ephemeral Stream	3	50	0.0003
S-4	Elm Fork Trinity River	Perennial Stream	80	101	0.19
S-5	Unnamed tributary to Hutton Branch	Intermittent Stream	30	152	0.10
S-6	Hutton Branch	Perennial Stream	40	151	0.14
S-7	Perry Branch	Intermittent Stream	14	141	0.05
S-8	Unnamed tributary to Hutton Branch	Intermittent Stream	12	100	0.03
S-9	Unnamed tributary to White Rock Creek	Intermittent Stream	15	121	0.04
S-10	White Rock Creek	Perennial Stream	50	108	0.12
S-11	McKamy Branch	Perennial Stream	40	131	0.12
S-12a	McKamy Branch East Fork Crossing 1	Perennial Stream	20	100	0.05
S-12b	McKamy Branch East Fork Crossing 2	Perennial Stream	20	278	0.13
S-13	Prairie Creek	Perennial Stream	40	122	0.11
S-14	Unnamed tributary to Spring Creek	Intermittent Stream	15	690	0.24
S-15	Spring Creek	Perennial Stream	50	490	0.56
W-1	Wetland on Unnamed Tributary to Grapevine Creek	Emergent Wetland	n/a	0	0.59
W-3	Wetland on P-1	Forested/Scrub shrub wetland	n/a	n/a	6.06
W-4	Wetland on P-1	Emergent wetland	n/a	n/a	0.22
W-5	Wetland adjacent to Hutton Branch	Forested Wetland	n/a	n/a	0.95
W-6	Wetland adjacent to Hutton Branch	Scrub/Shrub Wetland	n/a	n/a	2.54
P-1	Pond adjacent to Hutton Branch	Open Water	n/a	n/a	6.77
Total				3,680	19.36

Source: NCTCOG, 2015; GPC6, 2017

3.10 Water Quality

Legal Requirements and Regulatory Setting

Under Section 401 of the CWA, certification of compliance with water quality standards issued by the state water quality agency is required for any discharge of pollutants into waters subject to regulation under Section 404. In Texas, state water quality certification under Section 401 is carried out by the TCEQ. With regard to projects with impacts to waters of the US that meet the criteria for a NWP, TCEQ has provided conditional Section 401 certification. For transportation projects with impacts to water features covered by NWP 14, such as the Project, TCEQ's Section 401 conditional certification requires implementation of the Soil Erosion and Sedimentation Controls under NWP General Condition (GC) 12 and the Post-construction Total Suspended Solids (TSS) Controls under NWP GC 25. In essence, these GCs require the use of best management practices (BMPs) to manage water quality on construction sites.



Methodology

The Study Area for water resources used for the assessment of potential impacts includes a 0.25-mile corridor centered on the project centerline and 0.5 mile around the stations. Existing literature and mapping were reviewed for the Study Area to assess groundwater, surface waters, floodplains, soils, and potential wetland areas.

Affected Environment

The Study Area is located within the Trinity River basin, which drains approximately 17,969 square miles (TCEQ, 2004). For the purposes of monitoring water quality, the TCEQ has divided the Trinity River basin into 41 discrete segments. The Cotton Belt Project is located within Segment 0822 – Elm Fork Trinity River below Lewisville Lake, Segment 0822B – Grapevine Creek, and Segment 0827A – White Rock Creek. Defined uses of Segments 0822 and 0822B include aquatic life use, contact recreation use, general use, and public water supply. Defined uses of Segment 0827A include aquatic life use and contact recreation use. According to the 2012 Section 303(d) list, none of the segments are listed as impaired.

3.11 Air Quality

Legal Requirements and Regulatory Setting

The federal Clean Air Act (CAA)(42 USC § 7401 et seq.) and Clean Air Act Amendments (CAAA) require that states adopt ambient air quality standards. The standards have been established, through the TCEQ, to protect the public from potentially harmful amounts of pollutants. The EPA has set national ambient air quality standards (NAAQS) for the following six criteria pollutants: ozone (O₃), particulate pollution (PM₁₀, PM_{2.5}), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂) and lead (Pb). **Table 3-11** lists the NAAQS for these six pollutants. The CAA established two types of standards for these major air pollutants: primary and secondary. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation and buildings.

The CAAA requires all states to submit a list identifying those air quality regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions that are shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated "nonattainment" areas for that pollutant. The CAAA also establishes time schedules for the states to attain the NAAQS.

Methodology

Air monitoring station locations were identified using the NCTCOG Geographic Information System (GIS) database and determining the nearest active federal air monitoring stations (see *Air Quality Existing Conditions Technical Memorandum* in **Appendix B**). Specific monitor readings were obtained through the TCEQ air monitoring data website. The NCTCOG website for air quality identified specific programs implemented by the region to improve air quality.

Affected Environment

Air quality is a regional concern, not a localized condition. The Study Area is located in Tarrant, Dallas and Collin counties, which have been designated as moderate nonattainment areas for eight-hour ozone and Pb in Frisco, TX (Collin County) by the EPA. The NCTCOG eight-hour ozone nonattainment region includes Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise counties (NCTCOG, 2017). The formation of ozone is directly related to emissions from motor vehicles and point sources (AIRNow, 2017).



Table 3-11. Air Pollution Concentrations Required to Exceed the NAAQS

Pollutant	Averaging Period	Standard	Primary NAAQS*	Secondary NAAQS**
Ozone (O ₃)	8-hour	The average of the annual fourth highest daily eight-hour maximum over a three-year period is not to be at or above this level.	0.070 ppm	0.070 ppm
Carbon Monoxide (CO)	1-hour	Not to be exceeded more than once per calendar year.	35 ppm	--
	8-hour	Not to be exceeded more than once per year calendar year.	9 ppm	--
Sulfur Dioxide (SO ₂)	1-hour	Three year average of the annual 99 th percentile of the daily maximum 1-hour average is not to be at or above this level.	75 ppb	--
	3-hour	Not to be at or above this level more than once per calendar year.	--	0.05 ppm
Nitrogen Dioxide (NO ₂)	1-hour	Three year average of the annual 98 th percentile of the daily maximum 1-hour average is not to be at or above this level.	100 ppb	--
	Annual	Not to be at or above this level.	53 ppb	53 ppb
Particulate Pollution (10 microns or less) (PM ₁₀)	24-hour	Not to be at or above this level on more than three days over three years with daily sampling.	150 µg/m ³	150 µg/m ³
Particulate Pollution (2.5 microns or less) (PM _{2.5})	24-hour	The three-year average of the annual 98 th percentile for each population-oriented monitor within an area is not to be at or above this level.	35 µg/m ³	36 µg/m ³
	Annual	The three-year average of annual arithmetic mean concentrations from single or multiple community-oriented monitors is not to be at or above this level.	12 µg/m ³	15.0 µg/m ³
Lead (Pb)	3-Month	Three-month rolling average not to be at or above this level.	0.15 µg/m ³	0.15 µg/m ³

Source: USEPA, April 2017 (USEPA, 2017)

*Primary NAAQS: the levels of air quality that the EPA judges necessary with an adequate margin of safety to provide public health protection.

**Secondary NAAQS: the levels of air quality that the EPA judges necessary to protect the public welfare from any known or anticipated adverse effects including protection against decreased visibility and damage to animals, crops, vegetation and buildings.

Notes: ppb = parts per billion, ppm = parts per million, µg/m³ = microgram per cubic meter

The primary pollutants from motor vehicles are VOCs, CO, and NO_x. VOCs and NO_x can combine under the right conditions in a series of photochemical reactions to form ozone. The Dallas-Fort Worth region is in attainment for CO, sulfur dioxide, nitrogen dioxide and PM.

Meteorology plays a critical role in ozone formation, as wind and temperature dictate if this pollutant forms, and if so, how long it remains in the atmosphere. Calm weather days with low wind speeds and warm temperatures are favorable conditions for ozone formation. As expected, daily ozone concentrations are highest during the summer months, which is why the period between March 1 and October 31 is designated as "Ozone Season" in North Central Texas. The intensity of sunlight necessary for photochemically initiated reactions is highest during this time period (NCTCOG, 2016a).

The modeling procedures for ozone require long-term meteorological data, detailed area-wide emission rates and activity levels for all emission sources (on-road, non-road, point and area). Accordingly, concentrations of ozone are modeled by the regional air quality planning agency for the State Implementation Plan (SIP). The TCEQ monitors airborne pollutants in the Dallas-Fort Worth region on a continuous basis. Ozone is monitored 24 hours a day. Two Continuous



Air Monitoring Stations (CAMs) are the closest active monitoring stations to the Study Area. Recorded measurements have shown that ozone has been decreasing from 2005 to 2017.

3.12 Noise

Legal Requirements and Regulatory Setting

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human subjective response are (1) intensity or level, (2) frequency content and (3) variation with time. The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between 0 and 120 decibels. On a relative basis, a 3-decibel change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10-decibel change in sound level would typically be perceived as a doubling (or halving) in the loudness of a sound.

The frequency content of noise is related to the tone or pitch of the sound, and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the “A-weighting” system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called “A-weighted” sound levels, and are expressed in decibel notation as “dBA.” The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise.

Because environmental noise fluctuates from moment to moment, it is common practice to condense all of this information into a single number, called the “equivalent” sound level (Leq). Leq can be thought of as the steady sound level that represents the same sound energy as the varying sound levels over a specified period (typically 1 hour or 24 hours). Often the Leq values over a 24-hour period are used to calculate cumulative noise exposure in terms of the Day-Night Sound Level (Ldn). Ldn is the A-weighted Leq for a 24-hour period with an added 10-decibel penalty imposed on noise that occurs during the nighttime hours (between 10 p.m. and 7 a.m.).

Methodology

This section describes the methodology used to characterize the existing noise conditions along the Cotton Belt Project, and provides background information on airborne noise issues related to the proposed transit project. Noise impact assessment and mitigation development have been carried out in accordance with the guidelines specified in the US Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment* guidance manual (FTA, 2006) and in the DART policy document *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects* (August 2017).

Based on the screening distances provided in Chapter 4 of the FTA guidance manual, the noise Study Area for the Project was typically within 375-750 feet of the alignment, except for areas near grade crossings where land uses within 1,200 feet from the alignment were considered. This extended distance takes into account the train horn sounding required at these crossings.

Existing noise sources along the project alignment include roadway traffic, aircraft overflights and local community activities as well as occasional freight train operations. The existing ambient sound levels vary by location, depending on the proximity to major roads and other noise sources, and are generally typical of a suburban environment. Existing ambient noise



levels were originally characterized through direct measurements at selected sites in the Study Area during December 2010 for a previous Cotton Belt study. Supplementary noise measurements were conducted during March and April of 2017 to update the existing noise conditions. The *Noise and Vibration Technical Report* is in **Appendix B**.

FTA categorizes noise sensitive land uses into three groups as shown in **Table 3-12**.

Table 3-12. Land Use Categories and Metrics for Transit Noise Impact Criteria

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor Leq(h) ^a	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
2	Outdoor Ldn	Residences and buildings where people normally sleep. This category includes homes, hospitals, and hotels where a nighttime sensitivity to noise is assumed to be of utmost importance.
3	Outdoor Leq(h) ^a	Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters, and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and recreational facilities can also be considered in this category. Certain historical sites and parks are also included.
Source: FTA, 2006 ^a Leq for the noisiest hour of transit-related activity during hours of noise sensitivity		

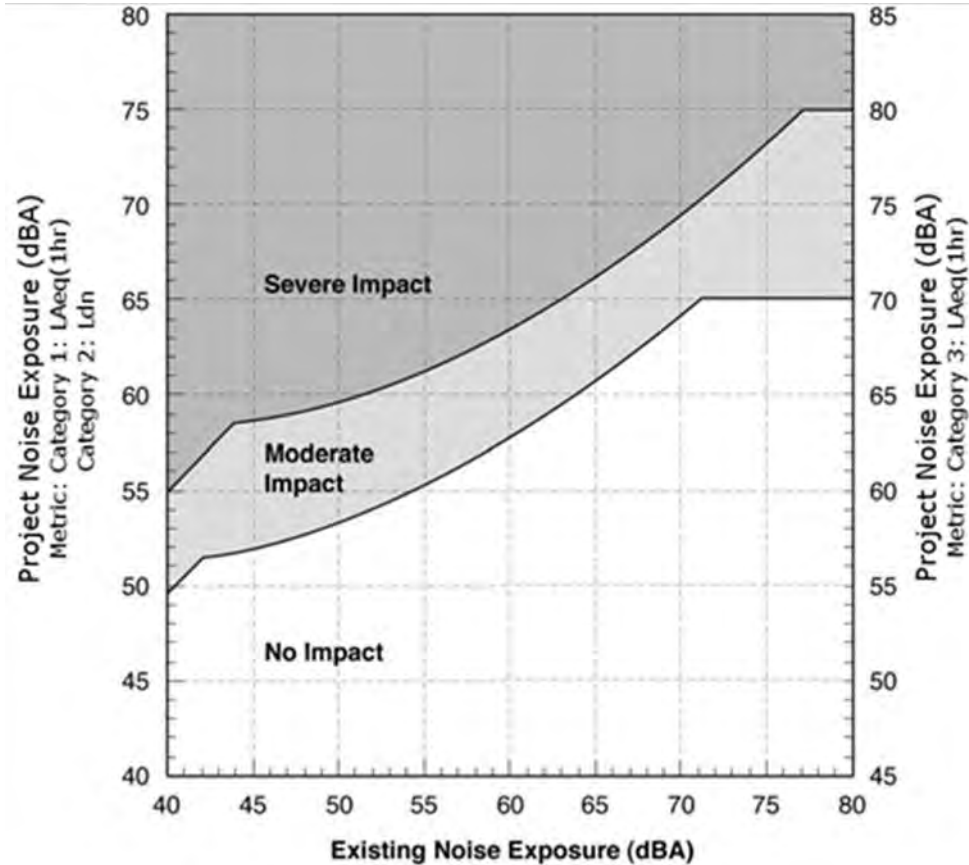
The FTA noise impact criteria include three levels of impact, as shown on **Figure 3-24**. The three levels of impact include:

- **No Impact:** In this range, the Project is considered to have no impact since, on average the introduction of the Project would result in an insignificant increase in the number of people highly annoyed by the new project noise.
- **Moderate Impact:** At the moderate impact range, changes in the cumulative noise level are noticeable to most people, but may not be sufficient to cause strong, adverse reactions from the community. In this transitional area, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation, such as the existing noise level, predicted level of increase over existing noise levels and the types and numbers of noise-sensitive land uses affected.
- **Severe Impact:** At the severe impact range, a significant percentage of people would be highly annoyed by the new project noise. Severe noise impacts are “significant” under NEPA, and should be avoided if possible. Noise mitigation should be applied for severe impacts where feasible.

Affected Environment

Land use in the Study Area includes a combination of residential, institutional, commercial and industrial zones. Noise-sensitive and vibration-sensitive land uses in the Study Area were identified based on alignment drawings, aerial photographs, visual surveys, and land use information. Sensitive receptors located along the proposed alignment include single-family and multi-family residences, hotels, schools, places of worship, museums, medical facilities and parks. Summary descriptions of noise and vibration sensitive land use along sections of the project alignment are provided below.

Figure 3-24 FTA Noise Impact Criteria



Source: FTA, 2006

DFW Airport to Freeport Parkway

Land use along this western-most section of the corridor is airport-related and industrial, and there are no noise-sensitive receptors. The only potentially vibration-sensitive receptor is the ASR-9 radar tower at the north end of DFW Airport (previously assessed for the TEXRail Project).

Coppell

The land use along the alignment in Coppell is primarily residential, with single-family residential neighborhoods located between Freeport Parkway and MacArthur Boulevard and multi-family apartment complexes located east of MacArthur Boulevard. Other sensitive receptors along this section of the corridor include the Pinkerton Elementary School, the Riverside Church of Christ and the Valley Ranch Baptist Church.

Carrollton

The area adjacent to the alignment between the PGBT and IH-35E in Carrollton is primarily commercial and industrial; the only sensitive receptor in this area is the Semihan Church located along West Belt Line Road. Between IH 35E and North Josey Lane, the alignment passes through downtown Carrollton with single-family residential land use as well as a large apartment complex just west of North Josey Lane. Other sensitive receptors in this area include the Miracle Tabernacle Pentecostal Church, the Korean Church of Dallas, and the W. Perry Homestead Museum. Between Josey Lane and John Connally Drive, the land use along the alignment is primarily industrial, and sensitive receptors are limited to the Polk Middle School



and the Islamic Association of Carrollton along Kelly Boulevard. At the eastern end of Carrollton, the land use along the alignment between John Connally Drive and Surveyor Boulevard includes single-family residential neighborhoods on the north side and industrial complexes on the south side.

Addison

The land use along the alignment in Addison is primarily commercial. Sensitive receptors include several hotels as well as Addison Church and Addison Circle Park.

North Dallas

The land use along the alignment in North Dallas includes heavy concentrations of single-family residences. There is also a large residential complex (Highland Springs Retirement Community) and new residential development located east of Coit Road. Other sensitive receptors in North Dallas include Preston Green Park, The Fairhill School, Frankford Middle School, Ivy Montessori Academy, Congregation Ohev Shalom, Spring Valley Bible Church, and the New Life in Jesus Christ Church.

Richardson

Land use along the alignment in Richardson includes a mixture of commercial and residential. The residential land use is primarily multi-family, except for one single-family neighborhood adjacent to Point North Park.

Plano

The land use along the alignment in Plano is primarily commercial and industrial, with single-family and multi-family areas. In addition to residences, other sensitive receptors include the Small Miracles Academy, the Darul Uloom School, the River of Glory Church, the Good Faith Baptist Church, the Sehion Mar Thoma Church, and the Collinwood Nursing and Rehabilitation Center.

Existing Noise Conditions

The noise measurement programs consisted of both long-term (24-hour) and short-term (1-hour) monitoring of the A-weighted sound level. All the measurement sites were located in noise-sensitive areas, and were selected to represent a range of existing noise conditions along the project corridor. For prior planning efforts in 2010, long-term noise measurements were made at 19 sites (designated as LT-1 through LT-19) and short-term noise measurements were made at five sites (designated ST-1 through ST-5). For the DEIS, updated noise measurements were conducted at or near the original sites and the original site designations have been retained. In addition, supplementary long-term noise measurements were made at an additional 10 sites (designated as LT-A through LT-J) and supplementary short-term noise measurements were made at an additional six sites (designated as ST-A through ST-F). The 2017 noise measurement locations are shown in **Figure 3-25**.

The results of the existing ambient noise measurements are summarized in **Table 3-13** for the long-term sites and in **Table 3-14** for the short-term sites. In each case, results are given for the 2017 measurements as well as for the 2010 measurements for comparison, where applicable. In addition, Ldn values for the 2017 long-term measurements in **Table 3-13** are provided both with and without freight train noise. Because freight train operations are infrequent and do not occur on a daily basis along the Cotton Belt Corridor, the results without freight train noise will provide a lower noise exposure level. **Section 2.3.1** and **Section 5.3** provide information on freight operations. Overall, the results in **Table 3-13** and **Table 3-14** serve as the basis for determining the existing noise conditions at all noise-sensitive receptors along the Project corridor.



3.13 Vibration

Legal Requirements and Regulatory Setting

FTA impact criteria for ground-borne vibration and ground-borne noise from transit operations relate to maximum vibration and ground-borne noise levels associated with a single event, such as the passing of a light rail vehicle or train. This approach is unlike the previously discussed criteria for air-borne noise levels (**Section 3.12**), which are associated with cumulative air-borne noise levels over a one-hour or 24-hour period.

Methodology

The operational vibration impact criteria used for the Project are based on the information contained in Chapter 8 of the FTA noise and vibration guidance manual. The criteria for a general vibration assessment are based on land use and train frequency, as shown in **Table 3-15**. Buildings, such as concert halls, recording studios and theaters, can have a higher sensitivity to vibration (or ground-borne noise) but do not fit into the three categories listed in **Table 3-15**. Because of the sensitivity of these buildings, special attention is paid to these buildings during the environmental assessment of a project. **Table 3-16** shows the FTA criteria for acceptable levels of vibration for several types of special buildings.

Vibration-sensitive land use along the project alignment is essentially the same as the noise-sensitive land use, except for parks and other outdoor sites which are not considered vibration-sensitive. Existing vibration sources along the project alignment include auto, bus and truck traffic on local streets. However, vibrations from street traffic are not generally perceptible at receivers in the Study Area unless streets have significant bumps, potholes, or other uneven surfaces. The only significant sources of existing ground vibration along the Cotton Belt alignment are infrequent freight train movements over limited sections of the corridor.

Section 2.3.1 and **Section 5.3** provide information on freight operations. Furthermore, the FTA vibration impact criteria are not ambient-based; that is, future project vibrations are not compared with existing vibrations to assess impact. Therefore, the vibration measurements for the Project focused on characterizing the soil conditions along the proposed alignments rather than on characterizing the existing vibration levels. The *Noise and Vibration Technical Report* is in **Appendix B**.

The objective of the vibration measurements for the Cotton Belt Project was to obtain data on ground-borne vibration propagation through the soil in the Study Area that could be used to project future vibration from commuter rail operations using the FTA procedures for a detailed vibration analysis (FTA, 2006). The tests were conducted by impacting the ground with an instrumented weight and measuring the vibration response of the soil at various distances. The results of the vibration propagation tests are combined with previously documented input force data for the proposed DMU vehicles to project vibration levels from DMU operations at locations along the alignment.

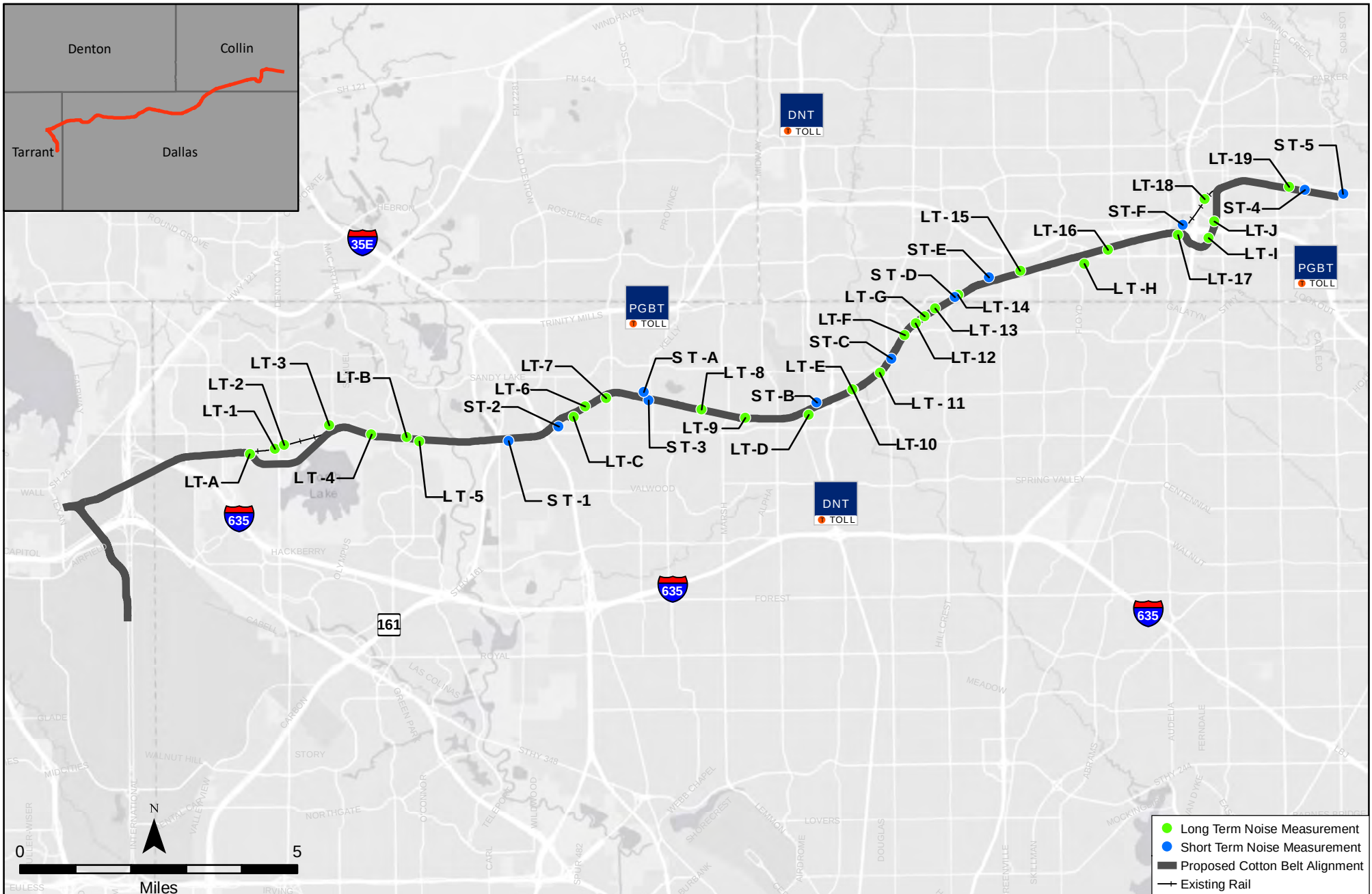


Figure 3-25
Noise Measurement Site Locations
 Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement





Table 3-13. Summary of Existing Ambient Long-Term Noise Measurement Results

Site No.	Measurement Location Description	Start of Measurement		Meas. Duration (hrs)	Noise Exposure Ldn (dBA)		
		Date	Time		2017 (with train noise)	2017 (w/o train noise)	2010 ¹
LT-1	800 Bullock Street – Coppell (SF Res.)	4/3/2017	10:00	24	66	59	60
LT-2	145 Glendale Drive – Coppell (SF Res.)	4/3/2017	11:00	24	57	56	56
LT-3	525 Carter Drive – Coppell (SF Res.)	4/3/2017	12:00	24	62	56	61
LT-4	853 Crestview Drive – Coppell (SF Res.)	4/4/2017	13:00	24	NA ²	NA ²	65
LT-5	1717 E Belt Line Road – Coppell (Apartments)	3/30/2017	11:00	24	67	67	66
LT-6	1608 Cecil Drive – Carrollton (SF Res.)	3/29/2017	15:00	24	55	53	62
LT-7	1853 N Josey Lane – Carrollton (Apartments)	3/29/2017	16:00	24	60	60	59
LT-8	2610 Lakehill Lane – Carrollton (MF Res.)	3/28/2017	14:00	24	59	59	57
LT-9	3232 San Sebastian Drive – Carrollton (SF Res.)	3/28/2017	14:00	24	58	58	55
LT-10	5665 Arapaho Road – Addison (Apartments)	3/27/2017	10:00	24	56	56	54
LT-11	16144 Chaifont Circle – Dallas (SF Res.)	3/28/2017	18:00	24	59	59	57
LT-12	16957 Davenport Court – Dallas (SF Res.)	4/3/2017	13:00	24	55	55	52
LT-13	6802 Duffield Drive – Dallas (SF Res.)	3/27/2017	10:00	24	57	57	57
LT-14	6906 Rocky Top Circle – Dallas (SF Res.)	3/27/2017	10:00	24	52	52	55
LT-15	8000 Frankford Road – Dallas (MF Res.)	3/27/2017	12:00	24	55	55	54
LT-16	800 W Renner Road – Richardson (Apartments)	3/30/2017	15:00	24	61	60	55
LT-17	3560 Alma Road – Richardson (Apts.)	3/30/2017	15:00	24	69	69	68
LT-18	1005 G Avenue – Plano (SF Residence)	3/28/2017	12:00	24	58	58	65
LT-19	2644 Ezekial Way – Plano (SF Res.)	3/28/2017	11:00	24	59	58	63
LT-A	400 Southwestern Blvd. – Coppell (SF Residence)	4/4/2017	13:00	24	62	62	--
LT-B	1315 Riverchase Drive – Coppell (Apts.)	4/4/2017	12:00	24	61	61	--
LT-C	1301 Clint Street – Carrollton (SF Res.)	3/30/2017	10:00	24	56	56	--
LT-D	Hawthorn Suites – Addison (Hotel)	3/29/2017	12:00	24	61	61	--
LT-E	5398 Bend Tree Forest Dr. – Dallas (MF Residence)	3/27/2017	11:00	24	55	55	--
LT-F	6341 Southpoint Drive – Dallas (SF Residence)	3/27/2017	10:00	24	55	55	--
LT-G	7010 Spanky Branch Court – Dallas (SF Residence)	3/27/2017	19:00	24	52	52	--
LT-H	1111 Timberview Lane – Richardson (SF Residence)	3/28/2017	10:00	24	59	59	--
LT-I	110 W CityLine Drive-Richardson (Apts.)	9/26/2017	10:00	24	65	65	--
LT-J	680 Executive Drive – Plano (Apts.)	9/25/2017	15:00	24	70	70	--

¹ Measurement results obtained in December 2010 at the same or nearby location for a previous study.

² Data at this site were not recorded due to a noise monitor programming error.

Source: HMMH., 2013 and Cross-Spectrum Acoustics Inc., 2017



Table 3-14. Summary of Existing Ambient Short-Term Noise Measurement Results

Site No.	Measurement Location Description	Start of Measurement		Meas. Duration (hrs)	Noise Exposure Leq (dBA)	
		Date	Time		2017	2010 ¹
ST-1	1615 W Belt Line Road – Carrollton (Church)	3/30/2017	11:01	1	66	64
ST-2	1107 Jackson Street – Carrollton (Church)	3/31/2017	09:42	1	61	61
ST-3	1901 Kelly Blvd. – Carrollton (Islamic Assoc.)	3/29/2017	16:00	1	56	55
ST-4	3100 S Rigsbee Drive – Plano (Nursing Home)	3/27/2017	14:46	1	55	52
ST-5	3760 14 th Street – Plano (Church)	3/29/2017	11:13	1	54	53
ST-A	2001 Kelly Blvd. – Carrollton (School)	4/4/2017	09:15	1	54	--
ST-B	4970 Addison Circle – Addison (Park)	3/28/2017	14:09	1	60	--
ST-C	16150 Preston Road – Dallas (School)	3/28/2017	16:04	1	56	--
ST-D	6950 McCallum Blvd. – Dallas (School)	3/27/2017	16:55	1	56	--
ST-E	7706 Osage Plaza Parkway – Dallas (School)	3/29/2017	09:17	1	61	--
ST-F	501 Accent Drive – Plano (Church)	3/27/2017	13:05	1	60	--

¹ Measurement results obtained in December 2010 at the same or nearby location for a previous study.

Source: HMMH., 2013 and Cross-Spectrum Acoustics Inc., 2017

Table 3-15. Ground-Borne Vibration and Noise Impact Criteria for General Assessment

Land Use Category	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch /sec)			Ground-Borne Noise Impact Levels (dBA re 20 micro Pascals)		
	Frequent Events ^a	Occasional Events ^b	Infrequent Events ^c	Frequent Events ^a	Occasional Events ^b	Infrequent Events ^c
Category 1: Buildings where vibration would interfere with interior operations.	65 ^d	65 ^d	65 ^d	N/A ^e	N/A ^e	N/A ^e
Category 2: Residences and buildings where people normally sleep.	72	75	80	35	38	43
Category 3: Institutional land uses with primarily daytime use.	75	78	83	40	43	48

Source: FTA, 2006

a. "Frequent Events" is defined as more than 70 vibration events of the same source per day. Most rapid transit projects fall into this category.

b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day. Most commuter trunk lines have this many operations.

c. "Infrequent Events" is defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines.

d. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

e. Vibration-sensitive equipment is generally not sensitive to ground-borne noise.



Table 3-16. Ground-Borne Vibration and Noise Criteria for Special Buildings

Type of Building or Room	Ground-Borne Vibration Impact Levels (VdB re 1 micro-inch /sec)		Ground-Borne Noise Impact Levels (dBA re 20 micro Pascals)	
	Frequent Events ^a	Occasional or Infrequent Events ^b	Frequent Events ^a	Occasional or Infrequent Events ^b
Concert Halls	65	65	25	25
TV Studios	65	65	25	25
Recording Studios	65	65	25	25
Auditoriums	72	80	30	38
Theaters	72	80	35	43

Source: FTA, 2006

a. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

b. "Occasional or Infrequent Events" are defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

If the building will rarely be occupied when the trains are operating, there is no need to consider impact. As an example, consider locating a commuter rail line next to a concert hall. If no commuter trains will operate after 7 pm, it should be rare that the trains interfere with the use of the hall.

Affected Environment

Twelve representative vibration propagation test sites were selected for the 2017 measurements. These included nine sites at or near locations where testing was conducted in 2010 (designated as VP-2 through VP-10) as well as three new sites (designated as VP-A through VP-C) (see **Figure 3-26**). The vibration measurements for the Project focused on characterizing the soil conditions along the proposed alignments rather than on characterizing the existing vibration levels. Projected ground-borne vibration impacts are summarized in **Section 4.15**.

3.14 Hazardous and Regulated Materials

Legal Requirements and Regulatory Setting

A hazardous material is any substance or mixture of substances capable of having adverse effects on human health and safety or the environment. Hazardous material issues are considered throughout project development to address compliance with NEPA and FTA regulations and guidelines. The primary federal laws regulating hazardous waste and materials are the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC §6901 et seq.) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) (42 USC §9601 et seq.). The National Priority List (NPL) is a listing of the most polluted sites in the nation that are eligible for cleanup funding (Superfund) under CERCLA. The EPA is the primary agency responsible for administering RCRA and CERCLA. Other regulatory acts address contaminants and hazardous materials including the Toxic Substances Control Act (TSCA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), CAA, and CWA. Federal, state, and local databases have been developed to keep track of sites which handle, generate, transport, store, or dispose of hazardous and/or regulated materials, in accordance with applicable environmental laws.

Methodology

This section analyzes potential contaminant sources that may be present within the Study Area. It assesses the potential of encountering hazardous waste and impacted soil and/or groundwater during project construction activities.

The Study Area was evaluated by reviewing available regulatory agency databases and topographic maps, and by performing a limited site reconnaissance in May 2017.



The regulatory databases were searched for sites within the American Society for Testing Materials (ASTM)-specified search distances (as listed in the ASTM E 1527-13 guidance) from the Project centerline (EDR, 2017). Also included in the search were sites that have sustained a known release of contaminants to soil or groundwater. These documents and site visits were intended to serve as an overall environmental screening method for the Cotton Belt Corridor and to identify sites with potential hazardous waste issues that are known to regulatory authorities. This environmental screening does not consider historical sites or sites with no recorded regulatory history (but with potential issues). Therefore, it does not constitute an ASTM-conforming Phase I Environmental Site Assessment (ESA). In addition, sites may be missed or not considered if they existed prior to modern environmental recordkeeping (generally pre-1990).

A potential hazardous waste site that was not listed in the database is Mercer Yard. No on-site reconnaissance was conducted of the yard since DART owns the property.

Affected Environment

The database identified 674 sites that were located within the Study Area. The sites were narrowed down based on the nature of each database listing, leaving over 150 potential risk sites. The site reconnaissance was conducted May 10-12, 2017. The proximity of the site to the Project, surface topography, and the information provided in the EDR database search helped to determine risk sites. Low, moderate, high, and indeterminate risks sites in the Study Area are shown in the *Hazardous Materials Existing Conditions Technical Memorandum* in **Appendix B**.

Of these sites, eight sites are ranked as high risk, 19 as moderate risk, and 16 as indeterminate risks. The remainder of the sites were ranked as having low risk to impact the Project. As stated, this risk classification is based on the nature of the site contamination, proximity to the Project, and groundwater gradient. It is important to note, that this risk ranking would be applicable to the Project only if the ground is disturbed during construction activities. If subsurface soils will not be disturbed during construction, then these sites would not pose a risk to the Project.

3.15 Biological and Natural Resources

Legal Requirements and Regulatory Setting

The Project corridor crosses the communities of Grapevine, Coppell, Dallas, Carrollton, Addison, Plano, and Richardson. These municipalities have tree protection ordinances in place. The ordinances provide protection against unnecessary removal of trees and may require replacement. Existing DART-owned right-of-way is exempt from the City of Dallas tree ordinance; however, the ordinance would apply to new right-of-way and station areas.

Federally-listed species and their habitats are protected under the Endangered Species Act of 1973 (16 USC § 1531 et seq.) as amended. The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC §668 et seq.) prohibits harm to all migratory birds, their nests, eggs, and nestlings. The Bald and Golden Eagle Protection Act further provides protection for Bald Eagles and Golden Eagles.

State law prohibits direct harm for state-listed species, but does not currently provide for habitat protection.

Methodology

The biological resource Study Area used for the assessment of impacts generally includes the 0.5-mile Study Area. However, a much larger search radius of 10 miles was used in the examination of threatened or endangered species occurrence data. Existing literature and



mapping were reviewed for the larger Study Area to identify potential vegetative communities, potential wildlife assemblages, and threatened or endangered species of potential occurrence. Maps examined include aerial imagery for the Study Area; USGS topographic maps for the Garland, Grapevine, Carrollton, Plano, and Addison, Texas quadrangles (USGS, 1973; USGS, 1981); GIS shapefiles obtained from the TPWD's Ecological Systems Classification and Mapping Project (EMST); and the TCEQ's *Ecoregions of Texas* (2007).

This assessment was built upon detailed field investigations conducted by project biologists in 2011 and 2013 for the Cotton Belt Project, and additional field reconnaissance in May 2017 to verify vegetative communities, wildlife habitat, migratory bird use, and potential habitat for rare, threatened and endangered species within the Study Area.

Affected Environment

The Study Area occurs within the Northern Blackland Prairie Ecoregion (Griffith et al, 2007). This ecoregion includes rolling to nearly level plains which stretch from Sherman in the north to San Antonio in the south. Historically this area was distinguished by a vast expanse of tallgrass prairie vegetation. This vegetation was supported by frequent fire events which suppressed invading woody species and stimulated the growth of grass and non-woody flowering plants. In addition, the grazing of bison within this area resulted in the production of organic matter and the spreading of seeds within the disturbed soil of the area, helping to sustain it. The majority of the Northern Blackland Prairie has since been converted to agricultural or urban uses.

The Study Area is also located within the Texan Biotic Province (Blair, 1950). The Texan Biotic Province is a region which trends from north to south, extending from the Red River to the Gulf Coast. This province includes sandy soils which support the growth of post oak-blackjack oak-hickory savannahs scattered among tallgrass prairies (Werler and Dixon, 2000). It also contains numerous wetland areas including freshwater marshes, peat bogs, and major river systems.

Vegetation

According to *The Vegetation Types of Texas* (1984), three vegetation types are mapped within the Study Area: "Urban", "Crops", and "Other Native and/or Introduced Grasses" (McMahan et al., 1984). Urban vegetation occurs within approximately 36 percent of the Study Area, and generally consists of maintained grasses in yards and transportation right-of-way, along with various ornamental plantings. Crops occur within approximately 49 percent of the Study Area, and include cultivated cover crops or row crops used for the purpose of producing food and/or fiber for either man or domestic animals. This type also includes grassland associated with crop rotations. The remaining areas within the Study Area, or approximately 15 percent, include Other Native and/or Introduced Grasses which consists of mixed native or introduced grasses and non-woody flowering plants on grassland sites or mixed herbaceous communities resulting from the clearing of woody vegetation.

Within the Study Area, vegetation found in association with residential areas and commercial developments is generally comprised of turf grasses, such as bermudagrass or St. Augustine grass, and ornamental plantings which can include a variety of types of trees, shrubs, or herbaceous plants.

Undeveloped land, including parks and stream corridors, may include vegetation types such as grasslands, savannahs, or woodlands. Stream corridors often have riparian woodland vegetation growing along their banks. Grasslands may include a variety of native and nonnative grasses and non-woody flowering plants. Savannahs have grassland vegetation along with invading woody shrubs and trees. Woodlands in the Study Area are likely to be dominated by a variety of deciduous and evergreen tree species with an understory consisting of grasses, non-woody flowering plants, and small shrubs or vines.



A more detailed vegetation analysis was also performed within the Study Area using EMST which were used to estimate vegetation areas and unique habitat types within the Study Area. The EMST data set provides an updated ecological system classification for Texas which includes more land cover classes than were previously identified for the state (TPWD, 2016).

Maps and a detailed description of these natural regions and vegetation types are available in the *Biological Resources Existing Conditions Technical Memorandum* in **Appendix B**.

Wildlife

Approximately 49 species of mammals, 57 species of reptiles, and 23 species of amphibians occur in the Texan Biotic Province (Blair, 1950). In addition, approximately 471 avian species, including both residents and migrants, have been reported in the Oaks and Prairies and Osage Plains of Texas (Freeman, 2003), an area that is roughly analogous to the Texan Biotic Province.

The Study Area is mostly urban and suburban in nature. Most wildlife species inhabiting the Study Area would be anticipated to be those which are generally associated with these types of areas.

No designated critical habitat or preferred habitat for any federally-listed species was identified within or near the Study Area. Fourteen state-listed threatened species could occur in the Study Area, including the American peregrine falcon (*Falco peregrinus anatum*), peregrine falcon (*Falco peregrinus*), piping plover (*Charadrius melodus*), alligator snapping turtle (*Macrochelys temminckii*), Texas horned lizard (*Phrynosoma cornutum*), timber rattlesnake (*Crotalus horridus*), bald eagle (*Haliaeetus leucocephalus*), white-faced Ibis (*Plegadis chihi*), wood stork (*Mycteria Americana*), shovelnose sturgeon (*Scaphirhynchus platyrhynchus*), Louisiana pigtoe (*Pleurobema riddellii*), sandbank pocketbook (*Lampsilis satura*), Texas pigtoe (*Fusconaia askewi*) and Texas heelsplitter (*Potamilus amphichaenus*). The Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter all have recorded TXNDD elements of occurrence within 0.7 – 7 miles from the project area. Twenty state-listed species of concern could occur within the Study Area counties, however only one of these, the Texas garter snake (*Thamnophis sirtalis annectens*) has a TXNDD element of occurrence record located approximately 7 miles north of the Study Area.

Maps and a detailed description of wildlife are available in the *Biological Resources Existing Conditions Technical Memorandum* in **Appendix B**.



4. Environmental Consequences and Mitigation

4.1 Introduction

This chapter describes the potential environmental impacts, both positive and negative, that would occur with the No-Build and the Cotton Belt Project. Unless otherwise stated for a given environmental category, the No-Build Alternative would have no impact. Detailed data and information are provided in technical reports and memoranda, as referenced in this chapter. Proposed mitigation measures for the Project are also included in each section.

Each section in this chapter is organized as follows:

- Impact Evaluation: a summary of the impact findings for each of the resource areas as a result of the implementation of the proposed action; and,
- Mitigation Measures: the measures that are proposed to be implemented to avoid, minimize, or mitigate impacts as appropriate for the Project.

Chapter 5 describes potential transportation impacts, while **Chapter 6** analyzes potential impacts of the Build Alternative related to FAA environmental impact assessment guidance.

4.2 Land Use

4.2.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and would not have any impacts to existing land use in the Study Area. However, the No-Build Alternative is not consistent with local and regional long-range plans, which have identified regional passenger rail in the Study Area. As such, the No-Build Alternative will not facilitate the continued implementation of transit-oriented development plans along the corridor and could have potentially negative impacts relative to each city's ability to achieve those plans and shape a more sustainable development pattern in the area. This No-Build or status quo land use pattern could lead to additional traffic congestion and a decline in the desirability of this part of the region as an employment center by limiting mobility options.

Build Alternative

With the exception of direct impacts caused by property acquisitions and displacements, no other adverse impacts to land use are anticipated with the construction of the Project, as regional and local planning activities have attempted to encourage more intensified growth in the region, especially around future transit stations. Mitigation for impacts caused by property acquisitions and displacements are addressed in **Section 4.4**.

The Cotton Belt Project is not expected to increase growth or development within the larger DFW region. Instead, the Project could serve to redistribute future regional land use growth patterns by supporting sustainable land use development patterns around existing residential and business centers within the Study Area and would thus influence growth on a local, station area level. At a regional level, NCTCOG has an established Sustainable Development Program. This program encourages land use and transportation practices that promote economic development while efficiently using limited resources.

The Cotton Belt Project could potentially be a catalyst for encouraging higher density, mixed-use development that is more transit efficient. To encourage this development, DART coordinated with corridor city planning officials to plan for future project implementation.



Along most of the corridor, cities are seeking a more walkable and pedestrian-friendly environment with denser, mixed-use development. Various cities have also begun infrastructure improvements in advance of the Cotton Belt Project. Surrounding streets are being constructed or reconstructed to make them more walkable and “complete”, and cities are working with developers on potential transit-oriented developments (TOD) within the station areas. If and when such development occurs depends upon the continued support and actions of the cities governing development in the Study Area and on local real estate market conditions.

Cities within the Study Area also have a variety of plans and policies aimed at promoting increased development within the Study Area as described in **Section 3.2**. These plans and policies range from Comprehensive Plans and Master Plans to specific station area plans, such as the Cypress Waters mixed-use development master plan, the UT Dallas Master Plan, and continuing development in the CityLine/Bush and 12th Street Station areas. Based on an assessment of these plans, the Cotton Belt Project is consistent with the DFW Airport and cities’ comprehensive plans and site-specific plans. Refer to **Section 4.20** for additional discussion on indirect land use impacts.

4.2.2 Mitigation Measures

As described above, many communities are developing station area plans along the Cotton Belt Project, which encourages transitioning to land uses that are more conducive to transit. As the Project design progresses, DART will continue working with both corridor cities and private developers to coordinate the Project design with their land use planning efforts.

4.3 Socioeconomic Characteristics and Cohesion

4.3.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no impacts to socioeconomic characteristics in the Study Area would occur. Physical boundaries of neighborhoods will remain unchanged and social interactions, including school access, will not be altered. The No-Build Alternative will not provide benefits of enhanced access to residents and facilities, and could adversely impact overall job growth within the corridor.

Build Alternative

The evaluation of potential impacts to socioeconomic resources resulting from the proposed Build Alternative is discussed in terms of potential permanent impacts resulting from the Project. Potential effects were evaluated for community facilities, community cohesion, schools, demographics, employment and economic development.

Community Facilities

The Cotton Belt Project would enhance mobility options for transport to and from community facilities both within and outside of the Study Area. These options would especially benefit students, the elderly, and economically disadvantaged individuals accessing community facilities as these are populations that are sometimes transit-dependent and may have no alternative form of transportation to access community facilities.

Existing community facilities assessed within the Study Area include community centers, places of worship, daycare centers, public service and government locations, medical facilities, and other areas of community importance. **Section 3.3** provides a list and map of 110 community facilities inventoried and observed within the Study Area. Of the 110 facilities, 82 are not adjacent to the right-of-way and are unlikely to be affected by noise impacts or access changes. The remaining 28 are adjacent to the proposed Build Alternative. Many of these facilities are



already adjacent to the existing rail tracks and would not be impacted by the addition of regional rail operations. **Table 4-1** lists the community facilities which are adjacent to the proposed Build Alternative and describes any potential impacts anticipated for each facility. The Map ID number listed in **Table 4-1** corresponds to the number previously associated with each facility shown on **Figures 3-6** through **3-9** in **Chapter 3**. Two fire departments are adjacent to the corridor at DFW Airport and in Coppell. A detailed discussion of potential impacts associated with emergency services such as police and fire is provided in **Section 4.8**.

Table 4-1. Community Facilities Adjacent to Cotton Belt Corridor Build Alternative

Map ID	Facility Name	Potential Impact
1	DFW Airport/Terminal B	None; access improvements with Terminal B Station
2	Comprehensive Women's Healthcare	None
3	Surgical Group of North Texas LLP	None
4	DFW Airport Fire Station 6	None; access improvements
6	US Postal Service Administration Offices	None
7	Coppell Fire Department Station 1	None
8	Coppell Fire Department Administration	None
9	Coppell Utilities Department	None
11	W.W. Pinkerton Elementary School	Possible noise impact*
12	Roy C. Brock Center-Coppell ISD	None
17	Discover and Share Preschool	Possible noise impact*
20	Valley Ranch Baptist Church	Possible noise impact*
21	Church on the Rock International	Possible noise impact*
37	Polk Middle School	Possible noise impact*
38	Islamic Association of Carrollton	Possible noise impact*
42	Addison Airport	None
45	MGA Home Healthcare	None
52	Fairhill School	Preston Road Station access; safety
57	Ivy Montessori Academy	Possible noise impact*
65	Highland Springs Medical Center and Retirement Community	Possible noise impact*
67	UT Dallas Southwestern Clinical Center	Access improvements with UT Dallas Station; Possible noise/vibration impact*
68	UT Dallas	Access improvements with UT Dallas Station; Possible noise impact*
73	World Ministry Fellowship Church	Possible noise impact*
101	US Post Office	None
102	The Collinwood Care Center	Possible noise impact*
105	Plano ISD, Shiloh Center	None
107	Islamic Academy	Possible noise impact*
108	Noori Masjid	Possible noise impact*
109	Dai Bi Buddhist Center	Possible noise impact*
110	Sehion Mar Thoma Church	Possible noise impact*

Source: GPC6 Team, August 2017

*Quiet zones will mitigate the noise impacts at these community facilities and no additional noise mitigation is required. See **Section 4.14** for additional information.

As shown in **Table 4-1**, the primary potential impacts to adjacent facilities is noise. Without mitigation, the major source of potential noise impacts for the Cotton Belt Project is from train horns that would be sounded at the numerous at-grade crossings along the proposed rail alignment. Thus, the primary recommended mitigation measure is the implementation of 36 quiet zones for the Cotton Belt Project. Impacts due to noise are described in more detail in



Section 4.14. The potential for vibration impacts was identified at three highly vibration-sensitive facilities located along the Cotton Belt Corridor in Richardson, including the UT Southwestern Medical Center Clinic, the Qorvo semiconductor facility and the Texas Instruments semiconductor facility. DART will conduct detailed, site-specific vibration studies at these facilities during project design to make a final determination regarding potential vibration impacts and any required mitigation. Such studies will include ground-to-building vibration propagation testing as well as evaluations of the buildings and any sensitive equipment they may contain. Additional impacts due to vibration are described in **Section 4.15** and in the *Noise and Vibration Technical Report* in **Appendix B**.

Adjacent community facilities that could potentially be affected by the Project include the Fairhill School and the UT Dallas Southwestern Clinical Center. The Fairhill School and its facilities would be adjacent to the proposed Preston Road Station. There is an existing private access driveway and vegetation that serves as a buffer between school buildings and the railroad right-of-way, and athletic fields are located immediately to the east. The primary concerns identified by the community are access, safety, noise and vibration. While there would be increased pedestrian/bicycle traffic associated with this neighborhood station, there would not be parking or passenger drop off areas and potential access impacts would be minimal. Given the adjacency, there will be safety fencing installed along the Cotton Belt Corridor right-of-way to separate uses. DART passengers using the Preston Road Station will be segregated from the school population. To increase safety, the station will feature appropriated lighting and security cameras. No noise or vibration impacts were projected at this location with quiet zones.

The primary concern identified at UT Dallas Southwestern Clinical Center is a potential vibration impact. The clinic is directly adjacent to the alignment near the proposed UT Dallas Station, which is located approximately 600 feet to the east. As situated, the increased foot and vehicular traffic would not directly affect the clinic. The station would enhance access to the clinic by providing new pedestrian and automobile crossings of the rail. The station would also provide rail and bus access to the clinic. As noted above, site-specific vibration testing would be done during final design for this facility.

Community Cohesion

Community cohesion refers to the level of social interaction experienced within and across neighborhoods. There are many registered neighborhood associations and homeowners' associations (HOAs) in the Study Area. These and similar organizations serve to bind neighbors to one another under a common identity or set of ideals, and create more meaningful social interactions.

The existing railroad corridor already serves as a physical separation in the Study Area, creating boundaries and defining neighborhoods. The addition of passenger rail in this existing corridor would not create new boundaries or divisions. In addition, the four proposed alignment deviations would create or modify the corridor alignment (the DFW Airport Connection, the Cypress Waters Alignment, Downtown Carrollton Reconfiguration, and the CityLine/Bush Alignment). However, these alignment deviations would not cause further divisions or adverse impacts to community cohesion because they would not divide any existing neighborhoods. The Cypress Waters Alignment would result in one residential displacement; however, the residence to be displaced is disconnected from any neighborhood associations or groups. The CityLine/Bush Alignment is located along a largely undeveloped area across US Highway 75; therefore, this alignment is not anticipated to affect the community cohesion of any neighborhoods.

The cities of Grapevine, Irving, Richardson, Plano and the Town of Addison do not have subdivisions or neighborhoods that are divided by the proposed Build Alternative and would not



have community cohesion effects. One neighborhood association in Carrollton (Old Downtown Carrollton Association) and several neighborhood associations belonging to the North Dallas Neighborhood Alliance (NDNA) span the proposed Build Alternative. Effects to community cohesion are not anticipated because these neighborhoods formed around and are already separated by the existing rail tracks. Access across the existing rail corridor would continue at designated street crossings as it does today.

In Carrollton, the Old Downtown Carrollton Association acknowledges that the downtown area would see an increase in passenger rail traffic based on the master plan for the area, and the relocation of Mercer Yard would result in a decrease in freight railroad switching activity. Positive effects could also result from increased customer traffic to this area from the proposed Build Alternative due to the new passenger rail station and projected ridership.

In Dallas, only one specific neighborhood, Highlands of McKamy, traverses both sides of the proposed Build Alternative. The Highlands of McKamy I, II and III neighborhood is located south of the alignment, and Highlands of McKamy IV and V neighborhood is located to the north. These two neighborhood subdivisions are separated by Hillcrest Road and McCallum Boulevard. Thus, the Project would not affect community cohesion. For the broader north Dallas neighborhood area, there is potential for impacts resulting from increased rail traffic since freight service was abandoned in 2010. Potential impacts primarily relate to noise, vibration, traffic, safety, and visual which are addressed in separate sections of this document. While no freight service and pedestrian crossings of the corridor between neighborhoods could occur, the corridor remains private right-of-way and is not designated for such access. From a community and neighborhood cohesion perspective, no effects are anticipated and access between neighborhoods would continue as it does today at designated public street crossings.

The North Dallas Eruv, a designated area for the local Jewish community, is centered around McCallum Boulevard and Hillcrest Road and within an approximate 2-mile radius of several synagogues and day schools. An Eruv is a symbolic boundary delineated with markers, utility wires and cables on utility poles that encircle the area. A City of Dallas ordinance was passed to symbolically allow the Eruv, and an agreement with Oncor exists to allow markers on utility poles. The proposed Build Alternative may necessitate changes in the configuration of utility poles that delineate the Eruv near Coit Road. Disruptions or modifications to the markers would invalidate Eruv until it is reestablished.

Schools

The Cotton Belt Corridor predates the development of most schools in the Study Area. As a result, many school attendance zones along the Cotton Belt Corridor use it as a logical boundary. However, thirty-seven school attendance zones are intersected by the Cotton Belt Corridor, resulting in increased frequency of train operations or modified alignment that results in the tracks being located in proximity to a school and requiring crossing of the alignment. The primary concern is the safety of school-aged children at these crossings. **Table 4-2** lists schools which have attendance zones that traverse the proposed Build Alternative. The table also includes a summary of the walkability characteristics for affected neighborhoods (those located across the proposed alignment from their designated schools). Schools located less than 0.5-mile from the alignment have moderate impact potential due to a higher probability of children crossing the alignment. Locations of these schools are shown on **Figure 3-11** in **Section 3.3**.

For many schools along the corridor, the neighborhoods separated by the proposed Build Alternative are also separated from their schools by long distances or other barriers, making non-motorized school access unlikely. Neighborhoods more than one mile from a school, separated by a major transportation facility (see **Section 5.2** for information on the roadway network), or disconnected by neighborhood design were not considered walkable.



Table 4-2. School Attendance Zones Crossing the Cotton Belt Project

School Name	Impact Potential	Neighborhood Distance from School
Coppell ISD		
W.W. Pinkerton Elementary	Moderate	Less than 0.5 mile from school
Barbara S. Austin Elementary	Low	Over 2 miles from school
Mockingbird Elementary	Low	Over 2 miles from school
Coppell Middle West	Low	Approximately 1.5 miles from school
Coppell Middle East	Low	Over 2 miles from school
Coppell High	Low	Approximately 1.5 mile north of alignment
New Tech High	Low	Approximately 1.5 mile north of alignment
Carrollton/Farmers Branch ISD		
Riverchase Elementary	Low	Approximately 1 to 1.5 mile from school
Carrollton Elementary	Moderate	Less than 0.5 mile from school
Country Place Elementary	Low	No residences south of the corridor; students not likely to cross tracks
Barbara Bush Middle	Moderate	Less than 1 mile from school
Ted Polk Middle	Moderate	Less than 1 mile from school
DeWitt Perry Middle	Moderate	Less than 1 mile from school
Newman Smith High	Low	Approximately 1 mile from school
Ranchview High	Low	Approximately 3 miles south of alignment
Dallas ISD		
Junkins Elementary	Low	No residences in areas across the corridor
Walker Bush Elementary	Low	No direct access and over 3 miles from school
Walker Middle	Low	Over 2 miles from school
White High	Low	Over 2 miles from school
Richardson ISD		
Brentfield Elementary	Moderate	Approximately 0.5 mile from school
Parkhill Junior High	Moderate	Approximately 0.5 mile from school
J.J. Pearce High	Low	Approximately 2 miles from school
Plano ISD		
Aldridge Elementary	Moderate	Approximately 0.5 mile from school but no at-grade crossings
Mendenhall Elementary	Low	Over 2 miles from school
Forman Elementary	Low	Over 2 miles from school
Jackson Elementary	Low	Over 2 miles from school
Frankford Middle	Moderate	Less than 1 mile from school
Wilson Middle	Low	Approximately 1 mile from school but separated by PGBT
Armstrong Middle	Low	Over 2 miles from school
Otto Middle	Low	Over 2 miles from school
Shepton High	Low	Over 2 miles from school
Vines High	Low	Over 2 miles from school
Williams High	Low	Over 2 miles from school
McMillen High	Low	Over 2 miles from school
Plano West Senior High	Low	Over 2 miles from school
Plano East Senior High	Low	Over 2 miles from school
Plano Senior High	Low	Over 2 miles from school

Source: GPC6 Team, August 2017

For this reason, most schools in **Table 4-2** have a low impact potential and a low safety concern for school-aged children traveling to or from school as a result of the Build Alternative. If the affected school is in an area where the alignment will deviate from the existing rail corridor or is less than one mile, there is an increased potential for children to cross the tracks and a potential for a moderate impact related to safety at these crossings. Project fencing would not restrict where crossings can occur and would not affect school access.



The Fairhill School in north Dallas was assessed in the Community Facilities section as it draws from a wider area of the region and is not bound by an attendance zone.

No Dallas ISD schools are likely to have students cross the Build Alternative to walk or bike to school; therefore, Dallas ISD schools would not be affected by the Project. Conversely, one school in Coppell ISD, five schools in Carrollton/Farmers Branch ISD, two schools in Richardson ISD, and two schools in Plano ISD have students who are likely to cross the Build Alternative to walk or bike to school and have the potential to be affected by the Project. Because freight rail currently operates along the Cotton Belt in most of these school districts, school children presently crossing the tracks are already aware of trains crossing their path and the security measures at the at-grade intersections. Only the north Dallas area within Richardson ISD does not have active freight so families and children may be unfamiliar with safety practices.

Coppell ISD

Coppell ISD has one school likely to have students crossing the Build Alternative and is anticipated to have a moderate impact potential related to safety at these crossings. W.W. Pinkerton Elementary is located south of the existing railroad corridor and west of Denton Tap Road. Its attendance zone extends both north and south of the existing railroad. However, the Cypress Waters Alignment shifts the passenger rail alignment approximately 600 feet south of the school. The new alignment would rejoin the existing railroad corridor west of the school. Several neighborhoods north of the school are close enough that walking or biking to school is likely to occur, especially where no major roadways create barriers to non-motorized travel between these neighborhoods and W.W. Pinkerton Elementary. Students walking along Denton Tap Road would not cross the passenger rail alignment. Students walking from one neighborhood northwest of the school would cross the passenger rail line twice, once at Coppell Road and once at Southwestern Boulevard. Although the school attendance zone extends south of the Cypress Waters Alignment, no residential neighborhoods are located to the south.

No other Coppell schools that have attendance zones that cross the Build Alternative are likely to be affected by the Project because students are not likely to walk or bike to school. A future middle school site was identified off Van Zandt Drive south of the corridor, but its attendance zone has not yet been determined to assess potential effects resulting from the Project.

Carrollton/Farmers Branch ISD

Only one of the three elementary schools with a school zone that traverses the Build Alternative is likely to have students walk or bike to school and is anticipated to have moderate impact potential related to safety at these crossings. Carrollton Elementary is located just south of the Cotton Belt Project on the east side of Perry Road. The attendance zone for Carrollton Elementary largely extends to the area south of the Project, with one exception: students must cross the Project to walk or bike to school if they live in the Woodcrest Estates neighborhood, which is nestled to the north between the Cotton Belt Project and BNSF corridors. The school is located approximately 0.4 mile from the nearest entrance to the neighborhood on Cecil Drive off Perry Road North, and the only formal crossing near this neighborhood is located at Perry Road North.

All three middle schools have moderate impact potential related to safety at railroad crossings. DeWitt Perry Middle School is just across Perry Road from Carrollton Elementary and has the same access conditions as described above. Barbara Bush Middle School, in the city of Irving, is part of the Carrollton/Farmers Branch ISD and located south of the Cotton Belt Project on Cowboys Parkway at MacArthur Boulevard. The school's attendance zone encompasses areas both north and south of the Project. Two large apartment complexes lie just north of Belt Line Road and the Project, and are within one mile of the school, making it common for students to



walk or bike at this crossing. Ted Polk Middle School is located north of the proposed alignment and west of Kelly Boulevard. The attendance zone for this school extends south to Belt Line Road and west to Josey Lane. Most properties south of the Build Alternative are industrial or commercial; however, a few single-family and multi-family residences south of the corridor and Country Club Drive fall within the attendance zone. These properties are approximately 0.8 mile from Ted Polk Middle School, by way of Country Club Drive and the rail crossing at Kelly Boulevard.

One high school, Newman Smith High School, is located less than one mile north of the Build Alternative along Josey Lane and is anticipated to have a low potential for safety effects at Project railroad crossings. Students living in the neighborhood south of the alignment and east of Josey Lane would need to cross the Build Alternative as well as Keller Springs Road to access the school. Because these are older students, and the walking and biking distance would be approximately one mile, non-motorized travel is possible.

Richardson ISD

Two Richardson ISD schools are located in the North Dallas area with attendance zones that traverse the Build Alternative and are likely to have students crossing the proposed alignment. It is anticipated that the Build Alternative would have a moderate impact potential related to safety at Project railroad crossings of access routes for these schools. Brentfield Elementary and Parkhill Junior High are located southeast of the Cotton Belt Corridor on Brentfield Drive and Shadybank Road, respectively. The distance from Brentfield Elementary to the nearest neighborhood west of the Cotton Belt Corridor is approximately 0.6 mile along Davenport Road/Brentfield Drive. The distance from Parkhill Junior High across the street on Shadybank Road is approximately 0.7 mile. Apartments are located on the west side of the Davenport Road at-grade crossing, so it is likely that this route is used for walking and biking to the elementary and junior high schools serving the area. Along St. Anne Street and Campbell Road, the schools are also approximately 0.6 mile from another apartment complex, located just west of the Campbell Road grade crossing. This is also a likely pedestrian and bicycle route to school. The second Davenport Road crossing (north of Campbell Road) is approximately 0.8 mile from the schools and is in a single-family residential area. The route to the schools would require crossing both the Cotton Belt Corridor and Campbell Road. All walking/biking routes would occur along existing streets with new controlled crossings at the project alignment.

Prior to year 2010 when there was active freight, families and students were likely more aware of safety practices along the railroad corridor. Since freight has been abandoned, there will need to be renewed emphasis on rail corridor safety education for this area.

Plano ISD

Plano ISD schools with students likely walking or biking to school across the Build Alternative are Aldridge Elementary and Frankford Middle School. Although the attendance zone for Aldridge Elementary in Richardson crosses the alignment, it is anticipated that the Build Alternative would have low potential to affect safety along routes to this school (see **Table 4-2**). Students would not have to cross at-grade railroad crossings and would freely cross the proposed alignment at grade-separated crossings at Custer Road or Renner Road to walk or bike to the school.

Frankford Middle School is located in Dallas just north of the Build Alternative on Osage Plaza Parkway. A small portion of its attendance zone extends south of the Cotton Belt Corridor. This area consists primarily of multi-family residences, so it is likely that middle school students may walk or bike to school. On the eastern edge of the zone, Coit Road would be grade separated allowing an unrestricted crossing of the alignment. Two proposed at-grade rail crossings would provide access to the school from the south. The distance is 0.5 mile from the middle of the



neighborhood by way of Dickerson Street. The distance to the school is 0.7 mile for residences on the western side of the neighborhood, crossing at Meandering Way and using the pedestrian and bicycle path. The southwestern portion of this neighborhood also borders the Hillcrest Road and McCallum Boulevard rail crossings; however, it is not likely these crossings would be used to access the school. It is anticipated that the Build Alternative would have moderate potential for effects related to safety at access routes to Frankford Middle School.

Population Demographics

No effects to demographics are anticipated from the Project. Potential changes in existing demographics may occur; however, additional passenger rail service would not alone cause substantial changes to the demographics of any communities along the Project corridor as population changes depend on various economic and social factors independent of the Project. Although direct effects to population demographics are not anticipated, potential indirect and cumulative impacts are further discussed in **Section 4.22** of the DEIS and in the *Indirect and Cumulative Impacts Assessment and Mitigation Technical Memorandum* in **Appendix B**.

The Study Area also has areas of transportation-disadvantaged population, which are generally those without automobiles, minority, or low-income persons. Dallas County and Collin County have 29 percent and 24 percent minority populations, respectively. Dallas has 7 percent households with no vehicle available, while Collin County is lower, at 3 percent. In general, the Study Area has five pockets of transportation-disadvantaged populations. These are primarily in the Downtown Carrollton area, around Coit Road, northeast of UT Dallas, around 12th Street and near Shiloh Road. While the Environmental Justice discussion in **Section 4.9** provides a detailed assessment of potential effects on these populations, the Project would improve overall mobility for transportation-disadvantaged populations by providing another mobility option to the numerous employment centers along the corridor. According to NCTCOG, Study Area employment is anticipated to grow from 208,134 to 281,094 by year 2040. With transfers available from rail and bus at key locations along the corridor, overall access to jobs would be improved for people around the region.

Employment

Overall, employment would benefit from an additional method of transportation that the Project would provide for nearby businesses. Commercial displacements may result from the new alignment sections and proposed stations; however, no substantial adverse effects to employment are anticipated from the Project. The Project is anticipated to benefit employment by making locations along the corridor more desirable for businesses to locate.

A total of 65 major employers were identified, as shown on **Figures 3-12 through 3-15** in **Chapter 3**. Of these, approximately 10 are adjacent to the Build Alternative and several major employers would be within walking distance of a proposed station (one mile or less) and would benefit from having access to a rail station. None of these major employers would be displaced by the Project. In addition, access to their facilities would not be affected. Therefore, these major employers are not expected to be affected by the Project.

Construction of the Project will have direct and indirect employment effects in the local economy. Direct effects would result from construction labor; employment related to production of goods and materials for the project; and design, engineering and architectural services employment. Indirect (supplier) and induced effects would result from the “multiplier effect” of these expenditures in the local economy. There are several models or methodologies that can be used to estimate employment effects based on using multipliers and the project cost. The American Public Transportation Association (APTA) estimates approximately 24,000 jobs created per \$1 billion of capital spending. The current working estimate for the Project (excluding real estate, vehicles and unallocated contingency) is approximately \$1 billion;



therefore, about 24,000 jobs are estimated. Based on APTA's estimate, this can be expected to be split at about 8,200 direct, 7,900 indirect, and 7,700 induced jobs. As with all projects, duration of jobs would vary with some lasting months and others lasting years. After construction is complete, there would be permanent jobs created to operate and maintain the service, which would in turn have a multiplier effect on the local economy.

Economic Development

No adverse effects to economic development are anticipated from the Project. Economic development would likely benefit from the Project in accordance with local plans and policies. Potential development are anticipated at the DFW North, Cypress Waters, Downtown Carrollton, Addison, Coit Road, UT Dallas, and 12th Street stations. New alignment sections and new station locations may result in commercial displacements which are discussed in **Section 4.4**. These displacements, however, would not result in a substantial effect to the overall economy and economic development of the areas along the corridor.

4.3.2 Mitigation Measures

Potential impacts to the function of two community facilities (the Fairhill School and the UT Dallas Southwestern Clinical Center) were evaluated. Safety fencing will be provided to separate the corridor and proposed Preston Road Station from the Fairhill School property to mitigate potential access and safety impacts. Potential noise impacts to UT Southwestern Clinical Center will be mitigated through the implementation of quiet zones. A detailed vibration analysis will be done for the UT Southwestern Clinical Center, the Qorvo semiconductor facility and the Texas Instruments semiconductor facility during final design to determine if mitigation is required.

Two areas (Old Downtown Carrollton and North Dallas) were evaluated for potential impacts to community cohesion as a result of the Build Alternative. These impacts are not considered to be significant and would not require mitigation. DART will provide safe crossings at all existing streets currently crossing the Cotton Belt Corridor in these areas. Although not specifically a mitigation measure, DART's action to abandon freight traffic through the north Dallas part of the corridor in 2010 permanently removed freight traffic from North Dallas, thus reducing the possibility of increased train movements above proposed Cotton Belt operations and eliminating crossing events of longer durations.

The North Dallas Eruv could experience temporary adverse impacts as a result of the Build Alternative at Coit Road. As design progresses, utility poles at Coit Road may be relocated. Additional design and siting of any relocations may be necessary. DART will coordinate with the City of Dallas to minimize any effects and avoid any disruptions to the existing city ordinance. In addition, the affected community will be engaged during project design and construction to avoid and minimize impacts and to assist with proposed solutions. During construction, attempts will be made to avoid disruption on Sabbath days.

The following schools have been identified as having moderate potential for impacts related to safety at access routes to the school because their attendance zones cross the Build Alternative and offer pedestrian access between residential areas and the schools:

- W.W. Pinkerton Elementary
- Carrollton Elementary
- Barbara Bush Middle
- Ted Polk Middle
- DeWitt Perry Middle
- Newman Smith High
- Brentfield Elementary
- Parkhill Junior High
- Frankford Middle

Potential impacts to these schools will be mitigated through the addition of enhanced safety features in addition to the standard at-grade crossing elements. DART will provide mitigation and is considering such strategies as flashing signals, pedestrian gates, enhanced signage or



striping, and/or tactile strips which will be evaluated for feasibility and reasonableness as the project advances. Use of these additional features will be determined during final design in consultation with school districts.

In addition, DART has a comprehensive transit education program used at schools and other community organizations. DART will coordinate with schools and neighborhoods in the corridor to provide these education sessions prior to operations.

No impacts to demographics, employment, or economic development are anticipated; therefore, no mitigation is proposed. **Section 4.8** provides an assessment of public safety services.

4.4 Acquisitions and Displacements

This section describes the potential acquisitions and displacements associated with the No-Build and Build Alternative. This assessment is based on the draft 10 percent level of preliminary engineering. As such, it may be refined with additions or deletions as project design advances.

4.4.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no acquisitions or displacements would be necessary.

Build Alternative

Purchased in 1990, DART owns the existing Cotton Belt railroad corridor right-of-way, which is generally 100 feet in width. However, additional acquisition of land would be necessary at several points adjacent to the alignment. Acquisitions and displacements are impacts of the Project requiring mitigation in the form of compensation and in some cases relocation. **Table 4-3** summarizes the proposed acquisitions and potential displacements that would be anticipated for the Cotton Belt Project including alignment deviations, stations, and facilities. Some parcels to be acquired are owned by the cities, and were purchased by the cities to accommodate the project.

For partial acquisitions, only the portion of the parcel falling within the right-of-way footprint is assumed to be acquired. In cases where a parcel would fall completely within the proposed right-of-way footprint, or where the parcel remainder would be substantially small (such that the remaining portion of the parcel would have little to no value or use), a whole acquisition is assumed to occur. For whole acquisitions, the total parcel acres would be acquired. Refer to **Appendix B** for *Property Acquisitions and Displacements Technical Memorandum*. A discussion of the key acquisitions and displacements associated with the Project follows. Final determinations of partial or whole acquisitions are subject to negotiation and would be finalized during final design.

DFW Airport Connection

New track would need to be constructed next to the TEXRail alignment from DFW Airport Terminal B Station to the DFW Airport North Station. In order to extend the rail alignment from the DFW Airport Terminal B Station to the DFW Airport North Station, an additional 30 acres would be required. From DFW Airport North Station to realignment with the existing Cotton Belt rail line, approximately 10 acres would be required. An easement agreement with DFW Airport and TEXRail will be executed for the Cotton Belt alignment needs. Additional easement may be required for a parcel located west of the thru-platform. All affected parcels are owned by the City of Dallas and the City of Fort Worth as part of DFW Airport.



Table 4-3. Summary of Proposed Cotton Belt Acquisitions and Displacements

Alignment, Station, or Facility	Parcel Acres	Current Use	Partial Acquisition	Whole Acquisition	Potential Displacements
Alignment Deviations					
DFW Airport TEXRail Alignment	30 Acres	Commercial, Vacant, TEXRail	None; Public Mass Transit Easement	None; Public Mass Transit Easement	None
DFW Airport North	10 Acres	Commercial, Vacant Commercial, TEXRail	1 Parcel; Public Mass Transit Easement	None; Public Mass Transit Easement	None
Cypress Waters Alignment	22 Acres	Commercial, Vacant	14 Parcels	3 Parcels	5 Businesses, 1 Residence, 1 Vacant Building; Relocation of two Oncor towers
Downtown Carrollton Reconfiguration	2 Acres	Commercial, Residential, Vacant	5 Parcels	1 Parcel	1 Business
CityLine/Bush Alignment	9 Acres	Commercial, Highway, Industrial, Residential Multi-Family, Vacant	14 Parcels	1 Parcel	1 Business (Multi-Lease Building)
Alignment Deviation Totals	73 Acres	See Above	34 Parcels	5 Parcels	7 Bus.; 1 Res.; 1 Vacant Bldg.
Stations					
DFW Airport-North	Included in Alignment Deviation Section above				
Cypress Waters	Included in Alignment Deviation Section above				
Downtown Carrollton	2 Acres	Vacant	None	4 Parcels	None
Addison	None	DART property	None	None	None
Knoll Trail	None	DART property	None	None	None
Preston Road	None	DART property	None	None	None
Coit Road	13 Acres	Commercial	None	3 Parcels	1 Business
UT-Dallas	9 Acres	Vacant – UTD owned	None; Easement Agreement	None; Easement Agreement	None
CityLine/Bush	0.3 Acres	Vacant	None	1 Parcel	None
12 th Street	3 Acres	Commercial, Vacant	None	6 Parcels	1 Business
Shiloh	7 Acres	Electric Substation, Vacant	1 Parcel	1 Parcel	None
Station Totals	34 Acres	See Above	1 Parcel	15 Parcels	2 Businesses
Facilities					
EMF Site Option 1 (Luna Road)	53 Acres	Commercial	None	5 Parcels	None; oil and gas site would remain and access road would be revised
Mercer Yard	2 Acres	Commercial	4 Parcels	None	None
Facilities Total	55 Acres	See Above	4 Parcels	5 Parcels	None
Other Real Estate Needs					
Royal Lane Alignment	0.5 Acre	Commercial, Vacant Commercial	2 Parcels	None	None
Coit Road Grade Separation	0.07 Acres	Commercial	None; Easement Agreement	None; Easement Agreement	None
White Rock Creek Bridge Alignment	0.2 Acres	Commercial	None; Easement Agreement	None; Easement Agreement	None
Other Totals	0.77 Acres	See Above	2 Parcels	None	None
Totals					
Total Area	163 Acres		41 Parcels	25 Parcels	9 Businesses 1 Residence 1 Vacant Building

Source: Tarrant Appraisal District (TAD), Dallas Central Appraisal District (DCAD), Collin Central Appraisal District (CCAD); Geographical Information Analysis



Cypress Waters Alignment

There would be several partial and whole parcel acquisitions for the Cypress Waters alignment, which would also encompass the Cypress Waters Station (22 acres).

- As currently designed, three commercial properties on the north side of Southwestern Boulevard would require full acquisition due to new track placement through the properties. These include the acquisition of the northeastern portion of one business (Deep Forest Gallery) which may constitute an adverse effect to the business. Impacts to the two other parcels include the displacement of a rental residence and Soto Automotive. These acquisitions are due to displacement of buildings, loss of property, and loss of property access.
- Five partial acquisitions of non-developed commercial properties on the south side of Southwestern Boulevard would be required for new track placement.
- Two commercial properties (north of the alignment and east of South Belt Line Road and west of Sanders Loop) would be acquired for new track placement. While building displacements are not anticipated, as the Project is on aerial structure along the southern boundary of the parcels, more detailed design is needed to determine how fire lane and rear building access would be altered and if that affects the operation of the properties. Partial acquisitions would be necessary of the rear access area for retaining walls of the new track.
- Two commercial properties (south of the alignment and east of South Belt Line Road and west of Sanders Loop) would be affected by the Project due to new track placement through the properties. One commercial building that is currently vacant would be displaced and the full parcel would be acquired. A partial acquisition of a non-developed commercial property would also be necessary.
- Four commercial properties, all located south of East Belt Line Road and east of Sanders Loop, would require partial acquisition of non-developed properties.
- Up to two Oncor transmission towers would be repositioned within the station area.

Downtown Carrollton Reconfiguration

The reconfiguration of track in Downtown Carrollton would require partial or full acquisition of seven parcels (two acres). One of the parcels is owned by the BNSF with a small area needed for realignment of the BNSF and Cotton Belt rail. One business, Cedar Supply, would be displaced. There is one residential parcel in Woodcrest Estates that extends between the two railroad corridors. While a section of this parcel would be required, there would be no displacement of the residence.

CityLine/Bush Alignment

CityLine/Bush Alignment would require acquisition of nine acres. At Alma Road, a small area of Oncor property would be needed. East of Alma Road and west of US 75, four parcels would be affected requiring partial acquisitions. Of these four, two are multi-family properties. The Project alignment will be located along the northern undeveloped boundary of these properties. No adverse impacts will occur. A third undeveloped property is owned by Oncor and a small corner is required. No adverse effects will occur. The fourth property, also undeveloped, was previously purchased by the City of Richardson for the Project. East of US 75 and south of PGBT, one vacant parcel would be acquired from the City of Richardson. North of PGBT, the alignment would be located parallel to and west of the existing LRT line. Given right-of-way constraints, slivers of property would be required from several property owners. One apartment complex, Aura One 190, has an on-site walking path and sitting area that would be affected by track placement. DART will work with the property owner to reconfigure this area. Just north of this point, five parcels would be affected by track placement. One multi-leased building may be



displaced due to effects to rear building access; more detailed design is needed to determine how rear building access and fire access would be altered and if that affects the operation of the properties. Based on preliminary design, only partial acquisition is assumed. At this level of design, it is assumed that most partial acquisitions would not affect businesses.

Stations

Several stations would require property acquisition with limited displacements. Three stations, Addison, Knoll Trail, and Preston Road, would be located within the existing DART-owned railroad corridor and would not require additional property. Property for the DFW North Station and Cypress Waters Station is included in the alignment deviations discussed above. Total acquisitions for stations would be approximately 34 acres with displacements or special conditions at the following locations:

- Most of Downtown Carrollton real estate is included in the alignment deviation discussed above; however, four full parcels would be needed.
- Coit Road Station – This station would require the full acquisition of three parcels that would displace Adventure Landing amusement park. While only one full parcel is required for the proposed park-and-ride, its acquisition would impact business operations and thus the other two parcels are assumed for acquisition as well. Excess property could be used for construction staging, parking expansion or future TOD.
- CityLine Station – One parcel would be acquired from the City of Richardson.
- 12th Street Station – Six parcels would be required for this station, four of which are owned by the City of Plano. One parcel acquisition would result in the displacement of a business.
- Shiloh Road Station – The City of Plano owns the parcel proposed for the park-and-ride lot. DART will need to negotiate an easement with Oncor to provide access from the parking lot to the platform.

Facilities

EMF Site Option 1 (Luna Road) would require acquisition of 53 acres of currently vacant land. The design of this EMF option was integrated with the City of Carrollton's thoroughfare plan which includes plans for a street through the northern portion of the property. An existing oil and gas use is located in the far southwest corner and would be maintained with a revised access road. Another site option is also being considered (see **Section 2.3.4**) with the ultimate location to be included in the FEIS/ROD.

Mercer Yard would be relocated to property currently owned by DART but would require use of four additional parcels (two acres). Partial acquisition of the parcels would be required to accommodate alignment for the yard. Three of the properties are commercial and are located along an industrial rail spur. The City of Carrollton owns the fourth property which houses their public water storage tanks.

Other Real Estate Needs

East at Royal Lane, portions of two additional parcels would be needed for a slight revision to the alignment to accommodate freight connections and the crossing under IH 635. One of these properties is vacant and the other is a Park and Fly lot; however, no displacements are anticipated.

Approximately 0.20 acres of the southeastern edge of the Clubs of Prestonwood golf course may be required for construction of retaining walls for the relocated White Rock Creek Bridge for use as a pedestrian trail (see **Sections 4.5** and **4.22** for additional information). Additional



design refinement may allow all construction to occur within the existing right-of-way. This land is not used for recreational purposes.

Construction of the Coit Road overpass would affect an access road to a Dallas Water Utilities property in the northeast corner. A modified easement with the Highland Springs Retirement Community would be needed to modify access to this site.

4.4.2 Mitigation Measures

DART's intent is to refine the design as the project advances, with one focus being to reduce or eliminate property acquisitions and displacements to the extent reasonably feasible.

DART will work with affected property owners and businesses as the Project advances in regard to business and property impacts.

All acquisition of property will adhere to the DART Board of Directors' Real Estate Policy and Procedures, adopted August 25, 1987, and modified in October 2000. These policies and procedures adhere to all federal guidelines regarding acquisition and relocation assistance including the Uniform Relocation Assistance and Real Property Acquisition Policies Act (URA) of 1970 (42 USC § 4601 et seq.). For all real property acquired, DART compensates the property owner for the fair market value of their property and for damages to any remaining parcel(s). Any real estate donations will be appraised by an independent appraiser to determine the fair market value of the property. This fair market value will be made available to the property owners per federal regulation.

Relocation benefits are provided for all businesses and residents (owner occupants and tenants) that are displaced by acquisition. The Project would displace one residence on a commercial lease property. Prior to the relocation of businesses, DART staff will prepare a relocation analysis that determines the availability of suitable locations or facilities for displaced businesses. The relocation benefits and services provided to those displaced are determined by eligibility guidelines based on Federal policies. For businesses, these generally include reimbursement of moving expenses and advisory assistance in locating a replacement site.

The URA, as amended, provides benefits to homeowners, businesses, community facilities, and farm operators resulting from acquisition. According to 49 CFR Part 24.205(A)-(F), relocation planning and services would be provided to businesses. These relocation services include the following:

- site requirements, current lease terms, and other contractual obligations
- providing outside specialists to assist in planning and moving, assistance for the actual move, and the reinstallation of machinery and other personal property
- identification and resolution of personal property/real property issues
- an estimate of time required for the business to vacate the site
- an estimate of the anticipated difficulty in locating replacement property
- an identification of any advance relocation payments required for the move

DART has also established guidance for acquisitions and displacements in the *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*, 2016.

The use of DFW Airport land needed to build and operate the Build Alternative would be gained through a Public Mass Transit Easement agreement between DART and DFW Airport. DFW Airport will be compensated fair market value for the use. A release from federal obligations and land use requirements would not be anticipated.



4.5 Parks and Recreation Facilities

4.5.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no direct or proximity impacts to parks or recreation facilities will occur.

Build Alternative

With implementation of the Project, there could be impacts to parks and recreational facilities. There are two types of impacts that can affect parkland:

- Direct impacts are those that will occur from acquisition of park property or the location of a transportation system element on park property; and
- Proximity impacts are those which arise from some feature or operation of a transportation system element.

Examples of proximity impacts are noise or vibration, changes in the visual environment, or changes in access. Where proximity impacts occur, an evaluation must be made as to whether the impact is of sufficient magnitude to substantially impair the activities of the resource.

There are 39 public parks, trails, and recreation areas within the Study Area. These parks are discussed and shown on **Figures 3-16 through 3-19** in **Section 3.4**, as well as in the Existing *Parks and Recreational Facilities Technical Memorandum* in **Appendix B**. Seven are adjacent to the Cotton Belt Corridor and four are nearby that were determined to be impacted by train horns (see **Section 4.14** for institutional noise impacts). **Section 4.22** (Section 4(f) and 6(f) Evaluation) provides evaluations of the assessment of two 4(f) properties used by the Project, which include the historic White Rock Creek Bridge, and one recreational facility, the Spring Creek Trail in Richardson. The following is a summary of the results of the direct and proximity impacts analysis for the remaining eleven park and recreation facilities. An assessment of potential impacts is listed below.

Although a small area (approximately 8,000 square feet) of Clubs of Prestonwood property would be required, impacts to the private recreational facility have been avoided. DART will obtain an easement for the area needed for bridge placement. The required property is not used for recreational purposes. The club currently has a license agreement to operate a golf cart path under the existing White Rock Creek Bridge. This path will be maintained with the new bridge structure for the Build Alternative. The relocated White Rock Creek Bridge will also span this path.

Grapevine Creek Park

This City of Coppell-owned park is located at 600 Moore Road. Currently, this parkland is undeveloped. Approximately 2,290 feet of the park's southern boundary is adjacent to the Cotton Belt alignment.

- Land Acquisition – There would be no land acquisition from Grapevine Creek Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – There are no noise or vibration impacts projected for this park.
- Visual – This undeveloped park is adjacent to an active freight rail alignment. The addition of passenger rail service for the Project would not change the use of the area. There would be an increase in frequency of passing railcars, but the railcars would be expected to travel faster than the existing freight trains. Since there is existing rail activity adjacent to Grapevine Creek Park, and the exposure time of additional railcars to recreational users is short, impacts to visual and aesthetic resources are expected to be minimal.



McInnish Park Sports Complex

This City of Carrollton-owned facility is located at 2340 Sandy Lake Road. Approximately 2,485 feet of the southern edge of this park borders the Cotton Belt alignment. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from McInnish Park Sports Complex.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – There are no noise or vibration impacts projected for this park.
- Visual – The visual and aesthetic resources at the park include sports fields and trails. Sports fields are currently adjacent to the active freight rail alignment in this area. The visual impact would be related to the increase in train frequency over what is experienced now. As the duration of exposure to railcars would be short, no significant impacts to visual resources would be expected by the Project.

Gravelly Park

The City of Carrollton's Gravelly Park is located at 1508 North Perry Road. Approximately 980 feet of the northern edge of the park is adjacent to the Cotton Belt alignment. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Gravelly Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – There is a severe noise impact projected for this park due to train horn noise. No vibration impacts are projected.
- Visual – The visual and aesthetic resources at this park include walking paths. With the Build Alternative, park users would be exposed to more frequent railcars on the tracks over the existing condition. The railcars for the Project would travel at a faster speed than the freight rail cars, so the duration of exposure to passenger railcars would be lower. The visual impact would be related to the increase in train frequency over what is experienced now. As the duration of exposure to railcars would be short, no significant impacts to visual resources would be expected with the Project.

Hutton Branch Green Trail

A portion of the Green Trail is located in Downtown Carrollton and crosses the Cotton Belt right-of-way. The trail follows a creek and active rail corridor through Carrollton. The trail, portions of which are also known as the Purple Trail and Green Trail, connects residents with parks and the city's DART Green Line LRT station.

- Land Acquisition – There would be no land acquisition from the trail.
- Access – Entry to the trail would not be restricted. Temporary access may be restricted during construction.
- Noise and Vibration – There are no noise or vibration impacts projected for this trail.
- Visual – The visual and aesthetic resources at this trail include walking paths. With the Build Alternative, trail users would be exposed to more frequent railcars on the tracks over the existing condition. Duration of exposure to passenger railcars would be lower than the freight railcars. The visual impact would be related to the increase in train frequency over what is experienced now. As the duration of exposure to railcars would be short, no significant impacts to visual resources would be expected with the Project.



Keller Springs Park

Keller Springs Park is a City of Dallas-owned park located at 5710 Keller Springs Road. Approximately 1,280 feet of the southeastern edge of this park borders the Cotton Belt Project. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Keller Springs Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – There are no noise or vibration impacts projected for this park.
- Visual – White Rock Creek and a community park are the primary visual and aesthetic resources. This park is adjacent to an existing, inactive freight rail alignment in this area. The visual impact would be related to the increase in train frequency. As the duration of exposure to railcars would be short, no significant impacts to visual resources or park users would be expected with the Project. Furthermore, this park is heavily wooded with a creek paralleling the corridor. Existing vegetation will be retained to the greatest extent feasible to retain existing visual screening.

Trafalgar Square Park

This private park is located within the Trafalgar Square residential development in Carrollton on the border with the Town of Addison, located off San Sebastian Drive. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Trafalgar Square Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – A severe noise impact is projected at this park due to train horns at Marsh Lane. Due to the short duration of the train passing by the park, a substantial negative effect on the park, park function or park characteristic is not anticipated. No vibration impacts are projected for this park.
- Visual – This park is in a fenced area, adjacent to an existing freight rail alignment. No significant impacts to visual resources or park users would be expected with the Project.

Beckert Park

This Town of Addison-owned park is located at 5044 Addison Circle Drive. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Beckert Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – A severe noise impact is projected at this park due to train horns at Quorum Drive. No vibration impacts are projected for this park.
- Visual – The park features a lighted walkway, park benches, and landscaping. The park is located within an urban area approximately 500 feet from the Addison Transit Center and the Project. No significant impacts to visual resources or park users would be expected with the Project.

Addison Circle Park

This Town of Addison-owned park is located at 4970 Addison Circle Drive. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Addison Circle Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – A severe noise impact is projected at this park due to train horns at Quorum Drive. No vibration impacts are projected for this park.
- Visual – The park features a pavilion, restrooms, public display fountains, water features, two stages, and benches. The park is located within an urban area approximately 500 feet



from the Addison Transit Center and the Project. No significant impacts to visual resources or park users would be expected with the Project.

Preston Green Park

This City of Dallas-owned park is located at 6900 Duffield Court. Over 840 feet of the southeastern edge of Preston Green Park is adjacent to the Cotton Belt alignment. An assessment of potential impacts is listed below:

- Land Acquisition – There would be no land acquisition from Preston Green Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – A severe noise impact is projected at this park due to train horns at Hillcrest Road. The noise impact may affect areas dedicated to passive recreation. No vibration impacts are projected for this park.
- Visual – This park contains a playground, basketball court, walking trails and benches and is adjacent to an existing, inactive freight rail alignment. The visual impact would be related to placement of new safety fencing along the park boundary. In addition, there would be an increase in train frequency over what is experienced now. As the duration of exposure to railcars would be minimal, no significant impacts to visual resources would be expected with the Project.

CityLine Park

This City of Richardson park is within the CityLine mixed-use development. Approximately 260 feet of the northwestern edge of this park would border the proposed Cotton Belt alignment. This park is adjacent to the DART's Light Rail Red Line and near the CityLine/Bush Station. The addition of regional rail service would not change transit use of the adjacent area, but the frequency of service would increase.

- Land Acquisition – There would be no land acquisition from CityLine Park.
- Access – Entry to the park would not be restricted.
- Noise and Vibration – There are no noise or vibration impacts projected for this park.
- Visual – The visual and aesthetic resources at this park include trails. This park is within a mixed-use development adjacent to an existing light rail corridor and station. The park is within an urban area and the addition of regional rail service would not be expected to cause a significant impact to visual resources.

Spring Creek Trail

One trail (Spring Creek Trail) will require partial relocation within the right-of-way DART will be acquiring for the CityLine/Bush alignment. Compliance with Section 4(f) and Chapter 26 of the Texas Parks and Wildlife Code would be followed. Additional information on this trail can be found in **Section 4.22**.

4.5.2 Mitigation Measures

A new bridge structure and relocated White Rock Creek Bridge would span the Clubs of Prestonwood golf cart path to avoid impact to the recreational facility. Noise impacts projected for Preston Green Park, Gravelly Park, Trafalgar Square Park, Beckert Park, and Addison Circle Park will be mitigated by implementation of quiet zones. Corridor landscaping will be continued along Preston Green Park to soften views of the proposed safety fencing and be consistent with adjacent residential areas. Mitigation for direct impacts to Spring Creek Trail are addressed in **Section 4.22**. No other impacts are anticipated which could result in constructive use of features and attributes to parkland or recreational facilities along the Cotton Belt Project. No other mitigation is necessary.



4.6 Cultural Resources

4.6.1 Impact Evaluation

The Cotton Belt Project is subject to compliance with the National Historic Preservation Act (NHPA) of 1966, Section 106 (54 USC § 306108 et seq.) and its implementing regulations (36 CFR 800). Specifically, Section 106 of the NHPA requires that the responsible Federal agency to take into account the effects of its actions on historic properties, which are properties listed in or determined eligible for listing in the National Register of Historic Places (NRHP), and provide the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking.

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no impacts to historic or archeological resources in the Study Area will occur.

Build Alternative

Archeological Resources

According to the Texas Archeological Sites Atlas (Atlas), 45 previous surveys have been conducted within one kilometer (0.62 mile) of the alignment. None of these sites would be disturbed by the current Project.

Three newly recorded archeological sites were discovered in the DART right-of-way:

- A historic-age domestic and agricultural site is located near the proposed Cypress Waters Alignment. Within the current APE, the site is recommended as not eligible for listing in the NRHP and no further archeological work is necessary. The resource would not be disturbed by construction activities and would not be affected by the Project.
- An early- to mid-20th Century historic site containing scattered remnants of houses is located the vicinity of the 12th Street Station. Although several features were identified within the site, artifacts are sparsely scattered; the bulk of material was scraped and removed from the site during demolition in the mid-1990s. The site was recommended as not eligible for listing in the NRHP and no further potential work is recommended at this site.
- A railroad section foreman's house most likely constructed by the St. Louis, Arkansas, and Texas Railway in the 1880s, was discovered in the vicinity of the proposed 12th Street Station. The resource would not be disturbed by construction activities and would not be affected by the Project.

If archeological resources are discovered during construction, all construction activities will cease in the area and be monitored by a certified historian or archeologist. Work will not proceed until additional review and clearance by the THC has been completed.

One area that would require additional testing prior to construction is where there may be relocation of Oncor towers. Relocation of two towers is proposed for the Cypress Waters alignment. Additional design and siting of the relocated towers is necessary before additional archeological efforts can begin. This is proposed to occur during final design efforts. Detailed documentation and evaluation of archeological properties are provided in the *Archeological Resource Survey* in **Appendix B** for additional information.

Non-archeological Historic Resources

Historic resources that are within the APE, but outside the current railroad right-of-way, will not be affected by the Project (see **Appendix B** for *Historic-age Resource Survey – Station*



Locations). Furthermore, historic resources within the right-of-way and adjacent to the tracks would not be affected by the Project, except for one resource, White Rock Creek Bridge, which, is recommended eligible for listing in the NRHP and located on the corridor. Review of the proposed actions for this Project has determined that there would be an adverse effect per the 106 regulations to this resource. FTA determined and the SHPO concurred that the current proposal of relocating and reusing the White Rock Creek Railroad Bridge has an adverse effect to this eligible historic resource and requested a draft Memorandum of Agreement (MOA) or any revised proposal be submitted to continue the Section 106 review and consultation process (**Appendix G**). THC concurrence was received on December 21, 2017 for the *Historic-Age Resources Determination of Effects Report of the Cotton Belt Corridor*, Tarrant, Dallas, and Collin Counties (FTA/106/THC Tracking #201708924). A draft MOA identifying steps to minimize harm to historic and archeological resources has been prepared between the THC, FTA and DART to document the measures and review process for the White Rock Creek Bridge. The MOA also details the actions to be taken by DART if an unanticipated discovery of resources is made during construction. The Draft MOA is included in **Appendix I**. On February 26, 2018, the FTA Region 6 office informed the Advisory Council on Historic Preservation (ACHP) of the adverse effect on White Rock Creek Bridge and invited them to participate in the MOA. The ACHP declined to participate in a letter to DART on March 5, 2018.

White Rock Creek Bridge is located northeast of the proposed station at Knoll Trail and spans White Rock Creek and a golf course cart path for the Clubs of Prestonwood. It was constructed in 1917. The bridge is a single span Warren with vertical pony truss manufactured by the American Bridge Company, organized by J.P. Morgan and Company in 1900. The bridge, which is currently part of the Cotton Belt Rail Line, is proposed to be removed and relocated to an area approximately 30 feet northeast of its current location within the Project right-of-way (see **Section 4.22**). Currently, the bridge is a single-track truss bridge which has been in disuse, unmaintained for approximately 30 years and showing signs of deterioration.

Maintaining the bridge in its current location would introduce new constraints for the Project. In order to bypass the eligible bridge, track geometry on the Project would need to be altered, and could introduce new issues, such as alteration of the flood plain with fill material and creation of drainage flow and stabilization issues to the existing earthen berms. Moreover, leaving the bridge in its existing location and not using the structure, provides the potential for continued degradation and vandalism. Relocation of the bridge within the DART right-of-way for continued transportation use as part of the proposed Cotton Belt Regional Trail provides an opportunity to optimize the project design and rehabilitate and reuse this resource.

Consultation with the THC and consulting parties will be ongoing to identify additional measures to minimize and mitigate the effects to the White Rock Creek Railroad Bridge (see **Appendix I**).

Four additional resources were recommended eligible or were previously found to be eligible for listing in the NRHP: Carrollton Depot, Addison State Bank, Hayes Dam and Old City Cemetery/LA Davis Cemetery (see **Table 4-4**). The cemetery was removed from the APE during further assessment because the Project is proposed to follow the CityLine route deviation alignment south of the existing corridor which avoids the cemetery. No effects were determined for these resources.

These eligibility determinations were submitted to the SHPO for review and concurrence. SHPO concurred with the determinations on December 21, 2017. Detailed documentation and evaluation of historic properties for NRHP eligibility are provided in the *Historic-age Resource Survey Report* in **Appendix B**. Agency coordination and consultation are provided in **Appendix G**.



The Carrollton Crossing Depot is located on Denton Drive at the railroad tracks in the DART station parking area in the proposed Cypress Waters alignment. The depot was constructed in 1925 and served the three railroads that came through Carrollton (City of Carrollton, 2017) and was recommended eligible under Criterion A for its association with early railroads and the development of Carrollton, and Criterion C as an example of a 1920s railroad depot in the 2013 survey effort. In addition, the depot was recommended as a contributing resource to a potential Cotton Belt Historic Railroad Thematic Corridor. As part of a MOA between DART and the THC in 2013, the Carrollton Depot was relocated to its current site and rehabilitated by DART (DART, 2013).

The Addison State Bank is located at 4803 Broadway in Addison, Texas, in the proposed Cypress Waters alignment. The bank was previously designated a Registered Texas Historical Landmark (RTHL) in 1984 (**Figure 3-20**) and was recommended eligible for the NRHP under Criterion A, as a building associated with a pattern of early community development in Addison. The building was constructed in 1913 to house the Addison State Bank, which had been organized the previous year to serve the new railroad community of Addison. The Addison State Bank is one of the few remaining structures from the original town (THC, 1984).

The Hayes Dam is in Richardson at Spring Creek in the proposed Cypress Waters alignment. The function of the dam is unknown, but it is mentioned in several deeds as a parcel boundary and transferred property. While the dam is heavily eroded, it once had two eight-foot tall wing walls on either side of an eight-foot spill way. It was recommended NRHP eligible under Criterion C.

4.6.2 Mitigation Measures

Table 4-4 provides a summary of the historic and archeological resources impacts and mitigation measures. The Section 106 process requires that efforts be made to resolve any adverse effects, which include visual impacts, to historic or archeological resources. Coordination with the Texas Historical Commission (THC) will be ongoing throughout the process.

DART proposes to replace the existing NRHP eligible White Rock Creek Railroad Bridge with a new bridge which will accommodate a double track structure, in order to provide a safe and reliable operation for the proposed passenger train. The NRHP eligible bridge will be relocated over the same creek to an area approximately 30 feet northeast of its current location within the Project right-of-way, thus allowing the existing structure to be reused as a pedestrian/bike trail bridge for the proposed Cotton Belt Regional Trail. Converting the bridge from a rail transit resource to a pedestrian transportation resource would extend its life and could provide further opportunities for interpretation of the history of the bridge.

Alterations to the White Rock Creek Railroad Bridge would consist of replacing the rail tracks with wooden timber decking, which would provide a safe platform for pedestrians to cross. Additionally, steel handrails are proposed to be installed along the length of the bridge, providing safety for pedestrians. The Warren Truss element will be preserved.

No other alterations are anticipated for the existing bridge structure. New concrete abutments and piers will be constructed for the relocated bridge support foundation and new retaining walls will also be constructed from the abutments along the creek for earth retainage. Final designs for the proposed alterations will be coordinated with the SHPO, prior to any movement to relocate the bridge in its new location. All proposed alterations will adhere to the Secretary of the Interior's Standards for the Treatment of Historic Properties (Weeks and Grimmer 1995). DART will coordinate all bridge activities (relocation process, and bridge maintenance) with the SHPO.



Table 4-4. Summary of Historic and Archeological Resources Impacts and Mitigation Measures

Resource	Project Effect	Mitigation Measure
White Rock Creek Bridge	Adverse Effect	Bridge will be shifted approximately 30 feet north within DART right-of-way to use as part of a future proposed pedestrian/bike trail. See Section 4.22 for additional mitigation measures. A draft MOA has been developed between FTA, THC and DART.
Hayes Dam, Carrollton Depot, Addison State Bank, Farmstead site in Cypress Water alignment	No Effect	No mitigation is necessary as the Project will have no effect on the resources.
Old City Cemetery/L.A. Davis Cemetery (Removed from APE)	No Effect	No mitigation is necessary as the Project will have no effect on the resource. The SHPO concurred that the proposed Cotton Belt Rail Project will have no effect on the cemetery. As a result of SHPO concurrence, DART has executed a deed transfer from the current DART right-of way, next to the cemetery, to the Old City Cemetery/L.A. Davis Cemetery, in order to protect and avoid potential ground disturbance, which may uncover the presence of any unrecorded burials (see Appendix G for SHPO concurrence).
Foreman's house (near 12 th Street Station)	No Effect	No mitigation is necessary as the Project will have no effect on the resource. The SHPO concurred that the Cotton Belt Project and 12 th Street Station development will have no effect on the foreman's house. Additionally, the foreman's house was removed from the APE (see Appendix G for SHPO concurrence).
Early- to mid-20 th Century historic site (at 12 th Street Station)	No Effect	Although several features were identified within the site, artifacts are sparsely scattered; bulk of material was scraped and removed from the site during demolition in the mid-1990s. However, if buried cultural materials are encountered during construction or disturbance activities, work will cease in the immediate area.
Archeological Resources	No impact	Archeological testing is recommended for the Oncor transmission tower relocations at the Cypress Waters alignment. Additionally, archeological testing is recommended if any changes to the right-of-way will occur.

Source: GPC6 Team, THC

The relocation and minor alterations of the White Rock Creek Railroad Bridge would not adversely affect the historic integrity of the resource because the NRHP eligible bridge would retain its design, setting, workmanship, feeling and association and the majority of its materials. The White Rock Creek Railroad Bridge would also retain its use as part of a transportation corridor. **Section 4.22** provides evaluation under Section 4(f) and additional information on the relocation of White Rock Creek Bridge.

Coordination and Consultation

FTA initiated cultural resources consultation in June 2010 and held an Agency Scoping Meeting in July 2010. The THC was consulted and letters were sent to representatives of four Native American tribes (The Caddo Nation, The Comanche Nation, The Tonkawa Tribe, and The Wichita and Affiliated Tribes). When the Project was reinitiated in 2017, this coordination was



also reinitiated. In February 2017, letters seeking consultation on cultural resource were sent to THC and the four tribes noted above. The Native American tribes have not responded to the letters, and coordination with THC is ongoing. Copies of these letters are included in **Appendix G**.

4.7 Visual and Aesthetic Conditions

4.7.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no impacts to visual and aesthetic conditions in the Study Area will occur.

Build Alternative

Because the Project is consistent with the current and historical use of the Cotton Belt right-of-way as a transportation corridor, and because visual elements associated with the railroad contribute to the overall visual quality and affect the visual sensitivity of the corridor, minimal visual impacts would occur from the proposed Project, the alignment already exists in most cases.

To assess the potential visual and aesthetic impacts of the project, each of the visual units described in **Section 3.6** were analyzed. Visual receptors and assets were assessed to determine which project characteristics would potentially have an impact, including:

- Station areas, including platforms, bus transfer areas, and parking lots
- Elevated structures or bridges
- Other vertical elements, such as poles, light standards, walls, and safety fencing
- Rail facilities such as the EMF and relocated Mercer Yard

Design and construction of the Cotton Belt Project would result in some visual impact with the introduction of new visual elements. Where potential impacts are identified, mitigation measures are proposed. These measures are intended to be consistent with those used in other parts of the DART system and would be consistent with design criteria related to landscaping and lighting for new visual elements at the Cypress Waters, Knoll Trail, Preston Road, Coit Road, UT Dallas, 12th Street, and Shiloh Road stations. In addition, each station would utilize an Art and Design program that would include community input, and selection of colors, finishes and materials complementary to the setting.

Design elements of the Cotton Belt Project (materials, brands of vehicles, colors, etc.) have yet to be determined; therefore, the following assessment of effects is based on typical design features. The Cotton Belt Project would be generally compatible with the character of the roadways, commercial/industrial, and residential areas within the Study Area. The majority of the Project would occur within the existing freight rail corridor. The visual character of the area would not change; however, the frequency of trains would increase. As the passenger railcars would travel more quickly than the freight railcars, the duration of exposure would be limited and potential privacy impacts would be minimal.

Table 4-5 presents the assessment of the visual units and indicates whether the impacts are potentially significant. Following the table, a discussion is provided with more information on the potential impacts for each section.



Table 4-5. General Rating of Corridor Visual Assessment Sections

Unit	Name	Primary Viewers*	Sensitive Receptors/Assets	Vertical Elements	Impacts
1A	DFW Airport to South Belt Line Road	A, E, H	None	Aerial structure over SH 114	Not Significant
	DFW North Station	A, E, H	None	N/A	Not Significant
1B	South Belt Line Road to Coppell/ Carrollton city limits	A, C, D, F	Riverchase Golf Course, RJ McInnish Park, and residences	Aerial structure over South Belt Line Road	Not Significant
	Cypress Waters Station	A, F	None	N/A	Not Significant
2A	Coppell/Carrollton city limits to Kelly Boulevard	A, B, C, E, F, G	Carrollton Heights Historic District and residences, Old Downtown Carrollton, Historic Depot	Elevated crossing over Elm Fork; elevated structure over BNSF	Not Significant
	EMF Site Option 1 (Luna Road)	A, H	Church	N/A	Not Significant
	Downtown Carrollton Station	A, E, F, G	Carrollton Heights Historic District and residences, Old Downtown Carrollton, Historic Depot	N/A	Not Significant
	New Mercer Yard	D	Maridoe Golf Club	N/A	Not Significant
2B	Kelly Road to Dallas North Tollway	A, B, C, D, E, G	Wheeler Bridge and residences	Grade separation over Midway Road	Potentially Significant
	Addison Station	A, C, D, E, G	Addison Circle Park	N/A	Not significant
3A 3B	Dallas North Tollway to Dallas/Richardson city limits	A, B, C, D, E, G	Keller Springs Park and Prestonwood County Club, Preston Green Park, Fairhill School/playgrounds, and residences	Grade separation at Custer Road, Coit Road bridge over Cotton Belt, noise walls	Potentially Significant
	Knoll Trail Station	A, C, E	Residences	N/A	Not significant
	Preston Road Station	A, B, H	Fairhill School and residences	N/A	Potentially significant
	Coit Road Station	A, B, C	Residences	N/A	Not significant
	Dallas/Richardson city limits to Shiloh Road in Plano	A, C, E, F, G, H	Spring Creek, green space, and residences	Grade separation over Spring Creek and US 75; elevated structure at Plano Pkwy.	Potentially Significant
	UT Dallas Station	A, C, D, G, H	Residences	N/A	Not significant
	CityLine/Bush Station	C, E, G	Residences	N/A	Not significant
	12 th Street Station	A, B, F	Residences	DART Red Line elevated LRT Station	Potentially significant
	Shiloh Station	A, E, F	Residences	N/A	Not significant

*Primary Viewers: A= Motorist; B= Single-Family Resident; C= Multi-Family Resident; D= Recreational Users; E= Commercial/Office Tenants; F= Industrial Tenants; G= Pedestrians; H= Others

Source: GPC6, 2017



Unit 1 – DFW Airport to Coppell/Carrollton City Limits

The majority of track alignment through Unit 1 would utilize the existing freight rail alignment. Double tracking or areas of new track (at the Cypress Waters alignment deviation) would typically be at ground level except for grade separations.

Section 1A

Section 1A extends from the DFW Airport to South Belt Line Road in the City of Coppell. As it crosses SH 114, the vertical alignment would be elevated on an aerial structure; this is currently under construction as part of the TEXRail Project. The profile would gradually descend as it approached the proposed DFW North Station. Visual impacts would not be significant due to low visual quality and low visual sensitivity.

DFW North Station

The proposed center platform station would be located north of the existing DFW Airport in a currently undeveloped location. Elevated highways are visible in the distance. The area is primarily industrial and visual impacts at this area would be viewed primarily by travelers. Visual impacts are not significant.

Section 1B

Section 1B extends from South Belt Line Road to the Coppell and Carrollton city limits. The vertical alignment in this section would be at grade until it crosses over South Beltline Road, where the commuter tracks would be on a grade separated bridge that resumes at grade before the Cypress Waters Station. The visual quality of this area is low overall, although it contains parks and adjacent residential areas north of the right-of-way. Visual sensitivity is low due to the current freight railroad and traffic. Visual impacts of the elevated structure are not significant to motorists and commercial and office tenants due to low visual quality and low visual sensitivity.

Cypress Waters Station

The side platforms for this proposed station would be located on newly constructed tracks between North Lake and East Belt Line Road at the Belt Line Trade Center. Views of residential areas are obstructed here from dense tree cover provided by Grapevine Creek, utility lines, and the industrial property northwest of the proposed station. Visual impacts due to construction of the proposed station are not expected to be significant due to the otherwise industrial character of the area.

Unit 2 – Coppell/Carrollton City Limits to the Dallas North Tollway

The majority of track alignment through this section would utilize the existing freight rail alignment. Double tracking would typically be at ground level with minimal visual impact except for where grade separations would be located over the BNSF.

Section 2A

Section 2A extends from the Coppell and Carrollton city limits to Kelly Boulevard in the City of Carrollton. The vertical alignment is elevated over the second crossing of Elm Fork. The profile is also elevated at its crossing of the BNSF Madill Subdivision tracks. Here, the existing IH 35E frontage roads and Belt Line Road are elevated to grade separate from the Cotton Belt and BNSF tracks, which allows the tracks to remain at grade. Residential neighborhoods are adjacent to the right-of-way. A noise wall is proposed along a significant stretch of this corridor (see **Section 4.14**), introducing a new visual element. This historical use of the Cotton Belt right-of-way as a transportation corridor and the visual elements associated with the current freight operations contribute to the overall moderate visual quality within the unit. Visual impacts would not be significant due to moderate visual quality and low visual sensitivity.

Equipment Maintenance Facility (EMF)

Two site options are included in this DEIS for the EMF (see **Section 2.3.4**). Visual impact of Site Option 1 (Luna Road) would not be significant due to the industrial setting of the area. A church is located south of the EMF site, separated by a six-lane divided roadway. Site Option 2 (Irving Yard) is an existing facility in a largely industrial area so no impacts are expected.

Downtown Carrollton Station

Visual impacts at this station are expected to be limited because the center platform would be located along the existing freight rail alignment immediately north of the existing park-and-ride lot and east of the aerial Green Line and Downtown Carrollton LRT Station. The Carrollton Heights Historic District and the historic Carrollton Depot are located east and north of the proposed station, respectively. This station would become an integral part of the area and continuity of the existing and proposed land uses would not result in visual impacts.

Mercer Yard

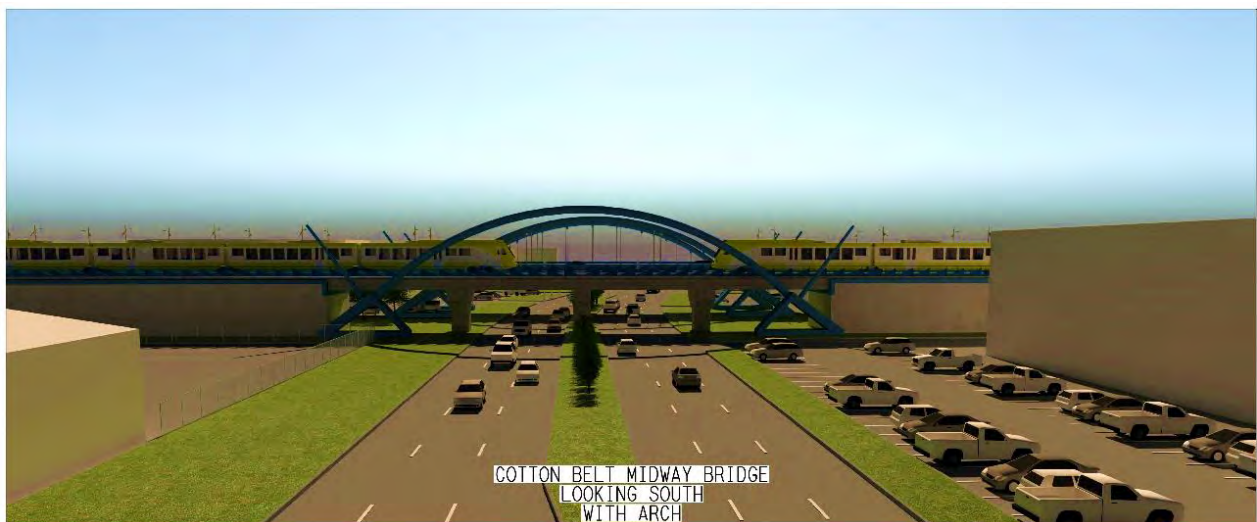
Visual impacts at this facility would not be significant due to the industrial setting. The Maridoe Golf course is located to the north of the proposed facility and there is existing vegetation that serves as a buffer from the Project.

Section 2B

Unit 2B extends from Kelly Boulevard to the Dallas North Tollway. The profile in this section would be elevated at its crossing over the unnamed tributary of the Hutton Branch as well as at Midway Road, before returning at grade as it approaches the proposed Addison Station. Single-family, and multi-family residential developments are located north of the Project.

The Wheeler Bridge on Arapaho Road over Midway Road in Addison, a local landmark and award-winning bridge, is visible from motorists and surrounding offices and residences. The elevated rail alignment in this area would alter views of this bridge, possibly resulting in visual impacts which has been a noted concern of the Town of Addison. **Figure 4-1** illustrates a conceptual design of a complementary structure.

Figure 4-1 Complementary Designed Structure Adjacent to Wheeler Bridge over Midway



Addison Station

The Addison Station side platforms would be located adjacent to the existing Addison Transit Center. The station area is surrounded by mixed-use developments and Addison Circle Park. It



is not expected to have any significant visual impacts as it will be an integral part of the urban fabric of this area.

Unit 3 – Dallas North Tollway to Shiloh Road

The majority of the alignment through Section 3 would utilize the existing freight rail alignment, except for the CityLine/Bush route deviation, which entails a long bridge structure. The alignment would typically be at ground level with minimal visual impact except for areas of grade separations at Custer Parkway, Coit Road, US 75, and Plano Parkway.

Section 3A

Section 3A extends from the Dallas North Tollway to the Dallas and Richardson city limits. The alignment is primarily at grade through this section. Coit Road would be raised by about 13 feet on a new bridge structure and the project alignment would be lowered by about seven feet. Freight operations ceased within this section of the corridor in 2010. Re-introduction of train operations would be a new visual element but would not be out of character with the historical transportation use of the corridor. The visual quality and visual sensitivity of this area is moderate to high as it contains parks, the Clubs of Prestonwood, adjacent residential development along one or both sides of the Project, and areas of dense and natural vegetation associated with creek crossings and adjacent parks.

Knoll Trail Station

This station is not expected to create a negative visual impact and would be compatible with the visual character of the surrounding urban area. Visual impacts are expected to be minimal. There is the potential for visual privacy impacts to the adjacent residential units recently constructed given their proximity to the platform.

Preston Road Station

This station would be visible from Keller Springs Road, the Fairhill School, and some nearby homes; however most residential areas would not see the station because of distance and obstruction by vegetation. The area along Preston Road is a developed setting; however, construction of this new station may have a moderate impact given the sensitivity of adjacent uses.

Coit Road Station

This area is primarily surrounded by multi-family residences and a residential assisted living center. The station location would be consistent with the surrounding character of the area. A more visible change will be raising Coit Road as a bridge over the existing rail. Visual impacts are not expected to be significant given the length and low profile of the bridge along with existing trees along Coit Road that will screen views from adjacent uses. New residential development east of Coit Road is set back from the roadway and separated by retention ponds and would not be affected.

Section 3B

Section 3B extends from the Dallas/Richardson city limits to Shiloh Road. The vertical alignment for this section would be grade separated at Custer Parkway with a new railroad overpass. The profile in this section is at grade up to its crossing of Spring Creek, where a long, aerial overpass is proposed to cross the creek, its floodplain, and US 75. It then again resumes an at-grade profile before ascending to cross Plano Parkway on another aerial structure. Although this would introduce a new bridge, it would be consistent with the existing character of the area and nearby US 75/PGBT interchange. The proposed Cotton Belt Project bridge design over US 75 would be standard and compatible with existing highway structures in the area. Any signature treatments or enhancements could be pursued by the City through other funding sources.



UT Dallas Station

This station would be visible at a distance until planned development in the area occurs. Although this would change the visual character of the area, the station would be integral to future development and impacts are expected to be minimal.

CityLine/Bush Station

This station would be adjacent to the existing, at-grade CityLine/Bush LRT Station, in an existing mixed-use transit station environment. No visual impacts are anticipated.

12th Street Station

Only limited visual impacts would be expected at the proposed 12th Street Station, which includes a new at-grade Cotton Belt platform and parking area, and a proposed infill LRT 12th Street Station on the elevated guideway just to the west. The surface parking lot to the south would be a new visual element for residences. The new elevated LRT station would represent a new visual element for the Douglass Community to the northwest, adding structure elements, vertical circulation and lighting to the elevated LRT guideway. The proposed station would not change the visual character of this mixed-use area.

Shiloh Road Station

This station would be adjacent to an electrical substation. The terrain is flat and open and the station may be visible; however, the station would be compatible with the surrounding industrial/commercial land uses and visual impacts are not expected to be significant.

4.7.2 Mitigation Measures

The historical use of the Cotton Belt right-of-way as a transportation corridor and visual elements associated with the former and current railroad use contribute to the overall visual quality and affect the visual sensitivity of the corridor. The Cotton Belt Project is consistent with the former use of the railroad. While certain project elements (grade separation structures, stations, noise wall, and facilities) would introduce new visual features to the corridor, most visual units do not support regionally or locally significant views except for the Wheeler Bridge in Addison. DART is working with the Town of Addison to design a complementary structure for the Cotton Belt bridge at this location.

To minimize visual impacts, DART will provide mitigation and is considering such strategies as the following:

- The DART Station Art & Design Program will be implemented for stations. Project engineers, architects, artists and neighborhood advisory committees will collaborate from station concept to completion. This includes specific architectural design, color, and landscaping that are within project guidelines and construction budgets.
- All lighting sources will be indirect, diffused, or covered by shielded type fixtures, and installed to reduce glare at adjacent properties.
- Maintaining vegetation to the greatest extent possible for the adjacent residential areas.
- Landscaping will be installed at intervals of approximately 120 to 150 feet along residential areas for visual screening and to soften views of sound walls and corridor fencing. Vegetation types will be native and low maintenance to be selected in cooperation with city staff and residents. Landscaping intervals would be provided at the following locations:
 - Residential areas that are directly adjacent to the alignment and where no natural buffer exists
 - Preston Green Park
 - Fairhill School



- Landscaping will be provided as part of the Knoll Trail station design where residential is immediately adjacent to the platform, unless residential construction at this location includes a wall or other landscaping barrier.
- Coordination to ensure compliance with DFW Airport development guidelines will continue as design progresses. Any project lighting will be designed to ensure compliance with DFW Airport development guidelines and will be compatible with approved and installed developments of similar elevation and distance from the airfield.

4.8 Public Safety and Security

4.8.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no impacts to safety or security in the area of the Cotton Belt alignment will occur. Public safety services would continue to be provided as they are today and as planned to keep up with growth.

Build Alternative

The construction and operation of public transit projects increases multi-modal traffic and the potential for conflicts with automobiles and pedestrians. The ensuing safety and security issues center around avoiding accidents between competing travel modes and ensuring the daily safety of transit patrons at and near station areas, as well as persons and automobiles that must cross the alignment. Consequently, transit projects can place additional demands on police and fire protection services in the communities they serve. While the Cotton Belt is an active freight corridor, freight operations are intermittent compared to regular passenger rail operations and freight has been abandoned through north Dallas since 2010. The impacts on safety and security under the Build Alternative is described below. The potential safety and security impacts address considerations including:

- Police protection and community safety services;
- Fire protection and emergency services;
- Pedestrian and vehicle activity; and
- Station area activity.

Police Protection and Community Safety Services

The Build Alternative is not expected to cause any increased demand for municipal police protection or community services. Police protection would be required during construction and operation of the Project, but DART police would take responsibility for those services. Both uniformed and undercover DART police would monitor the facilities and vehicles. If necessary, DART police would partner with local police to apprehend any criminals. The presence of DART police and other personnel would help to maintain a secure environment and reduce opportunities for crime on vehicles and at stations. Three police facilities are located within the Study Area, including the Dallas North Central Patrol Division in north Dallas, Addison Town Police Department and Plano Police Department. No project related impacts are anticipated for these facilities.

Fire Protection and Emergency Services

There are five fire stations located within the Study Area. These include DFW Airport Fire Station 6, Coppell Fire Station 1, Carrollton Fire Station 1, Addison Fire Station, and Dallas Fire Station 7. With any new project or development, there may be a need for fire protection services if a fire occurs on vehicles or at a facility. Vehicles and facilities would be constructed with fire resistant materials. Vehicles would be equipped with on board fire suppression systems and



have exterior emergency door releases. As the potential for fire is low, it is not anticipated that the Build Alternative would necessitate the hiring of additional fire protection personnel in any of the affected communities.

The concentration of passengers at rail stations could create the potential for increased demands for emergency medical services. However, this is not expected to necessitate the need for additional emergency medical services in the area.

A key concern of the community is related to potential impacts on emergency vehicle response times, whether for police, fire or other emergency services. It is possible that these services could be slightly delayed at rail crossings when a passenger rail vehicle passes by for approximately 35 to 50 seconds which is the typical crossing gate down-time for the Project.

Pedestrian and Vehicle Activity

The addition of regular passenger service to the existing freight rail corridor presents concerns for both residents and businesses. Both types of rail operations have the potential to impact pedestrian and vehicle safety where there are at-grade crossings or where there may be informal crossings. The potential for these conflicts is greatest around schools, especially where a school zones traverses the corridor, or where high concentrations of pedestrians or vehicles may occur, such as during special events. School aged students have a higher probability for conflicts at at-grade crossings when an at-grade crossing, a school attendance zone, and a residential neighborhood are close together.

Because freight rail currently operates along the Project except for where freight has been abandoned in North Dallas, school children presently crossing the tracks are already aware of trains crossing their path and the associated safety measures; however, DART Cotton Belt train operations trains would be more frequent. **Section 4.3** provides a more detailed discussion of schools and locations where there may be potential issues due to school zone boundaries. Eight schools along the corridor were identified as having moderate potential for safety impacts based on walkability between residential areas and the school location.

All public at-grade crossings along the Project would be protected by standard safety features including flashing lights, bells, and gate arms alerting vehicles, bicyclists, and pedestrians of approaching trains. The higher speeds and increased frequency of passenger trains compared to existing freight trains would require increased awareness at grade crossings on the part of drivers, pedestrians and cyclists.

Station Area Activity

Passenger rail service under the Build Alternative would increase the potential for conflicts between rail vehicles, automobiles, bicycles, passengers, and pedestrians in and around station areas. The potential for crime would also exist due to the regular gathering of waiting passengers at predictable times in and around stations. With stations offering parking, motor vehicle theft and theft of vehicle accessories could also be of concern. DART has policies in place to prohibit and deter this activity.

4.8.2 Mitigation Measures

Several mitigation measures can be implemented to enhance safety and security. Many of these measures will be implemented Project wide, and are specific to certain areas where specific concerns or issues exist. Mitigation is consistent with those in DART's *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*.



Police Protection and Community Safety Mitigation

Police coverage will be provided by DART Police. The officers operate on regular schedules and patrol the trains, providing fare enforcement personnel support to the conductors as well as a visible deterrent to crime. During construction and before service start-up, DART will host sessions with police, fire, schools, emergency response teams, employers, and other interested parties to discuss regional rail operations, potential safety or security issues, and agency or public responsibilities.

In addition, Positive Train Control (PTC) is a required system for the Project and will enhance community safety through items such as train separation or collision avoidance, speed enforcement, temporary speed restrictions, and rail worker wayside safety.

Fire Protection and Emergency Medical Services Mitigation

Alternate routes for fire and emergency service vehicles operating near at-grade crossings would be evaluated as part of the final design phase of the project through the Fire/Life Safety Committee. This committee was established in 1992 and provides a forum for regular communication and action plans with emergency service providers. Furthermore, final design of the project will be done in accordance with National Fire Protection Association NFPA-130 (Standard for Fixed Guideway Transit and Passenger Railway Systems), as well as the applicable fire and building codes of local jurisdictions.

As part of a prior agreement, a new at-grade crossing for DFW Airport Fire Station 6 will be constructed to provide a new access point for airport property north of the Cotton Belt rail alignment. This will enhance access and improve response times for this fire station.

Pedestrian and Vehicle Activity Mitigation

All federal, state, and municipal laws regulating safety, design and operating procedures will be followed for the Project. General and specific mitigation measures are outlined below.

To address pedestrian activity, final design will include the installation of special signage, designated street crossings, and adequate lighting, as required, to mitigate the potential for accidents involving pedestrians and cyclists. In addition, corridor safety fencing will be used to control informal pedestrian crossings and secure the project at select locations, including those areas where there are adjacent residential land uses, schools, or other high pedestrian activity centers such as Addison Circle where large special events are held. In nineteen residential areas, particularly north Dallas, noise barriers will serve as the safety barrier and additional fencing would not be needed except for gap locations. Given that this is an existing rail corridor with active freight on most sections, all current pedestrian crossings should be occurring at designated crossings. Fencing will formalize these crossings. In industrial areas where freight activity is higher and pedestrian activity is low, safety fencing may not be needed.

During final design, DART will coordinate with local jurisdictions to determine needs for enhanced pedestrian crossing features such as additional signage, tactile strips, safety lights or pedestrian crossing gates to address localized concerns for school children activity and special events. DART will also coordinate with local schools and interested parties to provide outreach events through the Transit Education Program to educate children, residents, business, and others about the project and best safety practices.

Regarding vehicle activity, the Project proposes five new grade separations to address projected vehicle traffic volumes or queuing impacts, thus eliminating conflicts (see **Section 5.2**). In addition, 36 at-grade crossings will be established as quiet zones and incorporate additional safety features. All public crossing approaches will be protected with warning signs, lights, bells, and gates to warn drivers, pedestrians, and cyclists of an approaching train. Most



private crossings will be protected in the same manner as public crossings. Gated crossings will have either two or four gates, depending on the characteristics of each crossing. Quiet zone crossings will incorporate either four gates or non-mountable barriers to enhance safety. During the approach of any rail vehicle (passenger rail or freight), the gates will lower and automobile traffic will be stopped until the rail vehicles have cleared the intersection. Adjacent traffic signals and at-grade crossings will be coordinated to improve traffic flow and clear intersections prior to train arrival.

To mitigate potential on board vehicle accidents, safety features on rail vehicles will include: emergency manual door releases, a public address system inside and outside the car, an automatic feature that stops the train if operators release the control lever, safety mirrors, sight and sound warning systems, impact resistant windows and windshields, “sensitive edges” on passenger doors to detect possible obstructions, and two brake systems (dynamic brakes and disc brakes) per rail car.

Station Area Activity Mitigation

Crime Prevention through Environmental Design (CPTED) principles will be followed to enhance safety and security at stations. This includes design elements, adequate lighting, clear pedestrian access points at dedicated crossings, and good visibility and sight lines. In addition, station cameras will be located on platforms and in parking lots, and monitored 24 hours per day. Stations will be regularly patrolled by police to deter crime.

Five stations will have intermittent freight trains through the platform area. Pedestrians will be channeled to platform crossing locations to avoid conflicts. In downtown Carrollton, there are three active freight lines that could create safety issues for passengers. The Cotton Belt Project runs east-west, the Madill Subdivision (BNSF Line) operates from southwest to northeast and the Union Pacific (UP) corridor runs north-south. The DART Light Rail Green Line also operates on aerial structure along the UP corridor. The new Cotton Belt Regional Rail station platform will allow for pedestrian movements across the Cotton Belt tracks. At the western edge of the Cotton Belt platform, DART will provide a crossing of the Madill Subdivision to connect the light rail and regional rail station areas. A crossing of the UP corridor will be provided near the intersection of Broadway Street and College Street to provide station access for new development to the east. DART will also construct accessible vertical circulation to a new aerial pedestrian walkway that will extend from the Cotton Belt platform to the Green Line aerial light rail platform. This will avoid at-grade crossing of the freight line.

At the 12th Street Station in Plano, a walkway will be located north of the freight tracks to channel pedestrians to the new LRT aerial platform. This connection will allow transfers to/from the Cotton Belt Project and Red Line. In order to further enhance pedestrian movements in the station area, DART will also install pedestrian crossings with pedestrian gates at two locations.

4.9 Environmental Justice

This section assesses the potential impacts to minority and low-income populations along the Cotton Belt Project route. The purpose is to determine whether and where populations experience disproportionately high and adverse effects as a result of the Project. Executive Order 12898, “Federal Actions to Address Environmental Justice (EJ) in Minority Populations and Low-Income Populations” was signed in February 1994. It requires Federal agencies to ensure that disproportionately high and adverse human health or environmental effects of proposed Federal projects on minority and low-income communities are identified and addressed. In addition, the Department of Transportation is committed to Title VI of the Civil Rights Act, which provides that no person in the United State shall, on grounds of race, color or



national origin, be excluded from participation, be denied the benefits of, or be subject of discrimination under any program or activity receiving Federal financial assistance.

The primary source of data for the Study Area is the 2011-2015 American Community Survey (ACS). ACS estimates are not available at the census block level; the 2010 Decennial Census was used for block level data for race and ethnicity. For this study, DART established local thresholds for determining EJ populations, based off of CEQ guidance. A block was considered to have a minority population if the block had twice the percentage of minority individuals as the county in which the block fell, or if the percentage of individuals identifying themselves in a minority group in that block was over 50 percent. A census block group was determined to contain a low-income population if the percentage of people below the poverty level was more than twice the county comparison area, or if the median household income of the block group was below the poverty level for a family of four. An impact to a minority or low-income population is determined to be disproportionately high and adverse by comparing the design elements and impacts with those in non-minority and non-low-income populations. The determination is made after taking into consideration mitigation and enhancement measures and offsetting benefits to each population. Refer to the *Socioeconomic and Environmental Justice Existing Conditions Technical Memoranda* in **Appendix B** for more details on data used for the EJ analysis.

4.9.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and no impacts relative to EJ populations will occur. However, these populations will also need to be provided the enhanced mobility and access benefits that would occur under the Build Alternative. Over time as congestion increases, mobility will continue to be degraded for residents in the Study Area

Build Alternative

Public Participation

In August 2016, DART relaunched the public process for the Cotton Belt Project that began in 2010. A series of nine public meetings were held in April, May, August, September and December 2017. A summary of the Public and Area Focus Group (AFG) Meetings is provided in **Chapter 8**. As DART sought meaningful public input specific to the EJ communities, a special effort was made to involve these communities. EJ involvement efforts included bilingual advertisements and publications, outreach to minority organizations, and material distribution within EJ communities. The following specific notifications were issued for the Project for each of the public community meetings:

- 20,000 brochures printed in both English and Spanish with a comment card attached;
- Bilingual meeting brochures placed on all DART vehicles including bus routes, LRT, and TRE;
- Windshield distribution at six DART facilities located near the Cotton Belt Project, including the Downtown Carrollton Station, Addison Transit Center, CityLine/Bush Station, Arapaho Station, Jack Hatchell Transit Center, and Parker Road Station;
- Door hanger notices along the Cotton Belt Project within 500 ft. from the center of the tracks on both sides of the alignment;
- Newspaper ads placed in the following publications: *Dallas Morning News*, *Al Dia* (Hispanic), *Dallas Weekly* (African American), *Dallas Chinese News* (Asian);
- Emailed/texted invitations of DART meetings to Cotton Belt subscribers (5,290);
- Posted on DART.org, Twitter and Facebook page;
- Posted to 38 Nextdoor neighborhoods along the corridor (12,384);



- Email to all media outlets and to AFGs, all previous meeting attendees and any other appropriate contact;
- Email to Chambers of Commerce including the Hispanic, African American and Asian Chambers; and
- Email to DART's congressional delegation, councilmembers, mayors and city managers and appropriate city staff.

In general, EJ community input and concerns with the Project mirrored those expressed by the community as whole. These were primarily associated with adjacent single-family neighborhoods along the Project corridor. These concerns focused on potential noise, vibration, visual, safety, and traffic concerns. In Plano, additional outreach was required in an EJ community near the 12th Street Station. Extensive coordination was conducted with the Douglass Community after archeological investigations along the existing railroad corridor encountered and unintentionally removed human remains within existing DART right-of-way south of the L.A. Davis Cemetery. During this coordination effort with the Douglass Community, DART eliminated plans to modify this portion of the existing railroad corridor. A portion of the right-of-way was turned over to the cemetery and the body was reinterred at its original location. This area of potential impact was removed from the Cotton Belt Project and the Douglas Community will be unaffected.

Demographic Analysis

There are 83 US Census block groups within the Study Area with a total population of approximately 118,900. Census block groups were used to calculate minority populations. Based on US Census American Community Survey (ACS) 5-year estimates; 58,105 persons identified themselves as a minority, as defined by EO 12898. In all, 27 of the block groups met the threshold for containing a minority population as identified in **Table 4-6** and **Figure 4-2**. Minority populations are spread throughout the Study Area, with concentrations around the Cypress Waters, Downtown Carrollton, Coit Road, 12th Street, and Shiloh Road stations, and between the UT Dallas and City Line/Bush stations.

Table 4-6 also includes the demographic data for Dallas, Collin and Tarrant County, which were used as the thresholds for comparison relative to the census block groups that fall within those counties. Comparisons focused on those block groups with minority populations at twice level of the county or over 50 percent of the total population.

Census block groups were also used to calculate low-income EJ populations. Based on the 2015 ACS data, of 83 Census block groups in the Study Area, with a total population of approximately 114,500 (this is a slightly lower number than the total number reporting demographic data as a result of differences in Census sampling techniques), there are 15 which met the threshold for a low-income population. This includes those where the percentage of those with income below the poverty level are twice or more the county average. All 15 of these block groups are located within Collin County based on that county's relatively low threshold compared to Dallas or Tarrant counties. There are three Census block groups where the median household income is lower than the Department of Health and Human Services poverty level for a family of four. Within the Study Area, low-income populations are located primarily east of the Coit Road Station. There are Census block groups which contain no population (including areas within DFW Airport and other industrial or commercial areas); these geographic units are not considered for this analysis. In all, the 27 Census blocks which contain a minority population, and 15 Census block groups met the threshold for a low-income population are considered EJ populations, as shown in **Table 4-6** and **Figure 4-2**.



Table 4-6. EJ Populations Within the Study Area

Census Geography	Racial Minority (Including More than One Race)	Hispanic of Any Race	Percent Below Poverty	Median Household Income*	No Vehicle Available (%)
Study Area Counties					
Collin County	24.2%	15.0%	7.6%	\$84,735	2.7%
Dallas County	29.5%	39.0%	19.3%	\$50,270	7.4%
Tarrant County	22.6%	27.6%	15.0%	\$58,711	4.7%
Collin County					
Block Group 1, Census Tract 317.09	58.0%	9.3%	30.0%	\$54,811	2.9%
Block Group 1, Census Tract 317.18	6.9%	13.6%	0%	\$100,179	2.0%
Block Group 2, Census Tract 317.18	21.9%	3.6%	3.5%	\$92,788	0.8%
Block Group 1, Census Tract 317.19	66.5%	4.2%	19.0%	\$41,984	18.7%
Block Group 2, Census Tract 317.19	9.0%	7.5%	1.3%	\$91,042	3.7%
Block Group 1, Census Tract 317.20	39.7%	52.4%	50.6%	\$21,711	33.4%
Block Group 2, Census Tract 317.20	51.1%	36.6%	41.0%	\$17,560	15.7%
Block Group 3, Census Tract 317.20	39.1%	39.4%	43.8%	\$25,625	9.8%
Block Group 2, Census Tract 318.02	53.7%	0.0%	8.7%	\$76,920	1.2%
Block Group 3, Census Tract 318.02	27.9%	7.3%	8.2%	\$61,467	5.7%
Block Group 5, Census Tract 318.02	7.4%	49.3%	16.3%	\$42,228	1.5%
Block Group 1, Census Tract 318.04	9.4%	25.3%	15.3%	\$54,886	10.8%
Block Group 2, Census Tract 318.04	11.0%	4.9%	1.8%	\$118,214	0%
Block Group 3, Census Tract 318.04	10.5%	1.9%	9.2%	\$56,595	17.0%
Block Group 4, Census Tract 318.04	39.4%	12.5%	79.7%	\$10,964	23.0%
Block Group 1, Census Tract 318.05	19.9%	3.7%	5.5%	\$100,847	3.1%
Block Group 2, Census Tract 318.05	7.1%	11.3%	4.4%	\$106,964	3.7%
Block Group 3, Census Tract 318.05	9.8%	12.8%	10.9%	\$96,111	3.3%
Block Group 1, Census Tract 318.06	69.9%	16.1%	9.3%	\$75,504	6.5%
Block Group 2, Census Tract 318.06	49.3%	17.7%	16.7%	\$63,082	4.5%
Block Group 1, Census Tract 318.07	18.9%	12.6%	11.1%	\$73,629	26.3%
Block Group 4, Census Tract 318.07	0.0%	17.4%	0%	\$104,265	0%
Block Group 1, Census Tract 319	3.6%	56.2%	29.6%	\$49,226	9.2%
Block Group 3, Census Tract 319	2.2%	85.9%	29.6%	\$43,935	11.3%
Block Group 3, Census Tract 320.03	13.2%	26.0%	21.6%	\$42,008	18.5%
Block Group 4, Census Tract 320.03	24.9%	62.0%	39.6%	\$35,717	8.9%
Block Group 3, Census Tract 320.04	33.6%	38.3%	10.1%	\$58,776	4.5%
Block Group 4, Census Tract 320.04	7.3%	60.1%	1.2%	\$48,892	4.3%
Block Group 5, Census Tract 320.04	22.1%	24.6%	9.6%	\$74,773	2.5%
Block Group 6, Census Tract 320.04	26.0%	54.6%	40.4%	\$27,121	12.0%
Block Group 2, Census Tract 320.10	34.5%	31.8%	26.5%	\$31,331	1.0%
Block Group 3, Census Tract 320.10	27.0%	22.3%	1.0%	\$54,069	0%
Block Group 1, Census Tract 320.11	45.7%	7.5%	4.5%	\$136,313	0%
Dallas County					
Block Group 1, Census Tract 136.11	5.1%	5.7%	2.2%	\$133,219	0%
Block Group 2, Census Tract 136.11	20.0%	4.3%	5.8%	\$115,625	0%
Block Group 1, Census Tract 136.16	25.6%	9.3%	10.5%	\$72,500	3.6%
Block Group 2, Census Tract 136.16	27.8%	12.1%	7.6%	\$73,125	0%
Block Group 3, Census Tract 136.16	8.4%	62.6%	20.3%	\$44,559	9.8%
Block Group 1, Census Tract 136.17	9.7%	10.7%	6.3%	\$106,957	1.3%
Block Group 2, Census Tract 136.17	5.0%	5.2%	1.1%	\$81,607	0%
Block Group 3, Census Tract 136.17	21.3%	20.0%	22.3%	\$38,542	0%



Table 4-6. EJ Populations Within the Study Area (continued)

Census Geography	Racial Minority (Including More than One Race)	Hispanic of Any Race	Percent Below Poverty	Median Household Income*	No Vehicle Available (%)
Block Group 1, Census Tract 136.18	26.9%	10.7%	9.8%	\$76,000	2.4%
Block Group 2, Census Tract 136.18	9.8%	9.0%	0.7%	\$151,500	5.5%
Block Group 2, Census Tract 136.19	10.5%	8.0%	4.5%	\$149,464	2.0%
Block Group 3, Census Tract 136.19	4.9%	4.7%	0%	\$134,583	0%
Block Group 1, Census Tract 136.20	35.9%	7.7%	4.3%	\$75,786	2.7%
Block Group 2, Census Tract 136.20	37.8%	5.5%	2.6%	\$39,910	6.3%
Block Group 3, Census Tract 136.20	25.2%	12.6%	4.4%	\$47,574	3.2%
Block Group 1, Census Tract 136.21	12.9%	25.8%	16.7%	\$42,568	1.7%
Block Group 2, Census Tract 136.21	16.0%	30.8%	3.0%	\$34,580	16.0%
Block Group 1, Census Tract 136.24	43.7%	35.4%	13.3%	\$35,611	2.8%
Block Group 1, Census Tract 137.14	3.4%	53.8%	12.6%	\$53,357	7.2%
Block Group 1, Census Tract 137.16	10.4%	60.8%	22.7%	\$66,793	4.7%
Block Group 3, Census Tract 137.16	30.0%	22.2%	4.6%	\$57,981	6.6%
Block Group 1, Census Tract 137.18	14.9%	77.0%	30.4%	\$36,250	5.4%
Block Group 2, Census Tract 137.18	11.8%	55.7%	26.3%	\$37,321	2.5%
Block Group 3, Census Tract 137.18	15.0%	81.4%	15.6%	\$50,906	8.6%
Block Group 1, Census Tract 137.25	13.3%	51.9%	25.0%	\$49,693	2.7%
Block Group 2, Census Tract 137.25	20.9%	65.5%	17.3%	\$32,583	17.9%
Block Group 1, Census Tract 137.26	24.8%	7.0%	2.9%	\$126,602	0%
Block Group 1, Census Tract 137.27	31.0%	27.1%	3.4%	\$51,360	4.0%
Block Group 2, Census Tract 137.27	19.1%	12.3%	7.5%	\$91,404	1.8%
Block Group 2, Census Tract 138.06	53.8%	13.2%	2.2%	\$75,455	0%
Block Group 2, Census Tract 140.02	0.0%	22.5%	22.5%	\$37,031	0%
Block Group 3, Census Tract 141.19	7.4%	7.4%	3.4%	\$145,455	1.1%
Block Group 1, Census Tract 141.20	30.3%	7.0%	1.3%	\$134,583	2.1%
Block Group 3, Census Tract 141.20	9.2%	1.2%	0%	\$131,250	0%
Block Group 2, Census Tract 141.21	28.0%	20.3%	3.2%	\$73,000	0%
Block Group 3, Census Tract 141.21	47.6%	4.7%	3.3%	\$71,007	6.4%
Block Group 4, Census Tract 141.21	33.1%	3.0%	13.7%	\$94,417	1.6%
Block Group 2, Census Tract 141.24	30.2%	16.3%	1.2%	\$187,900	1.4%
Block Group 1, Census Tract 141.26	16.3%	14.2%	1.8%	\$131,325	0.4%
Block Group 2, Census Tract 141.26	28.5%	26.8%	14.7%	\$83,068	3.6%
Block Group 1, Census Tract 141.27	71.3%	4.7%	5.8%	\$104,290	2.9%
Block Group 1, Census Tract 141.32	68.6%	2.1%	33.0%	\$51,188	5.7%
Block Group 1, Census Tract 192.05	7.7%	3.7%	3.0%	\$105,625	1.5%
Block Group 1, Census Tract 207	32.3%	5.5%	0%	\$63,750	0%
Block Group 2, Census Tract 207	18.7%	21.1%	4.9%	\$51,031	2.3%
Block Group 3, Census Tract 207	4.2%	15.9%	1.2%	\$85,549	0%
Tarrant County					
Block Group 2, Census Tract 1137.05	12.5%	33.5%	16.6%	\$56,771	3.6%
Block Group 4, Census Tract 1137.05	2.9%	45.0%	4.1%	\$37,390	0%

Source: USCB, 2015; GPC, 2018

Note: Bold indicates data is twice the county level or greater than 50%

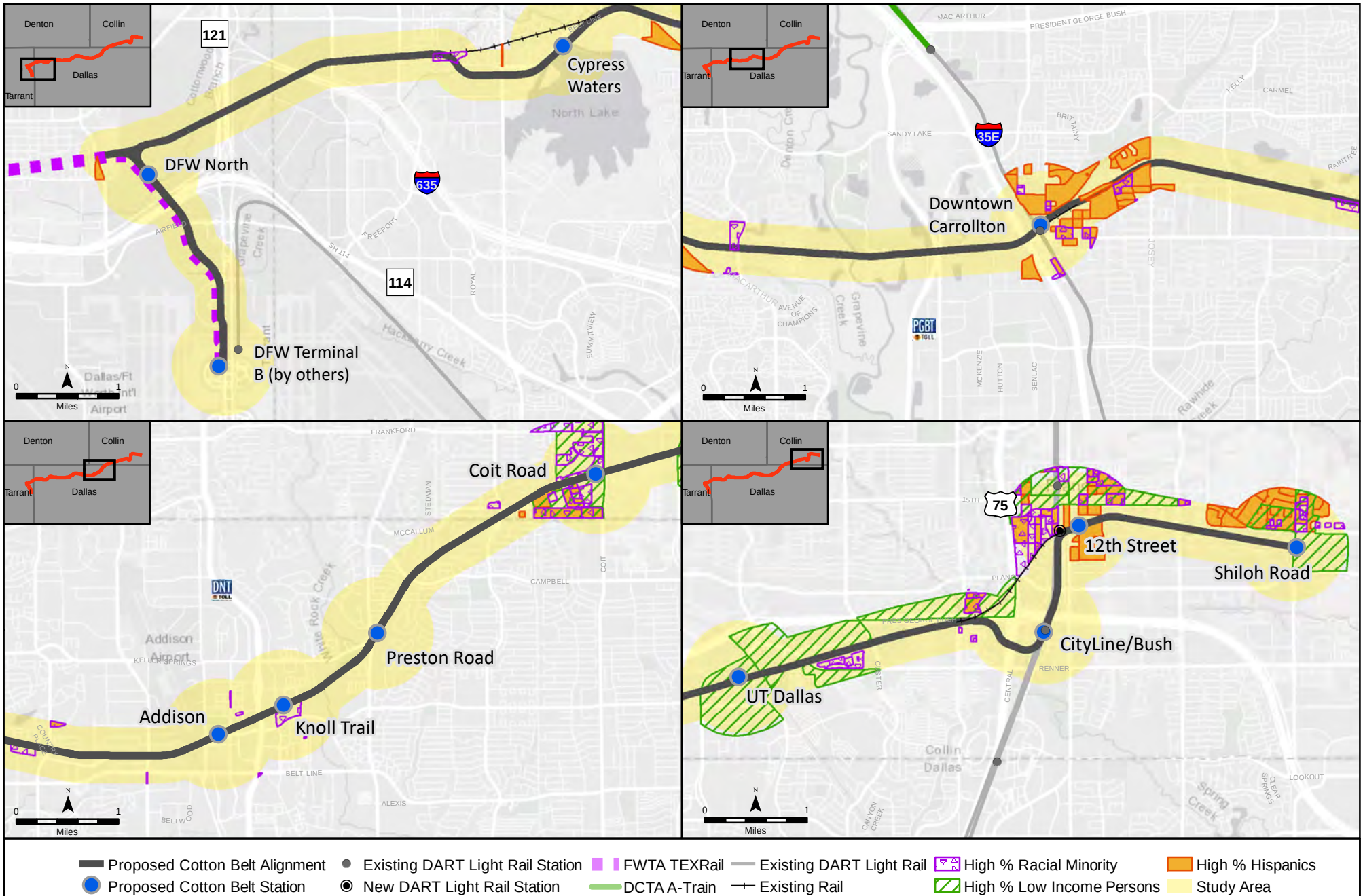


Figure 4-2
Environmental Justice Populations within Study Area

Data Source: U.S. Census Bureau, 2010

**Cotton Belt Corridor
Regional Rail Project**
Draft Environmental Impact Statement





Based on the 2015 ACS, 17,358 persons in the Study Area identify themselves as having limited English proficiency (LEP), representing 15.5 percent of the total Study Area population. Block groups with the highest LEP populations are located in Carrollton, Richardson, and Plano, near the proposed Coit Road, UT Dallas, 12th Street, and Shiloh Road stations.

Minority populations are scattered throughout the Study Area, with concentrations around the Cypress Waters Station, around and east of the Downtown Carrollton Station, around the Coit Road, 12th Street and Shiloh Road stations and between the UT Dallas and City Line/Bush stations. Low-income populations are concentrated around the five eastern station sites: Coit Road, UT Dallas, City Line/Bush, 12th Street, and Shiloh Road. LEP populations are identified at the Coit Road, UT Dallas, 12th Street and Shiloh Road stations. A discussion of impacts and benefits by EJ area follows.

Effects Assessment

Each resource area was reviewed to determine how potential impacts would affect EJ populations. Resource areas that could potentially impact EJ populations include Acquisitions and Displacements, Land Use and Economics, Visual and Aesthetic Resources, Noise and Vibration, Public Safety and Security, Traffic and Circulation, Community Facilities, Air Quality, and Parks and Trails. **Section 4.20** discusses Indirect and Cumulative Impacts on EJ communities. The analysis considered the nature and magnitude of the anticipated adverse impacts after mitigation that were identified for each resource area, and determined the nature and magnitude of the impact on the EJ populations in each station area and along the alignment as described below.

East of Downtown Carrollton

Impacts

The Project would acquire and relocate the Cedar Supply, Inc. business east of the proposed station. There are several other commercial locations within the area where the business could relocate. Relocation of the business would preserve the business and its employees. For these reasons, no disproportionately high and adverse impacts due to the displacement were identified in this tract.

Visual impacts to EJ populations east of the proposed Downtown Carrollton Station are expected to be limited because the center platform would be located along the existing freight rail alignment immediately north of the Downtown Carrollton park-and-ride lot and east of the aerial Green Line LRT Station. The alignment would be elevated at its crossing of the BNSF Madill Subdivision tracks allowing passenger rail to operate without delay on the aerial alignment and freight operations to continue at grade. While the elevated alignment would introduce a visual element, it would not change the visual character due to the nearby elevated highways.

The Carrollton Heights Historic District and the NRHP eligible Carrollton Depot are located east and north of the proposed station, respectively. The Art and Design program would include community input, and the selection of colors, finishes and materials complementary to the area. The station would become an integral part of the area and continuity of the existing and proposed land uses would result in minimal visual impacts (see **Section 4.7**).

As detailed in **Section 4.14**, severe noise impacts were projected around the Downtown Carrollton Station including in the EJ areas. Noise impacts will be mitigated with the establishment of quiet zones for at-grade crossings near impacted noise-sensitive receptors at S. Broadway Street, N. Denton Drive, Perry Road and N Josey Lane, in cooperation with local municipalities. Noise barriers will be installed where warranted by FTA guidance and DART policy. Together, noise barriers and quiet zone crossings will eliminate noise impacts to EJ



communities. No EJ populations in this area are anticipated to be impacted by vibration from the proposed alignment.

Benefits

The new station would be expected to benefit EJ populations by providing access to jobs, schools and transportation. The Project would provide transit access to several major employment centers including DFW Airport, CityLine and others in corridor cities. Connections to three LRT lines and the DCTA A-Train and TEXRail regional lines would further enhance access. The proposed elevation of the alignment over the BNSF tracks would allow passenger rail to operate safely and without delay on the aerial alignment, while allowing freight operations to continue at grade.

Coit Road/UT Dallas Area

Impacts

Visual impacts to EJ populations surrounding the proposed Coit Road and UT Dallas stations are expected to be minimal. The Coit Road Station would be built at the location of the Adventure Landing Theme Park. This area is primarily surrounded by multi-family residences and a residential assisted living center. The alignment would be grade separated from Coit Road. Coit Road would be raised on a new bridge structure and the rail alignment lowered slightly underneath Coit Road. While the station would add another element to the visual character of the area, it would be consistent with the surrounding land use. The Coit Road bridge is not anticipated to result in any impacts. Further east, the UT Dallas Station platform would be located in an open area with flat terrain. This station would be visible at a distance until planned development in the area occurs. The alignment would also be elevated over Custer Parkway. Although this would change the visual character of the area, the station would be integral to future development and impacts are expected to be minimal.

As detailed in **Section 4.14**, severe and moderate noise impacts were projected to occur around the proposed Coit Road Station, including in the EJ areas west of Coit Road. Noise barriers will be installed where warranted by FTA guidance and DART policy. Noise impacts would be mitigated with the establishment of quiet zones (some with bell mitigation) for at-grade crossings near impacted noise-sensitive receptors at Hillcrest Road, McCallum Boulevard, Meandering Way, and Dickerson Street, in cooperation with local municipalities. The installation of noise barriers is recommended in sections of alignment from Hillcrest Road to Coit Road, and Coit Road to Synergy Park Boulevard. Together, noise barriers and quiet zone crossings would eliminate the noise impacts to EJ communities.

It is estimated that the vibration impacts at residences between Hillcrest Road and Coit Road can be substantially mitigated by installing 550 lineal feet of tire derived aggregate (TDA) beneath both tracks along the alignment (see **Section 4.15**). The assessment of vibration impacts at residential locations in this area indicated residual impacts at one residence within the EJ area west of the proposed Coit Road Station. However, this impact is marginal, with a predicted vibration level just at the FTA impact threshold. Furthermore, the proposed mitigation is projected to reduce vibration by six (6) VdB and additional mitigation would not be feasible for this single residence.

Benefits

The new station would be expected to benefit EJ populations by providing access to jobs, schools and transportation. The Project would provide transit access to several major employment centers including DFW Airport, CityLine and others in corridor cities. Connections to three LRT lines and the DCTA A-Train and TEXRail regional lines would further enhance access. The grade separations proposed at Coit Road and Custer Parkway would benefit traffic



and mobility along the roadways. The UT Dallas Station would be located on the UT Dallas campus, improving access throughout the region to this university.

CityLine/Bush and 12th Street Area

Impacts

Visual impacts to EJ populations surrounding the proposed 12th Street Station are expected to be minimal. The proposed station platform would be located along the existing at-grade freight rail alignment, just east of the proposed infill DART Red Line LRT Station which would be located on the existing elevated guideway. The 12th Street Station would include a pedestrian connection to the proposed LRT station. The proposed stations would not change the visual character of this transitioning, dense, mixed-use area. South of 12th Street, the proposed CityLine/Bush Station would be adjacent to the existing at-grade CityLine/Bush Station, in an existing and visually complex transit station environment. The alignment approaching the station would be a large aerial overpass crossing Spring Creek and US 75. The proposed bridge design would be standard and compatible with existing highway structures in the area. Visual impacts to EJ populations are expected to be minimal, as the aerial overpass would not be visible from nearby EJ areas.

Severe and moderate noise impacts were projected within the EJ areas surrounding the proposed 12th Street Station. Noise impacts would be mitigated with the establishment of additional quiet zones for at-grade crossings near impacted noise-sensitive receptors at K Avenue and Municipal Avenue, in cooperation with local municipalities. Quiet zone crossings would eliminate noise impacts in this area (see **Section 4.14**). No EJ populations in this vicinity are anticipated to be impacted by vibration from the proposed alignment.

Benefits

The new station would be expected to benefit environmental justice populations by providing access to jobs, schools and transportation. The Project would provide transit access to several major employment centers including DFW Airport, CityLine and others in corridor cities. Connections to three LRT lines and the DCTA A-Train and TEXRail regional lines would further enhance access. The proposed new alignment which deviates from the existing rail, would reduce potential impacts to the Douglass Community.

Shiloh Road Area

Impacts

This proposed station would be located adjacent to an electrical substation. The terrain is flat and open and the station may be visible from nearby businesses; however, the station would be compatible with the surrounding industrial/commercial land uses and visual impacts would be expected to be minimal.

There is a quiet zone crossing currently in place at Shiloh Road and no noise impacts are anticipated from the Project in this area. No EJ areas in this vicinity are anticipated to be impacted by vibration from the Project.

Benefits

The new station would be expected to benefit EJ populations by providing access to jobs, schools and transportation. The Project would provide transit access to several major employment centers including DFW Airport, CityLine and others in corridor cities. Connections to three LRT lines and the DCTA A-Train and TEXRail regional lines would further enhance access.



Overall Environmental Justice Findings

A comparative analysis was undertaken to evaluate the design elements, impacts, mitigation and enhancement measures, and offsetting benefits to minority and low-income populations as well as non-minority and non-low-income populations in the Study Area. As discussed above, Project impacts, such as noise, vibration and visual changes, would be borne evenly by EJ and non-EJ communities. DART will apply mitigation measures where such mitigation is determined to be reasonably feasible to address Project impacts in minority and low-income populations as well as non-minority and non-low-income populations in the Study Area. Based on this analysis, Project impacts to minority and low-income populations will not be predominantly borne by an EJ population. Neither will the impacts to minority and low-income populations be appreciably more severe or greater in magnitude than the impacts to non-minority and non-low-income populations. For these reasons, the Project would not have a disproportionately high and adverse effect on minority and/or low-income populations.

Additionally, the EJ communities along the corridor would stand to benefit from the enhanced mobility that the Project would provide, since EJ populations tend to have a higher rate of transit-dependency than non-EJ populations. Enhanced mobility through increased access to public transit would afford EJ populations the opportunity to seek and accept employment in a wider geographical area, thus providing more employment options.

4.9.2 Mitigation Measures

The EJ communities within the Study Area are generally located around potential stations; therefore, these communities would have the benefit of improved access to the regional transit system and major employment/activity centers. While there are limited impacts in the EJ areas, they will be mitigated consistently with other areas along the corridor. Impacts are not disproportionate compared to non-EJ areas: minimal visual impacts and noise and vibration impacts are anticipated to occur along the alignment both in and outside of EJ population areas.

Stations proposed in EJ areas have the potential to indirectly impact housing prices, neighborhood character, and other aspects to which EJ populations can be particularly sensitive. Indirect effects are discussed in **Section 4.20**.

In addition, DART staff has documented public participation efforts to ensure full and fair participation by all potentially affected communities in the transportation decision making process. Therefore, no mitigation is needed or required to address EJ concerns.

4.10 Soils and Geology

4.10.1 Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and will not have any impacts to soils and geology due to construction or excavation.

Build Alternative

The Project is not designed to be below grade and would not impact geological resources. However, one area of the alignment would be depressed by approximately seven feet to accommodate a grade separation of Coit Road. In addition, support structures associated with the proposed station platforms and bridge crossings over roadways and identified water features would be secured into the underlying bedrock, therefore displacing bedrock material. The displaced bedrock from drilling to place proposed bridge support structures would not change or alter the geologic formation and therefore is not considered an impact to underlying geological resources.



No Farmland Protection Policy Act of 1981 (FPPA)-regulated farmlands would be affected by the Build Alternative.

Along the Cotton Belt Project, the majority of soils have moderately to severely restrictive soil conditions with respect to site development. These soils, where present along the rail alignment and at station locations, have the potential to cause differential movements and loss in foundation integrity. The restrictive soil conditions could impact vertical alignment of track and track support and cause differential movements of station foundations and platform slabs. There are no anticipated long-term impacts to the soils from the proposed Build Alternative.

4.10.2 Mitigation Measures

The Project is within an existing railroad corridor and not proposed to be below grade except for one short section of depressed track at Coit Road; all other proposed construction will be at or above grade. Mitigation is not warranted.

Geology

Since the proposed rail alignment and associated stations are not going to be built below grade, there are no measurable short- or long-term impacts to the geological resources within the Study Area and no mitigation is warranted.

Soils

The effect of restrictive soils will be mitigated by improving the track and station subgrade soils. Mitigation for the track will include chemical stabilization of active clays to improve the track subgrade where necessary or the use of synthetic geogrid reinforcement. For station structures, the effect of these soils will be mitigated by either conditioning the on-site soils or replacing the soils with non-expansive soils to limit soil movements to acceptable levels. The potential for station foundation movements will be mitigated by placing the foundations below the active soil depth with the addition of potential foundation anchors.

4.11 Hydrology and Floodplain

This section describes several hydrologic and water quality issues that must be addressed prior to construction: floodplain impacts, surface water quality impacts, and groundwater resources impacts. The following sections provide information relating to minimizing impacts to these resources.

4.11.1 Floodplains Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the Cotton Belt Project will not be built and will not have any impacts to hydrology and floodplains within the Study Area.

Build Alternative

The Project spans or borders the following flood zones: Cottonwood Branch, Grapevine Creek, Elm Fork of the Trinity River, Hutton Branch, Perry Branch, White Rock Creek, McKamy Branch, Cottonwood Branch, Prairie Creek and Spring Creek as described in **Section 3.8**. There are 1,344 acres of 100-year floodplain, 387 acres of 500-year floodplain, and 33 acres of 0.2 percent chance flood hazard within the Study Area. None of the proposed station locations lie within the 100-year floodplain. The EMF Site Option 1 (Luna Road) is located within the Hutton Branch floodplain.

The Federal Emergency Management Agency (FEMA) has regulations governing alterations or development within floodplains shown on Flood Insurance Rate Maps (FIRM). Under FEMA



regulations, no alterations of flood zones can result in an increase in the 100-year base flood elevation or cause an increase in the velocity of floodwaters. In addition, the cities have their own floodplain ordinances, and DFW Airport is responsible for issuance of construction permits on airport property. It would also be necessary to coordinate with the US Army Corps of Engineers (USACE) on the issue of fill in any floodplains, streams, or wetlands. While a Nationwide Permit might suffice for the construction of an aerial structure above the floodplain, an Individual Permit may be required if permanent or short-term construction impacts occur in associated streams or wetlands. This will be determined with the development of engineering details during final design (see **Section 4.12** for more information on wetlands).

Consultation with the appropriate local, state, and federal representatives, including DFW Airport, would be conducted prior to construction across floodplain areas. Federal law requires municipalities that participate in the National Flood Insurance Program (NFIP) to adopt floodplain ordinances that prohibit development in the existing 100-year floodplain. Cities along the alignment and DFW Airport require all development to meet not only the FEMA NFIP criteria, but also the ultimate condition flow rate floodplains. Each city has specific ordinances governing land alteration within a floodplain, as does the federal government. **Table 4-7** identifies the designated floodplains that would be impacted by placement of fill materials that has the potential to alter floodplain characteristics and the ordinance that must be followed for development in the floodplain.

Table 4-7. Designated and Suspected Floodplains Crossed or Bordered by Alignment

Name of Floodplain	City	Ordinance/Resolution Number
Cottonwood Branch	Grapevine, DFW Airport	Grapevine: 2009-33, § 2 (Exh. A), 9-1-09
Grapevine Creek	Coppell	Ord. No. 2001-952, § 1, 6-26-01
Elm Fork of the Trinity River	Carrollton, Dallas	Carrollton: Ord. No. 2581; Dallas: Reg. No. 51A-5.101
Hutton Branch	Carrollton	
Perry Branch	Carrollton	
White Rock Creek	Dallas	Reg. 51A-5.101
McKamy Branch	Dallas	
Prairie Creek	Richardson	Ord. No. 4221
Spring Creek	Richardson	

Source: GPC6; Municode

As preliminary and final design progresses, the impacts at these locations will be quantified. Current design proposes that all floodplain crossings be bridged, limiting direct impacts to the floodplain to minor amounts of fill associated with retaining walls and structures associated with the Project.

4.11.2 Floodplain and Hydrology Mitigation Measures

DART and its contractors would comply with all federal, state, and local regulations regarding construction and operation within floodplains. The Project is being designed to be above any 100-year floodplain that would be crossed. Impacts to floodplains would be minimized, when practical, to replacing existing piers located in the flood zone or minor amounts of fill associated with retaining walls, culverts, and other improvements to existing bridges. Future design phases will include a detailed hydrologic/hydraulic analysis to determine if the proposed structures placed in floodplains would adversely impact existing buildings or other structures within the zone of influence of the proposed structures. The final designer will evaluate corridor drainage and provide design for open ditches and underdrains as needed. In general, fill sections will have open ditches and cut sections will have open ditches or underdrains depending on placement of retaining walls. Preliminary engineering guideway typical sections and drainage



area maps can be seen in **Appendix A** for more information. Final design will also include erosion and runoff controls and include measures to restore beneficial natural functions of the floodplain including water circulation.

A Trinity River Corridor Development Certificate (CDC) is required for projects located within the Trinity River Regulatory Zone and is intended to minimize flood risk by regulating development within the Trinity River Corridor in North Central Texas. The Trinity River Regulatory Zone is consistent with the 100-year floodplain for the Trinity River, of which the Elm Fork of the Trinity River is crossed by the Project. Under the CDC process, local governments retain ultimate control over floodplain permitting decisions, but other communities along the Trinity River Corridor are given the opportunity to review and comment on projects in their neighbor's jurisdiction.

Section 408 of the Clean Water Act requires that projects which would take possession of, use, or cause injury to harbor or river improvements be reviewed and approved by the USACE. No facilities subject to Section 408 have been identified within the Study Area.

With regard to floodplain impacts, DART will continue to coordinate with the USACE, DFW Airport, and the cities of Dallas, Fort Worth, Carrollton, Grapevine, Richardson, Plano and the Town of Addison during final design. The Project design will require review and approval, and any mitigation measures that may be required will be included. Preliminary coordination with the USACE has been initiated to document the expected permits and mitigation needs. Due to possible design changes, the coordination efforts will continue until a permit has been authorized. Permit authorization may occur after the FEIS/ROD and into final design as more design details are known, but will be available for public review. DART will follow the public involvement process as outlined in Section 2(d) of E.O. 11988 Floodplain Management. Public notice will also be provided during the FEIS/ROD process.

4.11.3 Surface Water Quality Impact Evaluation

No-Build Alternative

Automobile traffic will not be reduced under the No-Build Alternative; therefore, adverse impacts to surface water quality as a result of non-point source contaminants (petroleum products, rubber, etc.) generated by automobiles and deposited on roadways may continue to increase. During storm events, this material is washed into local drainages, affecting surface water quality. In addition, chemicals associated with railroad activities, such as oil, grease, hydraulic fluid, and rail ties containing minor amounts of creosote have previously impacted surface water quality in the Study Area due to storm water runoff. Creosote will continue to degrade water quality under the No-Build Alternative.

Build Alternative

As described in **Section 3.8** and shown in **Figure 3-23**, the proposed alignment crosses one major river channel and 13 smaller streams. Project construction has the potential to cause both short-term and long-term impacts to these water bodies due to runoff from grading activities, removal or additions of fill materials, and incidental/accidental spills of mechanical fluids.

Operation of the Cotton Belt Project would result in minimal impacts to surface water quality. Potential impacts to water quality could result from the impervious surfaces of station platforms and parking areas associated with the project. Storm water run-off from platforms could contribute to erosion and sedimentation problems adjacent to station sites. Run-off from parking areas could contain anti-freeze, lubricating fluids, gasoline, and other petroleum hydrocarbons associated with automobiles.



The amount of non-point source contaminants that automobiles contribute to the surface water in the Study Area should be reduced since implementation of the Project would reduce the number of automobiles on area roadways. Water quality and runoff during construction is discussed in more detail in **Section 4.21**.

The equipment storage and maintenance functions would take place at an EMF; therefore, the potential impact to water quality would be associated with maintenance of trains at either of the site options.

The Project would also eliminate long term impacts by rehabilitating or rebuilding most of the existing bridges. Most of the existing bridges are constructed with creosote treated lumber, which leaches over time to the surface water bodies. The rehabilitated, rebuilt, or new bridges would be constructed of non-leaching materials such as concrete or steel.

4.11.4 Surface Quality Mitigation Measures

The EPA's National Pollutant Discharge Elimination System (NPDES) permit program, authorized by the Clean Water Act, controls water pollution by regulating point sources that discharge pollutants into Waters of the US in Texas. The NPDES program is administered by the Texas Commission on Environmental Quality (TCEQ), as part of the Texas Pollutant Discharge Elimination System (TPDES). Storm water runoff resulting from the Project would be addressed through compliance with the TPDES Construction General Permit.

Construction activities must comply with the TCEQ Storm Water Construction General Permit (CGP) TX150000. The 2018 CGP became effective March 5, 2018 and will expire in five years. Compliance with this permit would consist of the preparation of a complete storm water pollution protection plan (SWPPP) which will include an identification of BMPs for water quality. See **Section 4.21** for additional construction mitigation measures.

4.11.5 Groundwater Resources Impact Evaluation

Potential impacts to groundwater resources are expected to be minor. Due to over-development in the Dallas/Fort Worth Metroplex, the Study Area is not located within a significant groundwater recharge area. The water table is low in the Study Area, dropping at times to as much as 1,200 feet below the surface.

Construction of the Project would not impact aquifer resources. The Trinity Group, the primary source of groundwater for the upper Trinity River Basin, and the Woodbine Aquifer, a minor aquifer also producing water in this basin, are the two major components of the area's groundwater resources. Both aquifers outcrop west of Dallas County. Construction of below-grade sections of the alignment near Coit Road would not be expected to contact groundwater resources.

4.11.6 Mitigation of Impacts to Groundwater Resources

Implementation of the mitigation measures provided in **Section 4.11.4**, Surface Water Quality Impacts, and **Section 4.21**, Construction Impacts, would similarly mitigate impacts to shallow groundwater.

4.12 Wetlands Resources

All waters of the US were delineated on May 25 and 26, 2017 by GPC6 environmental scientists and in August 2017 by wetland biologists. The *Cotton Belt Corridor Environmental Waters of the United States (WOTUS) Technical Memorandum* in **Appendix B** identifies the waters of the US present within the Study Area. A summary of this information is presented in **Section 3.9** of this



DEIS. The following impact evaluation for these waters of the U.S. is quantified based on the acreage or linear distance of each water feature that could be impacted.

4.12.1 Impact Evaluation

No-Build Alternative

The No-Build Alternative will not impact any wetlands or other potentially jurisdictional waters of the US because this alternative will not have any ground disturbance. The waters of the US will remain as they are today.

Build Alternative

The Study Area would cross from west to east: Grapevine Creek (three crossings), Cottonwood Branch (two crossings), Elm Fork Trinity River, two unnamed tributaries to Hutton Branch, Hutton Branch, Perry Branch, unnamed tributary to White Rock Creek, White Rock Creek, McKamy Branch, McKamy Branch East Fork, Prairie Creek, Spring Creek, and an unnamed tributary to Spring Creek. In addition, North Lake is immediately adjacent to the centerline at the Cypress Water alignment. Three wetlands are crossed by the proposed centerline (west of Elm Fork Floodplain, EMF Site Option 1 (Luna Road), and west of downtown Carrollton). Several of these water resources lie adjacent to the Project, but would be avoided. To minimize filling of the water resources within this alternative, the preliminary designs indicate that all potential jurisdictional waters of the US would be bridged.

Table 4-8 lists the potential waters of the US and wetland areas anticipated to be impacted due to proposed construction within the Study Area, including the potential acres of impact. **Figures 4-3** through **4-6** illustrates the impact locations.

Table 4-8. Potential Impacts to Waters of the US

Crossing	Name	Acres of Potential Impacts
S-1b	Grapevine Creek Crossing 2	0.03
S-1c	Grapevine Creek Crossing 3	0.03
S-2b	Cottonwood Branch Crossing 2	0.01
S-3	Unnamed tributary to Cottonwood Branch	0.007
S-4	Elm Fork Trinity River	0.04
S-5	Unnamed tributary to Hutton Branch	0.03
S-6	Hutton Branch	0.06
S-7	Perry Branch	0.006
S-8	Unnamed Tributary to Hutton Branch	0.05
S-9	Unnamed Tributary to White Rock Creek	0.06
S-10	White Rock Creek	0.04
S-11	McKamy Branch	0.04
S-12a	McKamy Branch East Fork Crossing 1	0.02
S-12b	McKamy Branch East Fork Crossing 2	0.008
S-13	Prairie Creek	0.02
S-14	Unnamed tributary to Spring Creek	0.02
S-15	Spring Creek	0.14
W-1	Isolated Wetland	0.27
W-6	Wetland adjacent to Hutton Branch	0.43
W-7	Isolated Wetland	0.008
	TOTAL	1.32

Source: GPC6

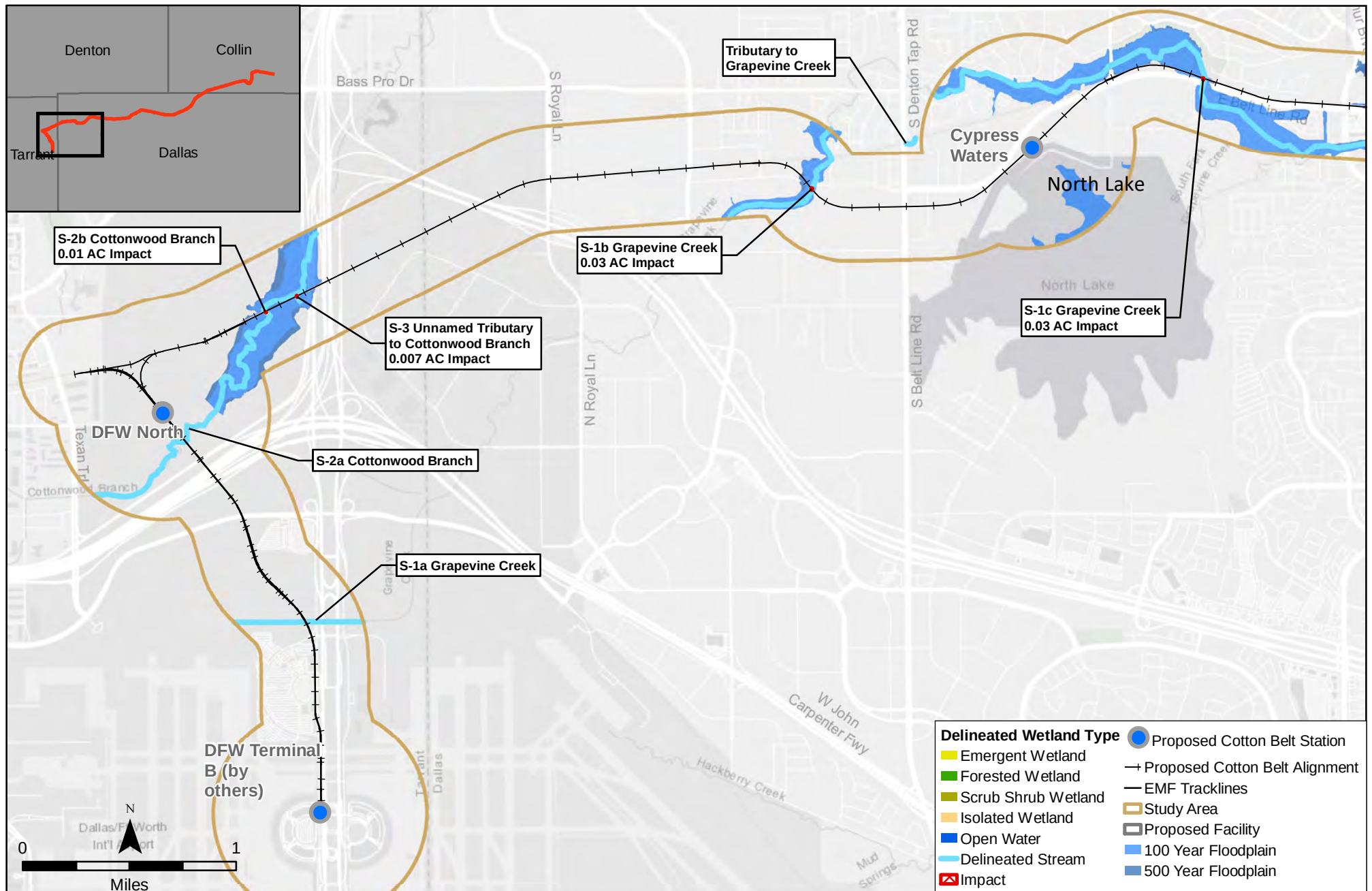
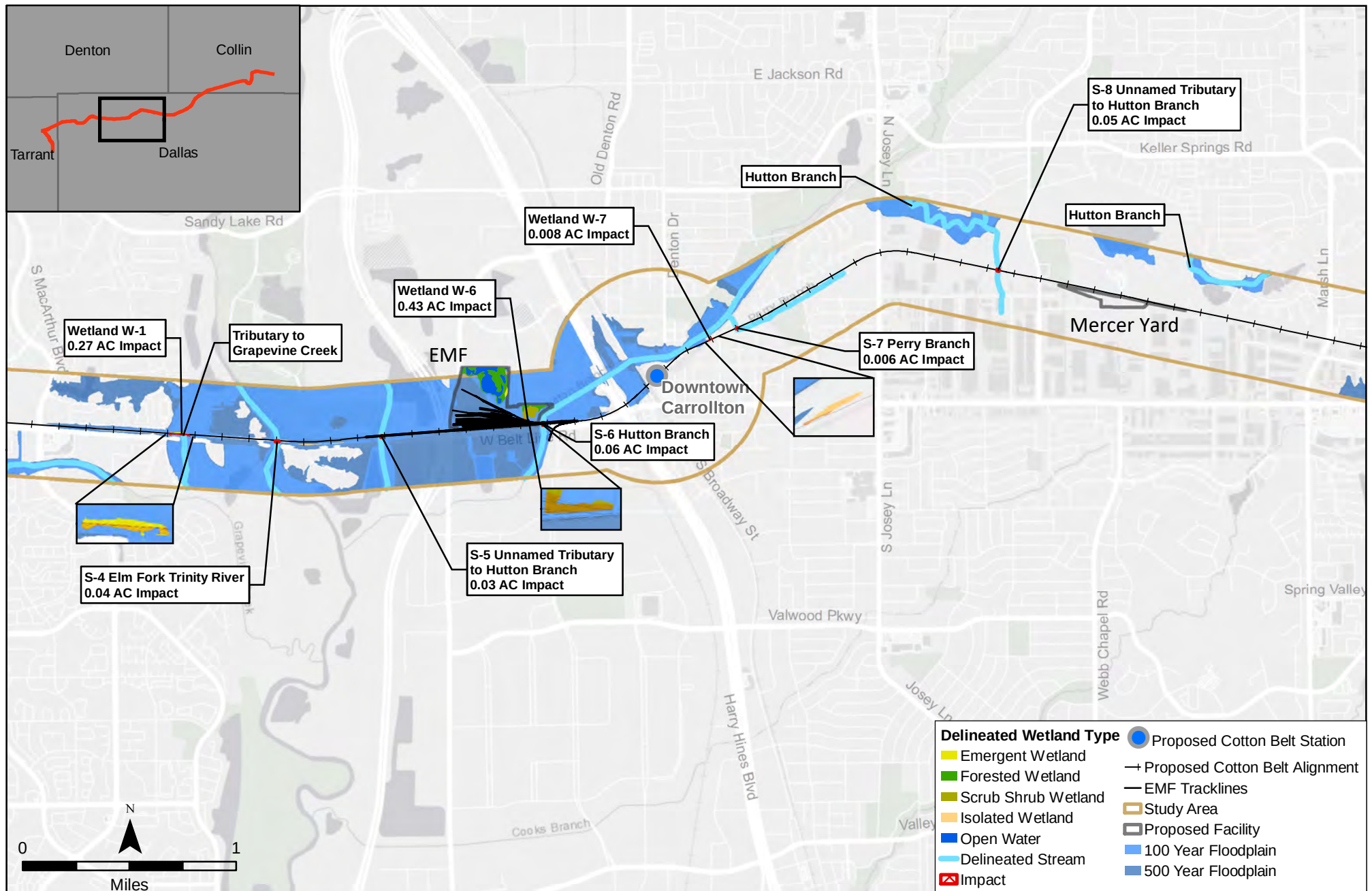
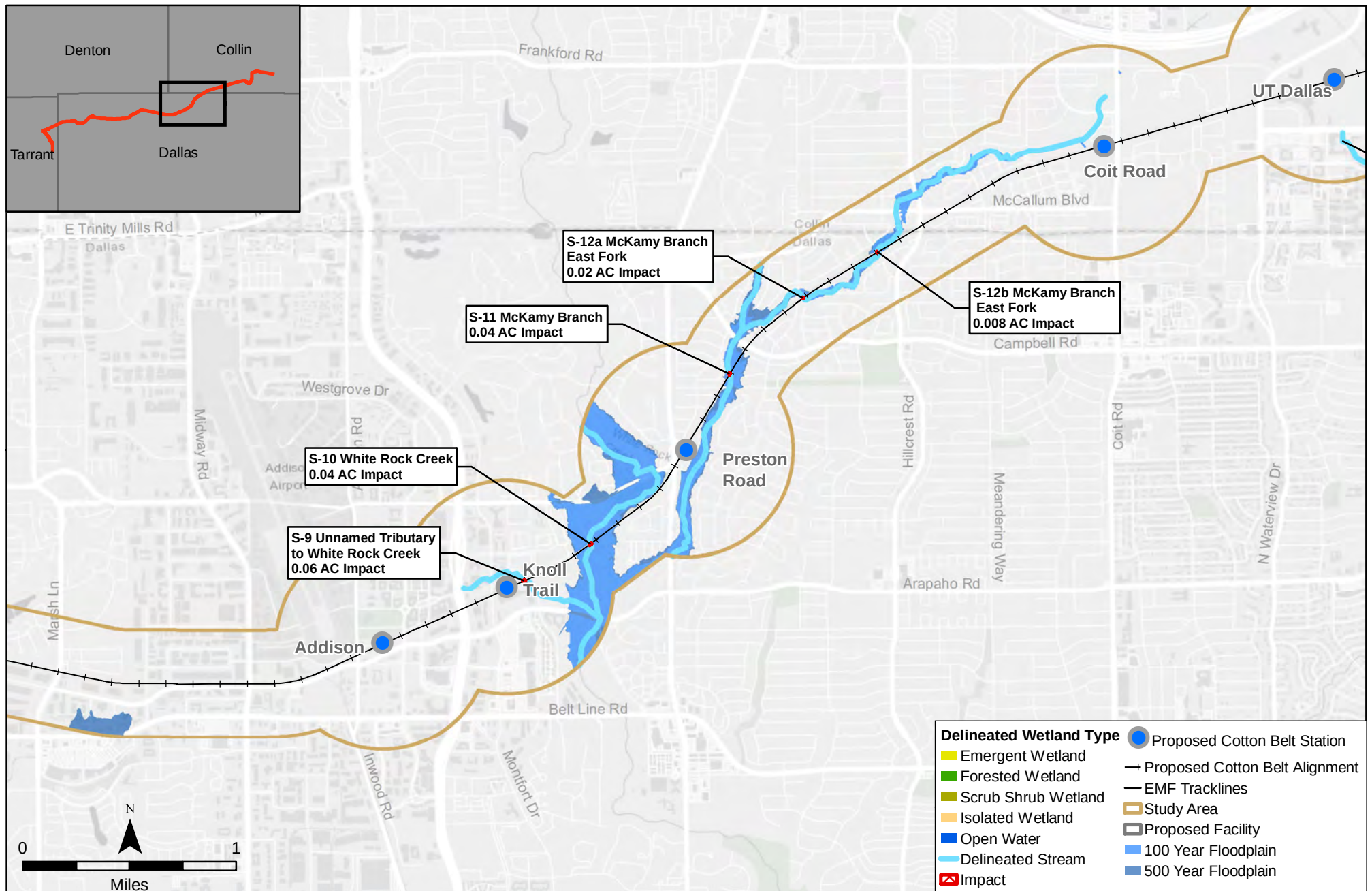
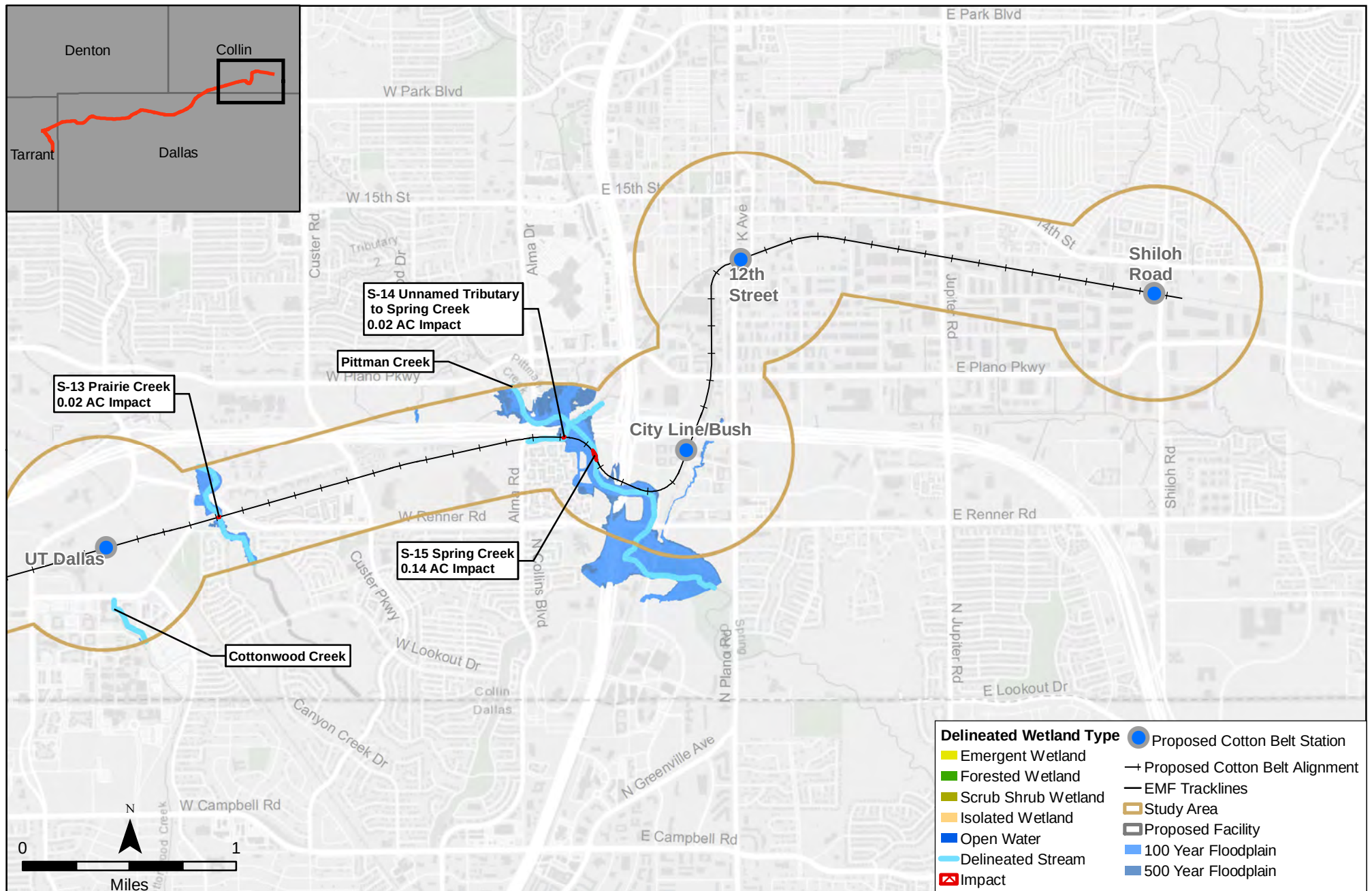


Figure 4-3
Impacted Water Resources
 Data Source: FEMA, 2012, HDR, 2017









Total impacts to these water bodies would be dependent upon the size and number of support columns placed within the ordinary high water mark (OHWM) for each individual water body. Despite placing support columns into these water bodies, impacts are not expected. Given the current design of the Project, the permanent impacts appear to be limited to the stream crossings where bridge columns would be placed in the water areas. These bridge column impacts would total approximately 1.32 acres.

The remaining bodies of water lie adjacent to the proposed location of construction and would not receive any direct impacts. However, indirect impacts could occur via surface water runoff, which may transport sediment into these water bodies.

Stations, Mercer Yard and EMF

No wetlands were identified in the station areas or at Mercer Yard. Four wetlands and one pond were identified at the potential EMF Site Option 1 (Luna Road) location. If this EMF site is selected, potential impacts would need to be determined.

4.12.2 Mitigation Measures

During final design, DART will continue to investigate reducing both the direct and indirect impacts to wetlands. DART will coordinate with USACE on all waters of the US and wetlands issues. Any changes developed during final design can be tracked and adjusted through DART's *Mitigation Monitoring Program*. Consultation with the USACE has been initiated to document the expected permits and mitigation needs. Additionally, the Cotton Belt Project is identified as a regionally significant project that can benefit from expedited review under the Section 214 program of the Water Resources Development Act (WRDA) Program which includes a Memorandum of Agreement (MOA) between NCTCOG and USACE to support expedited review and cost savings to major projects. The program was extended in the fall of 2016 to December 31, 2019. DART participates in the program and will inform NCTCOG when project permitting is initiated to take advantage of the program.

4.13 Air Quality

This section provides an assessment of the potential air quality impacts of the Project. This was conducted by assessing existing air quality conditions in the region, the potential for regional or localized impacts with the Project in operation, and a conformity assessment. **Section 3.11** provides an overview of the current air quality status in the Study Area and applicable air quality standards.

4.13.1 Impact Evaluation

No-Build Alternative

No new violations of the NAAQS and no adverse regional or local air quality impacts are expected. However, the No-Build Alternative maintains the status quo for automobile travel in this part of the region and will not provide alternative forms of transportation or support continued land use changes that create a more sustainable development pattern less dependent on automobile use. Furthermore, the No-Build Alternative would not create benefits associated with reduced VMT or reduced hours of congestion delay, therefore not contributing to air quality improvements in the region.

Build Alternative

The Build Alternative was assessed at a regional level and a local level relative to potential air quality and emission impacts related to:

- Emissions from the operation of regional rail vehicles



- Potential changes in emissions from automobiles traveling to park-and-ride locations, or based on changes in travel with commuters using the regional rail line rather than driving.

Vehicle Technology

The Project intends to procure new regional rail vehicles for operations. The vehicles would be self-propelled diesel multiple units (DMUs). These diesel-electric vehicles are different from current DART TRE or LRT operations in that they are not locomotive-hauled like the TRE or do not rely on an overhead catenary system and electric substations for power like LRT. The vehicle specifications state they will have diesel engines compliant with EPA Tier 4 ultra-low emission standards. These engines are housed inside the vehicle which power all systems. The Tier 4 standards are the latest standards and require that emissions of PM and NO_x be further reduced by about 90 percent beyond prior standards.

Regional Emissions

In addition to vehicle emissions advancements, a comparison of future vehicles miles of travel (VMT) and hours of congestion delay in year 2040 with and without the Project in operation was done. Vehicle emissions are a major contributor to ozone formation due to the presence of two key “precursors,” or ingredients, to ozone formation in automobile emissions: nitrous oxides (NO_x) and volatile organic compounds (VOCs). Despite improvements in technology that lead to cleaner-burning vehicles, the volume of traffic on our highways today continues to produce a significant amount of pollution that contributes to ozone formation. Forecast VMT with the Project in operation results in a reduction of nearly 80,000 daily (nearly 24,000,000 annual) VMT in the DART Service Area. In terms of hours of congestion delay within the DART Service Area, the Project would save nearly 3,800 daily hours of congestion, or 1,123,000 hours of congestion delay per year. Thus, it is unlikely the O₃ levels would increase as a result of the project due to overall decrease in VMT and congestion delay.

Localized Emissions Assessment

Based on TxDOT air quality procedures, a “CO” hot spot analysis of specific intersections is necessary if the region is in non-attainment or maintenance for CO or PM. Currently, the region is in attainment for these, so a micro-scale analysis was not conducted for the project. Based on project drive access volumes from the NCTCOG regional travel demand model, localized traffic at station park-and-rides is not anticipated to be substantial. Shiloh Road as an end-of-line station may have the most station automobile traffic and is the largest parking lot. In many cases, the Cotton Belt has higher transfer activity (bus to rail, or rail to rail) than drive access at stations due to the connectivity to the rest of the transit system.

Project Conformity Assessment

The Study Area is in Tarrant, Dallas and Collin counties, which have been designated as a “moderate” nonattainment area for eight-hour ozone by the EPA. Therefore, the transportation air quality conformity rule applies to the region and the Project is subject to a regional air quality analysis. Transportation conformity ensures that federal funding and approval goes to projects which are consistent with the region’s air quality goals. Under Section 176(c) of the CAA [42 USC Section 7670(c)], federal agencies such as the FTA and FHWA are prohibited from engaging in, supporting in any way, providing financial assistance for, licensing or permitting or approving any activity that does not conform to an approved State Implementation Plan (SIP). Because this Project is in a nonattainment area, the federal implementing agency would be responsible for ensuring that projects conform to the SIP. A conforming project definition is one that conforms to the SIP objectives of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards.



Under Section 176(c)(4) of the CAAA of 1990, Metropolitan Planning Organizations (MPOs) must conduct an air quality conformity analysis to ensure Metropolitan Transportation Plans (MTP) and Transportation Improvement Programs (TIP) are consistent with the region's air quality goals, for areas that are in nonattainment for ozone (NCTCOG, 2016a). Conformity measures the amount of two pollutants which are precursors to the formation of ground-level ozone, NO_x and VOCs. The SIP establishes a Motor Vehicle Emissions Budget (MVEB) for those two pollutants to limit the formation of ozone. On January 11, 2016, the EPA published the Adequacy Status of the Dallas-Fort Worth, TX Reasonable Further Progress 8-Hour Ozone Motor Vehicle Emission Budgets for Transportation Conformity Purposes (NCTCOG, 2016a), establishing the use of NCTCOG's developed MVEB for 2017. If a project is included in the emissions analysis of the MTP or TIP, and the plan or program has been approved as confirming to the SIP, then the project is presumed to conform. If the project's emissions are not analyzed in the MTP or TIP, then a separate project-level conformity determination is required. Showing that emissions under a build alternative are less than the no build alternative demonstrates project level conformity. Projects included in the region's approved MTP and TIP are projected to be below the set MVEB.

In March 2016, the Regional Transportation Council of NCTCOG adopted *Mobility 2040: The Metropolitan Transportation Plan for North Central Texas* and approved the results of the *2016 Transportation Conformity* (NCTCOG, 2016b; NCTCOG, 2016a). The Cotton Belt Project is included in Mobility 2040, and is part of the approved 2016 Transportation Conformity. Mobility 2040 meets all transportation air quality conformity requirements of the CAAA, the air quality plan, the transportation conformity rule, and the transportation conformity-related provisions contained in the United States Code, Title 42 §7506 (NCTCOG, 2016a). Currently, there are no federal or state regulations, or executive orders, specifically requiring GHG emissions or resiliency of project features to climate change be determined for planning of federal projects.

Based on this assessment, no new air quality violations of the NAAQS would be anticipated as a result of the Cotton Belt Project; therefore, no mitigation measures would be required.

4.14 Noise

This section presents the analysis of potential noise impacts due to the operation of the Project and discusses mitigation measures to minimize adverse impacts.

4.14.1 Noise Impact Assessment Methodology

The affected noise and vibration environment along the Study Area was investigated based on a review of current project and land use information, data from previous work summarized in the *Cotton Belt Corridor Regional Rail Noise and Vibration Existing Conditions Technical Memorandum* (December 2013), and measurements conducted during March, April and September of 2017. **Section 3.12** describes existing noise conditions.

Noise levels were projected based on the DART DMU vehicle noise specification, the Project's Operating Plan and the prediction model specified in the FTA guidance manual.

The primary components of wayside noise from the train operations are engine/exhaust and cooling fan noise from the DMU power units and wheel/rail noise from the steel wheels rolling on steel rails. Secondary sources, such as vehicle air-conditioning and other ancillary equipment, would sometimes be audible, but are not expected to be significant factors. The projection of wayside noise from train operations was carried out using the model specified in the FTA guidance manual, supplemented by DMU noise measurement data, with the following assumptions:



- Initially, the trains would consist of vehicles similar to one Stadler diesel-electric FLIRT3 vehicle, including four powered axles and eight unpowered axles, with a total length of 267 feet. Ultimately, it is anticipated that an additional coach section would be added to the train, extending the total train length to 318 feet.
- DMU noise is predicted as a function of speed and throttle setting based on noise measurements of a set of Stadler diesel-electric GTW 2/6 articulated DMU rail vehicles on the Denton County Transportation Authority (DCTA) A-Train system. Because the DCTA vehicle has only two powered axles and four unpowered axles, it has been assumed that the FLIRT3 vehicle would be equivalent to two (2) DCTA vehicles in terms of noise emission, with a 3-decibel increase in the sound exposure level (SEL). It has also been assumed that the increased train length for the ultimate configuration would result in an additional SEL increase of 0.76 decibels.
- Based on measurement data, a minimum speed of 35 miles per hour (mph) was used to predict noise from DMU vehicles decelerating to a stop at train stations to account for additional noise caused by regenerative braking.
- As described in **Section 2.4**, service would be offered seven days per week, with more frequent service during weekday morning and evening peak periods. During initial operations, weekday service would generally be from 6:00 am to 9:00 pm. The service hours for some stations could be as early as 5:15 am or as late as 10:15 pm as trains come in and out of revenue service from the EMF. However, the noise analysis assumes the potential for future operations to extend until 12:15 am. Although initial peak period service levels would be every 30 minutes, the noise analysis assumes more frequent service levels where trains would operate in both directions every 20 minutes during the peak travel periods of 6:00 am - 9:00 am and 3:00 pm - 7:00 pm. Trains would operate in both direction every 60 minutes during the non-peak travel periods of 9:00 am - 3:00 pm and after 7:00 pm. Service on Saturday, Sunday, and major holidays would be from 8:00 am to 8:00 pm operating in both directions every 60 minutes throughout the day.
- Vehicle operating speeds are based on speed profiles generated for the Project with speeds of up to 79 mph for the Project.
- The DMU throttle settings (i.e. the percent of full throttle) are based on acceleration profiles generated for the project, assuming that an acceleration of 2 mph/sec represents a full throttle condition.
- DMU horns are assumed to generate a sound level of 104.5 dBA at 100 feet, corresponding to a SEL of 113.5 dBA at 50 feet. The high horn noise level is based on compliance measurements conducted on the Stadler DMU rail vehicles on the DCTA A-Train system summarized in the test report Acoustic Warning Devices (Document No. TR: 0487, July 12, 2011). It is assumed that the horns would begin to be sounded 20 seconds, but not more than 0.25 mile, in advance of grade crossings in accordance with FRA regulations.
- Warning bells on the trains are activated as trains enter and leave passenger stations. This potential noise source was not included in this analysis because it would not be expected to be a major contributor to the overall noise exposure.
- Stationary warning bells, generating a sound level of 73 dBA at 50 feet, would be sounded at all gated crossings before and after each train for a total of 30 seconds.
- Wheel impacts at track crossovers and turnouts are assumed to cause localized noise increases of 6 dBA up to a distance of 50 feet, dropping off linearly to zero increase at a distance of 300 feet.
- It was assumed that there would be no change in freight rail operations due to the implementation of the Cotton Belt Project. Small shifts in the location of freight rail tracks were not considered in this analysis.



4.14.2 Impact Evaluation

No-Build Alternative

No-Build noise levels in the Study Area will continue to be generated principally from motor vehicles traveling on Study Area roadways. In the absence of planned roadway improvements or other major developments that would alter traffic patterns to a great degree, future No-Build noise levels can be expected to increase slightly due to projected traffic growth. However, the increase in noise would not be perceptibly different from existing noise levels.

Build Alternative

The results of the noise impact assessment with the Build Alternative in operation identified impacts at a total of 5,419 residential receptors, including 3,090 severe impacts and 2,329 moderate impacts. The figures illustrating the locations of the residential noise impacts are located in **Appendix B** (*Noise and Vibration Technical Report*).

In addition, noise impacts were identified at 19 institutional receptors, including 10 severe impacts and nine moderate impacts. **Table 4-9** lists the affected institutional receptors, which include four schools, seven churches, five parks, a museum, an art gallery and a cemetery.

Table 4-9. Summary of FTA Category 3 (Institutional) Noise Impacts Without Mitigation

Moderate	Severe
Valley Ranch Baptist Church, Coppell	Deep Forest Gallery, Coppell
Church on the Rock, Carrollton	Discover Share Pre-School, Coppell
Miracle Tabernacle Pentecostal Church, Carrollton	Hilltop Memorial Park, Carrollton
A. W. Perry Homestead Park, Carrollton	A.W. Perry Homestead Museum, Carrollton
Polk Middle School, Carrollton	Korean Church of Dallas, Carrollton
Trafalgar Square Park, Addison	Islamic Association of Carrollton, Carrollton
Beckert Park, Addison	Addison Circle Park, Addison
Congregation Ohev Shalom, Dallas	Preston Greek Park, Dallas
Frankford Middle School, Dallas	Ivy Montessori Academy, Dallas
	New Life in Jesus Christ Church, Dallas

Source: GPC 6

The major source of potential noise impacts for the Cotton Belt Project is noise from train horns that would be sounded at the numerous at-grade crossings along the proposed rail alignment.

Quiet zones would be established to eliminate the noise from the train horns near grade crossings in accordance with FRA regulations. In quiet zones, because of safety improvements at the at-grade crossings, train operators would sound horns only in emergency situations rather than as a standard operating procedure. Establishing quiet zones would require cooperative action among the municipalities along the Project, FRA, the freight railroads and DART. The municipalities are key participants in the process as they must initiate the request to establish the zones through application to the FRA. To meet safety criteria, the municipalities may also be required to provide improvements at grade crossings such as modifications to the streets, raised medians, warning lights, and other devices. The FRA regulation also authorizes the use of automated wayside horns at crossings along with flashing lights and gates as a substitute for the train horn. While activated by the approach of trains, these devices are pole-mounted at the grade crossing, thereby limiting the horn noise exposure area to the immediate vicinity of the crossing.

With quiet zones, it is estimated that approximately 96 percent of the 5,419 residential noise impacts would be eliminated and all 19 institutional impacts would be eliminated. Thus, it is



proposed that quiet zones be implemented in cooperation with local municipalities at the 36 at-grade crossings listed in **Table 4-10**.

Table 4-10. Proposed and Existing Quiet Zone Crossings

Street	City	Street	City
Coppell Road	Coppell	Knoll Trail Drive	Dallas
Southwestern Boulevard	Coppell	Davenport Road	Dallas
East Belt Line Road	Coppell	Campbell Road	Dallas
Moore Road	Coppell	Davenport Road	Dallas
Mockingbird Lane	Coppell	Hillcrest Road	Dallas
S MacArthur Boulevard	Coppell	McCallum Boulevard	Dallas
Fairway Drive	Coppell	Meandering Way	Dallas
Luna Road	Carrollton	Dickerson Street	Dallas
I-35E Access Road (SB)	Carrollton	Waterview Parkway (Existing)	Richardson
I-35E Access Road (NB)	Carrollton	Rutford Drive	Richardson
N Broadway Street	Carrollton	Custer Parkway (Existing)	Richardson
N Denton Drive	Carrollton	Alma Road (Existing)	Richardson
Perry Road	Carrollton	West CityLine Drive	Richardson
N Josey Lane	Carrollton	President. George Bush Turnpike (EB)	Richardson
Kelly Boulevard	Carrollton	President George Bush Turnpike (WB)	Plano
Marsh Lane	Carrollton	10 th Street (Existing)	Plano
Surveyor Boulevard	Addison	K Avenue	Plano
Addison Road	Addison	Municipal Avenue	Plano
Quorum Drive	Addison	N Avenue (Existing)	Plano
Spectrum Drive	Addison	Jupiter Road (Existing)	Plano
Dallas Parkway (SB)	Addison	Shiloh Road (Existing)	Plano
Dallas Parkway (NB)	Addison		

Source: DART, 2017

Note: At proposed quiet zone grade crossings, cities must apply for new Quiet Zones per FRA rules. DART will include Quiet Zone mitigation costs as part of the Project. There are seven existing Quiet Zones.

Table 4-11 summarizes the number of remaining noise impacts at residential locations assuming the implementation of proposed quiet zones. There is a total of 235 moderate noise impacts that would remain to be addressed, all at residential receptors. The next section provides information on proposed mitigation to address these impacts.

4.14.3 Mitigation Measures

FTA states that, in determining the need for noise mitigation, severe impacts should be mitigated unless there are no practical means to do so. At the moderate impact level, more discretion should be used, and other project-specific factors should be included in the consideration of mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-to-indoor sound insulation and the cost-effectiveness of mitigating noise to more acceptable levels. Consistent with DART policy, noise mitigation for moderate noise impacts is warranted at locations where a noise exposure increase of three (3) decibels or more is projected. Other moderate impacts would be evaluated on a case-by-case basis, depending on proximity to other mitigation measures.

As previously explained, most of the noise impacts from the Cotton Belt Project are due to the sounding of train horns at the numerous at-grade crossings along the alignment. The most practical way to mitigate these noise impacts is with the establishment of quiet zones for at-grade crossings near impacted noise-sensitive receptors. After quiet zones, 235 residential moderate impacts remain.



As shown in **Table 4-11**, a noise increase of 3 dB or greater is projected at 185 of these 235 receptors. Consistent with DART policy, the 185 impacts over 3 dB would be required to be mitigated. Mitigation of the remaining impacts is considered on a case-by-case basis, taking into consideration factors such as:

- Is the property within a cluster of residences where residences are impacted and require mitigation?
- Is the noise level increase near the moderate level and combined with significant community input regarding noise concerns?

The range of typical mitigation measures for reducing noise impacts are described below:

- **Noise Barriers:** Installation of noise barriers beside the tracks is commonly used to reduce noise from surface transportation sources. Depending on the height and location relative to the tracks, noise barriers can achieve between 5 and 15 dBA of noise reduction. The primary requirements for an effective noise barrier are that (1) the barrier must be high enough and long enough to break the line-of-sight between the sound source and the receiver; (2) the barrier must be of an impervious material with a minimum surface density of 4 lb./sq. ft.; and (3) the barrier must not have any gaps or holes between the panels or at the bottom. Because many materials meet these requirements, the selection of materials for noise barriers is usually dictated by aesthetics, durability, cost, and maintenance considerations. Noise barriers for transit projects typically range in height from 8 to 12 feet.
- **Building Sound Insulation:** Sound insulation of residences and institutional buildings to improve the outdoor-to-indoor noise reduction has been widely applied around airports and has seen limited application for rail and transit projects. Although this approach has no effect on noise in exterior areas, it may be the best choice for sites where noise barriers are not feasible or desirable and for buildings where indoor sensitivity is of most concern. Substantial improvements in building sound insulation (on the order of 5 to 10 dBA) can often be achieved by adding an extra layer of glazing to the windows, by sealing holes in exterior surfaces that act as sound leaks, and by providing forced ventilation and air-conditioning so that windows do not need to be opened.
- **Wheel/Rail Lubrication:** There are several options to mitigate potential wheel squeal from small-radius curves including on-board solid-stick rail lubrication and wayside rail lubrication. Automated wayside top-of-rail friction modifier systems put a small amount of lubricant onto the top of the rail, which maintains a constant coefficient of friction. This type of lubricant has been shown to reduce or eliminate the potential for wheel squeal.
- **Special Trackwork:** Because the impacts of rail vehicle wheels over rail gaps at track turnout locations increase airborne noise by about six dBA close to the track, turnouts are a major source of noise impact when they are located in sensitive areas. If turnouts cannot be relocated away from sensitive areas, other noise control measures can be used such as the use of spring-rail, flange-bearing, or moveable-point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.
- **Grade Crossing Bells:** Industry standards for warning devices at railroad crossings have been established by the American Railway Engineering and Maintenance of Way Association (AREMA, 2017) and by the American Public Transit Association (APTA, 2007). The AREMA standard states that grade crossing bells should generate a peak sound level between 75 dBA and 105 dBA at a distance of 10 feet from the bell, and should operate at a rate of between 100 and 325 strikes per minute. The APTA standard generally refers to AREMA for design specifications, but allows flexibility in the development of alternative practices. Thus, the noise exposure from the grade crossing bells could be minimized by adjusting the bell volume and ring rate to near the minimum



values. In addition, simple acoustic shrouds covering the back half of the bells could direct bell noise away from noise-sensitive areas and focus it in areas where it is needed. These measures have the potential to reduce noise from grade crossing bells by about 10 dBA.

- **Vehicle Wheel Skirts:** Vehicle wheel skirts may also lessen noise and vibration generated by wheels, rails, engines, and motors.
- **Property Acquisitions or Easements:** Additional options for avoiding noise impacts are for the agency to purchase residences likely to be impacted by train operations or to acquire easements for such residences by paying the homeowners to accept the future train noise conditions. These approaches are usually taken only in isolated cases where other mitigation options are infeasible, impractical, or too costly.

For 233 of the 235 impacts, DART will eliminate the impacts using the following mitigation:

- Installing a total of 20,300 lineal feet (3.84 miles) of approximately 12-foot high noise barriers in 19 sections adjacent to the tracks near locations with noise impacts.
- Reducing the noise from grade crossing bells near locations with impacts either by adjusting the bell volume to the minimum industry standard level of 75 dBA at 10 feet or by installing acoustic shrouds covering the back half of the bells.

The two remaining moderate noise impacts are on the westbound side of the tracks just east of the Perry Road grade crossing in Carrollton. These impacts are due to increased noise from a nearby crossover but do not warrant mitigation according to DART policy as the noise increase at these locations is projected to be less than three decibels. This area is not located in an EJ community. DART will consider additional mitigation at this location during final design including possible special trackwork relocation.

Table 4-12 provides the approximate location and extent for each recommended noise barrier. The noise impacts and the barrier locations are shown in **Figures 4-7** through **4-13**. The civil station references can be viewed in the guideway plan and profile drawings in **Appendix A**. These locations are approximate, and will need to be confirmed during final design. **Table 4-13** lists the eight at-grade crossings where bell noise mitigation is warranted. These crossing locations are also depicted on **Figures 4-7** through **4-13**.

Finally, **Table 4-14** summarizes the resulting noise levels and remaining impacts based on FTA impact criteria at residential locations with the implementation of all mitigation measures - quiet zones, noise barriers and crossing bell noise mitigation. The distances for the section in **Table 4-14** represent the distances for residences with residual noise impact after implementation of quiet zones. However, with implementation of all proposed mitigation measures, there are no noise impacts for this section and the distances in **Table 4-14** represent the receiver with the highest project noise level (which may not be the closest receiver to the track as stated in Note 5). In many cases, noise barriers are warranted for the receivers closest to the track, resulting in lower Project noise levels after mitigation than at receivers further from the track that do not require a noise barrier. As shown in **Table 4-14**, the only two remaining moderate impacts are in Carrollton and potential mitigation which will be evaluated for feasibility and reasonableness as the Project advances.



Table 4-11. Summary of Residential Noise Impacts with Implementation of Quiet Zones

Corridor Description	Side of Track ¹	Distance from Near Track (feet)	Train Speed (mph)	Existing Noise Level ²	Project Noise Level ²			Total Noise Level ²	Noise Level Increase ²	Number of Residential Impacts		
					Predicted ³	Impact Criteria				Moderate		Severe
						Moderate	Severe			<3 dB Incr.	≥3 dB Incr.	
Freeport Pkwy to S Denton Tap Rd ⁵	WB	259	25	62	47	59	64	62	0.1	0	0	0
Freeport Pkwy to S Denton Tap Rd ⁵	EB	193	25	62	46	59	64	62	0.1	0	0	0
S Denton Tap Rd to S Moore Rd ⁵	WB	567	35	56	41	56	62	56	0.1	0	0	0
S Moore Rd to S MacArthur Blvd ⁵	WB	97	79	61	57	58	64	62	1.3	0	0	0
S Moore Rd to S MacArthur Blvd ⁵	EB	278	76	61	48	58	64	61	0.2	0	0	0
S MacArthur Blvd to Elm Fork Trinity River ⁵	WB	128	72	67	57	62	67	67	0.5	0	0	0
S MacArthur Blvd to Elm Fork Trinity River ⁵	EB	225	71	67	50	62	67	67	0.1	0	0	0
Elm Fork Trinity River to Pres. George Bush Turnpike ⁴	WB	--	--	--	--	--	--	--	--	0	0	0
Pres. George Bush Turnpike to I-35E ⁴	EB	--	--	--	--	--	--	--	--	0	0	0
I-35E to N Josey Ln	WB	56 to 105	49 to 53	57	56 to 58	56	62	60 to 61	2.6 to 3.5	7	2	0
I-35E to N Josey Ln ⁵	EB	131	52	60	55	58	63	61	1.3	0	0	0
N Josey Ln to Kelley Blvd ⁴	WB	--	--	--	--	--	--	--	--	0	0	0
N Josey Ln to Kelley Blvd ⁴	EB	--	--	--	--	--	--	--	--	0	0	0
Kelley Blvd to Marsh Ln	WB	45 to 70	56 to 71	59	57 to 59	57	63	61 to 62	2.2 to 3.1	18	4	0
Marsh Ln to Midway Rd ⁵	WB	76	68	57	56	56	62	60	2.5	0	0	0
Marsh Ln to Midway Rd ⁵	EB	471	60	61	40	58	64	61	0.0	0	0	0
Midway Rd to Dallas Pkwy	WB	71	35	61	59 to 60	58	64	63	2.1 to 2.4	16	0	0
Midway Rd to Dallas Pkwy ⁵	EB	195	50	61	49	58	64	61	0.2	0	0	0
Dallas Pkwy to Preston Rd	WB	67	50 to 58	55	56	55	61	59	3.5	0	6	0
Dallas Pkwy to Preston Rd	EB	45 to 84	35 to 55	56 to 59	56 to 58	56 to 57	62 to 63	59 to 62	2.2 to 3.2	9	8	0
Preston Rd to Campbell Rd	WB	47 to 117	37 to 40	52	54 to 57	54	60	56 to 58	4.2 to 6.1	0	21	0
Preston Rd to Campbell Rd	EB	39 to 128	40	52	55 to 59	54	60	56 to 60	4.5 to 8.1	0	23	0



Table 4-11. Summary of Residential Noise Impacts with Implementation of Quiet Zones (continued)

Corridor Description	Side of Track¹	Distance from Near Track (feet)	Train Speed (mph)	Existing Noise Level²	Project Noise Level²			Total Noise Level²	Noise Level Increase²	Number of Residential Impacts		
					Predicted³	Impact Criteria				Moderate		Severe
						Moderate	Severe			<3 dB Incr.	≥3 dB Incr.	
Campbell Rd to Hillcrest Rd	WB	48 to 144	40 to 72	52	54 to 59	54	60	56 to 60	4.2 to 7.9	0	37	0
Campbell Rd to Hillcrest Rd	EB	47 to 115	40 to 74	52	54 to 59	54	60	56 to 60	4.2 to 7.9	0	27	0
Hillcrest Rd to Coit Rd	WB	80 to 133	58 to 63	52	54 to 58	54	60	56 to 59	4.3 to 7.2	0	10	0
Hillcrest Rd to Coit Rd	EB	40 to 124	54 to 67	52 to 55	54 to 60	54 to 55	60 to 61	56 to 61	3.8 to 6.1	0	25	0
Coit Rd to Synergy Park Blvd⁵	WB	148	61	55	50	55	61	56	1.3	0	0	0
Coit Rd to Synergy Park Blvd	EB	41 to 62	35 to 59	55	55 to 59	55	61	58 to 60	3.2 to 5.2	0	22	0
Synergy Park Blvd to Alma Rd⁵	WB	96	73	60	55	58	63	61	1.3	0	0	0
Synergy Park Blvd to Alma Rd⁵	EB	396	62	58	49	57	62	59	0.6	0	0	0
Alma Rd to E Plano Pkwy⁵	WB	39	41	70	62	64	69	71	0.7	0	0	0
Alma Rd to E Plano Pkwy⁵	EB	189	30	69	51	64	69	69	0.1	0	0	0
E Plano Pkwy to Jupiter Rd⁵	WB	300	36	63	43	59	65	63	0.0	0	0	0
E Plano Pkwy to Jupiter Rd⁵	EB	215	35	63	47	59	65	63	0.1	0	0	0
Jupiter Rd to end⁵	WB	94	65	58	54	57	62	60	1.5	0	0	0
TOTAL NUMBER OF NOISE IMPACTS:										50	185	0

Source: GPC6, 2017

¹ Eastbound (EB) or Westbound (WB)

² Noise levels are based on Ldn and measured in dBA (rounded to the nearest decibel). For better resolution, noise level increases are shown to the nearest 0.1 decibel.

³ Predicted levels include bell noise, where applicable (rounded to the nearest decibel).

⁴ There are no noise-sensitive receptors of this type in this section.

⁵ There are no receptors with noise impact in this section. It should be noted that the data for this section represent the receiver with the highest Project noise level which may not be the closest receiver to the track due to differences in train speed, acceleration, distance to special trackwork or track structure (aerial vs. at grade).



Table 4-12. Recommended Noise Barrier Locations

Noise Barrier Number	Barrier Location Description		Side of Track	Barrier Civil Station Location		Barrier Length (feet)
	Corridor Section	Street and Community		From	To	
1	I-35E to Josey Lane	Cecil Drive, Carrollton	WB	2134+00	2150+00	1,600
2	Kelley Blvd to Marsh Lane	Lakehill Townhomes, Carrollton	WB	2252+00	2262+00	1,000
3	Dallas Pkwy to Preston Rd	Adair II Apartments, Dallas	WB	3038+00	3044+00	600
4		Chalfont Circle, Dallas	EB	3055+00	3067+00	1,200
5	Preston Rd to Campbell Rd	Prestonwood Trails, Dallas	WB	3082+00	3097+50	1,550
6		Prestonwood Trails Apartments, Dallas	WB	3099+50	3106+00	650
7		Southpoint Dr., Preston Green, Dallas	EB	3100+00	3109+50	950
8	Campbell Rd to Hillcrest Rd	Bent Creek North Condominiums, Dallas	WB	3111+00	3118+00	700
9		Davenport Ct, Pepperwood Estates, Dallas	EB	3111+00	3126+00	1,500
10		Brushfield/Spanky Branch/Wester Way, Highlands of McKamy, Dallas	EB	3127+50	3143+50	1,600
11		Highlands of McKamy, Dallas	EB	3148+50	3161+50	1,300
12		Duffield Dr., Oakington Pt, Preston Green North, Dallas	WB	3130+00	3148+00	1,800
13		North, Dallas	WB	3155+00	3162+00	700
14	Hillcrest Rd to Coit Rd	Highland Heather Lane, Highland Square, Dallas	EB	3163+00	3170+00	700
15		Nicole Place, Dallas	EB	3172+00	3179+00	700
16		Rocky Top Circle, Highlands of McKamy, Dallas	WB	3171+00	3179+00	800
17		Energy Lane, Dallas	EB	3180+00	3186+00	600
18	Coit Rd to Synergy Park Blvd	University Place #2, Dallas (Sunflower Lane)	EB	3217+00	3227+50	1,050
19		University Place #1, Dallas (Snapdragon Way)		3232+00	3245+00	1,300
TOTAL BARRIER LENGTH:						20,300

Source: GPC6, 2017

See **Appendix A** for civil station locations and approximate locations of noise barriers on the project design plans

Table 4-13. Crossing Bell Mitigation Locations

Crossing Number	Crossing Location Description		Bell Noise Impact Location	
	Corridor Section	Street/Community	Civil Station	Crossing Quadrant
1	Kelly Blvd to Marsh Lane	Marsh Lane / Willow Lane Condominium	2286+50	NW
2	Midway Road to Dallas Pkwy	Spectrum Drive / Addison Circle Apartments	2361+00	NW
3	Dallas Parkway to Preston Road	Knoll Trail Drive / Aura Prestonwood Apartments	3019+50	SE
4	Preston Road to Campbell Road	Campbell Road, Bent Creek North Condominiums (NE) and Southpoint Drive home (SW)	3110+50	NW/SE
5	Campbell Road to Hillcrest Road	Davenport Road, Davenport Road Home (NW) and Brushfield Drive home (SE)	3127+00	NE/SW
6		Hillcrest Road, Highland Heather Lane home	3162+50	SE
7	Hillcrest Road to Coit Road	McCallum Blvd, Rocky Top Circle home (NE) and Highland Heather Lane home (SW)	3170+50	NE/SW
8		Meandering Way, Nicole Place home	3179+50	SW

Source: GPC6, 2017

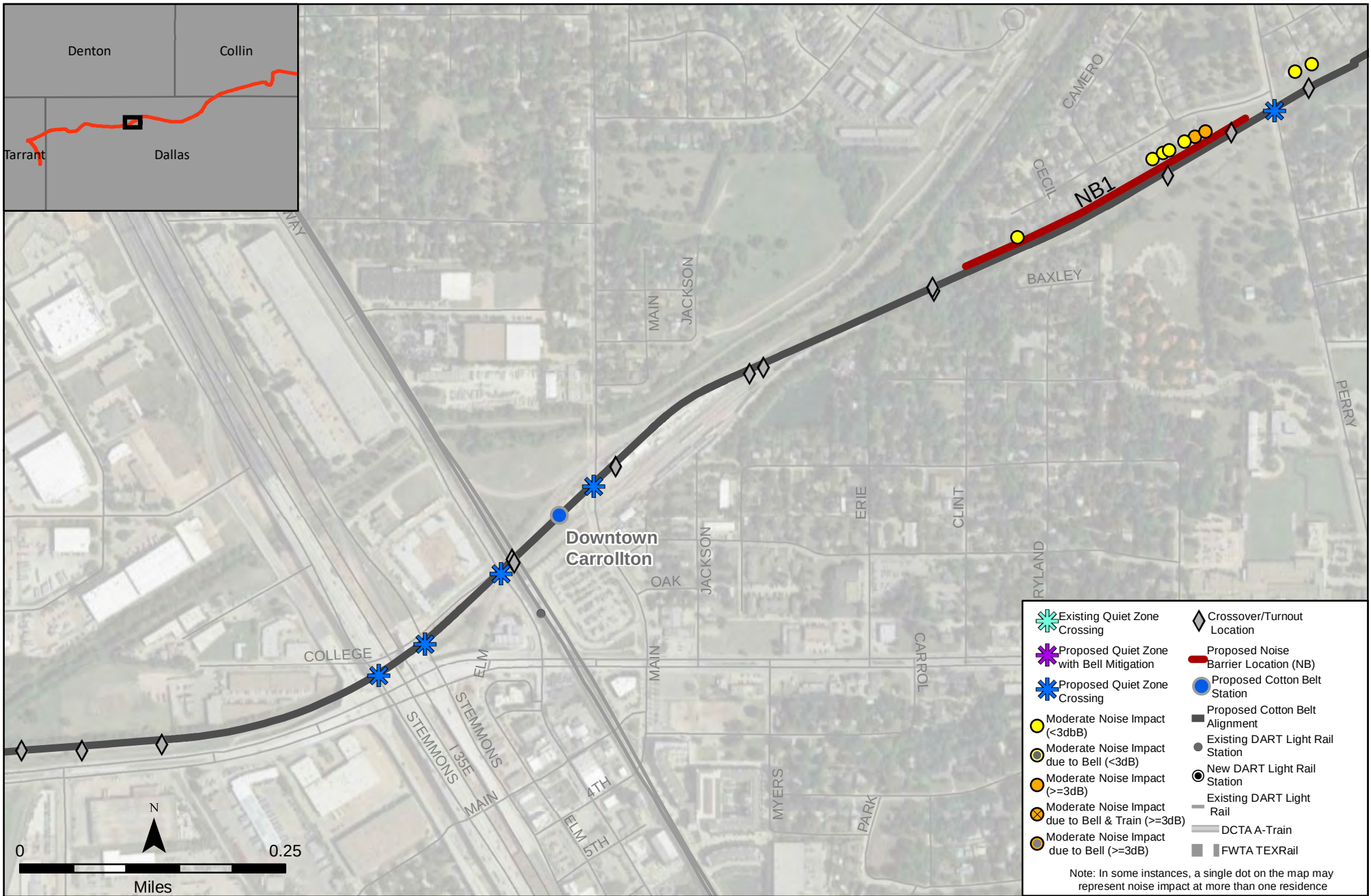


Figure 4-7
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



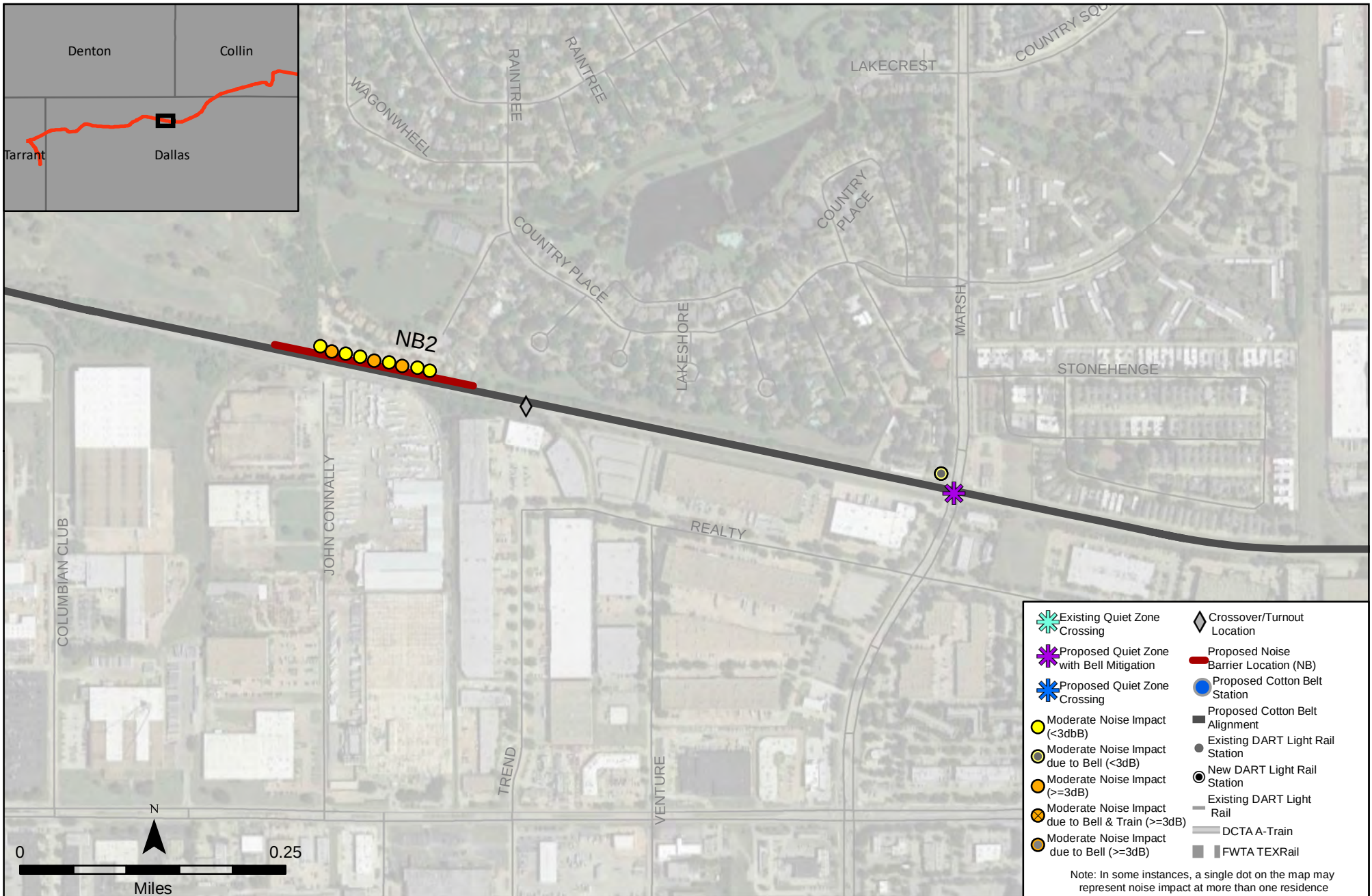


Figure 4-8
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



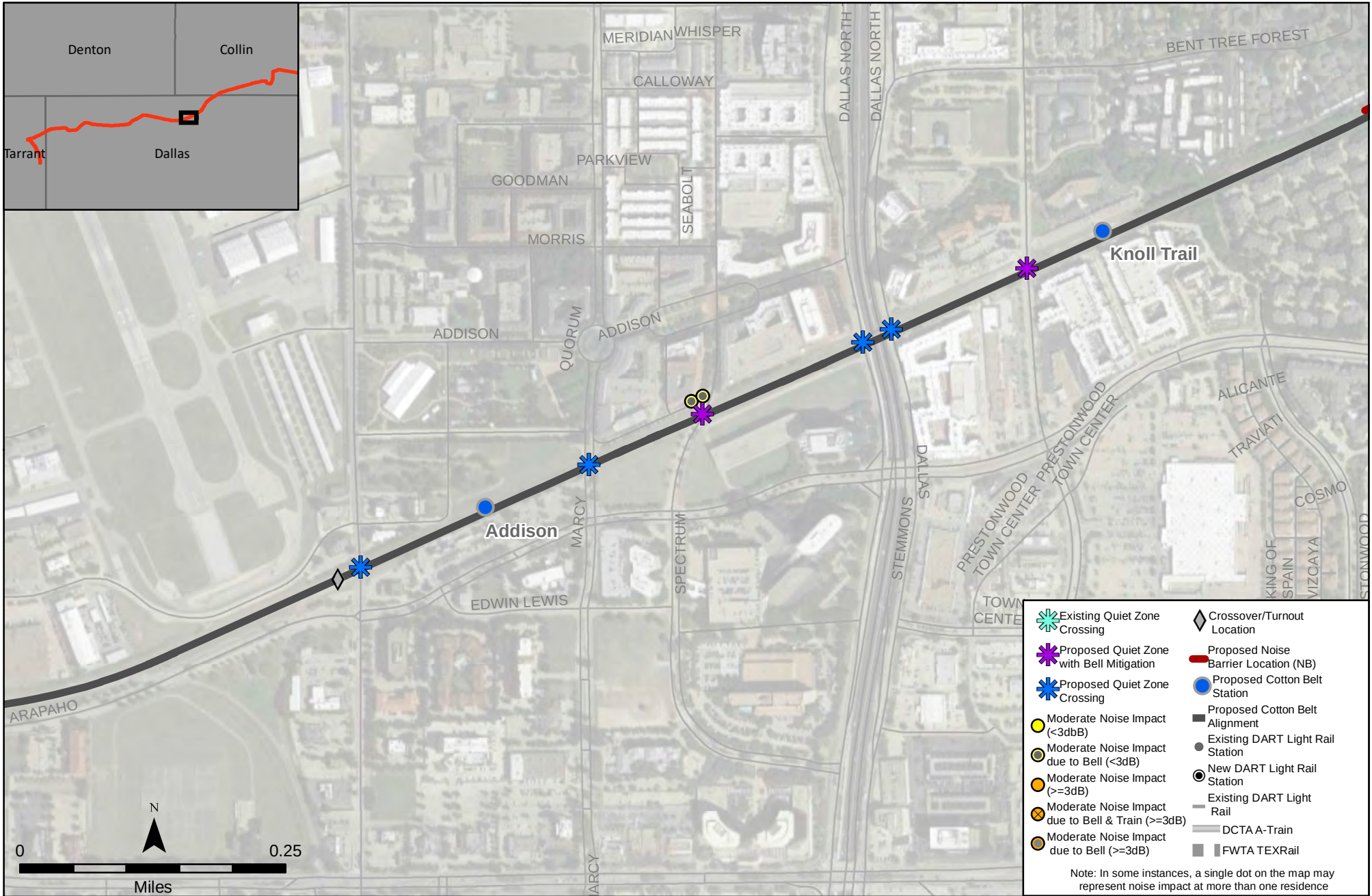


Figure 4-9
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



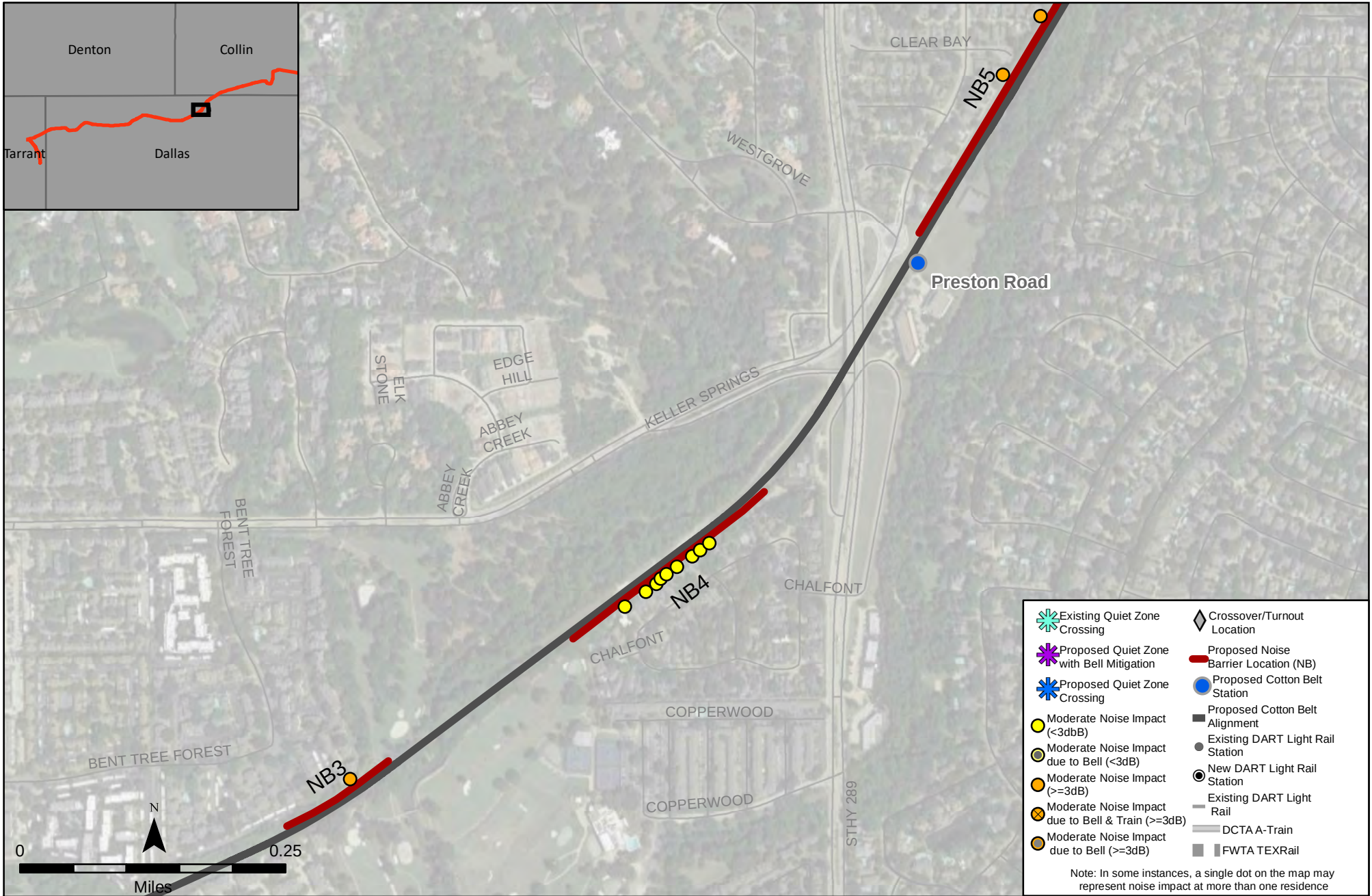


Figure 4-10
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



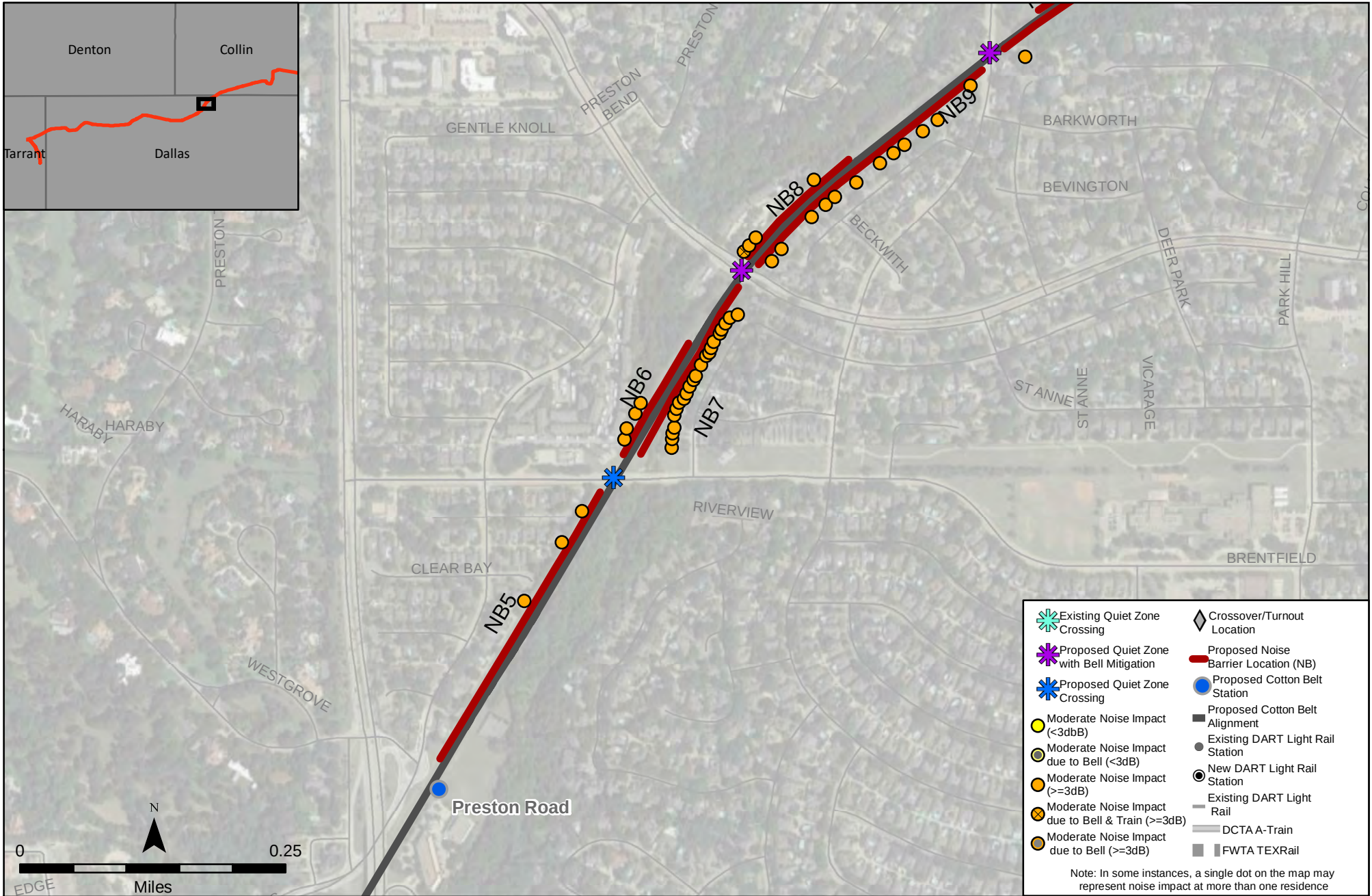


Figure 4-11
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project

Draft Environmental Impact Statement



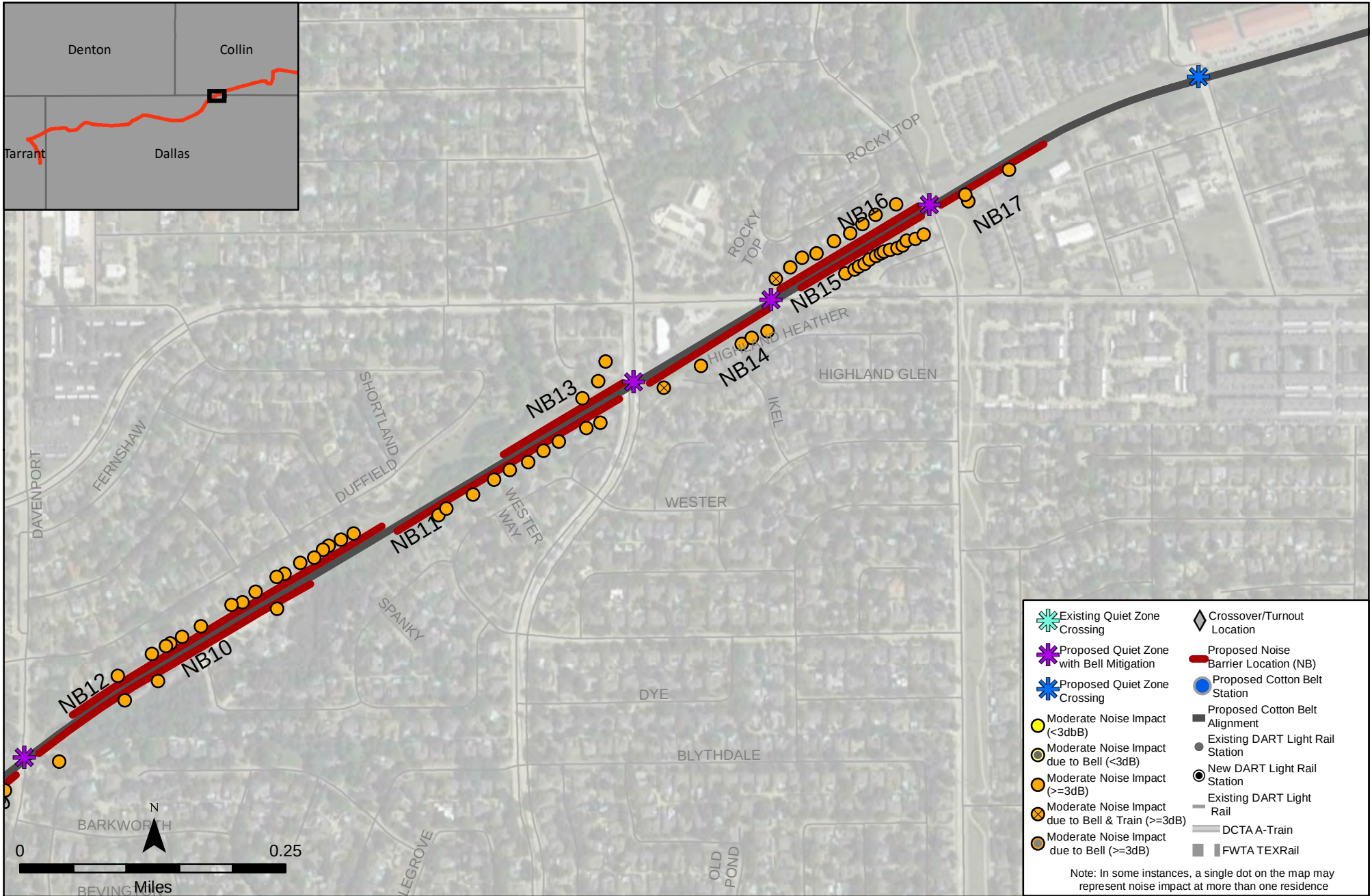


Figure 4-12
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



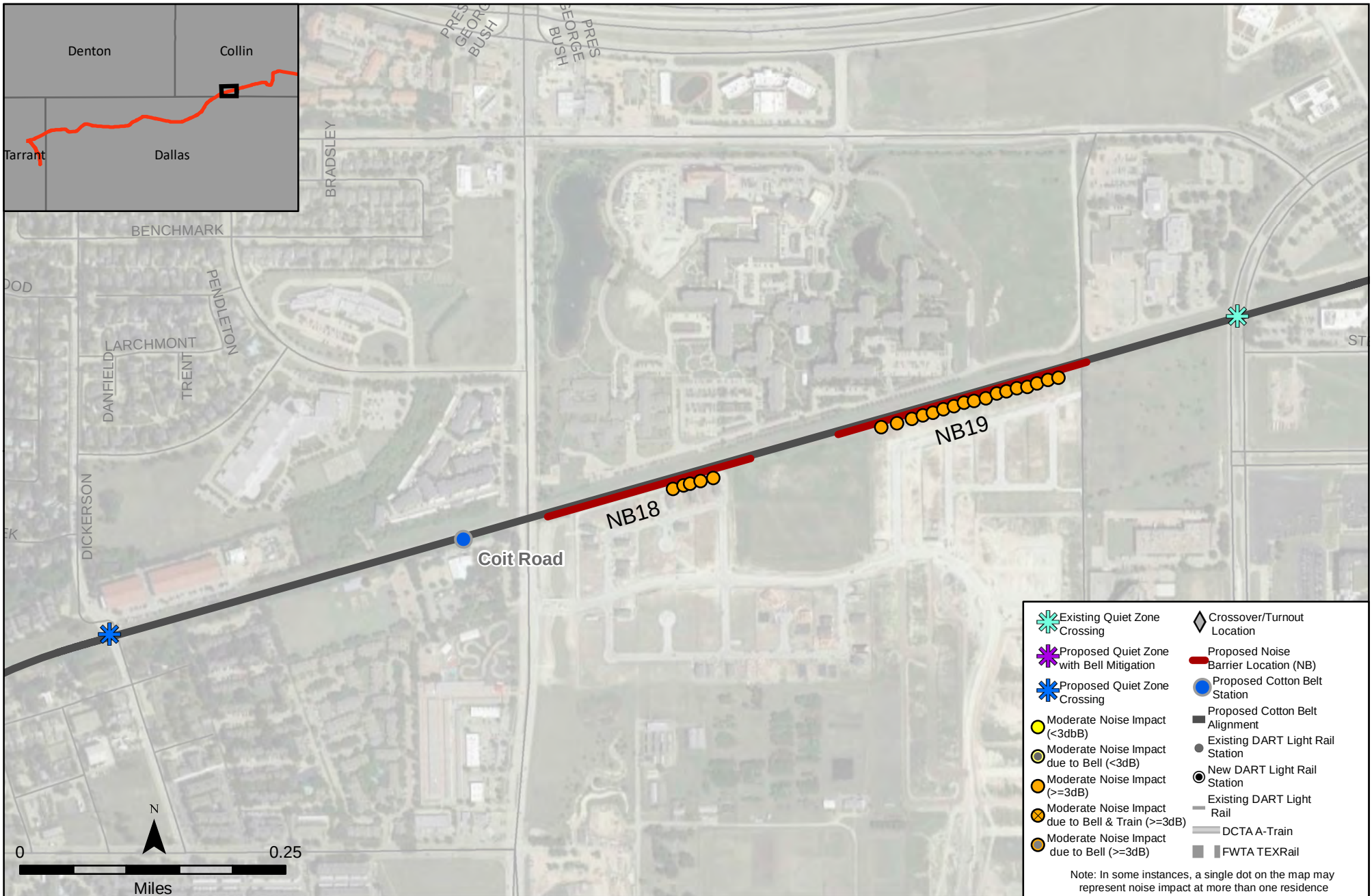


Figure 4-13
Noise Impacts and Proposed Mitigation Locations

Data Source: Cross-Spectrum Acoustics, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement



Table 4-14. Summary of Post-Mitigation Noise Conditions

Corridor Section Description	Side of Track ¹	Distance from Near Track (feet)	Train Speed (mph)	Existing Noise Level ²	Project Noise Level ²			Total Noise Level ²	Noise Level Increase ²	Number of Residential Impacts		
					Predicted ³	Impact Criteria				Moderate		Severe
						Moderate	Severe			<3 dB Incr.	>3 dB Incr.	
Freeport Pkwy to S Denton Tap Rd ⁵	WB	259	25	62	47.0	58.9	64	62	0.1	0	0	0
Freeport Pkwy to S Denton Tap Rd ⁵	EB	193	25	62	45.8	58.9	64	62	0.1	0	0	0
S Denton Tap Rd to S Moore Rd ⁵	WB	567	35	56	40.7	55.7	62	56	0.1	0	0	0
S Moore Rd to S MacArthur Blvd ⁵	WB	97	79	61	56.6	58.3	64	62	1.3	0	0	0
S Moore Rd to S MacArthur Blvd ⁵	EB	278	76	61	47.7	58.3	64	61	0.2	0	0	0
S MacArthur Blvd to Elm Fork Trinity River ⁵	WB	128	72	67	57.5	62.1	67	67	0.5	0	0	0
S MacArthur Blvd to Elm Fork Trinity River ⁵	EB	225	71	67	50.4	62.1	67	67	0.1	0	0	0
Elm Fork Trinity River to Pres. George Bush Turnpike ⁴	WB	--	--	--	--	--	--	--	--	0	0	0
Pres. George Bush Turnpike to I-35E ⁴	EB	--	--	--	--	--	--	--	--	0	0	0
I-35E to N Josey Ln	WB	94 to 105	49 to 53	57	56.4 to 56.6	56.2	62	60	2.7 to 2.8	2	0	0
I-35E to N Josey Ln ⁵	EB	131	52	60	55.3	57.7	63	61	1.3	0	0	0
N Josey Ln to Kelley Blvd ⁴	WB	--	--	--	--	--	--	--	--	0	0	0
N Josey Ln to Kelley Blvd ⁴	EB	--	--	--	--	--	--	--	--	0	0	0
Kelley Blvd to Marsh Ln ⁵	WB	70	71	59	56.9	57.2	63	61	2.1	0	0	0
Marsh Ln to Midway Rd ⁵	WB	76	68	57	56.0	56.2	62	60	2.5	0	0	0
Marsh Ln to Midway Rd ⁵	EB	471	60	61	40.3	58.3	64	61	0	0	0	0
Midway Rd to Dallas Pkwy ⁵	WB	78	35	61	56.0	58.3	64	62	1.2	0	0	0
Midway Rd to Dallas Pkwy ⁵	EB	195	50	61	48.5	58.3	64	61	0.2	0	0	0
Dallas Pkwy to Preston Rd ⁵	WB	182	39	59	47.4	57.2	63	59	0.3	0	0	0
Dallas Pkwy to Preston Rd ⁵	EB	62	55	56	55.6	55.7	62	59	2.8	0	0	0
Preston Rd to Campbell Rd ⁵	WB	137	40	52	52.3	54.0	60	55	3.2	0	0	0
Preston Rd to Campbell Rd ⁵	EB	146	40	52	52.3	54.0	60	55	3.1	0	0	0
Campbell Rd to Hillcrest Rd ⁵	WB	52	40	52	54.0	54.0	60	56	4.1	0	0	0



Table 4-14. Summary of Post-Mitigation Noise Conditions (continued)

Corridor Section Description	Side of Track ¹	Distance from Near Track (feet)	Train Speed (mph)	Existing Noise Level ²	Project Noise Level ²			Total Noise Level ²	Noise Level Increase ²	Number of Residential Impacts		
					Predicted ³	Impact Criteria				Moderate		Severe
						Moderate	Severe			<3 dB Incr.	>3 dB Incr.	
Campbell Rd to Hillcrest Rd ⁵	EB	78	55	52	52.9	54.0	60	55	3.5	0	0	0
Hillcrest Rd to Coit Rd ⁵	WB	93	60	55	54.4	55.2	61	58	2.7	0	0	0
Hillcrest Rd to Coit Rd ⁵	EB	123	62	52	53.0	54.0	60	56	3.5	0	0	0
Coit Rd to Synergy Park Blvd ⁵	WB	148	61	55	50.5	55.2	61	56	1.3	0	0	0
Coit Rd to Synergy Park Blvd ⁵	EB	41	54	55	43.6	55.2	61	55	0.3	0	0	0
Synergy Park Blvd to Alma Rd ⁵	WB	96	73	60	55.5	57.7	63	61	1.3	0	0	0
Synergy Park Blvd to Alma Rd ⁵	EB	396	62	58	49.3	56.7	62	59	0.6	0	0	0
Alma Rd to E Plano Pkwy ⁵	WB	39	41	70	62.5	64.3	69	71	0.7	0	0	0
Alma Rd to E Plano Pkwy ⁵	EB	189	30	69	50.9	63.5	69	69	0.1	0	0	0
E Plano Pkwy to Jupiter Rd ⁵	WB	300	36	63	42.7	59.5	65	63	0	0	0	0
E Plano Pkwy to Jupiter Rd ⁵	EB	215	35	63	46.9	59.5	65	63	0.1	0	0	0
Jupiter Rd to end ⁵	WB	94	65	58	54.2	56.7	62	60	1.5	0	0	0
TOTAL NUMBER OF NOISE IMPACTS:										2	0	0

Source: GPC6, 2017

¹ Eastbound (EB) or Westbound (WB)

² Noise levels are based on Ldn and measured in dBA (rounded to the nearest decibel). For better resolution, predicted project noise levels, moderate noise impact criteria, and noise level increases are shown to the nearest 0.1 decibel.

³ Predicted levels include bell noise, where applicable (rounded to the nearest 0.1 decibel).

⁴ There are no noise-sensitive receptors of this type in this section.

⁵ There are no receptors with noise impact in this section. It should be noted that the data for this section represent the receiver with the highest Project noise level which may not be the closest receiver to the track due to differences in train speed, acceleration, distance to special trackwork or track structure (aerial vs. at grade).



4.15 Vibration

4.15.1 Impact Evaluation

Vibration-sensitive land use along the Project sections is essentially the same as the noise-sensitive land use, except for parks and other outdoor sites, which are not considered vibration-sensitive. Existing vibration sources along the project alignments include auto, bus and truck traffic on local streets. However, vibrations from street traffic are not generally perceptible at receivers in the Study Area unless streets have significant bumps, potholes, or other uneven surfaces. The only significant sources of existing ground vibration along the Project are infrequent freight train movements over limited sections of the corridor. Furthermore, the FTA vibration impact criteria are not ambient-based; that is, future project vibrations are not compared with existing vibrations to assess impact. Therefore, the vibration measurements for the Project focused on characterizing the soil conditions along the proposed alignments rather than on characterizing the existing vibration levels.

The projection of ground-borne vibration and ground-borne noise from train operations was carried out using the model specified in the FTA guidance manual, supplemented by DMU vibration measurement data, with the following assumptions:

- Vibration source levels were based on test data for Stadler diesel-electric GTW 2/6 articulated DMU rail vehicles measured on the DCTA A-Train system. Because the suspension design is similar for the FLIRT3 vehicle, use of the DCTA vehicle vibration source levels is considered to be appropriate for this project.
- Vibration propagation tests were conducted at representative sites along the Study Area near sensitive receptors, as described in **Section 3.13**. The results of these tests were combined with the Stadler DMU vibration source level measurement data to provide projections of vibration levels from trains operating on the Cotton Belt Corridor.
- Vehicle operating speeds are based on speed profiles generated for the project with speeds of up to 79 mph along the Project.
- Wheel impacts at track crossovers and turnouts are assumed to cause localized vibration increases of 10 VdB up to a distance of 50 feet, dropping off linearly to zero increase at a distance of 300 feet.
- The ground-to-building coupling loss was assumed to be zero, except for large masonry buildings where a vibration coupling loss (i.e., reduction) of 10 VdB was applied.
- It was assumed that the Project is currently an infrequently used rail corridor, defined by FTA as typically having fewer than five existing trains per day. **Section 2.3.1** and **Section 5.3** provide information on freight operations. Therefore, the projected vibration levels from rail operations were compared directly to the FTA impact criteria.
- It was assumed that there would be no change in freight rail operations due to the implementation of the Cotton Belt Project. Small shifts in the location of freight rail tracks were not included in this analysis.
- The potential for ground-borne noise impact from train operations was not assessed for this project due to the dominance of airborne noise from the at-grade diesel-powered trains.

The approach used for assessing vibration impacts generally follows the approach used for noise impacts, except that existing vibration is typically not considered when evaluating impacts. For a general assessment, the FTA impact threshold for “occasional events” (i.e. in the range of 30-70 trains per day) is 75 VdB for residential buildings (Category 2) and 78 VdB for institutional buildings (Category 3); park lands are not considered vibration sensitive. For a detailed analysis, as was used for the Cotton Belt Project, the corresponding FTA one-third octave band impact thresholds are 72 VdB for Category 2 land use and 78 VdB for Category 3 land use.



Table 4-15 provides a summary of the projected ground-borne vibration impacts at residential receptors. No ground-borne vibration impacts are predicted at Category 3 receptors. In sections where impacts are projected, the data provided in the table represent a range for the impacted receptors. In sections where no impacts are projected, the data are for the receptor with the highest projected project vibration level. The table includes the distance to the near track, maximum speed, the impact criteria, and the projected future ground-borne vibration levels.

As shown in **Table 4-15**, there are nine residences projected to have a vibration impact that will require mitigation.

Table 4-15. Summary of Residential Ground-Borne Vibration Impacts Without Mitigation

Corridor Section Description	Side of Track ¹	Distance from Near Track (ft.)	Train Speed (mph)	Vibration Level (VdB) ²		Number of Impacts
				Predicted	Impact Criterion	
Freeport Pkwy to S Denton Tap Rd ⁴	WB	658	40	61	72	0
Freeport Pkwy to S Denton Tap Rd ⁴	EB	193	25	60	72	0
S Denton Tap Rd to S Moore Rd ⁴	WB	1097	41	61	72	0
S Moore Rd to S MacArthur Blvd ⁴	WB	89	79	64	72	0
S Moore Rd to S MacArthur Blvd ⁴	EB	483	78	52	72	0
S MacArthur Blvd to Elm Fork Trinity River ⁴	WB	115	70	58	72	0
S MacArthur Blvd to Elm Fork Trinity River ⁴	EB	224	72	52	72	0
Elm Fork Trinity River to PGBT ³	WB	--	--	--	--	0
PGBT to I-35E ³	EB	--	--	--	--	0
I-35E to N Josey Ln ⁴	WB	73	51	67	72	0
I-35E to N Josey Ln ⁴	EB	122	54	60	72	0
N Josey Ln to Kelley Blvd ³	WB	--	--	--	--	0
N Josey Ln to Kelley Blvd ³	EB	--	--	--	--	0
Kelley Blvd to Marsh Ln	WB	45 to 46	67 to 68	72	72	4
Marsh Ln to Midway Rd ⁴	WB	76	68	64	72	0
Marsh Ln to Midway Rd ⁴	EB	368	60	52	72	0
Midway Rd to Dallas Pkwy ⁴	WB	62	35	64	72	0
Midway Rd to Dallas Pkwy ⁴	EB	195	50	57	72	0
Dallas Pkwy to Preston Rd ⁴	WB	67	58	64	72	0
Dallas Pkwy to Preston Rd ⁴	EB	45	55	70	72	0
Preston Rd to Campbell Rd ⁴	WB	47	40	68	72	0
Preston Rd to Campbell Rd	EB	39	40	72	72	1
Campbell Rd to Hillcrest Rd	WB	48	69	76	72	1
Campbell Rd to Hillcrest Rd	EB	47	54	72	72	1
Hillcrest Rd to Coit Rd ⁴	WB	80	62	65	72	0
Hillcrest Rd to Coit Rd	EB	40 to 46	60	76 to 78	72	2
Coit Rd to Synergy Park Blvd ⁴	WB	148	61	52	72	0
Coit Rd to Synergy Park Blvd ⁴	EB	41	55	68	72	0
Synergy Park Blvd to Alma Rd ⁴	WB	94	74	66	72	0
Synergy Park Blvd to Alma Rd ⁴	EB	284	69	65	72	0
Alma Rd to E Plano Pkwy ⁴	WB	39	41	67	72	0
Alma Rd to E Plano Pkwy ⁴	EB	216	35	55	72	0
E Plano Pkwy to Jupiter Rd ⁴	WB	415	44	56	72	0
E Plano Pkwy to Jupiter Rd ⁴	EB	1245	20	54	72	0
Jupiter Rd to end ⁴	WB	94	65	54	72	0
TOTAL NUMBER OF VIBRATION IMPACTS:						9

Source: GPC6, 2017

¹ Eastbound (EB) or Westbound (WB)

² Maximum one-third octave frequency band ground-borne vibration velocity level, measured in VdB referenced to 1 µin/sec (rounded to the nearest dB).

³ There are no residential receptors in this section.

⁴ There are no receptors with vibration impact in this section. It should be noted that the data for this section represent the receiver with the highest Project vibration level which may not be the closest receiver to the track due to differences in train speed, distance to special trackwork or track structure (aerial vs. at grade).



4.15.2 Mitigation Measures

The vibration assessment assumes that the rail vehicle wheels and track are maintained in good condition with regular wheel truing and rail grinding. Beyond this, there are several approaches to reduce ground-borne vibration and ground-borne noise from train operation, as follows:

- **Ballast Mats:** A ballast mat consists of a pad made of rubber or rubber-like material placed on an asphalt or concrete base with the normal ballast, ties, and rail on top. The reduction in ground-borne vibration provided by a ballast mat is strongly dependent on the vibration frequency content and the design and support of the mat.
- **Tire Derived Aggregate (TDA):** A typical TDA installation consists of an underlayment of 12 inches of nominally 3-inch size tire shreds or chips wrapped with filter fabric, covered with 12 inches of sub-ballast and 12 inches of ballast above that to the base of the ties. Tests suggest that the vibration attenuation properties of this treatment are midway between that of ballast mats and floating slab track. This option has been installed on two US light rail transit systems (San Jose and Denver) and test results have shown this treatment to be effective at frequencies above about 25 Hz.
- **Floating Slabs:** Floating slabs consist of thick concrete slabs supported by resilient pads on a concrete foundation; the tracks are mounted on top of the floating slab. Most successful floating slab installations are in subways, and their use for at-grade track is less common. Although floating slabs are designed to provide vibration reduction at lower frequencies than ballast mats, they are extremely expensive.
- **Resiliently Supported Concrete Ties (Under-Tie Pads):** This treatment involves a special soft rubber pad embedded in the base of a concrete tie. The pad serves two purposes: (1) it provides a pliable surface to help anchor the ties on ballast, and (2) it provides vibration isolation between the tie and the ballast. This relatively simple treatment has been used extensively in Europe. Test results have shown this treatment to be effective at frequencies above about 25 Hz and its cost is about 1.2 times the cost of a standard concrete tie.
- **Resilient Rail Fasteners:** Resilient fasteners can be used to provide vibration isolation between rails and ties, as well as on concrete slabs for direct fixation track on aerial structures or in tunnels. These fasteners include a soft, resilient element to provide greater vibration isolation than standard rail fasteners in the vertical direction. Resilient rail fasteners are effective at frequencies above about 40 Hz.
- **Special Trackwork:** Because the impacts of vehicle wheels over rail gaps at track turnout locations increases ground-borne vibration by about 10 VdB close to the track, turnouts are a major source of vibration impact when they are in sensitive areas. If turnouts cannot be relocated away from sensitive areas, another approach is to use spring-rail, flange-bearing or moveable-point frogs in place of standard rigid frogs at turnouts. These devices allow the flangeway gap to remain closed in the main traffic direction for revenue service trains.

Vibration impacts that exceed FTA criteria are significant and warrant mitigation, if reasonable and feasible. Therefore, the predicted ground-borne vibration impacts that have been identified above need to be considered for mitigation. It is estimated that the vibration impacts identified at nine residential locations can be mitigated by installing 2,800 lineal feet of TDA beneath both tracks at three locations along the alignment. At this time, TDA was chosen because its vibration-reduction properties would be sufficient to mitigate the projected vibration impacts in a cost-effective manner. Test results suggest that the vibration-reduction effectiveness of TDA is equal to or greater than that of ballast mats and, as opposed to ballast mats, that TDA can be modestly effective at frequencies as low as 16-20 Hz. Floating slab track may need to be considered for vibration-sensitive facilities in Richardson where the potential for vibration impact has been identified. DART will provide mitigation and is considering such strategies as



described above, which will be evaluated for feasibility and reasonableness as the Project advances.

Table 4-16 summarizes the approximate locations and extents for the vibration mitigation treatment, and the TDA locations are shown in **Figures 4-14** through **4-16**. These locations are approximate, and will need to be confirmed during project design.

Table 4-16. Summary of Recommended Vibration Mitigation Locations

Vibration Mitigation Number	Vibration Mitigation Location			Tire Derived Aggregate (TDA) Civil Station Location		Length of TDA Installation (feet)
	Corridor Section	Street and Community	Side of Track	From	To	
1	Kelly Blvd to Marsh Lane	Lakehill Townhomes, Carrollton	WB	2253+00	2263+00	1,000
2	Preston Rd to Campbell Rd	South Point Dr., Dallas	EB	3103+00	3109+50	650
3	Campbell Rd to Hillcrest Rd	Davenport Road, Dallas	EB	3124+00	3126+50	250
4	Campbell Rd to Hillcrest Rd	Oakington Ct, Dallas	WB	3158+00	3162+00	400
5	Hillcrest Rd to Coit Rd	Energy Lane, Dallas	EB	3180+50	3185+50	500
TOTAL TDA LENGTH:						2,800

Source: Cross-Spectrum Acoustics, 2017

Table 4-17 summarizes the assessment of vibration impacts at residential locations with installation of the recommended mitigation, indicating residual impact at one residence on 17455 Energy Lane. However, this impact is marginal, and over the threshold by only less than 0.1 VdB, so further mitigation is not recommended at this time. Furthermore, the proposed mitigation is projected to reduce vibration by six VdB.

Table 4-17. Summary of Residential Ground-Borne Vibration Impacts with Mitigation

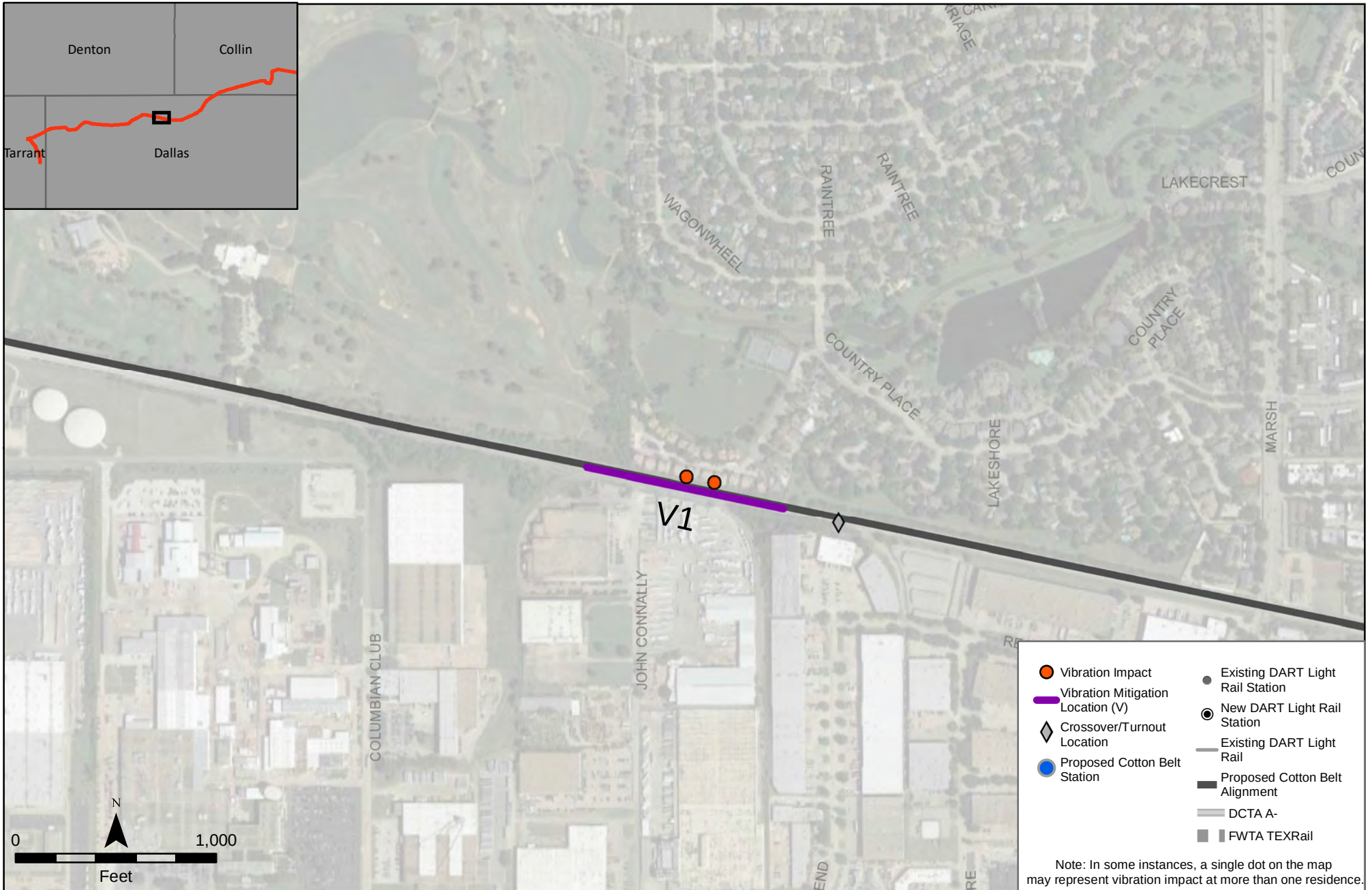
Corridor Section Description	Side of Track ¹	Distance from Near Track (feet)	Train Speed (mph)	Vibration Level (VdB) ²		Number of Impacts
				Predicted	Impact Criterion	
Hillcrest Rd to Coit Rd	EB	40	60	72	72	1
TOTAL NUMBER OF VIBRATION IMPACTS:						1

Source: Cross-Spectrum Acoustics, 2017

¹ Eastbound (EB) or Westbound (WB)

² Maximum one-third octave frequency band ground-borne vibration velocity level, measured in VdB referenced to 1 μ in/sec (rounded to the nearest decibel).

Three community facilities were identified as potentially vibration sensitive. In view of the potential for ground-borne vibration impacts at the UT Southwestern Medical Center Clinic, the Qorvo facility, and the Texas Instruments facility in Richardson, DART will conduct detailed, site-specific vibration studies at these FTA Category 1 (high sensitivity) facilities during project design to make a final determination regarding impact and any required mitigation. Such studies will include ground-to-building vibration propagation testing as well as evaluations of the buildings and sensitive equipment.









4.16 Hazardous and Regulated Materials

4.16.1 Impact Evaluation

No-Build Alternative

With no project-related construction or project-related property acquisition, there will be no anticipated hazardous materials impacts associated with the No-Build Alternative.

Build Alternative

Excavation and ground disturbing activities would occur with development of the Project, including guideway construction, station elements, utilities, retaining walls, structures for bridges and grade separations, and subsurface areas of track such as at Coit Road. As documented in **Section 3.14**, nine sites ranked as High Risk, 19 as Moderate Risk, and 18 as Indeterminate Risks in the Study Area. The remainder of the sites were ranked as having Low Risk to impact the Project. The risk classification is based on the nature of the site contamination, proximity to the Project, and groundwater gradient. It is important to note that this risk ranking would be applicable to Study Area only if the ground is disturbed during construction activities. If subsurface soils are not disturbed during construction, then these sites would not pose a risk to the Project. The approximate location and nature of contamination of the identified High and Moderate Risk sites are summarized in **Figures 4-17** through **4-20** and **Table 4-18**. One high risk site (No. 52 U.S. Brass) at 10th Street in Plano is proposed as a Municipal Setting Designation (MSD). It is anticipated the City of Plano will enact a municipal ordinance that will define the MSD zone and restrictions at the property.

In addition, a potential hazardous waste site that was not listed in the database is Mercer Yard. No on-site reconnaissance was conducted of the yard since DART owns the property.

4.16.2 Mitigation Measures

Further investigation of at-risk areas will be done during final design. Investigations will focus on areas where construction activities involve soil excavation and/or dewatering operations.

During construction activities within the Plano MSD zone, the construction contractor must enact precautions to restrict human exposure to the contaminated groundwater. Additionally, any subsurface soils being excavated from the MSD zone to facilitate construction will require segregation for laboratory analysis and may require special handling and disposal.

A Phase I ESA will be conducted for Mercer Yard during final design.

Mitigation measures would be needed only in areas where construction activities encounter known or suspected contaminated soil or groundwater. Even where the alignment is located near or over part of a known contaminated site, the construction may not involve excavation to a depth that exposes contaminated soil. In addition, any existing structures will be surveyed for the presence of hazardous/regulated materials such as asbestos-containing materials, lead-based paint, chemical storage, etc., prior to their demolition or modification. These investigations will provide a basis for determining construction health and safety specifications, contaminated soil and groundwater remediation, disposal procedures and asbestos or lead based paint management or remediation practices. The design and preparation of required monitoring and remediation plans would be coordinated with the TCEQ.



Figure 4-17
High, Moderate, and Indeterminate Hazardous Materials Risk Sites
 Data Source: EDR, 2017

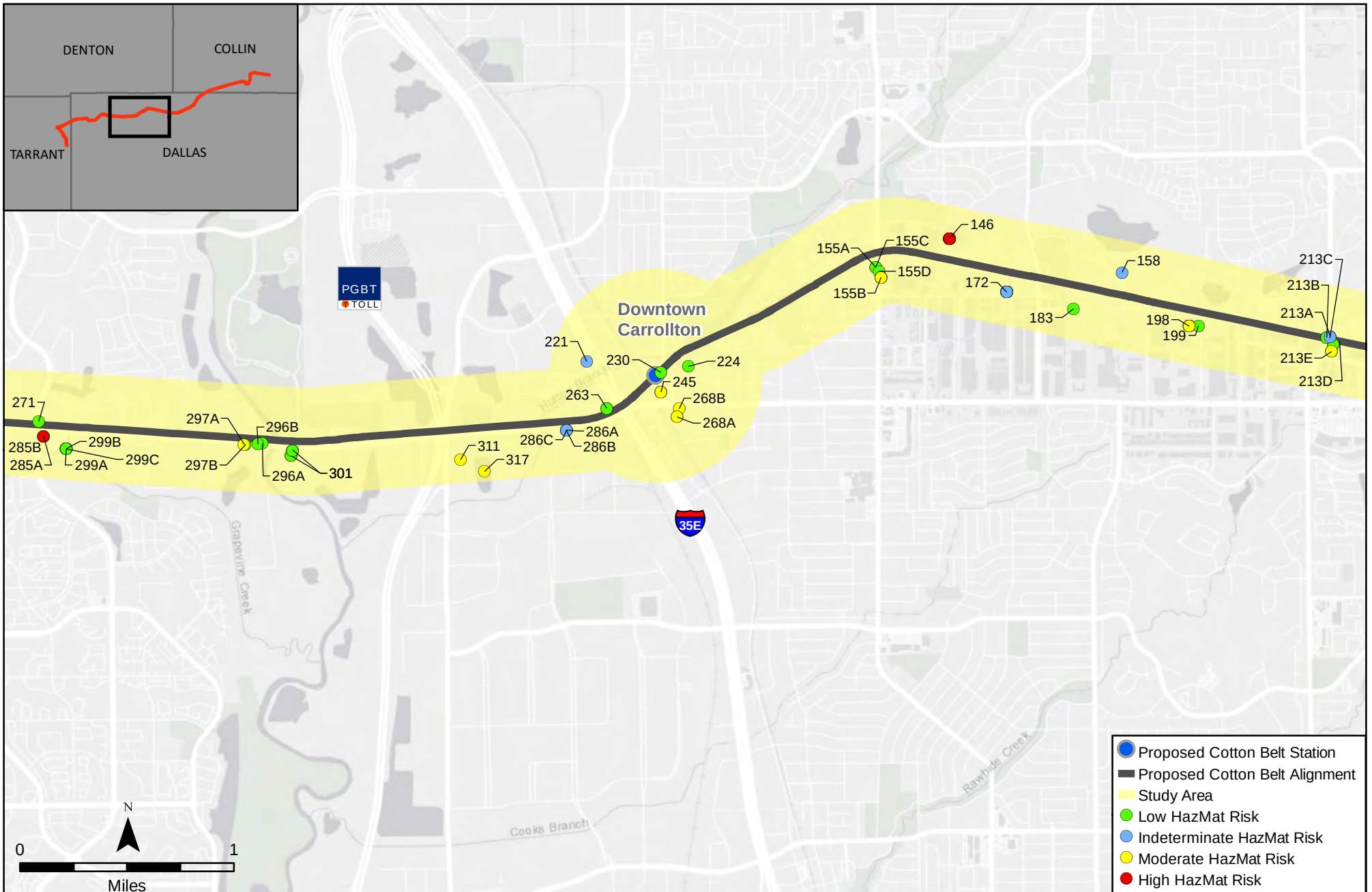


Figure 4-18
High, Moderate, and Indeterminate Hazardous Materials Risk Sites
 Data Source: EDR, 2017

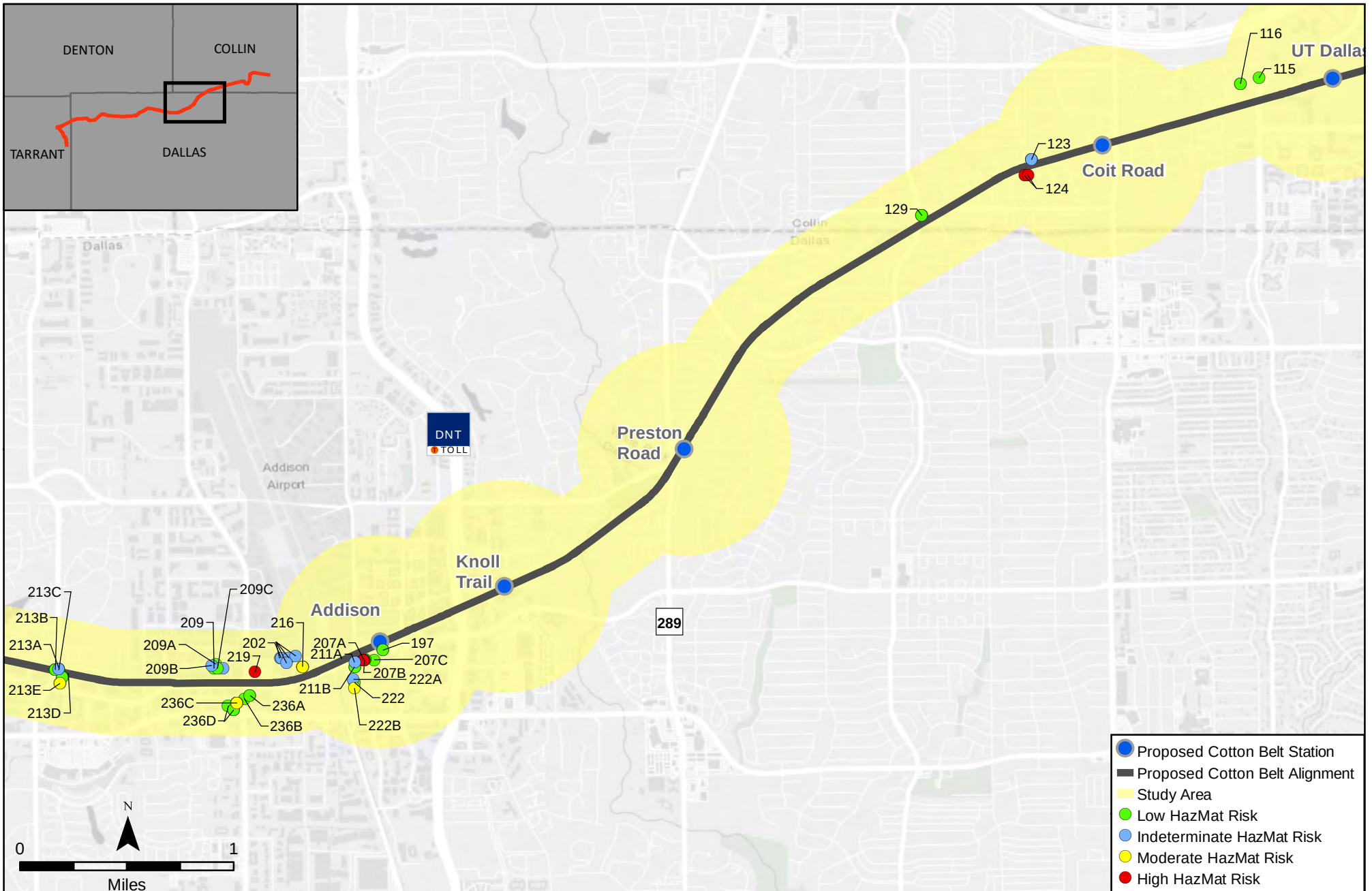


Figure 4-19
High, Moderate, and Indeterminate Hazardous Materials Risk Sites
 Data Source: EDR, 2017

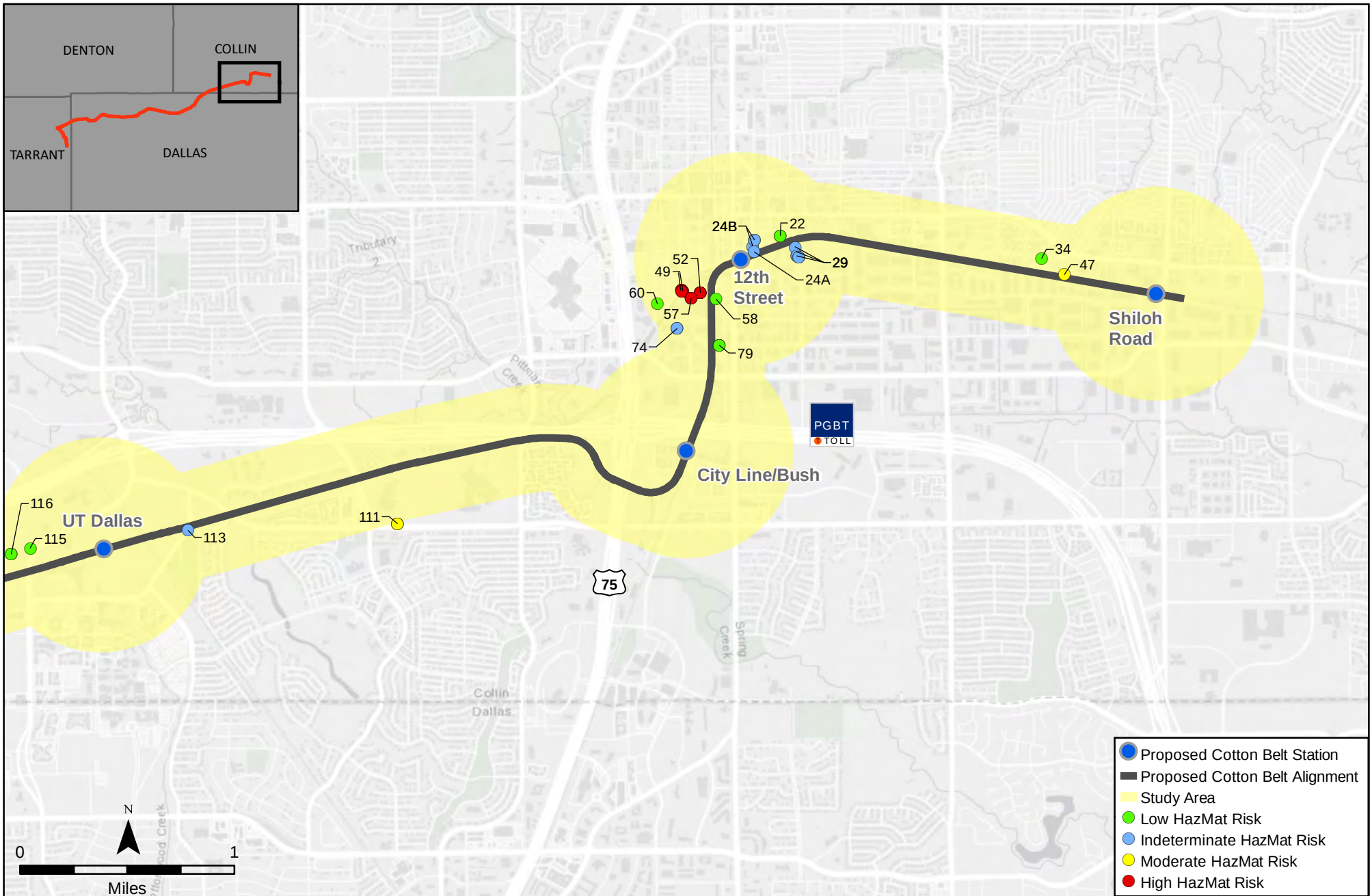


Figure 4-20
High, Moderate, and Indeterminate Hazardous Materials Risk Sites
 Data Source: EDR, 2017



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites*

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
High Risk			
2A	Budget 5305 DFW APO N North Facility DFW Airport, TX	450' / West	Databases of Concern: LPST, UST. An LPST was reported at this facility in 1993. This case was listed as minor soil contamination which did not require a RAP. Final concurrence has been issued and the case is closed. Formerly used for fleet refueling, two 10,000 gallon and one 500 gallon USTs were reported as removed from the ground.
49	Industrial complex - Capital Cable and Wire 910 E. 10th St., Plano	737' / West	Databases of Concern: SPILLS, APAR, IHWCA, GCC, FINDS, ECHO, FTTS, Hist FTTS There is the potential for impacts during subsurface construction to the Project from soil and groundwater contamination at the site with metals and chlorinated solvents.
52	U.S. Brass 901 E. 10th St., Plano	265' / West	Databases of Concern: RCRA-SQG, ECHO (ICIS, US AIRS), Tier 2, GCC This site has the potential to impact the Project during subsurface construction due to soils and groundwater contaminated with VOCs, metals, chlorinated solvents, and TPH.
57	Cable Corp. / Saskaway Eight LP., 910 10th St., Plano	500' / West	Databases of Concern: ERNS, IOP This site has the potential to impact the Project during subsurface construction with groundwater contaminated with chlorinated solvents.
124	Empty lot 7721 Ronnie Dr., Dallas	207' / South	Databases of Concern: UST, Hist Auto Due to proximity to the Project, there would be potential for contamination from former USTs at the site to affect the Study Area during subsurface construction.
146	Akzonobel Paints LLC - The Glidden Company, ICI Paints, PPG Architectural, Glidden Coatings and Resin 1900 N. Josey Ln., Carrollton	520' / North	Databases of Concern: Tier 2, TRIS, SEMS-Archive, RCRA-SQG This site was listed in the SEMS-Archive database with NFRAP. More information about this property, which is near the Cotton Belt, would be necessary.
207A	Addison Transit Center 4801-4807 Arapaho Rd., Addison	199' / Southeast	Databases of Concern: GCC, VCP This site on the Project has the potential to cause impacts during subsurface construction due to soils and groundwater contaminated with chlorinated solvents, metals and VOCs.
219	Coca Cola Bottling of North Texas 15200 Midway Rd., Addison	273' / North	Databases of Concern: LPST, UST This site has the potential to impact the Project, during subsurface construction, with soils and/or groundwater contaminated with TPH and petroleum due to a LPST. The LPST case is not closed.



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites* (continued)

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
285A	Maple Mart, 1301 E. Belt Line Rd., Coppell	281' / South	Databases of Concern: LPST, UST This site has the potential to impact the Project with contaminated groundwater due to a LPST if groundwater is encountered during construction. The LPST case is not closed.
Moderate Risk			
24B	US Brass Trucking 1212 Municipal Ave., Plano	335' / Northwest	Database of Concern: LPST This facility has the potential to affect the Project during subsurface construction with soils impacted by a former LPST. Final concurrence has been issued and the case is closed.
47	Heller Automotive, 3104 S. Rigsbee Dr., Plano	81' / North	Databases of Concern: EDR Hist Auto Automotive shop, which is adjacent to the Project, has the potential to have impacted soils and/or groundwater due to petroleum products used and accumulated during business activities. These impacted soils and/or groundwater could be encountered during subsurface construction.
111	Triquint / Qorvo, 500 W. Renner Rd., Richardson	1,351' / South	Databases of Concern: RCRA-LQG, IHW, IHW Corr Action, AST This site is a large manufacturing complex located adjacent to the Cotton Belt. Several waste streams were identified in the database report as well as several written informal notices of violation. There is a risk of contamination to be encountered along the Cotton Belt during subsurface construction.
155B	Merico, Inc., 1820 N. Josey Ln., Carrollton	633' / South	Database of Concern: LPST This site has potential to impact the Project if groundwater is encountered during construction due to groundwater contaminated with petroleum products from an LPST. As of 2000, final concurrence had been issued and the case is closed.
198	Cargill Steel and Wire (Currently Gerdau Carrollton-Wire) 1915 John Connally Dr., Carrollton	224' / South	Databases of Concern: Hist FTTS, FTTS, RCRA CESQG, ECHO, Tier 2, TRIS, HMIRS Spills impacting this site have been cleaned up. There would be the potential to encounter impacted soil during subsurface construction.
213E	Racetrac 64 15196 Marsh Ln., Addison	289' / South	Databases of Concern: UST, EDR Hist Auto This facility has active USTs which have the potential to impact soils and groundwater. Impacts would occur during subsurface construction.
216	W.O. Bankston Body Shop – Nissan, 4300 Lindbergh Dr., Addison	247' / North	Databases of Concern: UST, ECHO, RCRA NonGen / NLR, EDR Hist Auto Due to proximity to the Project, there would be potential for contamination from former USTs at the site to affect the Project during subsurface construction.



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites* (continued)

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
222B	Wash Depot 71, 15209 Addison Rd., Addison	749' / Southeast	Databases of Concern: LPST, UST This facility has the potential to affect the Project during subsurface construction with soils impacted by a former LPST. Final concurrence has been issued and the case is closed.
236C	Exxon 6 0275 4191 Belt Line Rd., Addison	491' / South	Databases of Concern: LPST, RCRA NonGen / NLR, ECHO This facility has the potential to affect the Project if groundwater is encountered during construction with groundwater impacted by a former LPST. Final concurrence has been issued and the case is closed.
236C	S T Food Mart Citgo 4191 Belt Line Rd., Addison	667' / South	Databases of Concern: LPST, GCC This facility has the potential to affect the Project with groundwater impacted by a former LPST. The status of the LPST case was showing as in the pre-assessment/release determination phase.
236C	Dixie Gas Station 4191 Belt Line Rd., Addison	491' / South	Databases of Concern: LPST, UST, GCC, EDR Hist Auto, ENF This facility has the potential to affect the Project with groundwater impacted by former LPST cases. Final concurrence has been issued and the cases were closed. This facility has received multiple notices of violation including in 2017 when the facility was cited for failure to maintain spill prevention equipment and failure to test the operability of the cathodic protection system.
245	One & Only Convenience Store, 1013 E. Belt Line Rd., Carrollton	383' / Southeast	Databases of Concern: UST, LPST, GCC This facility has the potential to affect the Project with soils and groundwater impacted by a former LPST. Final concurrence has been issued and the case is closed.
268A	Driveway Auto Parts 1103 Carroll Ave., Carrollton	1,105' / Southeast	Databases of Concern: UST, LPST This facility has the potential to affect the Project with soils and groundwater impacted by a former LPST. This case is open pending documentation of well plugging.
268B	DUB Thompson Site 1104 Belt Line Rd., Carrollton	997' / Southeast	Database of Concern: SEMS-Archive This site was listed in the SEMS-Archive database. More information about this property which is near the proposed Carrollton Station would be necessary.
285B	Mobil Oil Corporation 1301 E. Belt Line Rd., Coppell	281' / South	Databases of Concern: RCRA NonGen / NLR, ECHO, EDR Hist Auto This service station which was located near the Project has the potential to have impacted soils and/or groundwater due to petroleum products used and accumulated during business activities.
297A	Beazer West Belt Line & Le, Coppell	154' / South	Database of Concern: UST USTs have the potential to leak and impact soils and groundwater with their contents.



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites* (continued)

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
311	Carrollton Dump Carrollton – SE quadrant of Beltline and Luna	750' / South	Database of Concern: CLI A closed landfill site which previously accepted hazardous materials and industrial waste. This site may currently be in the VCP; more information on the location is needed.
317	DUB Thompson Landfill SWC Belt Line and Luna Rd., Carrollton	208' / South	Database of Concern: VCP It is unclear whether this site has been issued a certificate of completion, nor what the affected media or contaminants of concern were.
321	Soto's Automotive Incorporated 390 Southwestern Blvd., Coppell	55' / East	Database of Concern: EDR Hist Auto This service station which was located adjacent to the Cotton Belt Project has the potential to have impacted soils and/or groundwater due to petroleum products used and accumulated during business activities.
322	Texas Stock Tank Impreso Inc. 652 SW Blvd., Coppell	322' / South	Databases of Concern: RCRA NonGen/NLR, UST USTs have the potential to leak and contaminate soils and groundwater with their contents.
326	Park N Fly 800 S. Royal Ln., Coppell	Adjacent / South	Database of Concern: UST USTs have the potential to leak and impact soils and groundwater with their contents.
Indeterminate Risks			
2B	Budget DFW Airport	450'/West	Database of Concern: UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
8	DFW Airport	471'/Southe ast	Database of Concern: IHW More information is needed to determine whether the site would pose a risk to the project.
24A	John & Sharon Lewis (Owners) 1204 L Ave., Plano	65'/ Northwest	Database of Concern: UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
24B	TXU Electric Maintenance Facility 1212 Municipal Ave., Plano	193'/ Northwest	Database of Concern: UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
29	Lattimore Materials / - Plano Ready Mix 1200 Ave. N, Plano	402' / South	Databases of Concern: Tier 2, RCRA NonGen/NLR, TRIS, ECHO, UST, AST USTs have the potential to have leaked and impact soils and groundwater with their contents.
74	Collin Creek II Business Park 820-860 Ave. F, Plano	845' / West	Database of Concern: VCP More information regarding the cleanup of this VCP site would be necessary to determine risk.



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites* (continued)

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
113	KCS Train Derailment Synergy Park & Point North, Richardson	On track	Database of Concern: SEMS More information regarding the derailment and cleanup would be necessary to determine risk to the Cotton Belt Project.
123	First City Texas Dallas 17800 Dickerson St., Dallas	131' / North	Databases of Concern: UST, LPST, EDR Hist Auto This facility has the potential to affect the Project with soils impacted by a former LPST. Final concurrence has been issued and the case is closed. Since only soils were impacted, more information regarding cleanup would be required to gauge the risk to the Project.
158	Columbian Country Club of Dallas, 2525 Country Club Dr., Carrollton	570' / North	Database of Concern: UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
172	Not Reported - Currently Texas Lonestar Auto Auction, 2205 Country Club, Carrollton	500' / South	Databases of Concern: HMIRS, SPILLS USTs have the potential to have leaked and impact soils and groundwater with their contents.
202	Multiple - 4303, 4305, 4321, 4341, 4204 Lindbergh Dr., Addison	450'-586' / North	Databases of Concern: EDR Hist Auto, UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
209B	A.J. Bart 4040-4130 Lindberg Dr., Addison	356' / North	Databases of Concern: AUL, VCP, ECHO More information regarding the cleanup for the VCP and institutional controls would be required to gauge this site's risk to the Cotton Belt Project.
211A	7 Eleven 1602 26769 15305 Addison Rd., Addison	178' / South	Database of Concern: UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
213A	Jiffy Lube 1610 Marsh Ln., Carrollton	<30' / North	Databases of Concern: EDR Hist Auto, UST USTs have the potential to have leaked and impact soils and groundwater with their contents.
213D	AAMCO 15200 Marsh Ln., Addison	118' / South	Database of Concern: EDR Hist Auto This service station which was located nearby the Cotton Belt Project has the potential to have impacted soils and/or groundwater due to petroleum products used and accumulated during business activities.
221	Telenova, Inc. 1201 N. Stemmons Fwy., Carrollton	1,378' / North	Database of Concern: SEMS-Archive More information would be required on this SEMS-Archive site to determine whether the site poses a risk to the Cotton Belt Project.



Table 4-18. High, Moderate, and Indeterminate Hazardous Materials Risk Sites* (continued)

Map ID (EDR Site ID)	Site Name/Address	Approx. Distance / Direction	Databases of Concern/Comments
222A	Stanford Addison 15211 Addison Rd., Addison	542' / South	Databases of Concern: IHW Corr Action, EDR Hist Auto More information is needed on the IHW Corr Action for this site to determine what the risk to the Cotton Belt Project may be.
286C	K&D Investments 1445 W. Belt Line Rd., Carrollton	212' / South	Databases of Concern: UST, LPST More information would be required to determine whether this LPST which did not impact groundwater was cleaned up to where soils would not impact subsurface construction on the Cotton Belt Project.
Key: AUL: Activity and Use Limitation; APAR: Affected Property Assessment Report; AST: Aboveground Storage Tank; CESQG: Conditionally Exempt Small Quantity Generator; CLI: Closed and Abandoned Landfills; CORRACTS: RCRA Corrective Action; ECHO: EPA Enforcement and Compliance History Online; ENF: Enforcement Report; FTTS: FIFRA/TSCA Tracking System; GCC: Groundwater Contamination Cases; HMIRS: Hazardous Material Information Resource System; IHW: Industrial Hazardous Waste; LPST: Leaking Petroleum Storage Tank; RAP: Response Action Plan; RCRA: Resource Conservation and Recovery Act; NLR: No Longer Regulated; SEMS: Superfund Enterprise Management System; TRIS: Toxic Release Inventory System; UST: Underground Storage Tank; VCP: Voluntary Cleanup Program			

Source: EDR, 2017a

*These are sites with listings of concern within 0.25 mile of the Cotton Belt Project.



DART will acquire real estate along the Project for the portions of the alignment, stations, and other facilities. Environmental due-diligence activities would be performed prior to property acquisition or other real estate transactions. According to ASTM 1527-13, “due diligence is the process of inquiring into the environmental characteristics of a parcel of commercial real estate or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes.” A compliant Phase I ESA would be conducted; if the Phase I ESA concludes that one or more recognized environmental conditions (RECs) exist, Phase II testing would be performed to help establish whether contamination is present and, if present, its nature and extent. Contractors will be prepared to encounter potentially hazardous conditions when working in proximity to high or moderate risk sites and will have proper equipment available to protect their workers and the environment if hazardous materials are encountered.

4.17 Biological and Natural Resources

4.17.1 Impact Evaluation

No-Build Alternative

Implementation of the No-Build Alternative will result in no impacts to biological or natural resources.

Build Alternative

Vegetation within the existing railroad right-of-way varies from mown urban grasses to wooded areas, although the majority of this area was previously disturbed from maintenance activities. Impacts to vegetation types within the Study Area will be minimal since approximately 74.3 percent of the Project occurs within areas defined as urban. As the current project design is not sufficiently advanced to accurately assess areas of impact, the impact analysis for the Project utilizes a conservative approach, assuming that all vegetation within the right-of-way and current station footprints would be affected by removal of vegetation for new track placement or realignment. Impacts to vegetation types located within the Project right-of-way (including the Cypress Waters Alignment and CityLine/Bush Alignment) would be approximately 351 acres. Impacts would occur in the four EMST vegetation types that make up one or more percent of the Study Area. These include Blackland Prairie: Disturbance or Tame Grassland, Native Invasive: Deciduous Woodland, Central Texas: Floodplain Hardwood Forest and row crops.

The vegetation types (in acres or percentage of the right-of-way) that would most likely be disturbed by the Project include:

- Urban Low Intensity (215.9 acres or 1.9 percent),
- Urban High Intensity (54.7 acres or 0.5 percent),
- Blackland Prairie: Disturbed or Tame Grassland (40.6 acres or 0.4 percent),
- Native Invasive: Deciduous Woodland (20.5 acres or 0.2 percent),
- Central Texas: Floodplain Hardwood Forest (7.7 acres or 0.07 percent),
- Row Crops (5.0 acres or 0.04 percent),
- Oak woodland and forest (4.2 acres or 0.04 percent),
- Floodplain Herbaceous Vegetation (0.8 acres or 0.007 percent),
- Savanna Grassland (0.7 acres or 0.006 percent),
- Riparian Hardwood Forest (0.6 acres or 0.006 percent), and
- Native Invasive: Mesquite Shrubland (0.4 acres or 0.003 percent).

There are several areas along the Project through residential areas where parallel streams and wooded areas provide a buffer from the Project. Portions of these areas may extend into the right-of-way and those areas could be removed during construction activities.



Permanent fencing proposed for residential areas along the Project, and temporary construction fencing, could affect wildlife by destroying habitat and creating barriers that keep animals from accessing habitat. In areas where habitat would be affected, similar habitats are available in nearby areas. The majority of state- or federally-listed wildlife species within the Study Area are mobile species and would be able to shift to other suitable habitats in the area until construction is completed. However, five state-threatened species that utilize aquatic habitats, and are not mobile, may be affected by the Project, including: The Alligator snapping turtle (*Macrochelys temminckii*), Louisiana pigtoe (*Pleurobema riddellii*), sandbank pocketbook (*Lampsilis satura*), Texas heelsplitter (*Potamilus amphichaenus*), and Texas pigtoe (*Fusconaia askewi*). Of the terrestrial species listed, the state-threatened timber rattlesnake is more at risk for being affected by construction activities than any other due to its limited mobility and the likelihood of its suitable habitat occurring within the Study Area.

The Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter, all have recorded TXNDD element of occurrences within 0.7 to 7.0 miles from the Study Area and could be affected by the Project. One state-listed species of concern, the Texas garter snake (*Thamnophis sirtalis annectens*), has a TXNDD element of occurrence record located approximately 7.0 miles north of the Study Area, and could be affected by the Project.

Also within the Study Area, migratory birds could be affected during site preparation and grading activities by disturbing existing vegetation and bare ground that may harbor active bird nests. These include nests that may occur in grass, shrubs and trees, and on bare ground including gravel pads and roads.

4.17.2 Mitigation Measures

Vegetation/Habitat

Site planning and construction techniques will be designed to avoid and preserve existing mature native trees and shrubs to the greatest extent possible, especially through residential areas. To enhance the value of the Project to both wildlife and the community, and to aid in water conservation, native vegetation beneficial to fish and wildlife has been proposed for use by DART. To avoid soil disturbances, machinery and other vehicles will utilize nearby roadways and bridges when crossing drainages, wetlands, and creeks.

Construction activities would temporarily disturb vegetated areas and animals' habitat; however, long-term impacts would be mitigated through re-vegetation. Re-vegetation within the existing and proposed right-of-way, where mainly infrastructure improvements are proposed, would be undertaken to the extent that is reasonably feasible. Replacement vegetation will utilize native species that are generally useful to wildlife. The replacement vegetation can provide habitat for numerous wildlife species. Areas of re-vegetation will be monitored to ensure that plantings are established to their original condition.

Re-vegetation of affected areas would use durable, native, and non-native materials that require little maintenance. Within station areas and additional landscaping along the Project, plant materials will also be drought resistant and be supported by operating irrigation systems and a permanent commitment to on-going maintenance. On DFW Airport property, any new landscaping or replacement vegetation will use recommended vegetation that will not attract hazardous wildlife to comply with FAA and DFW Airport design criteria.

Vegetation affected by Project construction activities along the existing right-of-way would consist of removing the minimum amount of vegetation required to construct the Project. The Project crosses through seven municipalities which have some form of tree protection ordinances in place. Removal or alteration of trees on public or private property may require a



permit from the city in question. Any tree removals associated with project activities would be done in accordance with city ordinances and permits would be obtained if necessary.

Migratory Birds

If clearing vegetation during the March 15th through September 15th nesting season is unavoidable, DART will survey the construction area to ensure that no nests with eggs or young will be disturbed by construction. Any vegetation or bare ground areas where occupied nests are located will not be disturbed until the eggs have hatched and the young have fledged. Removal of trees which contain colonial waterbird rookeries will be avoided through route adjustments to the extent reasonable and feasible.

Artificial nighttime lighting can attract and disorient night-migrating birds. Birds that circle the light's glare can cause collision with station structures or exhaustion mortality. DART will utilize the minimum amount of nighttime lighting needed for safety and security along the right-of-way, at passenger stations, and at maintenance/operation yards. DART will down-shield lighting to light the ground only and reduce glare.

Reptiles

DART will inform employees and contractors of the potential for the timber rattlesnake to occur in the Study Area. Contractors should be advised to avoid impacts to this and other snake species, and should avoid contact with the species if encountered. Any state-listed species encountered during construction will be reported to the TXNDD.

If the Project area is found to contain unavoidable habitat of the timber rattlesnake, DART will provide a biologist to monitor during clearing and construction activities to assist in detecting state-listed species in the right-of-way. If trenching is involved, DART will cover the trenches or excavated areas overnight or inspect the areas every morning to ensure no reptiles or other wildlife have been trapped. Trenches left open for more than two daylight hours will be inspected for the presence of trapped reptiles prior to backfilling. If trenches cannot be backfilled the day of initial trenching, then escape ramps should be installed at least every 90 meters. Escape ramps can be short lateral trenches or wooden planks sloping less than 45 degrees to the surface.

For soil stabilization and/or revegetation of disturbed areas within the project area, DART will use erosion and seed/mulch stabilization materials that avoid entanglement hazards to snakes and other wildlife species. DART will use no till-drilling, hydromulching and/or hydroseeding rather than erosion control blankets or mats due to a reduced risk to wildlife.

Due to the abundance of available habitat within and adjacent to the Project, the potential impacts to the riparian areas within the Study Area are not anticipated to adversely impact the Texas garter snake. However, per BMPs, contractors will be advised of potential occurrence in the Study Area, and to avoid harming the species if encountered. BMPs would be included in the MMP.

Aquatic Species

The Project includes a number of river or stream crossings. In accordance with TPWD recommendations for the proposed project, all new proposed crossings will, when feasible, span any riparian vegetation, and be placed perpendicular to the stream to minimize loss of riparian habitat. Crossings will also utilize vertical and horizontal space beneath bridges for local terrestrial wildlife to comfortably cross under the facility. The majority of the bridges currently in place will need to be replaced or modified, however, the use of BMPs would avoid or minimize water quality impacts to these water bodies, thus avoiding significant impacts to aquatic species.



As a precautionary measure, the Freshwater Mussel BMPs will be included in the MMP. These include:

- When work is in the water, survey project footprints for state listed species where appropriate habitat exists.
- When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD permit and implement Water Quality BMPs.
- When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the 401 water quality certification for the project will be implemented.

DART will avoid placement of temporary fills, culverts or structures into waters serving as suitable habitat for freshwater mussels. If construction should occur during times when water is present and dewatering, fill or trampling activities are involved, then DART will relocate potentially impacted native aquatic resources in conjunction with a *Permit to Introduce Fish, Shellfish or Aquatic plants into Public Waters* and an Aquatic Resource Relocation Plan (ARRP). DART will coordinate with TPWD Kills and Spills Team (KAST) for appropriate authorization if work is required within streams.

If equipment comes in contact with inland streams or waterbodies, such as during construction/demolition of temporary or permanent crossings, DART will prepare and follow an aquatic invasive species transfer prevention plan which outlines BMPs for preventing inadvertent transfer of aquatic invasive plants and animals on project equipment.

Permanent fencing for residential areas, and temporary construction fencing proposed for the Project will be placed in an effort to avoid as much as possible any riparian habitat, upland and bottomland woodlands, and wetland areas. The Project will be constructed to avoid or minimize adverse impacts and to mitigate any impacts when rare plant and animal species and their habitat are found within or near the Project area.

State law prohibits direct harm for state-listed species, but does not currently provide for habitat protection. As the project advances, DART will examine ways to reduce or eliminate impacts to riparian habitat. If any state-listed species are encountered within the Study Area during construction, care should be taken to avoid harming them. Contractors will be advised of the potential for occurrence in the project area, and to avoid harming the species if encountered.

4.18 Relationship between the Short-term use of the Environment and the Maintenance and Enhancement of Long-term Productivity

4.18.1 Impact Evaluation

This section identifies short-term uses and long-term productivity of environmental resources as defined per 40 CFR 1502.16. Overall, operation of the project would maintain and enhance productivity and general quality of life in the surrounding area. Short-term uses and impacts from the use of resources related to the project would be consistent with the enhancement and maintenance of long-term productivity in the local area.

4.18.2 Mitigation Measures

The most disruptive short-term impact associated with the Project would occur during land acquisition and project construction (see **Section 4.21**). Any short-term uses of human, physical, socio-economic, cultural and natural resources would contribute to the long-term benefits of improved access to employment centers; a transportation alternative that can easily respond to increased demand from a growing population; improvements in both transit



accessibility and availability; and improved air quality in the region. The long-term benefits of implementing transit supportive land use policies could also be realized. The Project would contribute to the long-term productivity of the area by enhancing transportation options in the Study Area. In addition, the Project would meet the region's desires to implement long-range plans that integrate land use and transportation policies.

4.19 Irreversible or Irretrievable Commitment of Resources

Irreversible commitments would include undeveloped land acquired for construction of stations and maintenance facilities, as well as the irreversible and irretrievable resources from construction materials and the use of non-renewable fossil fuel resources that would be necessary to power construction equipment, electrical devices, vehicles, and trains. The general loss of vegetation in the area from construction of stations and other facilities along the rail right-of-way would also represent an irreversible commitment. Potential degradation to air quality that would result from construction activities would be temporary and reversible upon completion of project construction. Although BMPs would be incorporated to reduce soil erosion, the minor loss of soil during construction activities represents an irretrievable and irreversible commitment of resources.

4.20 Indirect and Cumulative Impacts

Impact Assessment

Indirect impacts (i.e., effects) are defined as impacts that are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable” per the CEQ (40 CFR §1508.8) and may “include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.” In addition, the CEQ (40 CFR §1508.7) defines cumulative impacts as “the impact on the environment which results from the incremental impact of the proposed action when added to other past, present and reasonably foreseeable future actions.” The potential indirect and cumulative impacts of the Project are described below utilizing guidance from the 2016 American Association of State Highway and Transportation Officials (AASHTO) Practitioner's Handbook on *Assessing Indirect Effects and Cumulative Impacts Under NEPA*.

Indirect Impacts

In addition to direct impacts, major transportation projects may also have indirect impacts on land use and the environment. For this analysis, the evaluation of indirect impacts is focused on induced growth impacts. Induced growth impacts are defined by AASHTO as “changes in the location, magnitude or pace of future development that result from changes in accessibility caused by the project.” An example of an induced growth impact is commercial development occurring around a new rail station and the environmental impacts associated with this development. The primary goal of the indirect impacts analysis is to understand the causal relationship between the Project, the induced growth and the resources potentially affected from the induced growth.

The indirect impacts study area, also known as the Area of Influence (AOI), is the same as the Project's Study Area, consisting of approximately 0.25 mile on either side of the proposed alignment and a 0.5-mile radius around each proposed rail station. This AOI was delineated in consideration of typical induced growth and development likely to occur around the proposed stations and alignment. The AOI generally consists of highly developed, urban environments with a mixture of industrial, commercial and residential properties with intermittent pockets of undeveloped lands. The AOI covers approximately 12,496 acres which includes approximately 285 acres of existing rail right-of-way and 158 acres of additional right-of-way for the Project.



The temporal range for the indirect impacts analysis extends from 2017 to 2040, the horizon year of the current NCTCOG Mobility 2040 MTP.

The evaluation of potential indirect impacts resulting from the proposed Build Alternative follows the four-step process outlined in the *Indirect and Cumulative Impacts Analysis Methodology Technical Memorandum (Appendix B)*.

Step 1: Assess the potential for increased accessibility

Proposed access changes are evaluated to help assess the potential for increased accessibility within the AOI. Access changes within the project limits would result from the proposed stations that would provide new access to the proposed Cotton Belt rail line. All proposed stations would be sources of new, added accessibility to other areas in the region through the proposed Cotton Belt rail line or through connections to other existing rail lines. The Cotton Belt Project would interface with three DART LRT lines: The Red Line in Richardson/Plano, the Green Line in Carrollton, and the Orange Line at DFW Airport. Also at DFW Airport, the Project connects to the TEXRail Project to Fort Worth and the DFW Airport Skylink People Mover. The accessibility potential of each station is summarized in the *Indirect and Cumulative Impacts Assessment and Mitigation Technical Memorandum* in **Appendix B**. Additional information on transportation and access is included in **Chapter 5**.

Although the connections to the other existing rail lines (DART LRT Green, Red and Orange lines, TEXRail, and potentially DCTA A-Train) are located at only four proposed stations (DFW Terminal B, Downtown Carrollton, City Line/Bush and 12th Street), these existing rail lines could be accessed by any of the proposed stations because they would all be connected by the Cotton Belt Project.

Most of the proposed stations have or would have parking areas available. Two stations (Knoll Trail and Preston Road) would not have any parking areas. The Knoll Trail Station would have drop off areas whereas the Preston Road Station would be accessed by pedestrians and bicyclists only, which would limit its accessibility. The DFW Terminal B Station does not have a designated parking area, but is anticipated to be a destination station versus a boarding station as it shows more alightings than boardings in the 2040 ridership forecast. In other words, travelers are likely to board at a different station to get to this station and to DFW Airport.

All other proposed stations have existing or proposed parking areas which would enable rail users to drive to the station and board at these locations. As mentioned above, all proposed stations would be connected by the Project which would result in increased accessibility for rail users. Rail users can access areas along the Project from any of the proposed stations, as well as areas along the other existing rail line corridors through connections at three proposed stations. In addition, riders departing at the proposed stations could connect to bus options to reach a farther distance than from walking or biking; however, it is more likely that riders are attempting to reach destinations within walking distance to the stations.

The 2040 ridership forecast also determines ridership potential of the Project. The following summarizes the Cotton Belt Project ridership effects:

- Drive access would be the highest boarding mode (28 percent of all boardings) and highest at the DFW North Station (nearly 21 percent of all drivers board here).
- Transfers from the DART LRT lines would provide the next highest boarding mode (22 percent of all boardings) and would occur most often at the Downtown Carrollton and CityLine/Bush stations.
- The Downtown Carrollton Station would have the highest overall station ridership due to the transferring rail riders from the LRT lines at this location.



- Transfers to the Cotton Belt Project from DART LRT lines would occur as expected at the 12th Street Station and CityLine/Bush Station (from the Red Line), the Downtown Carrollton Station (from the Green Line) and the DFW Terminal B Station (from the Orange Line).
- The Addison Station would be the second highest in overall ridership and would have the highest walk egress for all the stations. The Addison Transit Center is also one of the busiest transit centers in the DART system.
- DFW Terminal B Station provides access to a major activity center and the high rail ridership forecasted at this station reflects that – both for employees and passengers. It would primarily be a destination station (427 boardings versus 1903 alightings).

Although all proposed stations are interconnected through the Project, once reaching the desired station, additional transportation modes may be needed to reach ultimate destinations. Destinations near or within walking distance from the proposed stations would receive the most benefit and result in an increase in accessibility. Conversely, destinations with distances greater than one mile from a proposed station would not experience an increase in accessibility because of the additional transportation needs. In summary, the Project has the potential to increase accessibility at and near destinations within walking distance of the proposed station locations.

Step 2: Assess the potential for induced growth

To assess the potential for induced growth, feedback was gathered from local planners in April and May 2017 to get their professional opinion on potential areas of development and redevelopment. Local planners and staff provided feedback and input on future developments planned or likely to occur, potential impacts of the Project, and induced growth within their jurisdiction. Input was received from the following municipalities: Town of Addison and the cities of Carrollton, Coppell, Dallas, Plano, and Richardson. The planners identified areas for development which are evaluated and included in this analysis. These areas are generally mixed-use developments near the proposed stations or within the Study Area and are primarily TOD because most of the cities have anticipated the construction of the Cotton Belt Project.

Using this feedback from local planners as well as information from the NCTCOG Regional Data Center, potential for induced growth was determined and areas of development and redevelopment identified. It is anticipated that the Project has the potential to induce development as well as increase the rate and intensity of potential development.

Step 3: Assess the potential for impacts on sensitive resources

As a result of the induced growth areas identified in Step 2, it is anticipated that socioeconomic resources and ecological resources would be the only sensitive resources impacted. No negative impacts are anticipated to socioeconomic resources; alternatively, positive effects to employment and businesses are anticipated along the Project because of the potential for TOD. Providing additional access opportunities for employees and customers would positively impact business surrounding proposed stations. Providing services to accommodate the potential growing population and changing demographic in association with the TOD may impact local schools and community facilities. Emergency service providers in areas of high density development may also need to accommodate such increases of population and development. Generally, development and redevelopment near the proposed stations would result in positive community effects and greater access to transit for EJ populations. More focused development around stations would also enhance accessibility and job opportunities for transit-dependent populations from throughout the service area.



Sensitive ecological resources include water and vegetation. These resources have the potential to be affected from induced growth. Anticipated induced growth from redevelopment of existing structures and properties would not result in impacts to water and vegetation. For new development, conversion of undeveloped land would result in minimal water and vegetation impacts. Such areas are minor in the context of the 26-mile corridor where most of the area is already developed and converted to urbanized land use. Surface water runoff which may transport sediment into water bodies could have the potential to impact impaired waters, nearby streams and water features. Structural columns within floodplain areas and construction of additional impervious surfaces could result in additional stormwater runoff which could contribute to erosion and sedimentation problems.

Step 4: Assess potential minimization and mitigation measures

As mentioned in Step 3, ecological and socioeconomic resources are sensitive resources that have the potential to be affected by induced growth from the Project. BMPs and Stormwater Pollution Prevention Plans (SWPPP) implemented in accordance with TCEQ requirements would alleviate any potential impacts resulting from activities that could result in erosion and sedimentation. Furthermore, water resources impacts would be mitigated through coordination with the USACE (through permits) and the NCTCOG (under the Section 214 program of the Water Resources Development Act) and in accordance with DART's Mitigation Monitoring Program.

Impacts to socioeconomic resources could be minimized through continued monitoring of safety, access, traffic volumes and parking demands at and near proposed station locations. A mitigation plan could be developed if any issues arise. In addition, impacts to community resources would be minimized and mitigated through existing land use development regulations which would govern induced development projects within the AOI. Indirect impacts from the project, particularly potential land use redevelopment effects, are consistent with local goals and trends.

Cumulative Impacts

The purpose of the cumulative impacts analysis is to assess the direct and indirect impacts of the Project within the larger context of past, present, and future activities that are independent of the Project, but which are likely to affect the same resources in the future. This approach evaluates the incremental impacts of the Project in respect to the overall health and abundance of selected resources.

Cumulative impacts are analyzed in terms of the specific resource being affected. Before initiating the cumulative impacts analysis, key resources/issues are identified and it is determined whether a cumulative analysis is warranted for each resource. The cumulative impacts analysis focuses on 1) those resources substantially impacted by the project (directly or indirectly) and 2) resources currently in poor or declining health or at risk even if project impacts (either direct or indirect) are relatively small.

It was determined that the following resources warrant a cumulative impacts analysis: land use and socioeconomic resources. The evaluation of cumulative impacts resulting from the proposed Build Alternative follows the five-step process outlined in the *Indirect and Cumulative Impacts Analysis Methodology Technical Memorandum*. Each resource cumulative impacts analysis and findings followed this five-step process:

- Step 1: Describe resource conditions and trends;
- Step 2: Summarize effects of the proposed action on key resources;
- Step 3: Describe other actions and their effects on key resources;
- Step 4: Estimate combined effects on key resources; and



- Step 5: Consider minimization and mitigation.

The temporal boundary for the cumulative analyses extends from 1996 to 2040, the year DART opened its first rail line and the horizon year of the current NCTCOG Mobility 2040 MTP, respectively. The Resource Study Area (RSA) for land use and socioeconomic resources was determined to follow the general areas surrounding the proposed stations and proposed alignment. Like the AOI for indirect impacts, the RSA for the cumulative impacts analyses also consists of approximately 0.25 mile on either side of the proposed alignment and a 0.5-mile radius from the proposed stations.

Land Use

Land uses within the RSA are stable and improving. Land use development and redevelopment has been occurring at a steady pace, reflecting local goals and trends.

No adverse impacts are anticipated to socioeconomic resources; alternatively, positive effects to employment and businesses are anticipated along the Project because of the potential for TOD. Providing additional access opportunities for employees and customers would positively impact business surrounding proposed stations. Providing services to accommodate the potential growing population and changing demographic in association with the TOD may impact local schools and community facilities. Emergency service providers in areas of high density development may also need to accommodate such increases of population and development. Generally, development and redevelopment near the proposed stations would result in positive community effects and greater access to transit for EJ populations.

Past and present actions include extensive development and redevelopment of land uses, as the Project traverses seven cities and towns within three growing counties: Tarrant, Dallas and Collin. There are several reasonably foreseeable development and transportation projects that would take place generally in the same timeframe as the proposed action's construction. Various local development plans are discussed in more detail on **Table 3-2** located in **Section 3.2**. In addition, there are 19 development projects, identified through the NCTCOG Regional Data Center, that are either announced, in the conceptual phase of planning or under construction within the RSA. These developments are mostly multi-family apartment complexes, but also include single-family residential, industrial and office commercial developments. Key transportation projects in progress within the RSA include highway, tollway and rail projects sponsored by TxDOT, the NCTA and FUTA.

These reasonably foreseeable development and transportation projects would result in the continued development and redevelopment of land, as the cities along the Cotton Belt Project proceed toward the goals articulated in their various land use plans. The Project may influence investment in redevelopment projects, such that redevelopment may occur at a somewhat accelerated pace. Utility service and infrastructure demands may increase. From a larger perspective, the Project, in addition to these other reasonably foreseeable transportation projects, supports the goals of the NCTCOG Mobility 2040 MTP: congestion relief, improved safety, air quality, quality of life, enhanced economic opportunities, and streamlined project delivery. These projects are also aligned with US DOT Livability Principles, such as providing more transportation choices, improving economic competitiveness, supporting existing communities, and enhancing the unique characteristics of a community. Compact development that allows people to lead a transit-focused lifestyle, with shorter commutes between residences and workplaces, is ultimately a more environmentally friendly land use development pattern.

The Project has been developed in conjunction with planned public transportation and roadway improvements as well as regional and local land use plans and projects. It is anticipated that the Project would encourage TOD, which would support local land use plans and projects. Current land uses surrounding potential station locations are compatible with these objectives. The



Project would not contribute to cumulative adverse local land use impacts that could result from development of the surrounding areas, but rather would benefit communities by supporting more efficient land use development. Therefore, the Project in addition to other development and transportation projects, implemented within existing land use development regulations and other environmental regulatory protections, would not result in substantial, adverse, cumulative impacts.

Socioeconomic Resources

Overall, the Study Area has a total number of 71,853 households; the median household income is \$70,366; and 5 percent of the households have no vehicle available. The City of Dallas has the lowest median household income of the cities located within the Study Area and has the highest percentage of households with no vehicle available that rely on transit services for their mobility.

The Project would have long-term benefits for the communities it traverses as it would further goals and policies for revitalization and investment within the RSA and broader regional economies. The fiscal benefits of operation would have a long-term impact for the communities. It is anticipated that the possible loss of tax revenue would be offset by increased development near stations and along the alignment. Therefore, once operational, the Project would not result in any adverse cumulative impacts and would have an economically beneficial effect on the surrounding communities.

Construction activities associated with the Project could result in community disruptions. These disruptions may result in temporary, short-term economic impacts on local businesses. The construction activities would, however, result in overall beneficial impacts as increases in employment and spending would offset any short-term economic impacts. Community disruptions could also result from other development projects also occurring in the RSA as a result of TOD. This may result in a longer duration of noise and dust from construction, and greater traffic delays and obstructions. The combined impact may heighten the perception of disruption experienced by the local communities. These impacts may be concentrated in locations at different times during construction, but would diminish as the Project concludes. The resulting benefits to the communities and businesses would outweigh the temporary disruptions.

Property acquisitions (both full and partial) would result from implementation of the Project. These proposed acquisitions would produce impacts across the RSA through the displacement of one local residence and nine businesses; however, relocation services would be provided in accordance with federal policies and guidelines. With the anticipated TOD, suitable employment could be found by affected employees in the general area. It is further anticipated that local residents would be relocated into houses that are decent, safe and sanitary, with adequate living space to accommodate the displaced household which would be within the household's financial limits. With the anticipated potential TOD and relocation assistance, the cumulative impact from displacements would not be substantial.

Traditionally, neighborhoods and communities within the RSA have been built around existing rail right-of-way and other major transportation corridors such as the DNT, US 75, IH 35 and the PGBT. It is anticipated that the Project, when considered in conjunction with other current and future projects, would enhance the neighborhoods as an option for transport to and from community facilities. These community facilities include medical centers, places of worship, police and fire stations, libraries, schools, and universities. Therefore, the Project would have a positive cumulative impact both within the RSA and the broader metropolitan context as accessibility would be enhanced which in turn, benefits access to local businesses and improves potential for economic development.



EJ Communities

Stations proposed in EJ areas have the potential to indirectly impact housing prices, neighborhood character, and other aspects to which EJ populations can be particularly sensitive. The Project would also likely induce development/redevelopment within the station areas and with EJ populations located within some of these station areas, indirect impacts could occur due to the redevelopment of land within the station areas. However, impact to EJ populations that would occur as a result of the Project would not constitute a disproportionately high or adverse impact to these populations relative to other populations within the Study Area. With the planned mitigation measures, project effects will not predominantly be borne by an EJ population, or will not be suffered by the EJ population, and will not appreciably be more severe or greater in magnitude than the adverse effect that will be suffered by the non-EJ population. EJ communities are located near the existing LRT stations in downtown Carrollton and 12th Street, which is just south of the proposed 12th Street Station, where development has already begun.

Conclusions

Indirect Impacts

It is anticipated that the Project could induce development as well as increase the rate and intensity of future development. The induced growth could result in impacts to socioeconomic and ecological resources. Impacts to community resources would be minimized and mitigated through existing land use development regulations. In addition, positive impacts to employment and businesses are anticipated along the Study Area because of the potential of TOD, providing additional access opportunities for employees and customers that would positively impact business surrounding proposed stations of the Project. For ecological resources, BMPs and SWPPP requirements would alleviate any potential impacts. In the context of the 26-mile corridor, most of the Study Area is already developed and converted to urbanized land use; therefore, induced growth impacts would not be substantial and would be outweighed by the positive impacts to the community and economic development of the cities along the Project. As a result, no mitigation is proposed for induced growth impacts.

Cumulative Impacts

The incremental impact of the Project when added to past, present, and reasonably foreseeable future actions is not anticipated to be substantial. In general, the implementation of a passenger rail line would have a positive impact on existing and proposed projects thus offsetting potential cumulative impacts. Direct benefits of transit include improved access, reduced parking requirements and reduced traffic congestion. Passenger rail construction has also been demonstrated to have a positive impact on land use through TODs which align with local plans.

No substantial environmental impacts have been identified for the Project. DART continues to work closely with local municipalities, agencies, developers, and businesses to develop a passenger rail line that fits well within the existing and future environment thereby reducing the potential for incremental impacts to other past, present, and reasonably foreseeable future actions. Additionally, the proposed action utilizes 2040 traffic projections and demographic forecasts, accounting for much of the foreseeable development and any associated impacts.

Based on the cumulative impacts assessment, no substantial impact would result from any projected incremental impacts of the Project combined with other past, present and reasonably foreseeable future actions; therefore, no mitigation is proposed.



4.21 Construction Impacts

This section presents the short-term impacts and mitigations associated with constructing the Cotton Belt Project. The construction scenario describes the construction process while the other sub-sections analyze short-term construction impacts by impact category.

4.21.1 Construction Scenario

The implementation of the Cotton Belt Project would follow the traditional steps of project development successfully used by DART on prior projects, as well as recommended by FTA. These steps provide DART as the owner the needed opportunities for oversight and review, and to provide the greatest assurance of cost and schedule control. These implementation steps include:

1. Preliminary Engineering and Environmental Analysis / Preparation of NEPA Document / Record of Decision (FEIS/ROD)
2. Final Design
3. Construction
4. Testing of Project and Systems Elements / Opening for Revenue Service

Traditionally, each of these implementation steps is completed prior to the next step being initiated allowing review of project status, solicitation of public input, and confirmation of project budget. There are warranted occasions where some of these steps may be combined for cost efficiencies and expedited schedule. The Cotton Belt Corridor Project would use the Design/Build implementation method where the Final Design and Construction steps are contracted simultaneously with the same contractor. The procurement process for this step has been initiated and an award is anticipated pending the FEIS/ROD. Concurrent with this Design/Build contract, DART would also award an Owner's Representative contract. This latter contract would help to ensure DART oversight of all design/build activities, including budget and schedule. More information on the design/build activities and construction approach is described below.

Construction of the Project would involve a number of activities. The construction scenario is assumed to follow the approach outlined below.

- Preparation of Traffic Detour Plans – Traffic detour plans would be developed and agreed upon by DART, the cities along the Project, and DFW Airport, and any other agencies during final design. The plans would include provisions for traffic, bus service, pedestrian and bicycle activity while delineating a construction area.
- Clearing and Grubbing – As required, site preparation within the right-of-way will occur to allow for the movement of construction equipment and construction operations.
- National Pollutant Discharge Elimination System (NPDES) – A NPDES SWPPP would be developed and implemented to address potential impacts related to pollutant discharge.
- Utility Relocation – This step would involve localized excavation and relocation of existing underground utilities. The work would generally be undertaken by local agency utility crews. Utility relocations may take place prior to construction of the rail line and stations.
- Track Bed – The regional rail track bed would be placed within DART-owned right-of-way on an approximate two-foot layer of ballast and sub-ballast. Aerial structures would be constructed of reinforced concrete or structural steel supported by single or dual columns or piers.
- Guideway – The rail will be continuously welded rail and be installed in sections.
- Stations and Parking Facilities – All station construction would be coordinated with the appropriate traffic detour plan.



- Roadway Modifications – Each of the at-grade street crossings will require reconstruction and modification due to the implementation of the double track along the Project which will be coordinated with each city jurisdiction.
- Landscape Restoration – Upon completion, disturbed elements such as landscaping, open storm drainage, and other disturbed areas would be restored.
- Systems Construction – Signaling and communication systems would be installed along the rail line.

Mitigation measures for construction-related impacts are outlined in *DART Light Rail Project – General Provisions, General Requirements, and Standard Specifications for Construction Project*, including DART standard specification 02270, Erosion and Sediment Control. Section 01560, titled Environmental Protection, includes environmental protections considerations related to, but not limited to the following:

- Natural resources including air, water, and land;
- Solid waste disposal;
- Noise and vibration;
- Control of toxic substances and hazardous materials;
- Chemical, physical, and biological elements that adverse effect ecological balances;
- Degradation of the aesthetic use of the environment, and;
- Historical, archeological and cultural resources.

It is anticipated that DART would award the construction contract for the Cotton Belt Project as one primary design/build contract. An overview of the anticipated construction activities (Facilities, Trackwork, Systems, and Landscaping) follows. Discussion of necessary staging areas is also included.

Facilities Construction

The proposed alignment would contain aerial, at-grade, and cut construction components. **Table 4-19** outlines the summary of work for each type of construction by elevation.

The typical construction scenario would start with utility and storm sewer relocations, followed by construction of permanent and temporary facilities to support rerouting of vehicular and rail traffic. Once the utilities are cleared and the permanent/temporary facilities constructed, the contractors would build long duration construction items such as cut and bridge sections. For bridge structures, the contractors would first construct the substructure/foundations, bridge piers, and abutments. Once these items are complete, the contractor would place beams, pour the bridge deck, and install parapet railing. Retained earth embankments can be constructed concurrently with the bridges. At-grade guideway construction can proceed concurrent with open cut and bridge construction, but would be phased to not impede progress on the tunnel and bridge work.

Station construction would commence with subsurface utility, drainage, and foundation work. This would be followed by platform, canopy, and ancillary construction, including architectural finishes.

Trackwork Installation

Trackwork installation would follow substantial completion of the line section. It would include the installation of the fixed guideway elements: ballast, ties, rail, concrete plinths on direct fixated bridges, and special trackwork. DART would provide the rails and ties to the trackwork installation contractor. These items would be strategically placed throughout the Project to minimize haul distances and facilitate construction. It is anticipated that track installation would last approximately one year and overlap the facilities and systems construction



Table 4-19. Construction Activities and Equipment by Elevation

Construction Location and Activities	Typical Construction Equipment Used
At-Grade Regional Rail Construction	
Clearing and grubbing	dozer, motor grader, dump/haul truck, loader/backhoe
Storm water and erosion control	loader/backhoe, ditcher/trencher, tractor with hole auger
Utility and street relocation	motor grader, loader/backhoe, ditcher/trencher, compaction equipment, paving machine, excavator
Demolition of existing facilities	dozer, motor grader, dump/haul truck, loader/backhoe, jackhammer/ramjack, concrete saw
Drainage and storm water systems	loader/backhoe, ditcher/trencher, compaction equipment, rubber tire loader
Excavation, embankment, and subgrade preparation	dozer, motor grader, compaction equipment, tiller
Retaining walls and ballast walls	rubber tired crane, ditcher/trencher, concrete vibrator, bucket grading machine
Lime subgrade	motor grader, compaction equipment, tiller
Subballast	motor grader, compaction equipment
Chain link fencing	loader/backhoe, concrete vibrator, tractor with hole auger
At-Grade Stations	
Station platform slab and special use platform	rubber tired crane, dump/haul truck, drilled pier rig, compaction equipment, concrete vibrator, bucket grading machine
Structural steel canopies and roofing systems	tracked crane, air compressor, welding machine, rubber tire loader, man lift
Electrical systems	rubber tired crane, ditcher/trencher, compaction equipment, man lift
Mechanical systems	rubber tired crane, ditcher/trencher, loader/backhoe, air compressor
Architectural finishes	rubber tired crane, welding machine, sand blaster
Painting	sand blaster, paint sprayer, man lift
Street, Driveway, and Parking Lot Construction	
Street pavement and street at-grade crossing headers	rubber tired crane, motor grader, loader/backhoe, compaction equipment, paving machine, concrete vibrator
Permanent street signage and pavement markings	air compressor, sand blaster, tractor with hole auger, street sweeper
Aerial Regional Rail Construction	
Drilled shaft construction	tracked crane, drilled pier rig, water pump, concrete vibrator
MSE wall construction at bridge approaches	dump/haul truck, loader/backhoe, compaction equipment, bucket grading machine
Bridge pier construction	tracked crane, rubber tired crane, concrete vibrator
Bridge deck and parapet	tracked crane, rubber tired crane, concrete pump, man lift, concrete vibrator
Grounding system	rubber tired crane, loader/backhoe
Open Cut Construction	
Backfill and final grading	motor grader, dump/haul truck, compaction equipment

Source: DART, GPC6

Systems Construction

Systems construction would follow substantial completion of trackwork installation. This would provide for the installation of wayside signals, communication, and fare collection elements. Systems construction and testing is anticipated to last one year, commencing after substantial completion of the facilities and trackwork elements.



Landscape Installation

The landscaping activities would include installing planting materials and irrigation systems where needed to stabilize the ground surface or mitigation has been determined necessary, as well as at other selected locations along the proposed alignment. This work would be performed concurrent with, but towards the end of, the trackwork and systems contracts.

Construction Staging Areas

Several staging areas may be required for the storage of equipment and materials used for the construction of the project. All of these staging areas would be located adjacent to the Project. Their final size and location would be determined by the selected design/build contractor as the project progresses through final design. Where possible, construction staging areas would be located in DART-owned right-of-way and newly acquired right-of-way for route deviation and station areas.

Construction Staging Areas Impacts

If exposed to the weather, construction equipment and materials have the potential to release chemicals during storm events. The storage of construction equipment and materials on the ground also has the potential to disturb the soil and kill or prevent the growth of groundcover, which causes the soil to be susceptible to wind and water erosion. Construction equipment has the potential to leak oil and grease, hydraulic fluid, brake fluid, and other petroleum hydrocarbons. There is also the possibility of spillage during fueling operations.

Construction Staging Areas Mitigation

The *DART Facilities Standard Specifications Section 01560 Part 1.3* addresses environmental protection related to a wide range of construction activities. Regarding construction staging, the specifications state that:

- contractor must store equipment and materials in conformance with applicable local regulations;
- unnecessary materials and equipment are not allowed to be stored at the job site;
- no structure is allowed to be loaded with a weight that would endanger its structural integrity or the safety of persons;
- materials are not allowed to be stored on private property without written authorization of the owners of the property; and
- only use established roadways unless authorized by the contracting officer.

The *DART Facilities Standard Specifications Section 01560 Part 1.3E, Water Resources* states that a SWPPP would be developed for the Build Alternative (01560-2). It also states that the construction contractor is required to use BMPs as prescribed in the *Storm Water Quality Best Management Practices Manual for Construction*, prepared by the NCTCOG, to prevent stormwater runoff from construction materials and equipment by covering such materials and equipment with awnings, roofs, or tarps; storing materials on asphalt or concrete pads; surrounding material stockpiling areas with diversion dikes or curbs; and using secondary containment measures such as dikes or beams around fueling areas. The contractor is also required to mulch and reseed disturbed areas to prevent air and water erosion on the site after termination of construction operations.

Coordination with Other Scheduled Construction Projects

The construction of the Project would be coordinated with Dallas, Tarrant and Collin counties, the cities of Plano, Richardson, Dallas, Addison, Carrollton, and Coppell, TxDOT, North Texas Tollway Authority (NTTA) and DFW Airport. Coordination would need to occur with regards to electric cables, copper cables, and telephone conduit servicing FAA equipment and



communications due to line disruptions, relocations, and general improvements during certain construction activities. Mitigation and plans for coordination with DFW Airport and FAA would be required during all stages of final design and construction and are addressed in the mitigation discussion included in **Section 4.21.4**.

4.21.2 Impact Evaluation

No-Build Alternative

No construction impacts are anticipated under the No-Build Alternative, because no rail construction will occur.

Build Alternative

Short-term impacts and mitigation associated with constructing the proposed rail alignment would be anticipated to occur with regards to noise, vibration, traffic flow, air quality, and water quality. Construction activities would be carried out in accordance with *DART Facilities Standard Specifications, Dallas-Fort Worth International Airport Construction and Fire Prevention Standards Resolution and Amendments to the Codes, October 2007*, and any other applicable laws and ordinances. Also, construction activities will comply with all guidelines and requirements of DFW Airport's Soil Management Plan.

Construction Noise

Construction of the track, stations, and rail storage yard would result in the generation of noise from construction equipment. Construction noise varies greatly depending on the construction process, type and condition of equipment used, and the layout of the construction site. Many of these factors are traditionally left to the contractor's discretion, which makes it difficult to accurately estimate levels of construction noise.

The potential for construction noise impact varies by location and land use. Given the ambient conditions, commercial and industrial land uses, which adjoin the majority of the alignment, should not be adversely impacted by construction noise. Residential areas along the alignment have the potential to be impacted by construction noise.

Construction Noise Mitigation

Construction activities would be carried out in compliance with all applicable local noise regulations. *DART Facilities Standard Specifications Section 01560 Part 1.11* states that construction activities must comply with the noise and vibration maximum limits set out in tables 01560-1 and 2. The guidelines also specify appropriate techniques to minimize and mitigate noise and vibration near sensitive land uses. In addition, specific residential property line noise limits would be developed during final design and included in the construction specifications for the project. Noise monitoring would be performed during construction to verify compliance with the limits. This approach allows the contractor flexibility to meet the noise limits in the most efficient and cost-effective manner. Noise control measures that would be applied as needed to meet the noise limits include the following:

- Avoiding nighttime construction in residential neighborhoods;
- Using specially quieted equipment with enclosed engines and/or high performance mufflers;
- Locating stationary construction equipment as far as possible from noise-sensitive sites;
- Constructing noise barriers, such as temporary walls or piles of excavated material between noisy activities and noise-sensitive receivers;
- Routing construction-related truck traffic along roadways which would cause the least disturbance to residents; and



- Avoiding impact pile driving near noise-sensitive areas, where possible. Drilled piles or the use of other non-impact piling methods are quieter alternatives where the geological conditions permit their use (DART Specification 01560-7, 8).

Construction Vibration

The most noteworthy source of construction vibration is pile driving. Pile driving would occur in the elevated sections of the alignment, which are primarily located in existing railroad, street, and highway right-of-way. Other construction activities that could cause intrusive vibration include vibratory compaction, jack hammering, and the use of tracked vehicles, such as bulldozers.

The potential for construction vibration impact varies by location and land use. Commercial and industrial land uses, which adjoin the majority of the alignment, should not be impacted by construction vibration. Residential areas along the alignment have the potential to be impacted by construction vibration.

Construction Vibration Mitigation

Per the *DART Facilities Standard Specifications Section 1.11*, vibration impacts during construction would be avoided through numeric limits and monitoring requirements that would be developed during final design and included in the construction specifications for the project (01560-7, 8). Measures that would be considered as requirements to meet the vibration limits include the use of alternative equipment or processes, such as the use of drilled piles in place of impact pile driving and avoiding the use of vibratory compactors near vibration-sensitive areas. Construction activities would be closely coordinated and developed with DFW Airport. Appropriate measures would be taken to avoid vibration impacts to sensitive airport equipment and facilities. During final design, DART will coordinate with FAA to examine potential vibration impacts associated with construction practices so as to limit any impacts to airport facilities (i.e., ASR9).

Three community facilities were identified as potentially vibration sensitive. In view of the potential for ground-borne vibration impacts at the UT Southwestern Medical Center Clinic, the Qorvo facility, and the Texas Instruments facility in Richardson. Detailed, site-specific vibration studies will be conducted at these FTA Category 1 (high sensitivity) facilities during project design to make a final determination regarding impact and any required mitigation. The analysis will consider construction vibration impacts and mitigation.

Traffic Flow

During the construction of any roadway or rail line project, road and traffic disruption is expected on minor and major roadways. The following sections address traffic impacts due to construction of the project and mitigation measures to alleviate these problems.

Construction of the Project would affect several major and minor roadways in the cities of Plano, Richardson, Dallas, Addison, Carrollton, and Coppell, and within DFW Airport. When roadway or lane closures would be required during construction, DART and its contractors would coordinate with the traffic control divisions of the cities and DFW Airport to maintain reasonable and safe traffic operations at affected crossings.

Traffic Mitigation

The cities of Plano, Richardson, Dallas, Addison, Carrollton, and Coppell, and DFW Airport require notification of all construction activities within their jurisdictional boundaries. The construction contractors will identify the appropriate regulations and incorporate mitigation measures in the construction specifications as directed by DART guidelines (*DART Facilities Standard Specifications Section 01570, Maintenance and Control of Traffic 01570-1*). A



Maintenance of Traffic/Transportation Plan will be developed and implemented during construction.

All construction specifications, traffic control plans, and mitigation measures must be approved by local traffic engineering authorities prior to initiation of construction. Barricading and flagging staff will be used when appropriate. Private business parking areas and driveways will not be used for equipment maneuvering or parking. Construction specifications will include provisions for a maximum number of lanes blocked during peak traffic hours, maintenance and removal of traffic control devices, efficient traffic rerouting measures, and scheduling of construction activities within the roadways for times other than during peak traffic periods.

Short-term disruptions to local business or residential access routes may occur requiring detours or development of temporary access. During construction, DART community engagement representatives will work closely with the contractor to provide advance notifications to property owners and the public.

For airport roads, coordination with DFW Airport would be required. Access to all FAA facilities would be maintained during construction activities. The contractors would follow the same DART Construction Guidelines.

Public Services, Safety, and Security

DFW Airport has jurisdiction for fire protection and emergency medical services on airport property. Outside of airport property, local municipalities have jurisdiction.

Public Services, Safety, and Security Mitigation

DFW Airport and DART are currently developing an MOA to govern any safety and security issues along the DART alignment and at the DFW North Station during construction and operation phases of the project. Coordination with local jurisdictions will be conducted to address safety and security issues along the DART alignment.

Wildlife and Threatened or Endangered Species

Most wildlife, including some threatened, endangered, and rare species, are mobile in nature and would most likely relocate away from disturbances during construction activities. Most of the state-listed species listed in **Section 4.17.1**, however, are freshwater mussels, which are not mobile. Avoidance of habitat destruction for these non-mobile species, especially in riparian areas, is an important consideration.

Wildlife and Threatened or Endangered Species Mitigation

As prescribed in the DART General Provisions for LRT Construction contracts, Item 52 Protection of Existing Site Conditions, the contractor shall, “preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site which are not to be removed and which do not unreasonably interfere with the work required under this contract”. Methods to avoid destruction of native resources include a field survey by qualified biologist to mark trees and shrubs to be avoided in construction areas. Highly visible construction fencing will be installed surrounding designated vegetation and construction equipment and personal vehicles will be restricted from the area to avoid soil compaction and root disturbance. If roots of large trees are exposed, they will be wrapped with heavy burlap for protection and to prevent excessive drying.

Construction techniques will be designed to avoid and preserve existing mature native trees, shrubs, and prevent harm to non-mobile wildlife species by avoiding riparian areas when possible. To avoid soil disturbances to riparian areas, machinery and other vehicles will use nearby roadways and bridges when crossing drainages, wetlands, and creeks BMPs will be



employed. Re-vegetation of disturbed areas will also be planned to avoid invasive species gaining footholds on disturbed soils as directed in Executive Order 13112. Where possible, re-vegetation will be achieved using native plant species.

As a precautionary measure, the Freshwater Mussel BMPs will be included in the MMP. These include:

- When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD permit and implement Water Quality BMPs.
- When work is adjacent to the water; Water Quality BMPs will be implemented as part of the SWPPP for a construction general permit or any conditions of the 401 water quality certification for the project will be implemented.

Due to the abundance of available habitat within and adjacent to the Project, the potential impacts to the riparian areas within the Study Area are not anticipated to adversely impact the Texas garter snake. However, per BMPs, contractors will be advised of potential occurrence in the Study Area, and to avoid harming the species if encountered. BMPs would be included in the MMP. As the Project advances, DART will examine ways to reduce or eliminate impacts to state-threatened species and state species of concern.

Water Resources

Construction activities within the ordinary high water mark would have the potential to generate additional sediment loads in the drainage area if bare or unvegetated earth is exposed to rainfall for an extended period of time. Construction of retaining walls and bridge columns near any of the other streams or drainage channels crossed by the proposed rail alignment would also create the potential to generate additional sediment loads.

Construction activities could increase storm runoff (and possibly erosion and surface water pollution) by disturbing ground cover and soils and increasing nonpermeable surface area.

Water Resource Mitigation

As identified in **Section 4.2.1**, bridge columns would be anticipated to be placed in a water of the U.S.; however, the area impacted by the columns would be less than the threshold set by the USACE for individual permitting process. DART and its contractors would follow the guidelines of the USACE Nationwide Permit 14 or 25, depending on construction methods chosen.

BMPs for erosion control, sedimentation control, and control of total suspended solids would be incorporated into the project design to minimize impacts to water quality.

Water resources would be protected from contamination by adherence to DART Facilities Standard Specifications and required SW3P (DART Facilities Standard Specifications Section 01562-1). Special attention will be focused on planning the necessary locations of disturbance and restricting construction traffic to those locations in order to reduce overall damage to native vegetation and reduce erosion. Promptly revegetating any disturbed area at the end of the construction sequence would also reduce erosion potential. To make this effective, construction and erosion control implementation activity will be planned to progress as rapidly and completely as possible to reduce the amount of time during which there is a high potential for erosion.



Air Quality

Air quality impacts during construction will be limited to short term, increased fugitive dust and mobile source emissions. These impacts would be short-term and cease once construction is complete.

As discussed in **Section 3.11**, the proposed alignment is located within the ten-county ozone nonattainment area for North Central Texas and has been included in current Transportation Improvement Plan (TIP) conformity analysis. Air quality impacts from transportation projects generally focus on changes in motor vehicle-related pollution caused by on road vehicles; however, during construction non-road equipment would be expected to generate exhaust emissions which could contribute to a localized area of degraded air quality. Non-road equipment typically used for construction of transit projects and the types of tasks they perform is listed in **Table 4-17**.

Other impacts to air quality due to construction activities include dust generated from construction activities associated with concrete demolition, delivery trucks, and earth-moving operations throughout the Project.

Mitigation of Air Quality Impacts

For the proposed alignment, compliance with Clean Air Act legislation would require that DART or its designated Design-Build contractor submit FAA Form 7460-1, Notice of Proposed Construction or Alteration. For DFW Airport which is located within an ozone non-attainment area, an Airport Construction Emissions Inventory will accompany the FAA Form 7460-1 for this Project. This inventory will be completed by the Design-Build contractor once construction material quantity estimates are completed and construction staging planned.

The control of exhaust emissions emanating from non-road equipment and other construction related vehicles will be in accordance with EPA guidelines. To minimize exhaust emissions, contractors will be required to use emission control devices and limit the unnecessary idling of construction vehicles. Other measures to mitigate air quality include minimizing emissions through the use of clean fuels in construction equipment, deployment of clean diesel construction equipment (new, retrofit, rebuilt or repowered), and the implementation of anti-idling practices at construction sites.

There are no federal, state or local regulations concerning the generation of dust from construction activities except as a nuisance complaint; however, the *DART General Provisions, General Requirements and Standard Specifications for Construction Projects, Section 01560* (Part 1.8, Dust Control) provides dust control measures for construction activities. The regulations state that the contractor would be required to have sufficient equipment at the site to implement dust control measures. The measures will be implemented at all areas of construction at all times including non-working hours, weekends, and holidays. Common dust mitigation techniques on construction sites include applying water or other soluble moisture-retaining agents to dirt areas, cleaning construction equipment and adjacent paved areas that may be covered with dirt or dust, and covering haul trucks carrying loose materials to and from construction sites.

Soils Impacts

Construction-related activities for the proposed alignment would include excavation for the development of: guideway (i.e., railbed preparation and track installation), retaining walls, support structures for aerial tracks, grade separations, culverts, and a cut section. These activities have the potential to increase soil erosion and decrease soil stability.



Soil Mitigation

Direct impacts to soil could include removal of vegetation, exposure of the soil, mixing soil, or loss of topsoil, and short-term increased susceptibility to wind and water erosion due to construction.

Concerns associated with short-term increased soil erosion potential would be reduced through the establishment and implementation of storm water BMPs as prescribed in the *Storm Water Quality Best Management Practices Manual for Construction*, prepared by the NCTCOG, during and following construction such as maintaining vegetative ground cover, the use of silt fences, mulch blankets, diversion ditches, rock dams, and related measures to prevent wind and water erosion.

Socioeconomic

The Project has the potential to affect the North Dallas Eruv by temporary construction impacts if markers are down, causing a break in what is to be a continuous boundary. The Eruv must remain in good repair and with no breaks to be effective.

Socioeconomic Mitigation

DART will coordinate with the City of Dallas to minimize any effects to markers and avoid any disruptions to the existing city ordinance and the Eruv boundary. In addition, the affected community will be engaged during project design and construction to avoid and minimize impacts and to assist with proposed solutions. During construction, attempts will be made to avoid disruption on Sabbath days.

Wildlife and Threatened or Endangered Species

Most wildlife, including some threatened, endangered, and rare species, are mobile in nature and would most likely relocate away from disturbances during construction activities. Most of the state-listed species listed in **Section 4.17.1**, however, are freshwater mussels, which are not mobile. Avoidance of habitat destruction for these non-mobile species, especially in riparian areas, is an important consideration.

The timber rattlesnake is more at risk for being impacted by construction activities than any other terrestrial state-listed species, due to its limited mobility and the likelihood of its suitable habitat occurring within the Project area.

In addition, within the Project area, migratory birds could be impacted during site preparation and grading activities by disturbing existing vegetation and bare ground that may harbor active bird nests, including nests that may occur in grass, shrubs and trees, and on bare ground including gravel pads and roads.

Wildlife and Threatened or Endangered Species Mitigation

As prescribed in the DART General Provisions for LRT Construction contracts, Item 52 Protection of Existing Site Conditions, the contractor shall, “preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site which are not to be removed and which do not unreasonably interfere with the work required under this contract”. Methods to avoid destruction of native resources include a field survey by qualified biologist to mark trees and shrubs to be avoided in construction areas. Highly visible construction fencing should be installed surrounding designated vegetation and construction equipment and personal vehicles should be restricted from the area to avoid soil compaction and root disturbance. If roots of large trees are exposed, they should be wrapped with heavy burlap for protection and to prevent excessive drying.



Construction techniques will be designed to avoid and preserve existing mature native trees, shrubs, and prevent harm to non-mobile wildlife species by avoiding riparian areas when possible. To avoid soil disturbances to riparian areas, machinery and other vehicles will use nearby roadways and bridges when crossing drainages, wetlands, and creeks. BMPs will be employed. Re-vegetation of disturbed areas should also be planned to avoid invasive species gaining footholds on disturbed soils as directed in Executive Order 13112. Where possible, re-vegetation should be achieved using native plant species.

As a precautionary measure, the Freshwater Mussel BMPs will be included in the MMP. These include:

- When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
- When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD permit and implement Water Quality BMPs.
- When work is adjacent to the water; Water Quality BMPs implemented as part of the SWPPP for a construction general permit or any conditions of the 401 water quality certification for the project will be implemented.

Due to the abundance of available habitat within and adjacent to the Project, the potential impacts to the riparian areas within the Study Area are not anticipated to adversely impact the Texas garter snake. However, per BMPs, contractors will be advised of potential occurrence in the Study Area, and to avoid harming the species if encountered. BMPs would be included in the MMP. As the Project advances, DART will examine ways to reduce or eliminate impacts to state-threatened species and state species of concern.

4.21.3 Utilities

No-Build Alternative

The No-Build Alternative will not impact utilities because this alternative will not have any ground disturbance.

Build Alternative

Various utilities within the project right-of-way include electric, natural gas, telephone, water and sanitary sewer. Existing utility composite drawings were prepared as part of the 10 percent design efforts using record drawings, investigation by the previous 5 percent design consultant team, and GIS data obtained from the cities of Coppell, Grapevine, Carrollton, Dallas, Richardson, Plano, Town of Addison, Explorer Pipeline Company, Atmos Energy, Chesapeake Energy, Verizon, Time Warner Cable, Oncor Electric, Sprint, CenturyLink and other identified utility owners.

The completeness and accuracy of all information obtained regarding existing utilities have not been fully verified. The final designer for the Cotton Belt would need to verify and obtain accurate horizontal and vertical information for existing utilities using subsurface utility engineering or other methods.

A high-voltage electric transmission line bisects the proposed parking lot at the Cypress Waters Station area and crosses the rail line on a skew. Oncor policy requires that crossings be greater than 45 degrees. They also have restrictions on development under the transmission line. DART proposes to relocate one or two of the transmission towers to reconfigure the transmission lines crossing the station area. **Figure 4-21** illustrates one potential configuration of the towers. Ongoing and additional coordination with Oncor and adjacent property owners would be necessary to appropriately locate the towers and potentially modify the station plan.



The reconfiguration of the towers may require additional environmental analysis and coordination.

The radio towers located at Cypress Waters are scheduled to be removed in 2019 by the tower owners.

Other utility details have not been determined at this level of preliminary design so the assessment of potential impacts is qualitative. There are many utilities that cross or parallel the Project. Many existing utilities were not encased from right-of-way line to right-of-way line across the Project. Instead, they may have been encased for only a distance of 50 or 75 feet centered on the existing track. Since the Project will entail relocating or adding track to create a double-track corridor, situations would require encasement pipes to be lengthened.

Also, existing utility lines may have been constructed with adequate ground cover below the existing rail, but may no longer have sufficient cover in areas where the Project would modify the track profile lower than it exists today.

Finally, there are numerous at-grade utilities, predominantly at street crossings, that conflict with the new alignment and would need to be relocated. Most of these utilities fall into the following categories: light posts, traffic signal posts, crossing gates, railroad control utilities, and in rare instances, water and sanitary sewer manholes.

4.21.4 Mitigation Measures

In the event utilities must be rebuilt or new construction is warranted, the Project will be designed in conformance with requirements of the owning/operating utility company and the jurisdictional agency. Locations and elevations of all existing utilities will be field verified during final design and the proposed improvements would be coordinated with all utility companies prior to construction to avoid conflicts.

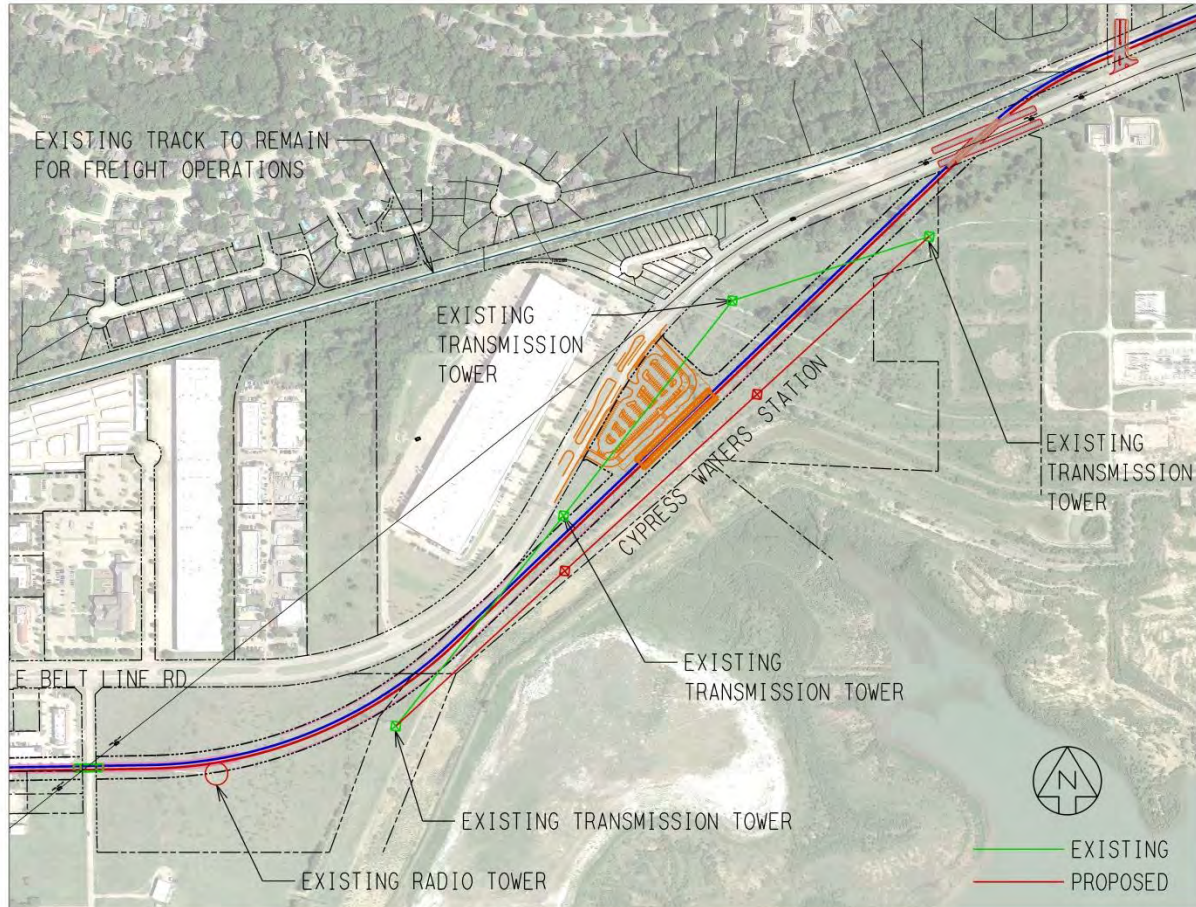
Mitigation measures for potential utility impacts as a result of the Project will include, but may not be limited to, the following:

- Prior to construction, all area utility companies will be contacted through One Call and requested to provide line location measures.
- Businesses and residences affected by utility disruptions during construction of the Project will be notified of the disruption at least two weeks in advance, unless there is an emergency situation requiring immediate attention.
- Disruptions in service to businesses will be scheduled during off-business hours and never exceed a 24-hour period except during unusual circumstances.
- To the extent possible, businesses such as restaurants, grocery stores or food preparation/manufacturing facilities will be accommodated to protect food preparation and storage mechanisms.
- Should utilities be discovered during construction that were not previously identified, work will cease in that area and the appropriate utility companies and agencies will be contacted to identify the line(s). The newly identified utilities will not be disrupted until businesses and residences are notified and the utility owner/operator has approved or made the required adjustment.
- The reconfiguration of the transmission towers at the Cypress Waters Station may require additional environmental analysis and coordination, including archeological surveys (see **Section 4.6**).

In addition, an allowance will be included within the project budget to cover adjustment, protection and/or consolidation of all utilities along the alignment. Utility adjustment and

protection will be closely coordinated with affected companies and designed to avoid any disruption in service.

Figure 4-21 Potential Transmission Towers Reconfiguration at Cypress Waters



4.22 Draft Section 4(f)/6(f) Evaluation

Section 4(f) of the US Department of Transportation Act of 1966 (49 USC § 303 and 23 USC §138) protects publicly-owned parks and recreation areas, as well as wildlife and waterfowl refuges and historic sites, and directs the conditions under which such properties may be used. Properties may only be used if:

- 1) there is no prudent and feasible alternative to using that land; and,
- 2) 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.

USDOT's Section 4(f) regulations (23 CFR Part 774) also require coordination with relevant state and local officials. For historic sites, consultation with the State Historic Preservation Office (SHPO) is required. For recreational resources, consultation with the agency responsible (official with jurisdiction) for the resources is also required. Several exceptions, and additional conditions that must be met for use of an exception, are set forth in the implementing regulations found in 23 CFR 774.13.

The Project intersects or is adjacent to eight Section 4(f) resources. These resources consist of an historic site, publicly-owned parks, recreation areas, and trails. The assessment for six



facilities adjacent to the Project is provided in **Section 4.5**. There are no uses that would rise to a constructive use that would substantially impair the characteristics that qualify the resource for protection for these six facilities.

Table 4-20 summarizes the remaining two Section 4(f) properties within the Cotton Belt Study Area. The descriptions of the undertakings and use determinations for these two resources are described below. Additional information on alternatives considered and the purpose and need of the Project can be found in **Chapters 1 and 2**.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965, as amended, (16 USC 4601-4 et seq.) protects recreational lands purchased or improved with LWCF program funds.

Table 4-20. Summary of Section 4(f) Properties

Name	Distance (ft.) from Alignment or Station Location	Address/Location	City	Size	4(f) Use
White Rock Creek Bridge historic resource	On alignment	North of Knoll Trail Station at Clubs of Prestonwood	Dallas	150 feet	4(f) Exception; Bridge will be moved 30 feet north of alignment for use in the Cotton Belt Regional Trail.
Spring Creek Trail*	Bisects alignment	East of Alma Road, south of PGBT	Richardson	1,500 feet	<i>De minimis</i> under 4(f). Trail will be realigned south of the existing trail.

Source: DART; GPC6

*Additional consultation with Texas Parks and Wildlife Department

4.22.1 Historic Resources

Impact Evaluation

The 4(f) use determination for the NRHP eligible resources in the APE were evaluated. On August 29, 2017, the SHPO concurred that the removal and/or demolition of the White Rock Creek Railroad Bridge would be an adverse effect on the historic resource; SHPO concurred that there were No Adverse Effects for the other historic resources. The relocation of the bridge requires the evaluation of the resource under Section 4(f).

Mitigation Measures

A Determination of Effects (DOE) for historic resources was prepared and is in **Appendix B**. Preliminary engineering has determined the location for the relocation of the White Rock Creek Railroad Bridge. Section 106 mitigation measures may include:

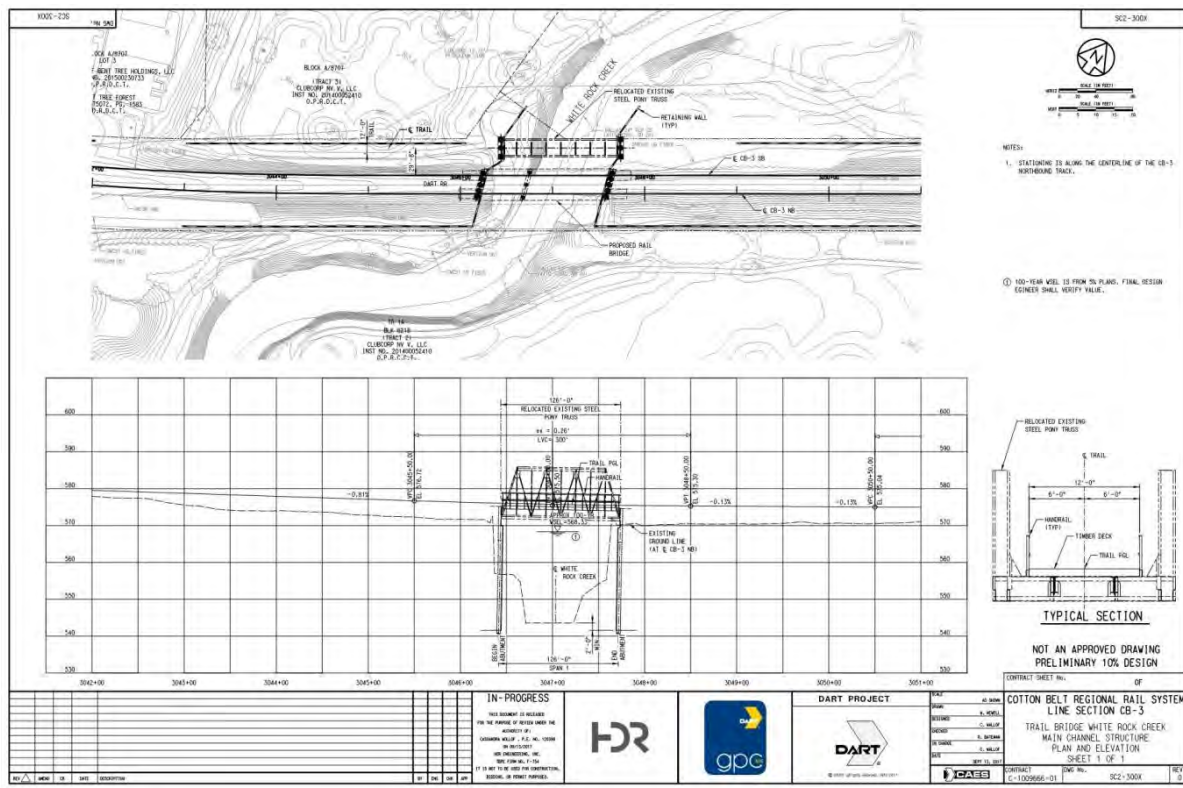
- Repair, rehabilitation or restoration of the White Rock Creek Railroad Bridge in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR 68).
- Preservation and maintenance operations in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Documentation (drawings, photographs, histories) of the White Rock Creek Railroad Bridge due to relocation.
- Production of interpretive educational displays or exhibits describing the history of the area, including architectural drawings and/or photographs.

An MOA will be implemented to establish measures to avoid, minimize, or mitigate any effects to the NRHP-eligible White Rock Creek Railroad Bridge with concurrence and consultation among DART, FTA, and SHPO. The Draft MOA, identifying steps to minimize harm to historic

resources, has been prepared to document these measures and is included in **Appendix I**. On February 26, 2018, the FTA invited ACHP to review information and participate in the MOA if desired. On March 5, 2018, the ACHP indicated they would not participate in the MOA.

The White Rock Creek Railroad Bridge spans White Rock Creek and a golf course cart path for the Clubs of Prestonwood. The bridge, which is currently part of the Cotton Belt Rail line, is proposed to be removed and relocated to an area approximately 30 feet northeast of its current location on the Project as shown in **Figure 4-22**, for use as an element of the future Cotton Belt Regional Trail within the DART-owned right-of-way. DART will fund the removal and placement of the bridge at the new location for use on the future Cotton Belt Regional Trail. The relocation and minor alterations of the White Rock Creek Railroad Bridge would not create an adverse effect on the historic integrity of the resource because the NRHP-eligible bridge would retain its design, setting, materials, workmanship, and feeling. The White Rock Creek Railroad Bridge would also retain its use as part of a transportation corridor.

Figure 4-22 White Rock Creek Bridge Relocation



The FTA has determined that Section 4(f) does not apply to this resource because the relocation of the bridge is a transportation enhancement that will result from mitigation as specified in 23 CFR 774.13(g). This exception states:

- (1) The use of the Section 4(f) property is solely for the purpose of preserving or enhancing an activity, feature, or attribute that qualifies the property for Section 4(f) protection; and
- (2) The official(s) with jurisdiction over the Section 4(f) resource agrees in writing to paragraph (g)(1) of this section.



On March 26, 2018, FTA consulted with the SHPO regarding the 4(f) exception. The SHPO, as the official with jurisdiction over the resource, concurred with FTA's determination to apply this exception. This consultation is documented in **Appendix G**.

4.22.2 Parks and Recreational Resources

Impact Assessment

The City of Richardson Spring Creek Trail is a 12-foot-wide multi-use hike and bike trail on the City's comprehensive transportation and open space parks plan that provides a significant route for transportation bike commuters to safely travel under US 75.

The northern leg of the Spring Creek Trail is a 1.28-mile-long, 12-foot wide hike and bike trail that was completed on October 14, 2011. This trail connects Alma Road to the Spring Creek Nature Center. It was funded from a variety of local and federal sources including Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) funds in 1997 that were later converted to American Recovery and Reinvestment Act of 2009 (ARRA) funds in 2009. The trail is not located on property that was purchased with federal funds nor is the property dedicated parkland. The trail was constructed with pre-existing easement agreements between the City of Richardson and private property owners.

Extending east from Alma Road, the route of the CityLine Alignment would intersect with the Spring Creek Trail at two locations. The Project would displace approximately 150 linear feet of the Spring Creek Trail near Alma Road and approximately 100 linear feet of trail approximately 1,500 feet east of Alma Road. As a result, another 1,500 feet of the trail would be severed by the project. The assessment of this resource is as follows:

- Land Acquisition – A permanent use due to land acquisition from the Spring Creek Trail will be required.
- Access – Entry to the trail will be restricted during construction and will require temporary use.
- Noise and Vibration – There is an existing quiet zone at Alma Road. No noise or vibration impacts are projected.
- Visual – The trail is located south of the existing freight line and south of elevated PGBT. The trail is within an urban area and the addition of regional rail service would not be expected to cause a significant impact to visual resources.

To avoid these crossings, DART proposes to realign the trail. DART prefers that all pedestrian crossings of the rail alignment occur at street intersections and at stations. DART would acquire new right-of-way, including the land occupied by the trail, for this portion of the Project.

Mitigation Measures

DART will rebuild the displaced portion of the trail within the new right-of-way, parallel to and south of the new tracks, reconnecting the trail connection at Alma Road to the untouched portion of the trail 1,500 feet to the east. This concept is shown in **Figure 4-23**. A new pedestrian structure over Spring Creek will be constructed to accommodate the relocated trail.

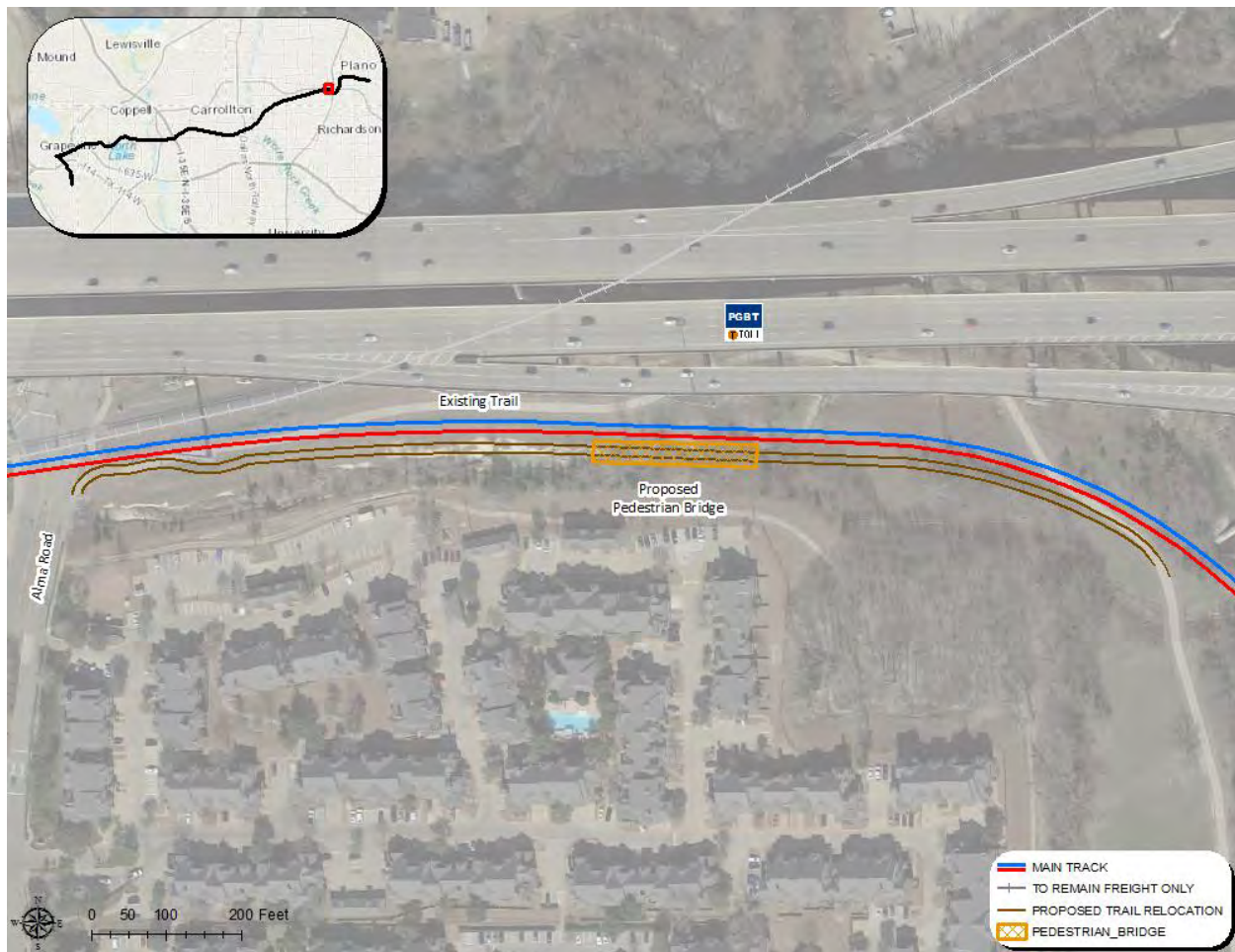
For publicly-owned parks and recreation facilities, *de minimis* impacts are defined as those that will not adversely affect the features, attributes or activities qualifying the property for protection under Section 4(f). The trail will be reconstructed with similar features and attributes to the existing trail and will not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f). FTA intends to make a *de minimis* impact determination following public review and input, and will seek the City of Richardson's approval on FTA's determination of a *de minimis* finding. In a letter dated December 4, 2017, the City of Richardson stated support for the Project and use of the Spring Creek Trail (see **Appendix G**).

Documentation of the planning, engineering and coordination activities is provided that demonstrates the use of the resource is justified, necessary and meets the *de minimis* impact requirements of Section 4(f) legislation. A *de minimis* determination requires public involvement. Circulation of this DEIS and public comment period meets that requirement. Additionally, the Spring Creek Trail realignment and Section 4(f) use was presented in a series of public meetings for the Project.

For compliance with Chapter 26 of the Texas Parks and Wildlife Code, there is no feasible and prudent alternative to the use, and the Project includes all reasonable planning to minimize harm to the park, resulting from the use. The City of Richardson, in coordination with DART, will advertise and hold a public hearing in compliance with Chapter 26.

Construction will be staged to maintain access to the Spring Creek Trail. This will be accomplished by first building the new portions of trail before severing the existing trail. However, in order to maintain safety for trail users during construction of the Cotton Belt Project adjacent to the relocated trail, DART and its contractor may need to intermittently close the Spring Creek Trail during the Cotton Belt Project construction activities. Coordination between DART, its contractor, and the City of Richardson will be required to develop detours and/or construction methods to limit or minimize temporary closures to Spring Creek Trail.

Figure 4-23 Spring Creek Trail Relocation





6(f) Properties

Two parks within the Study Area qualify as 6(f) properties, McInnish Park and Thomas Park, both in Carrollton have received funds from the LWCF. McInnish Park has received three LWCF grants since the 1970s for different portions of its complex, and Thomas Park received a grant for the Thomas Park Swimming Pool. The McInnish Park Sports Complex is adjacent to the Cotton Belt alignment; however, no property acquisition or conversion of park land would be required from the park for the Project. Thomas Park is approximately 540 feet north of the Cotton Belt alignment, and approximately 2,500 feet northeast of the proposed Downtown Carrollton Station.



5. Surface Transportation Impacts Evaluation

The Cotton Belt Project has the potential to have far reaching impacts on the transportation network. It is a corridor that parallels three primary east-west freeways (IH 635, PGBT, and SH 121), and creates a new east-west transit corridor that connects with existing and planned transit lines. Several major activities centers are located along the Project.

This chapter describes the anticipated transportation impacts of the No-Build and Build Alternative. The evaluation is based upon the anticipated travel demand, transportation capacity, transportation performance measures, and impacts to the road network, traffic parking, and freight delivery. The analysis was developed from 2040 travel demand forecasts for the Project using the NCTCOG's regional travel demand model. Where possible, quantitative and qualitative data are presented to show the relative performance measures and impacts of each alternative.

5.1 Transit Facilities and Services

Affected Environment

A network of buses and transit facilities currently serves the Study Area. Existing transit facilities and rail stations from west to east include the DFW Airport LRT Station, Downtown Carrollton LRT Station, Addison Transit Center, and CityLine/Bush LRT Station. The Addison Transit Center is one of the busiest facilities in the system with nine bus bays and 300 parking spaces. The DFW Airport LRT station provides a direct connection to Terminal A and connections to DFW Shuttles. The Downtown Carrollton Station has 251 parking spaces and four bus bays, while the CityLine/Bush Station has nearly 1,200 parking spaces and on-street bus interface.

Several bus routes serve the Project and this part of the DART Service Area. Addison Transit Center is served by 12 routes including two local routes, one express route, five feeder routes, three crosstown routes, and two rail feeder routes. Most of the bus and rail service consists of north-south and radial service with east-west services mostly limited to shorter local and feeder bus routes. There is no direct east-west route connecting this part of the DART Service Area to DFW Airport. Existing express bus service is primarily focused on north-south connections from Northwest Plano park-and-ride to Addison Transit Center and continuing to downtown Dallas via the DNT. There is one new east-west express route, Route 211, operating from Parker Road Station to northwest Plano to service the growing Legacy business area. Of the three cross town routes, two terminate at Addison Transit Center, with only route 400 (recently split into shorter routes 402 and 403) providing longer crosstown service from Downtown Garland to North Irving/Las Colinas. This route follows Belt Line Road for much of its route. Routes 361 and 362 provide east-west service from Arapaho Center Station to Addison Transit Center via Arapaho Road and Campbell Road, respectively.

The UTD Route 883 shuttle, known as the Comet Cruiser, operates from CityLine/Bush to UT Dallas and parts of north Dallas. This is currently the highest ridership route on the DART system.

Three existing LRT lines interface directly with the Project (Orange, Green and Red Lines) and provide radial service to downtown Dallas, with the Red and Green Lines extending further south into the southeast Dallas and West Oak Cliff areas. While the Blue Line also provides service, it does not directly interface with the Project. In addition to LRT, DCTA operates the A-Train from Denton to the Trinity Mills Station just north of downtown Carrollton. The TEXRail Project is under construction and scheduled to open the DFW Airport Station at Terminal B and the DFW North Station in late 2018.



Table 5-1 summarizes the headways and average ridership for key routes traversing or paralleling parts of the Project. As shown, the 400 series of crosstown routes have the highest ridership of key routes for the Project. The UTD route has over 7,000 riders per day. While ridership varies based on student population fluctuations it retains high ridership all year.

Light rail ridership on the four existing lines ranges from 23,000 to 27,200 on an average weekday. Ridership at existing rail stations along the Project range from 630 at Downtown Carrollton, to 1,000 at DFW Airport, to 1,500 at CityLine/Bush.

DART also has transit use incentive programs through its employer pass (E-pass) program. This program can be a valuable benefit to both employers and employees.

Table 5-1. Existing Bus Service Levels and Ridership

Route	Name/Description	Weekday Headway (minutes) (peak/off peak)	Average Weekday Ridership
350	Addison TC - Collin County College	30/60	690
361	Arapaho Center – Addison TC via Arapaho	30/60	410
362	Arapaho Center – Addison TC via Campbell	30/60	630
400*	Las Colinas Urban Center - Downtown Garland via Addison TC	30/60	2,010
463	Addison TC – Downtown Garland	30/60	1,610
488	LBJ/Skillman – Brookhaven College	30/60	2,080
534	Addison TC – Trinity Mills Station	20/60	1,180
536	Trinity Mills Station – Addison TC	30/--	220
841	Telecomm Corridor Flex Route	60/--	190
843	South Plano Flex Route	35/--	80
883	UT Dallas Comet Cruiser		7,090
	East	30/30	
	East Express	30/30	
	West (McCallum/Meandering)	20/20	
	West (McCallum/Frankford)	20/20	

Source: DART Service Planning; www.DART.org; September 2017 average daily ridership data

Note: *Route 400 was split into two shorter routes 402 and 402 on March 26, 2018.

In addition to bus and rail, DFW Airport operates the airport Skylink people mover system, which is accessible at all terminals on the secure side of operations. A network of DFW shuttles provides service between the terminals (Terminal Link), TRE CentrePort Station, and Remote South and North Parking lots on the non-secure side.

Operations and Ridership

As part of the March 2018 service changes, DART implemented operational improvements in this part of the Service Area, primarily improvements to mid-day and weekend service frequency and adjustments to the Route 400. Route 400, as one of the longest east-west crosstown routes, was split into two shorter routes given schedule reliability issues due to increasing traffic congestion. This congestion has affected bus run times, which requires adding more fleet (and costs) to meet schedules and maintain reliability. With these challenges, bus ridership has been experiencing a decline system-wide. Although other factors may contribute to ridership losses, rail ridership has continued to be steady or is growing. This is due to the ability to maintain a reliable schedule and provide more direct connections to key employment and activity centers.



Impact Evaluation

No-Build Alternative

DART recently implemented service improvements throughout the Service Area to improve headways and adjust routing which will enhance services in the Study Area. However, under the No-Build Alternative, there will continue to be a lack of direct east-west transit service to employment/activity centers in the Study Area. Furthermore, transit services will continue to operate on the roadway system and be subject to increasing traffic congestion and incident delays.

Build Alternative

The Build Alternative would add a new east-west high capacity, fixed guideway rail service to the DART system. The Project would create new connections to existing and planned services and facilities in the north part of the Service Area, adding east-west capacity and improving access to employment and activity centers and residential areas. Service levels, ridership, reliability and geographic coverage would be improved. The Project would provide a new option for mobility within the DART Service Area and accessible from around the region.

Transit System Levels of Service

Table 5-2 summarizes transit system performance measures comparing the No-Build and Build Alternatives. Overall, the Project will have a positive impact on system performance. Local bus trips would increase due to additional riders using this mode to access the rail stations. Express bus and light rail ridership changes less than 1 percent. This is largely because there are no competing express bus or light rail modes. Regional rail trips increase by 16,000 or 42 percent with the additional riders now using the Project as part of their total trip. The total regional transit system, including DART, FWTa, and DCTA would see an overall 2.6 percent increase in linked trips, or an additional 7,400 riders. Linked trips include all segments and modes of travel to complete one trip.

The Build Alternative would increase total transit system passenger miles by 2.5 percent, and total passenger hours by 1.6 percent. This indicates that the project has the effect of allowing transit passengers to travel longer distances but with travel time savings over the No-Build Alternative.

Table 5-2. 2040 Transit System Performance Measures

Daily Performance Measure	No-Build	Build Alternative	Change
Number of Unlinked Transit Trips			
DART Local Bus	171,000	173,800	+2,800 / 1.6%
DART Express Bus	33,600	33,400	-200 / 0.6%
DART Light Rail	135,500	134,700	-800 / 0.6%
Regional Rail	38,300	54,200	+16,000 / 42%
Total	378,400	396,100	
Number of Regional System Linked Transit Trips	279,900	287,300	+7,400 / 2.6%
Added Riders			
Passenger Miles	2,735,300	2,804,512	+692,212 / 2.5%
Passenger Hours	130,871	133,021	+2,150 / 1.6 %

Source: DART 2040 Base and CB Alt7 Model Runs and Performance Reports; December 2017.



Geographic Coverage

The Project would improve the geographic coverage of transit in the northern part of the DART Service Area, providing a benefit to transit users system wide given the range of connections available from bus, light rail and other regional rail systems. This new regional rail service would expand the reach of transit to 11 new rail stations using an enhanced feeder bus network to better link residents with transit and associated employment/activity centers.

Figure 5-1 identifies the major employment/activity centers along the corridor, as well as the major transfer locations from the existing and programmed transit network. Using the NCTCOG regional travel demand model, origin and destination data were analyzed to determine the travel patterns and passenger demand for riders using the Project. Productions (origins) are spread throughout the DART Service Area, with some also coming from outside of the DART Service Area. Approximately 80 percent of productions and attractions that would use the Project start or end outside of the 0.5-mile Study Area, supporting the importance of this Project in enhancing access and mobility system-wide. Examples of these travel patterns from major transfer locations include:

- Riders using DFW North Station primarily originate to the west and transfer from TEXRail, with attractions concentrated around the activity centers identified in **Figure 5-1**.
- Riders using Downtown Carrollton originate from along the Project alignment, and also from areas along the DART Green Line corridor to the south and DCTA to the north. Attractions are concentrated at the Project's activity centers as well as the high employment area along the Green Line south of Carrollton such as the Medical District and Dallas Love Field Airport in northwest Dallas.
- Addison origins come from a large area, mostly in the northern part of the DART Service Area. Attractions for riders using the Addison Station are at activity centers along the Project corridor, and north and south along the DNT to growing employment centers such as the Plano Legacy Business area via a transfer to bus from the Addison Station.
- At CityLine/Bush, trips originate from areas to the east and north, and also from the south along the existing DART Red Line corridor. Attractions for riders using this station are focused at the Project's activity centers and also to areas south along the Red Line and the Green Line.

These observations demonstrate the strong interactions between the Project and the existing and future rail and bus transit network. They also illustrate the extent of geographic coverage that would occur with the enhanced mobility and access provided by the Project.

Travel Time

One of the primary purposes of the Project is to provide connections to improve mobility, accessibility and linkages to employment and activity centers in this part of the DART Service Area. The Project would accomplish this through improved travel times, convenient and reliable connections, and direct access to key locations. The Project would use an exclusive guideway that would not be subject to incidents or accidents on the roadway system, providing a reliable service schedule. While every station will have bus transfer opportunities, four major transfer locations to the larger transit network would be provided. During off-peak times, the Project travel time may take longer than auto travel given station stops and dwell times. However, roadway travel during these times is still subject to potential incidents and the local traffic signal systems.

Table 5-3 summarizes anticipated station to station travel times. Overall, end to end travel time is 60 minutes, compared to auto travel time which can take from 35 minutes to more than one hour during peak times and depending on traffic congestion. There is no current direct route to DFW Airport to CityLine, which is a growing business and residential area.

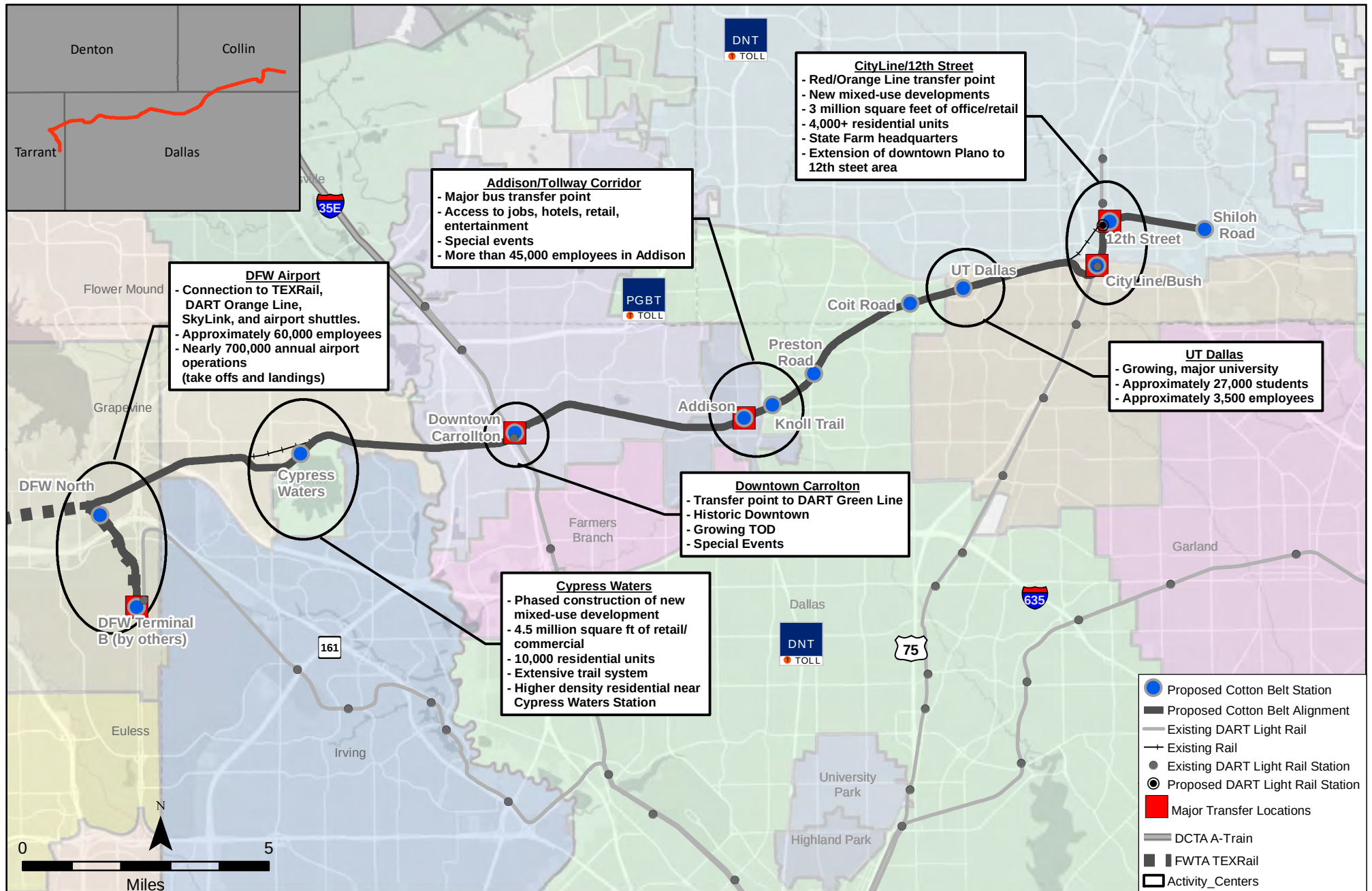




Table 5-3. Anticipated Station to Station Travel Times (minutes)

Station	Eastbound Direction	Westbound Direction
DFW Terminal B	-	60
DFW North	7	53
Cypress Waters	17	42
Downtown Carrollton	24	35
Addison	32	26
Knoll Trail	35	24
Preston Road	37	21
Coit Road	41	17
UTD	44	14
CityLine/Bush	50	8
12th Street	54	4
Shiloh Road	59	-

Source: GPC6, 2017

Note: Times are estimated and include station dwell times. Dwell time is the time the train is stopped at each station.

Using existing LRT through downtown Dallas to get from the CityLine area to DFW Airport takes 1 hour and 45 minutes. A combination of bus/rail across the northern part of the DART Service Area for this same trip would require four bus routes and one rail transfer at more than three hours. Transit travel time from major LRT transfer locations will also be improved. For example, from Downtown Carrollton Station (projected to have the highest rail to rail transfers to the Cotton Belt) to Addison Transit Center would be eight minutes, compared to 20 minutes on Route 400 today. Travel from Downtown Carrollton LRT to UT Dallas would take more than one hour today using Routes 400 and 362, compared to 20 minutes using the Project. The CityLine/Bush Station, where there is a growing residential population, to Addison, a major employment center, would be 18 minutes compared to nearly 30 minutes from Arapaho Station using Route 362.

Reliability and Comfort

The No-Build Alternative would continue to have people rely on the roadway network and bus routes subject to local traffic congestion. Given increasing congestion levels in the area, buses would continue to be subject to less reliable schedules and increased travel times. Because the Build Alternative would operate on exclusive guideway and not be subject to congestion, it would offer a reliable travel mode for residents, employees and visitors.

The Build Alternative would also offer a comfortable transit experience by using new regional rail vehicles equipped with passenger amenities such as Wi-Fi, air conditioning, heat and comfortable seating. The new track infrastructure would offer an even ride experience compared to roadway travel, and vehicles are design for smooth acceleration and deceleration at stations. All facilities and vehicles would be designed for easy access by mobility-impaired individuals.

Corridor and Station Ridership

System level ridership impacts and benefits are highlighted in **Table 5-2**. This section assesses corridor and station level ridership in more detail. Ridership is directly related to Project goals, including improving mobility and accessibility and increasing transit usage, which can in turn reduce VMT and congestion delay (see **Section 4.13**). A summary of the station characteristics, including platform types, access characteristics and available parking, is provided in **Table 2-1** in **Chapter 2**. The DFW Airport Terminal B Station is currently under construction as part of the



TEXRail Project but ridership for this station associated with the Project is reported in this section. **Table 5-4** summarizes the Project and station ridership including projected mode of access percentages. As shown, daily Project ridership is forecasted to be 12,010. Based on the regional travel demand model, 7,400 transit trips are new riders that would be switching from another mode, mostly like automobile (see **Table 5-2**). In addition to new riders, some riders are current transit users that now complete their trip using the Project due to improved access and connectivity.

In addition to the proposed Cotton Belt stations, the Project also includes an infill station on the DART Red Line at 12th Street to interface with the Cotton Belt Project. Projected ridership at this infill station is 4,426 daily riders.

Table 5-4. Year 2040 Ridership and Station Mode of Access

Station	Daily Riders	Mode of Access Percent (%)			
		Rail Transfer	Bus Transfer	Drive	Walk
DFW Airport	1,170	49	26	0	25
DFW North	1,320	57	10	27	6
Cypress Waters	910	0	17	36	47
Downtown Carrollton	1,970	60	18	7	15
Addison	1,690	0	46	5	49
Knoll Trail	530	0	9	0	91
Preston Road	400	0	29	0	71
Coit Road	760	0	16	22	62
UT Dallas	850	0	63	5	32
CityLine/Bush	1,380	70	8	11	11
12th Street	370	46	8	32	14
Shiloh	660	0	13	47	40
Total Corridor	12,010	31	23	14	12

Source: DART CB Alt7 Model Run

As shown in **Table 5-4**, rail transfers account for the highest mode of access percentage at 31 percent, demonstrating the importance of the intermodal rail connectivity this project provides. At DFW Airport, most alightings from the Cotton Belt walk, but many also transfer to the Skylink system and the Orange Line. At DFW North, most station activity is associated with the transfers from TEXRail to Cotton Belt where passengers continue east into the DART Service Area, indicating a strong travel pattern between Fort Worth and the north part of the DART Service Area.

Substantial rail-to-rail transfers occur at the Downtown Carrollton and CityLine/Bush stations, and to a lesser degree at the 12th Street Station. The Downtown Carrollton Station shows the highest overall station ridership, due mostly to transfers to and from the DART Green Line. Transfers from LRT represent nearly 19 percent of all boardings and 21 percent of all alightings for the Project. Given high transfer activity, station circulation and pedestrian walkways are being designed to accommodate expected loads to provide safe and efficient transfers.

Bus access is also strong, especially at the Addison and UT Dallas stations. As a major destination and employment area, more than 80 percent of ridership to Addison are alightings that walk or transfer to bus to reach their destination. At UT Dallas, 60 percent of station activity is associated with the bus network.

Drive and walk access are the lowest modes of access to the Project. Drive access is only available at stations with parking and is highest at stations at either end of the Project (DFW North and Cypress Waters on the west, and 12th Street and Shiloh Stations on the east). Coit



Road also has strong drive access given its accessibility from one of the highest volume arterials in this area.

Walking is highest at the Preston Road and Knoll Trail stations as those are platform only stations serving the immediate area. The Cypress Waters, Addison, Coit Road stations also forecast high walking access due to the mixed-use nature and proximity to multi-family residential areas.

The stations at Knoll Trail, Preston and 12th Street have the lowest ridership along the Project. There is also community concern regarding the Preston Road Station (see **Section 5.4**). Elimination or deferral of the Preston Road Station would result in the loss of the walking access ridership, but other riders could be redistributed to nearby stations.

Special Events

In addition to average daily ridership forecast, the Project also includes multiple special events that will draw riders and provide an alternative to automobile travel. This includes events such as Addison Kaboom Town, Richardson Wildflower Festival and Carrollton Festival at the Switchyard. DART would coordinate with corridor cities to plan for service and crowd control for these and other major events. Prior special event surveys by DART have shown transit mode share of up to 20 percent when there is direct and convenient access by rail.

Stations

The Project will not modify any existing DART stations, but will construct or expand facilities adjacent to them, including new connections to facilitate access and transfers between modes. Details of the platforms, including enhanced pedestrian connections, are shown in the 10 percent preliminary engineering drawings contained in **Appendix A**. Where the side platforms are adjacent to the bus loading areas, the site pavement/sidewalks would match the platform elevation creating a unified transit plaza space and reducing the need for steps and railings. This would facilitate a seamless transition between modes for the most vulnerable transit riders in wheelchairs or those visually impaired.

Five stations will have enhanced features to address access from other modes. In downtown Carrollton, the Project would include additional park-and-ride lots to the north of the tracks, and would add specific pedestrian improvements to facilitate movements between platforms and to new facilities (refer to **Section 4.8**). In Addison, the Project would construct the platform adjacent to the Addison Transit Center. Increases in bus service may be needed in the future, and a recent analysis by DART shows the need to increase bus bays at this location. DART would continue to monitor bus service and plan for facilities improvements at the appropriate time. A parallel platform would be constructed next to the existing CityLine/Bush Station to provide a cross platform transfer opportunity. At the 12th Street Station, there would be specific pedestrian connections designed to connect the elevated, infill 12th Street LRT station and the at-grade Cotton Belt platform.

Pedestrian access to the Shiloh Station is a critical component of the site plan, as passengers would be diverted around the substation to reach station platforms. A pedestrian access easement would be provided between the substation and the platform on the west side. There would also be a crew room at this station located at the northeast end of the tracks.

Mitigation Measures

In general, no mitigation is required relative to transit service and facilities. Rather, the Project provides an overall benefit and the design would be developed to accommodate increases in passenger activity and bus services based on specific conditions at each station. Bus route



modifications will be defined through a Feeder Bus Plan to be developed as the Project advances (see **Section 2.4.6**).

5.2 Highway and Roadway

Affected Environment

Parallel Roadways

The Project generally extends across the northern portion of the DART Service Area from DFW Airport to Plano. According to the NCTCOG Mobility 2040 MTP, the area north of LBJ Freeway in this part of the DART Service Area will continue to experience severe congestion based on increased travel time on area roadways. As described in **Chapter 1**, the region's population is expected to increase by approximately four million persons, to nearly 11 million, by 2040. Combined, Dallas, Collin and Tarrant counties (through which the Project travels) will account for 75 percent of this population. These counties will also account for 85 percent of the region's nearly seven million jobs by 2040.

Two primary east-west freeways (IH 635 and PGBT) in this part of the region extend through the northern portion of the DART Service Area. The Cotton Belt Project is situated midway between these two east-west freeways. Additionally, Belt Line Road parallels the Project for about 11 miles. IH 635 is the seventh most congested highway in the State of Texas.³ The highway was recently reconstructed, and the improvements included two travel lanes and six managed/tolled lanes that replaced the two existing HOV lanes. PGBT is a six-lane tollway way that carried 84,590 vehicles per day in 2017 and is projected to carry over 90,000 vehicles per day by 2040 in the Study Area. Belt Line Road is a six-lane regional arterial running east-west through the Study Area. In 2017, traffic was over 38,000 vehicles per day (vpd) and is projected to increase to over 45,000 vpd by 2040.

The roadway network within the Study Area currently has moderate to severe traffic congestion. **Table 1-3** indicates that VMT per day, VHT per day, and vehicle hours of congestion delay per day are all projected to increase by 2040 within the 0.5-mile Study Area. Hours of congestion delay are forecasted to increase by approximately twice the rate of VMT and VHT. In addition, **Table 1-4** shows that by 2040, 23 percent of Study Area roadways will be operating at LOS D or E, with 41 percent operating at LOS F.

Crossing Roadways

The existing Cotton Belt railroad corridor traverses the area in a generally at-grade configuration. The Project includes deviations from this corridor in four locations: DFW Airport Terminal B Connection, Cypress Waters Alignment, Downtown Carrollton reconfiguration, and the CityLine/Bush Alignment. Excluding the DFW Airport Terminal B Connection, which is discussed separately, the Project introduces a regional rail line that crosses 63 existing and future roadways (see **Figures 5-2** through **5-5**). The roadways range in size from single-lane dirt roads to six-lane major arterials. Of these there are 10 existing roadway grade separations. Since all major freeways crossing the alignment would be grade separated, two additional roadway grade separations (PGBT and US 75) along the CityLine Alignment are assumed. The freeway grade separations include SH 121, IH 635, PGBT (twice), IH 35E/Frontage, DNT, and US 75. Additional existing grade separations are at Preston Road, Synergy Park Boulevard, Renner Road, and two private driveways. Average daily traffic volumes on three of the busiest arterials (Midway Road, Coit Road and Plano Parkway) range from 44,000 to nearly 60,000 vpd.

³ <http://www.txdot.gov/inside-txdot/projects/100-congested-roadways.html>

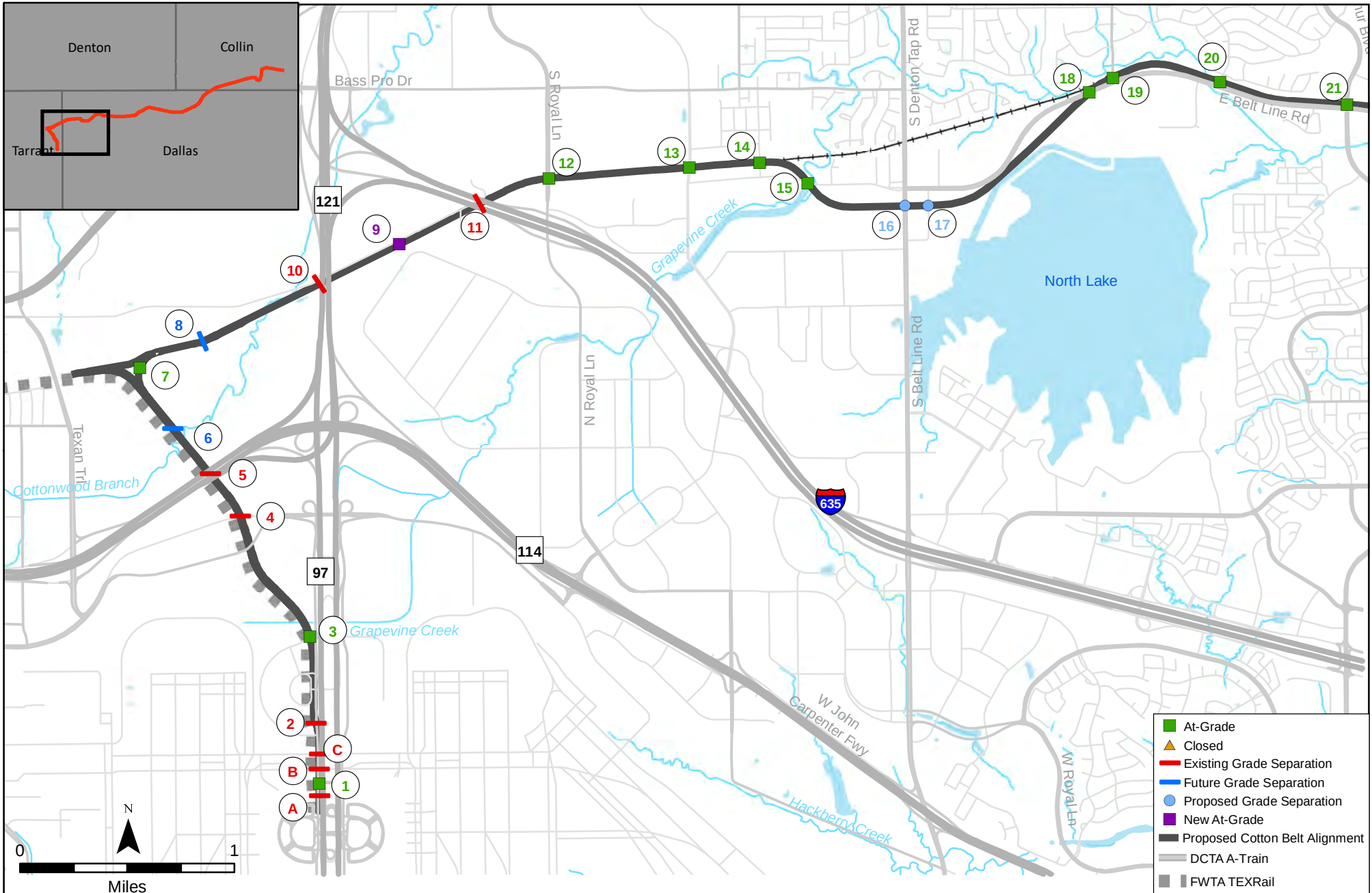


Figure 5-2
Roadway and Other Crossings of the Cotton Belt
 Data Source: GPC6, 2017

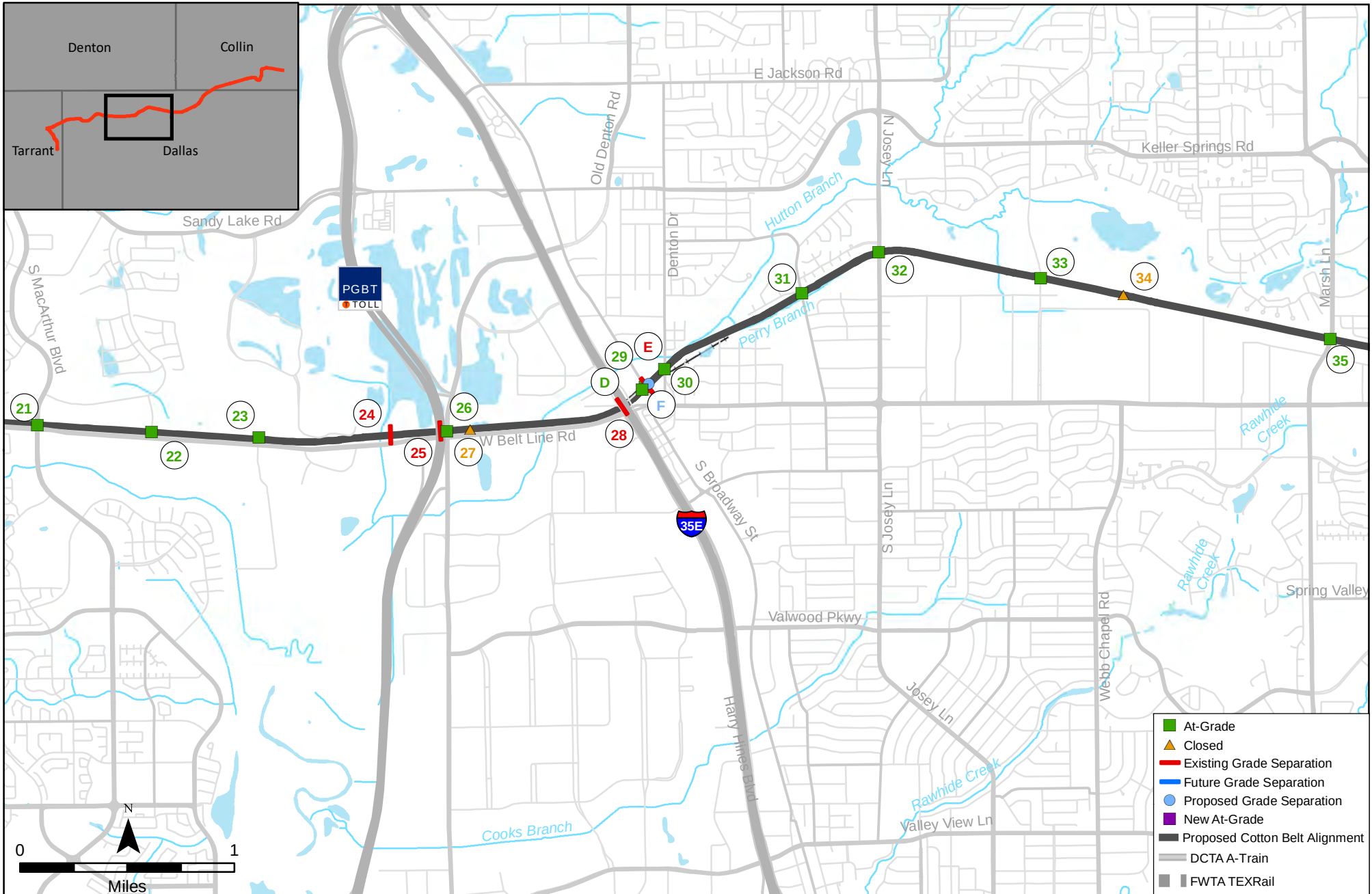


Figure 5-3
Roadway and Other Crossings of the Cotton Belt
 Data Source: GPC6, 2017

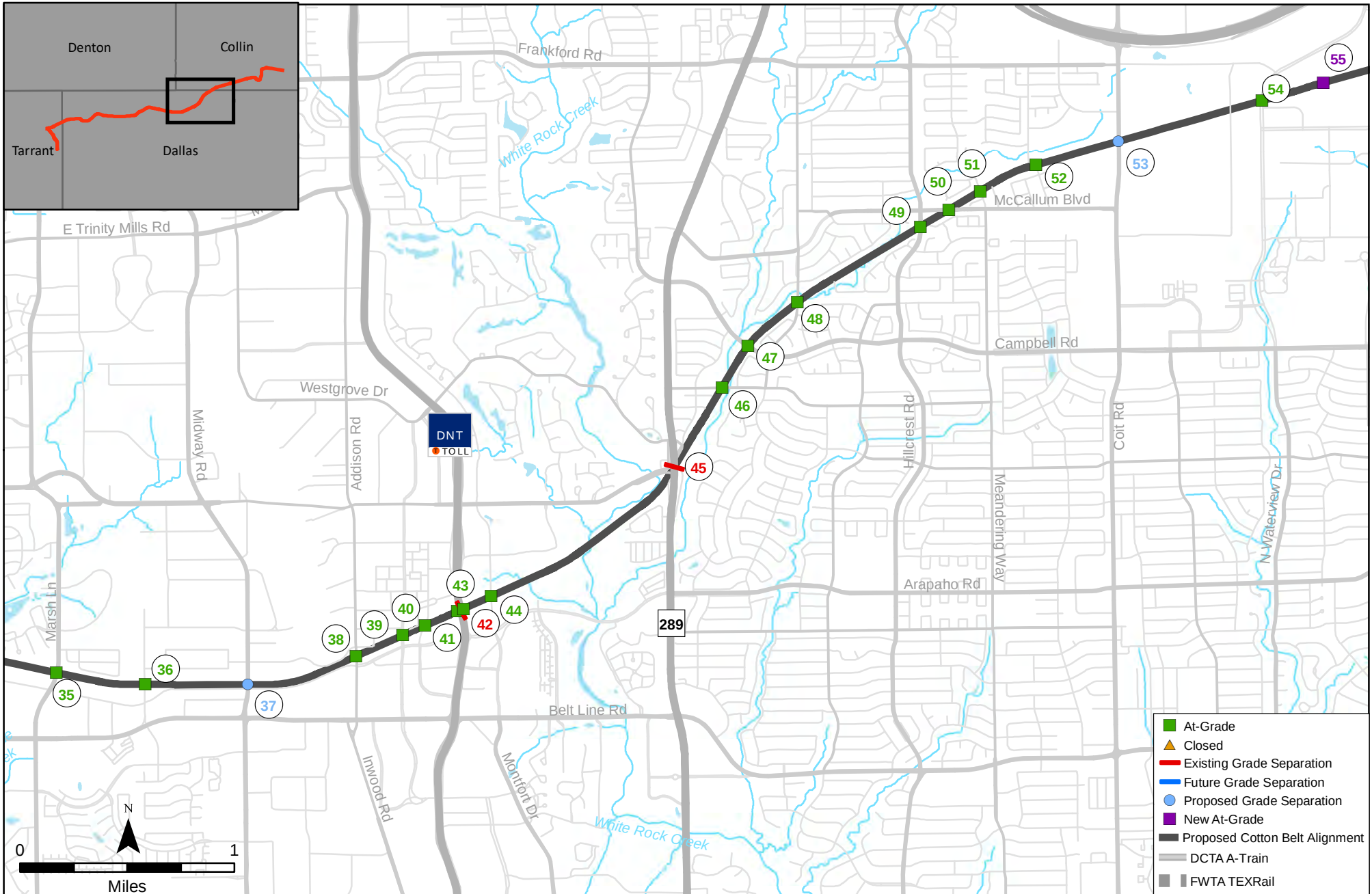


Figure 5-4
Roadway and Other Crossings of the Cotton Belt
 Data Source: GPC6, 2017

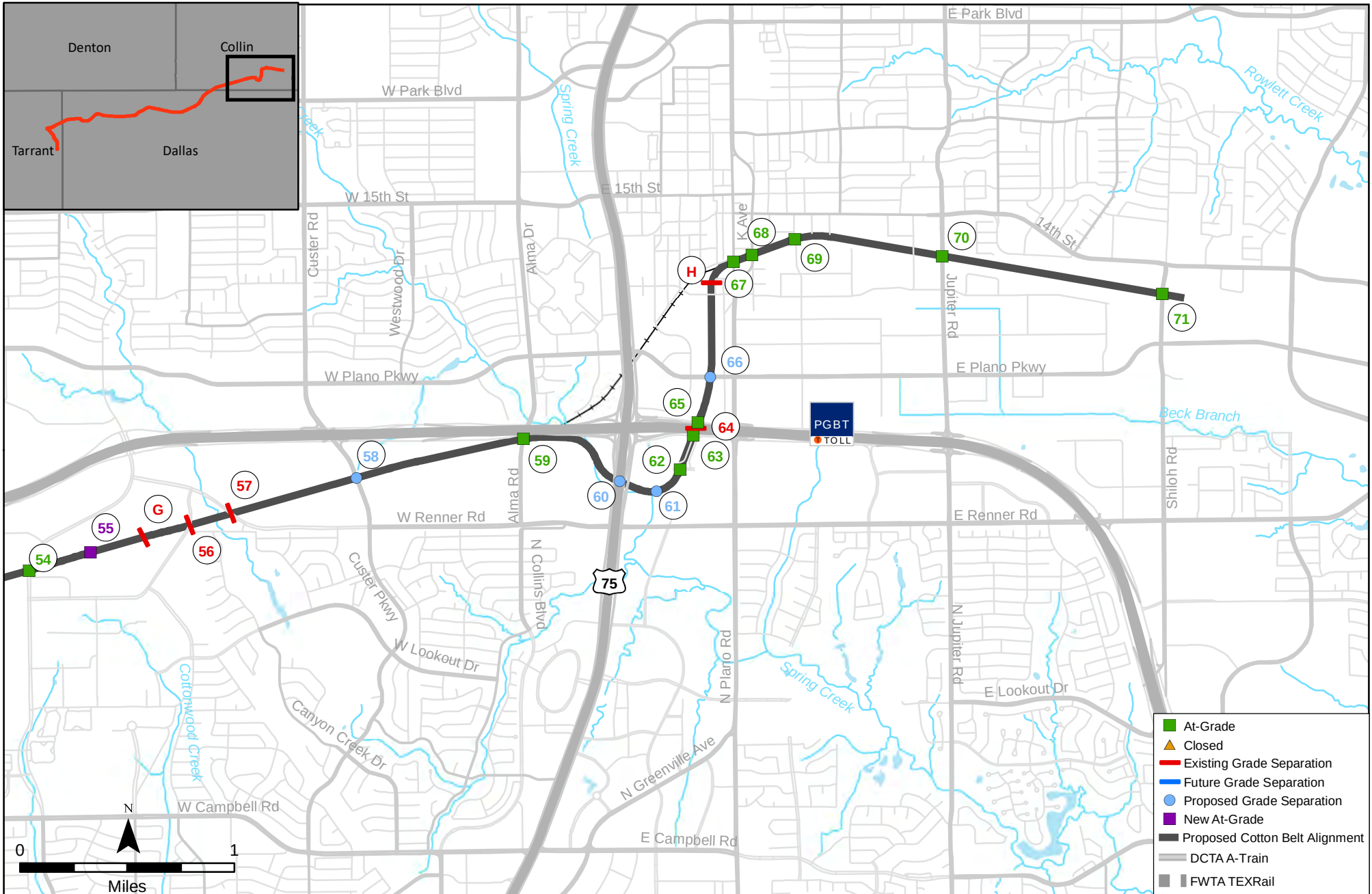


Figure 5-5
Roadway and Other Crossings of the Cotton Belt

Data Source: GPC6, 2017

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement





DFW Airport Connection

On DFW Airport property, the Project turns south from the railroad right-of-way to join the TEXRail alignment in a new right-of-way. Before merging with the TEXRail alignment, the new rail alignment would cross an existing access road to a Chesapeake natural gas facility. Along the DFW Airport Terminal B Connector, the Project would match the configuration of the TEXRail Project within the existing TEXRail right-of-way. The alignment crosses over SH 121/SH 114 and extends southeast to parallel International Parkway before terminating at the DFW Airport-Terminal B Station. The alignment through DFW Airport has been closely coordinated with DFW Airport and FUTA to accommodate both rail projects. The TEXRail Project has been environmentally cleared and is currently under construction. Grade separations include SH 121/SH 114, North Airfield Drive and the southbound International Parkway Service Road. The Cotton Belt and TEXRail rail lines are also grade separated from Taxiways X and Z and the Skylink People Mover. The Cotton Belt and TEXRail rail lines will cross two roadways at-grade: North Employee Road and Service Road Crossunder No. 2.

DFW Airport, in cooperation with DART, is also planning new roadways to accommodate growth and development of the area around the DFW North Station. At DFW Airport Fire Station 6 (711 Regent Boulevard) along the existing railroad right-of-way, DART would construct a new at-grade crossing to allow fire access to the north side of the right-of-way. Two future aerial roadway crossings of the Cotton Belt rail line are also being planned. One would cross the existing railroad right-of-way east of the DFW North Station to connect to future airport developments north of the Cotton Belt rail line. The second is Dallas Road which would cross the new right-of-way south of the DFW North Station. This would facilitate east-west circulation.

EMF Site Option 2 (Irving Yard) Connection

Should the EMF Option 2 (Irving Yard) be selected, non-revenue trains would operate between the EMF and the Cotton Belt along the existing TRE corridor east to the Madill Subdivision then north along the Madill Subdivision to the Cotton Belt. These train movements would occur once in the morning prior to the a.m. peak and once in the evening after the p.m. peak. One operating plan is being developed for these train movements and will be included in the FEIS. This route would cross 26 streets at grade. Because of the low number of train cars (7) and the off-peak operations, these movements are not anticipated to have a traffic impact.

Impact Evaluation

No-Build Alternative

The No-Build Alternative would limit options for east west movements to the existing street network and transit services. As a result, there would be no reduction in VMT and hours of congestion delay. However, potential street crossing and station area impacts would not exist.

Build Alternative

Regional Impacts

The Project is anticipated to have beneficial impacts to the regional transportation system by helping to reduce VMT and hours of congestion delay. As indicated in **Section 4.13**, DART conducted a comparison of VMT and hours of congestion delay in 2040 with and without the Project. Forecast VMT with the Project in operation results in a reduction of nearly 80,000 daily (nearly 24,000,000 annual) VMT in the DART Service Area. In terms of hours of congestion delay within the DART Service Area, the Project will save nearly 3,800 daily hours of congestion; or 1,123,000 hours of congestion delay per year. For freeways alone, the VMT is reduced approximately 26,000 daily miles and the project will save nearly 1,100 daily hours of congestion, or 330,000 hours of congestion delay per year.



Local Impacts

The Project, with its associated park-and-ride lots and feeder bus network, would provide incentive for commuters to use transit and therefore decrease automobile travel on area roadways. However, roadways in localized areas may experience potential traffic impacts. This is because of short delays at gated intersections and vehicles entering and exiting the stations. The gates would create brief interruptions to the flow of traffic to allow for the safe crossing of rail vehicles. In addition, the construction of park-and-ride lots, regional rail stations, and the traffic they would attract, could have limited impact on traffic operations near those stations. Roadway and intersection impacts are discussed in greater detail below. Station area impacts are discussed in **Section 5.4**.

Roadway and Intersection Impacts

As detailed in the *Street At-Grade Crossing Traffic Analysis Report* in **Appendix B**, an extensive study of the roadway crossings for the Cotton Belt Project was conducted. This study analyzed future traffic conditions at 46 major roadway crossings, determined traffic impacts due to the Cotton Belt Project, and established whether any of these at-grade rail crossings might warrant a grade separation based on year 2040 conditions. All major freeways, which are assumed to be grade separated, and existing grade separations were excluded from this analysis. Other roadways were not included in the traffic analysis and are discussed in the summary section below. **Table 5-5** shows the existing and projected ADT for the at-grade crossings that were studied for the Project.

As detailed in the *Street At-Grade Crossing Traffic Analysis Report*, an initial screening identified 25 crossings requiring additional analysis. Thirteen of these met Institute of Transportation Engineers' (ITE) thresholds for consideration of mitigation. An additional 12 were based on proximity of nearby intersections to rail crossing or community concerns. The goal of the traffic study was to evaluate the existing at-grade rail crossings and nearby roadway intersections to determine the effects that the Project would have on the operation of these roadways and intersections in the study year of 2040. The analyses were performed in accordance with the procedures outlined in the Highway Capacity Manual Year 2000 Edition (HCM 2000), published by the Transportation Research Board, Washington, D.C., as implemented by SYNCHRO software package, Version 9.0. The results of these analyses provided projected LOS and queue values on crossing or nearby roadways.

If the presence of DART's rail line causes the LOS on streets adjacent to the rail line to drop two or more levels or causes the street to have a LOS of "F", a LOS impact may exist. If the presence of DART's rail line causes vehicular traffic on streets adjacent to the rail line to queue through adjoining intersections or queue through the rail intersection, a queuing impact may exist.

The results of the roadway grade crossing analysis indicated that 10 crossings would experience queuing or LOS impact and will require mitigation. The Project would only have minimal impact on traffic operations at 36 of the 46 crossings. Most of the at-grade crossings would continue to operate at acceptable LOS with projected queuing not affecting adjacent signalized intersections.

Although the traffic analysis did not identify it as an impact, both the City of Dallas and the neighboring community have expressed concerns over traffic on Hillcrest Road crossing the rail line. Concerns focus on both traffic volumes and queuing impacts to adjacent streets. To alleviate these concerns and to account for a potential of higher than anticipated growth, DART is recommending mitigation at Hillcrest Road.



Table 5-5. Average Daily Traffic At-Grade Crossings

Location	Name	ADT Year	Existing ADT	Growth Rate	2040 ADT Estimate
Coppell	Royal Lane	2014	15,009	2%	25,116
Coppell	Freeport Parkway	2017	16,788	2%	26,473
Coppell	Coppell Road	2014	1,379	2%	2,308
Coppell	Southwestern Boulevard	2014	4,265	2%	7,137
Coppell	South Belt Line Road	2014	37,290	0%	37,290
Dallas	East Belt Line Road	2017	16,499	1%	20,742
Coppell	Moore Road	2014	5,631	1%	7,294
Coppell	Mockingbird Lane	2014	3,068	2%	5,134
Coppell	MacArthur Boulevard	2014	20,031	0.7%	24,014
Coppell	Fairway Drive	2010	4,323	2%	7,831
Coppell	Private Driveway/Ledbetter Road	2010	1,049	2%	1,900
Carrollton	Luna Road	2014	16,385	1%	21,223
Carrollton	North Broadway Street	2014	4,741	2%	7,934
Carrollton	North Denton Drive	2016	4,692	2%	7,547
Carrollton	Perry Road	2014	3,158	2%	5,285
Carrollton	North Josey Lane	2015	31,648	0%	31,648
Carrollton	Kelly Boulevard	2014	11,535	0%	11,535
Carrollton	Private Driveway (Maridoe Golf Club)	2010	159	2%	288
Addison	North Marsh Lane	2014	32,244	0.5%	36,708
Addison	Surveyor Boulevard	2014	3,365	2%	5,631
Addison	Midway Road	2016	39,168	0.5%	44,149
Addison	Addison Road	2014	19,210	0.5%	21,870
Addison	Quorum Drive	2014	6,975	2%	11,672
Addison	Spectrum Drive	2010	2,444	2%	4,427
Addison	DNT SB Frontage Road	2017	13,536	0.5%	15,181
Dallas	DNT NB Frontage Road	2017	12,328	0.5%	13,826
Dallas	Knoll Trail Drive	2014	8,063	2%	13,493
Dallas	Davenport Road (South)	2017	4,634	0%	4,634
Dallas	Campbell Road	2017	18,013	2%	28,405
Dallas	Davenport Road	2017	3,401	2%	5,363
Dallas	Hillcrest Road	2017	17,494	0.5%	19,620
Dallas	McCallum Boulevard	2014	5,343	2%	8,941
Dallas	Meandering Way	2014	2,652	2%	4,438
Dallas	Dickerson Street	2014	1,094	2%	1,831
Dallas	Coit Road	2016	46,291	1%	58,777
Richardson	Waterview Parkway	2016	26,101	1%	33,141
Richardson	Custer Parkway	2017	19,950	2%	31,459
Richardson	Alma Road	2015	10,100	2%	16,570
Plano	PGBT EB Frontage Road	2013	2,232	0.5%	2,554
Plano	PGBT WB Frontage Road	2017	6,680	1%	8,398
Plano	Plano Parkway	2010	30,851	2%	55,882
Plano	K Avenue	2017	12,318	1%	15,486
Plano	Municipal Avenue	2017	11,166	2%	17,608
Plano	N Avenue	2014	1,572	2%	2,631
Plano	Jupiter Road	2016	25,850	1%	32,823
Plano	Shiloh Road	2016	10,874	2%	17,490

Source: GPC6, 2017



Table 5-6 shows the results of the traffic analysis of the 25 crossings that were advanced for additional analysis.

Table 5-6. Recommended Mitigations At-Grade Crossings

Roadway at Crossing	Location	LOS Impact	Queue Impact	Mitigation Recommended
Freeport Parkway	Coppell	No	No	No
South Belt Line Road	Coppell	Yes	Yes	Yes
East Belt Line Road	Coppell	No	No	No
MacArthur Boulevard	Coppell	Yes	Yes	Yes
Luna Road	Carrollton	Yes	Yes	Yes
Josey Lane	Carrollton	No	No	No
Marsh Lane	Carrollton	Yes	Yes	Yes
Midway Road	Addison	No	Yes	Yes
Addison Road	Addison	Yes	Yes	Yes
DNT SB FR	Addison	No	No	No
DNT NB FR	Addison	No	No	No
Davenport Road South	Dallas	No	No	No
Campbell Road	Dallas	No	No	No
Davenport Road	Dallas	No	No	No
Hillcrest Road	Dallas	No	No	Yes
Coit Road	Dallas	No	Yes	Yes
Waterview Parkway	Richardson	No	No	No
Custer Parkway	Richardson	Yes	Yes	Yes
Alma Road	Richardson	Yes	Yes	Yes
PGBT EB FR	Richardson	No	No	No
PGBT WB FR	Plano	No	No	No
Plano Parkway	Plano	Yes	Yes	Yes
K Avenue	Plano	No	No	No
Municipal Avenue	Plano	No	No	No
Jupiter Road	Plano	No	No	No

Source: GPC6, 2017

DFW Airport Terminal B Connection Impacts

There are only three at-grade crossings of the DFW Airport Terminal B Connection. The Chesapeake Access Road is a minor, low volume access road. It is anticipated that Crossunder No. 2 would have minimal impact on traffic operations. The intersection of North Employee Road and the southbound International Service Road is anticipated to experience minimal queuing and LOS impacts with the addition of the Cotton Belt operations.

Roadway Closures Impacts

Locating the EMF Site Option 1 (Luna Road) in Carrollton would require closure of an unnamed access road. This road connects Belt Line Road to a small utility facility north of the tracks. Currently this unpaved road crosses under existing railroad structure to provide access to the site. If the EMF Site Option 1 (Luna Road) is selected, this structure would be replaced with a culvert as part of the EMF design. Otherwise, it will remain grade separated.

Relocating Mercer Yard requires the closure of a private driveway to Maridoe Golf Club. The property on which this driveway is located was sold by the private club to DART in 2012 as right-of-way preservation. The club continues to use the driveway through DART property with



the understanding that it will be closed when DART develops the property. Alternative access to the site exists.

The proposed Coit Road grade separation would eliminate the current driveway to a small Dallas Water Utilities facility located northeast of the Cotton Belt intersection with Coit Road.

Mitigation Measures

Roadway and Intersection Mitigation

The Project would operate within exclusive right-of-way and the moving train would always take precedence over automobile traffic at grade crossings through the use of priority signals and warning devices. All grade crossings would have active warning devices, train signals, and gates that are activated by approaching trains.

Signal systems at grade crossings within the Cotton Belt right-of-way would include all signs, signals, and warning devices. The function of these systems would permit safe and efficient operation of the train, on track equipment, highway traffic, and pedestrians over level grade crossings. Grade crossing warning devices would be designed in conformance with the Texas Manual on Uniform Traffic Control Devices (TMUTCD), TxDOT, and the recommended American Railway Engineering and Maintenance-of-Way Association (AREMA) practices.

As a result of the grade crossing analysis, several modifications to existing conditions are proposed for the Cotton Belt Project. As described in DART's *Environmental Impact Assessment and Mitigation Guidelines for Transit Projects*, there are several techniques that can be employed to mitigate traffic impacts. These include grade separation, signal timings improvements, signal phasing, and roadway capacity improvements. Site-specific conditions help determine the mitigation.

Of 11 crossings recommended for mitigation, a grade separation is infeasible at three locations. At Luna Road and Alma Road, the proximity of the elevated PGBT does not allow for a grade separated rail line. Addison Road is located within the runway protection zone for Addison Airport and vertical structures are restricted. Based upon the grade crossing analysis and in accordance with DART's Grade Separation Policy, a new grade separation is recommended at the following crossings:

- South Belt Line Road
- Midway Road
- Coit Road
- Custer Parkway
- Plano Parkway

Except for Coit Road, all proposed grade separation would elevate the rail over the roadway. To accommodate an at-grade station at Coit Road, the rail would be slightly depressed and Coit Road would be elevated over the rail line.

Traffic impacts at the following locations could be mitigated by signal timing and signal phasing improvements:

- MacArthur Boulevard and Belt Line Road
- Luna Road and East Belt Line Road
- Marsh Lane and Arapaho Road
- Addison Road and Arapaho Road
- Hillcrest Road and McCallum
- Alma Road and SH 190 Frontage Roads



DART would continue to coordinate with the appropriate jurisdictions to determine if intersection capacity improvements may be necessary to achieve maximum efficiency and improve the overall LOS.

DFW Airport Terminal B Connection Mitigation

As part of the TEXRail Project, several infrastructure modifications are being implemented. New rail aerial structures over SH 121/SH 114, the southbound International Parkway Service Road, and North Airfield Drive would be elevated over the rail line. The access road to ASR-9 Radar facility has been rerouted to avoid crossing the rail line. Access to the North Employee parking area and the North Express Parking area have been modified to accommodate circulation changes.

Additionally, the signal free right turn lane from southbound International Service Road to North Employee Road is being eliminated to channel traffic through a single crossing. These turning movements would utilize the signalized intersection at North Employee Road and southbound International Service Road. DART proposes to mitigate traffic impacts at this location by improving signal timing. DART would continue to coordinate with DFW Airport to determine if additional intersection capacity improvements are needed to achieve maximum efficiency and improve the overall LOS.

Roadway Closures Mitigation

If the Site Option 1 (Luna Road) EMF is selected, the unnamed utility access road would be relocated. An access road would be provided from the EMF entrance on Luna Road.

The driveway to a small Dallas Water Utilities facility located northeast of the Cotton Belt intersection with Coit Road would be relocated to extend north parallel to the Coit Road aerial structure before entering the roadway at ground level. The easement granting access to the current driveway would be required to be modified to accommodate the relocated driveway.

No mitigation is required for the closure of a private driveway to the Maridoe Golf Club. The property was sold to DART in 2012 with the understanding that if the roadway were to be closed, alternative access to the site exists.

Highway and Roadway Summary

All major freeways would be grade separated and all existing grade separations, except for one potential relocation, would remain grade separated. Along the DFW Airport Terminal B Connector, the Cotton Belt would align with the configuration of the TEXRail Project. Outside of this alignment, DART conducted an extensive traffic analysis to determine roadway configurations. Roadways not discussed in the analysis include: Chesapeake Access Road, DFW Airport Fire Station 6 Road, Sanders Loop, an unnamed utility road, Maridoe Gulf Club driveway, Rutford Avenue, Red Moon Way and West City Line Drive. Several of these roads are low volume roads that would not meet warrants for mitigation. Others are proposed or recently constructed roadways that have been located to cross the Project alignment as configured.

- Chesapeake Access Road is a minor, low volume utility access road that will be crossed at-grade.
- The DFW Airport Fire Station 6 Road at-grade crossing was requested by DFW Airport and is being constructed as part of the Project to allow only emergency vehicles access across the tracks.
- Sanders Loop is a low volume street parallel to South Belt Line Road. The proximity to the two roadways requires that Sanders Loop be included as part of the South Belt Line grade separation.



- An unnamed access road provides utility vehicle access under the existing track structure. This access would be rerouted to accommodate the Site Option 1 (Luna Road) EMF. If the Site Option 2 (Irving Yard) EMF is selected, this grade separation will remain.
- Maridoe Gulf Club driveway is low volume driveway that would be closed through a prior agreement.
- The at-grade Rufford Avenue crossing would be constructed as part of the Project at the request of the City of Richardson. It was designed to cross the Cotton Belt Line at-grade. This roadway would improve access and circulation to the station and UT-Dallas campus
- Red Moon Way is a newly constructed roadway that will pass under the Cotton Belt aerial structure over US 75. It was located to cross under the Cotton Belt Line aerial structure.
- W. City Line Drive is a circulator street that was designed to cross both the Red Line LRT line and the Cotton Belt Line at-grade.

In total, the Project would cross 71 existing or future roadways, three freight railroads (see **Section 5.3**), two LRT lines, two taxiways, and one automated people mover (APM). One additional driveway would be modified to accommodate a grade separation. Of the 71 roadway crossings along the Cotton Belt alignment:

- 47 would be at grade
- 22 would be grade separated
- 1 would be relocated or remain grade separated; and
- 1 would be closed.

Table 5-7 lists the proposed configuration of all roadways and other crossings of the Cotton Belt alignment from DFW Airport Terminal B Station to Shiloh Road. **Figures 5-2** through **5-5** show the location of these crossings.

Table 5-7. Cotton Belt Proposed Crossing Configuration

ID	Location	Name	Type	Configuration
1	DFW	Crossunder # 2	Street	At-Grade
2	DFW	International Service Road	Street	Existing Grade Separation (Rail Under)
3	DFW	North Employee Road	Street	At-Grade
4	DFW	North Airfield Drive	Street	Existing Grade Separation (Rail Under)
5	DFW	SH 121/SH 114	Freeway	Existing Grade Separation (Rail Under)
6	DFW	Dallas Road	Street	Future Grade Separation (Rail Under)
7	DFW	Chesapeake Access Road	Access	At-Grade
8	DFW	New DFW Road	Street	Future Grade Separation (Rail Under)
9	DFW	DFW Airport Fire Station 6 Road	Driveway	New At-Grade
10	DFW	SH 121	Freeway	Existing Grade Separation (Rail Under)
11	DFW	IH 635,	Freeway	Existing Grade Separation (Rail Under)
12	Coppell	Royal Lane	Street	At-Grade
13	Coppell	Freeport Parkway	Street	At-Grade
14	Coppell	Coppell Road	Street	At-Grade
15	Coppell	Southwestern Boulevard	Street	At-Grade
16	Coppell	South Belt Line Road	Street	Proposed Grade Separation
17	Coppell	Sanders Loop	Street	Proposed Grade Separation
18	Dallas	East Belt Line Road	Street	At-Grade
19	Coppell	Moore Road	Street	At-Grade
20	Coppell	Mockingbird Lane	Street	At-Grade
21	Coppell	MacArthur Boulevard	Street	At-Grade
22	Coppell	Fairway Drive	Street	At-Grade
23	Coppell	Private Driveway/Ledbetter Road	Driveway	At-Grade
24	Carrollton	Private Driveway (Gun Range Road)	Driveway	Existing Grade Separation (Rail Over)
25	Carrollton	PGBT	Freeway	Existing Grade Separation (Rail Under)
26	Carrollton	Luna Road	Street	At-Grade
27	Carrollton	Unnamed dirt road (Utility)	Access	Remain Grade Separated or Relocated



Table 5-7. Cotton Belt Proposed Crossing Configuration (continued)

ID	Location	Name	Type	Configuration
28	Carrollton	IH-35E/Frontage	Freeway	Existing Grade Separation (Rail Under)
29	Carrollton	North Broadway Street	Street	At-Grade
30	Carrollton	North Denton Drive	Street	At-Grade
31	Carrollton	Perry Road	Street	At-Grade
32	Carrollton	North Josey Lane	Street	At-Grade
33	Carrollton	Kelly Boulevard	Street	At-Grade
34	Carrollton	Private Driveway (Maridoe Golf Club)	Driveway	Closed
35	Addison	North Marsh Lane	Street	At-Grade
36	Addison	Surveyor Boulevard	Street	At-Grade
37	Addison	Midway Road	Street	Proposed Grade Separation
38	Addison	Addison Road	Street	At-Grade
39	Addison	Quorum Drive	Street	At-Grade
40	Addison	Spectrum Drive	Street	At-Grade
41	Addison	DNT SB Frontage Road	Street	At-Grade
42	Dallas	Dallas North Tollway	Freeway	Existing Grade Separation (Rail Over)
43	Dallas	DNT NB Frontage Road	Street	At-Grade
44	Dallas	Knoll Trail Drive	Street	At-Grade
45	Dallas	Preston Road,	Street	Existing Grade Separation (Rail Under)
46	Dallas	Davenport Road (South)	Street	At-Grade
47	Dallas	Campbell Road	Street	At-Grade
48	Dallas	Davenport Road	Street	At-Grade
49	Dallas	Hillcrest Road	Street	At-Grade
50	Dallas	McCallum Boulevard	Street	At-Grade
51	Dallas	Meandering Way	Street	At-Grade
52	Dallas	Dickerson Street	Street	At-Grade
53	Dallas	Coit Road	Street	Proposed Grade Separation
54	Richardson	Waterview Parkway	Street	At-Grade
55	Richardson	Rutford Avenue	Street	New At-Grade
56	Richardson	Synergy Park Boulevard	Street	Existing Grade Separation (Rail Over)
57	Richardson	Renner Road	Street	Existing Grade Separation (Rail Over)
58	Richardson	Custer Parkway	Street	Proposed Grade Separation
59	Richardson	Alma Road	Street	At-Grade
60	Richardson	US 75	Freeway	Proposed Grade Separation
61	Richardson	Red Moon Way	Street	Proposed Grade Separation
62	Richardson	W. CityLine Drive	Street	At-Grade
63	Plano	PGBT EB Frontage Road	Street	At-Grade
64	Plano	PGBT	Freeway	Existing Grade Separation (Rail Under)
65	Plano	PGBT WB Frontage Road	Street	At-Grade
66	Plano	Plano Parkway	Street	Proposed Grade Separation
67	Plano	K Avenue	Street	At-Grade
68	Plano	Municipal Avenue	Street	At-Grade
69	Plano	N Avenue	Street	At-Grade
70	Plano	Jupiter Road	Street	At-Grade
71	Plano	Shiloh Road	Street	At-Grade
A	DFW	Skylink People Mover	APM	Existing Grade Separation (APM Over)
B	DFW	Taxiway Z	Taxiway	Existing Grade Separation (Taxiway Over)
C	DFW	Taxiway Y	Taxiway	Existing Grade Separation (Taxiway Over)
D	Carrollton	UP Railroad	Railroad	At-Grade
E	Carrollton	DART Green Line	LRT	Existing Grade Separation (LRT Over)
F	Carrollton	BNSF/Madill Subdivision	Railroad	Proposed Grade Separation
G	Richardson	KCS Railroad	Railroad	Existing Grade Separation (KCS Over)
H	Plano	DART Red Line	LRT	Existing Grade Separation (LRT Over)

Source: GPC6, 2017



5.3 Freight Rail

Affected Environment

The existing Cotton Belt Railroad Corridor traverses the area from west to east in a generally at-grade configuration. The corridor width varies in a few locations but is primarily 100-feet wide. The existing freight tracks in the corridor are primarily in a single-track configuration. Along the existing Cotton Belt Railroad Corridor, there are 16 active industrial spurs or sidings and two industry tracks that are inactive. There are two at-grade freight rail crossings in downtown Carrollton and a grade-separated freight rail crossing (KCS) in Richardson.

The general condition of the existing track, throughout the corridor is at best Class 2. Portions are Class 1 or lower. Much of the corridor is comprised of substandard rail, ties, special trackwork and other track materials. Many of the existing roadway crossings are also substandard and exhibit varying degrees of wear. Most crossings have an Active Warning System with crossing gates that appear to have been in place for several years. Operating speeds of the corridor are severely restricted and the existing condition of the track is not suitable for passenger rail service. Local freight rail service is provided by short line and regional carriers.

Four freight railroad companies (DGNO, FWRR, KSC, and UP) can operate within the Cotton Belt Corridor through agreements on DART-owned tracks. The UP Railroad, which currently does not operate any trains in the corridor, has track usage rights on the entire corridor except for the freight abandoned section in North Dallas. A fifth freight operator (BNSF), has limited switching in downtown Carrollton.

Figure 2-3 shows the current freight service providers. Freight operates on the Cotton Belt Railroad Corridor except for the area between the DNT and the KCS Crossing at Renner Junction. There are typically 27 freight train trips per week along the various sections of the Cotton Belt Corridor and typically 12 trains per week on any given section. The FWRR, which provides local freight service from Fort Worth to west of downtown Carrollton, operates three trains per week with switching activity within the Project corridor. The DGNO provides local freight service from the UP in downtown Carrollton east to Addison. The DGNO also operates Mercer Yard in downtown Carrollton. Mercer Yard is the local hub for the DGNO that serves switching operations and train storage. The DGNO currently operates 12 trains per week, with extensive switching operations at Mercer Yard. The KCS provides local freight service from Renner Junction east to Plano.

Two freight lines cross the Cotton Belt Corridor in downtown Carrollton. The BNSF corridor, or Madill Subdivision, intersects the Cotton Belt Corridor at grade. The BNSF operates several trains per day with train lengths as long as 8,000 feet. The UP Rail corridor also crosses the Cotton Belt corridor at grade. The UP corridor operates four trains per week.

Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, freight will continue operate on and across the corridor as it does today. The tracks in downtown Carrollton will not be reconfigured and Mercer Yard will not be relocated. There will be no potential disruption in service to accommodate construction activities. The general condition of the existing track throughout the corridor will remain at best Class 2.



Build Alternative

The existing rail corridor would be upgraded to be in compliance with DART passenger rail standards. The existing single-track configuration would be completely reconstructed as a double-track configuration. The Project would be designed to Class 4 track standards and consist of new track, ballast, subballast and subgrade. Existing single-track roadway crossings would be rebuilt with new crossing panels to accommodate the double track configuration. The existing Active Warning System and crossing gates would be upgraded and replaced. The Project would also include PTC, which is a system for monitoring and controlling train movements.

As designed, freight would continue to operate on the existing railroad corridor and only passenger service would run on the new alignments, including the DFW Airport Terminal B Connection, the Cypress Waters Alignment, the North Dallas freight abandoned segment, and the CityLine Alignment.

The railroad crossings in downtown Carrollton would be reconfigured as part of the Project. An existing lumber yard situated between the rail rights-of-way would be acquired and relocated to accommodate the reconfiguration. The dual track Cotton Belt Project will be shifted slightly to the north. The at-grade crossing of the Cotton Belt Corridor and the Madill Subdivision would be eliminated. This rail intersection would be reconfigured by moving the crossing approximately 1,800 feet to the east where the Project would be elevated over the Madill Subdivision. Freight on the Madill Subdivision would continue to operate at grade. The UP tracks running north-south have limited traffic and would be maintained as an at-grade crossing. The 16 active industrial spurs would remain in place. The two inactive industry tracks would be removed. Details of all modifications are shown in the 10 percent preliminary engineering drawings contained in **Appendix A**.

Mercer Yard, currently located southeast of the proposed station, would be relocated to the east of the Downtown Carrollton Station on DART- and City of Carrollton-owned property located approximately 1.5 miles to the east along the Cotton Belt. The relocated Mercer Yard would be located within the City of Carrollton between Country Club Road and the existing Cotton Belt Corridor on the south side of the tracks. The engine shop and transload track would be relocated to the existing Mockingbird Yard.

With the implementation of passenger rail, the Cotton Belt Corridor would see an increase in train traffic which would limit windows of opportunities for freight providers to operate. However, there would also be an upgrade to the track conditions and number of tracks. This would increase the speed and efficiency of the freight providers. Relocating Mercer Yard would also provide upgraded switching operations.

As shown in the draft *DART Cotton Belt Operations and Maintenance Plan* in **Appendix B**, DART can operate the Project and provide ample opportunity for freight providers. The passenger rail would be grade separated over the Madill Subdivision and would have no impact on BNSF operations. The KCS through movements at the east end of the line are assumed to operate at any time, including peak periods. Local freight service on the Cotton Belt and UP would be dispatched by the regional rail operator dispatch center. Freight operation would be restricted from peak period operation to avoid interference with Cotton Belt passenger services.

During construction, it is anticipated that there would be minimal disruption of freight activities and service.



Mitigation Measures

The Project is being designed to avoid, minimize or mitigate impacts to freight operations. The Cotton Belt will be grade separated over the Madill Subdivision to avoid any conflicts with BNSF Railway operations.

DART will dispatch trains within and across the corridor to ensure appropriate freight operations. DART will continue to coordinate with the freight providers to identify windows of opportunity for freight operations. The FRA will be involved as necessary during final design, particularly as it relates to safety and the shared use of the corridor.

DART will stage the construction to minimize disruption in service. For instance, the new Mercer Yard would be constructed before construction would occur in downtown Carrollton. During construction, minimal freight activities may be temporarily switched to trucking.

5.4 Station Access and Parking

Nine stations along the Build Alternative would have park-and-ride lots, three of which exist and would remain as is or be expanded. Stations with new or expanded parking would generate additional traffic with increased auto access. All stations would have bus access as well (see **Table 2-2**). Each station would have different potential impacts to the surrounding area, depending on the layout, access points, and forecast activity levels.

The following sections describe conditions relative to existing stations along the corridor, including parking at those facilities. Potential auto and bus access and parking impacts are also discussed, along with mitigation measures to address access or parking concerns. Station site plans are included in **Appendix A**. General parking along the corridor and potential parking displacements are also discussed.

Affected Environment

Park-and-ride activity currently occurs at existing stations or transit centers along the corridor, including Downtown Carrollton, Addison, and CityLine/Bush. A parking utilization survey was conducted by DART on December 2, 2015, to assess capacity levels for an average weekday. Downtown Carrollton has 251 parking spaces with parking utilization of 83 percent. Addison Transit Center has 300 parking spaces with parking utilization of 42 percent. The CityLine/Bush Station has 1,193 parking spaces with parking utilization of 58 percent.

Along the corridor, non-transit facility parking is generally associated with land use developments and not located within the Project right-of-way.

Impact Assessment

No-Build Alternative

The No-Build Alternative will not create any impacts relative to station access or parking. The Addison Station will continue to be a high-volume bus transfer facility as it is today with route additions and service enhancements planned under the No-Build Alternative.

Build Alternative

Most stations would be accessible from major arterial roadways for automobiles and buses. Existing and forecasted traffic volumes along roadways that intersect the alignment are discussed in **Section 5.2** and the *Street At-Grade Crossing Traffic Analysis Report* in **Appendix B**. The preliminary bus routes anticipated to serve stations is documented in **Table 2-2**. Roadways that would provide access to stations with new or expanded park-and-ride facilities include:



- Cypress Waters Station: Denton Tap Road/South Belt Line Road, East Belt Line Road and Moore Road via East Belt Line Road
- Downtown Carrollton Station: Denton Drive and Belt Line Road
- Coit Road Station: Coit Road
- UT Dallas Station: Waterview Parkway, Rutford Road via Synergy Park Boulevard
- 12th Street Station: K Street, Municipal Avenue, 12th Place
- Shiloh Road Station: Shiloh Road

It is anticipated that the Project would add traffic volume to the roadway network surrounding and adjacent to potential station locations that would have park-and-ride facilities. Volumes associated with this passenger drop off mode of access are low and not expected to impact traffic. Based on the forecast mode of access for stations shown in **Table 5-2**, the additional drive access traffic volumes generated by each station during the AM and PM peak hours are not expected to substantially impact traffic flow or require additional capacity on the adjacent street network. The highest auto mode of access and largest parking facilities would be located at DFW North, Cypress Waters, Coit Road, 12th Street and Shiloh Road.

Parking facilities and passenger drop-off locations are not proposed for the Knoll Trail or Preston Road Stations, as these are primarily neighborhood walk access stations. However, there is the potential for overflow parking into adjacent neighborhoods or commercial areas. In addition, bus access for both stations would be on-street and could present pedestrian access issues on high traffic roadways. A discussion of potential impacts at each station follows.

DFW Airport Station

This station is under construction by DFW Airport, and was cleared environmentally by the FWTa. The station features a cross platform transfer to TEXRail. There is no driving access. The station will include a pedestrian walkway to Terminal B and a walkway to the Orange Line Station at Terminal A. DFW Airport Terminal Link bus service can be accessed at each terminal. The DFW Airport people mover system (Skylink) can also be accessed on the secure side of each terminal.

DFW North Station

DART would be constructing one platform adjacent to the TEXRail platform to serve DFW Airport and facilitate cross platform transfers. A second platform would be constructed by DART on the existing railroad corridor to facilitate through east-west train movements not entering the airport. DART would be constructing a pedestrian linkage between the two new stations. This linkage would also provide station access to future development north of the tracks. Much of this station infrastructure is being built as part of the FTWA TEXRail Project with 362 parking spaces to be shared by DART and FWTa. Roadway access is also being constructed by FWTa by extending Dallas Road to the west from SH 26/Texas Trail. This station has a high rail transfer mode of access and parking demand for both projects combined is anticipated to be accommodated in the near term. The additional traffic associated with the drive access and limited bus operations can be absorbed by the network and accommodated by the existing traffic signal at Texan Trail and Dallas Road. Enhanced headways in the future could create additional parking demand beyond the parking spaces provided initially. FWTa has reserved an area as part of their project for future parking expansion. As discussed in **Section 5.2.2**, DFW Airport is also planning two new elevated roadways over the Cotton Belt tracks. These would help facilitate north-south and east-west circulation through the station area. Both of these could contain pedestrian elements to improve pedestrian circulation.



Cypress Waters Station

This facility would be accessible directly off East Belt Line Road for both automobiles and buses. The station site plan identifies construction of turn lanes along Belt Line Road into the facility to provide protected turns into the facility. Approximately 192 parking spaces would be provided which translates into low additional traffic generation onto East Belt Line Road throughout the day. This traffic would largely come from Denton Tap or MacArthur Boulevard, both of which are currently signalized at Belt Line Road. No additional traffic signalization is anticipated. Pedestrian and bicycle access would primarily be associated with new mixed-use development to the south and would be coordinated with the developer and the City of Dallas. Cypress Waters is planning an extensive mixed-use trail that will circulate through the development with connections to Campion Trail, the Cotton Belt Regional Trail and trails planned for the City of Coppell. Portions of the Cypress Waters Trail will use the new DART right-of-way through Cypress Waters. Given that this is the only station between DFW Airport and downtown Carrollton, parking demand could be higher than projected.

Downtown Carrollton

The Project includes the addition of parking north of the rail corridor to supplement existing Green Line LRT parking, which is already highly utilized and near capacity. Drive access is projected to be low at this station, however its visibility and accessibility from IH 35E and Belt Line Road could increase this projection. Bus access would continue to be in the current LRT station facility so this new parking area would be for passenger parking and potential kiss-and-ride/passenger drop off only. The new parking is in two separated lots both accessible from Denton Drive and separated by an active freight spur, which could lead to additional traffic to and from Denton Drive if drivers need to circulate between the two lots to find a parking space. Denton Drive would be reconstructed through this area to match the cross-section to the south and provide a center turn lane for protected turn lane access into the new park-and-ride areas. The City of Carrollton has made pedestrian improvements along Denton Drive which will provide access from the north parking lot to the platform. Much of the projected station ridership is transfers between the LRT and regional rail. The two station areas are separated by the Madill Subdivision/BNSF tracks. To facilitate transfers, DART would be constructing a stairway and elevators off the western end of the Cotton Belt platform to connect to the elevated LRT platform level. A pedestrian connection from the north end of the LRT platform would be extended to the top vertical circulation. Additionally, a new gated, at-grade, pedestrian crossing would be installed across the Madill Subdivision/BNSF tracks between the two station areas. This would increase pedestrian access between regional rail, LRT and buses. A second gated at-grade pedestrian crossing would be installed across the UP railroad track running north-south. This would open the station to pedestrian traffic from the west.

Addison

As part of this Project, no new parking would be provided at this station but there is the potential for increased traffic to the current parking lot based on projected 5 percent drive mode of access. Bus access would continue with improvements planned under the No-Build Alternative to keep up with growth and demand. Traffic impacts to the surrounding street network are not anticipated under the Build Alternative and station traffic is anticipated to be absorbed into the network. The station would allow new pedestrian access across the tracks at the platform. The Town of Addison is currently conducting a special area study around the station to create a long-term vision. This study will look at all access to the station and how to facilitate connections to development area and may recommend a shared parking facility.



Knoll Trail Station

This would be a walk-up and bus access station only. Bus Route 347 will continue to operate on Knoll Trail and stops may need to be adjusted to enhance access to the platform. The nearest pedestrian access across Knoll Trail is at Bent Tree to the north and Arapaho to the south. The Cotton Belt Regional Trail at this location presents an opportunity for a controlled pedestrian and bicycle crossing of Knoll Trail to enhance access to this station. Given the multi-family development in the vicinity, DART and the City of Dallas would explore opportunities for pedestrian access enhancements. This station would not have parking, which could present problems like “hide-and-ride parking” in nearby office or commercial developments.

Preston Road Station

Preston Road Station would be a walk-up neighborhood station and would be accessible from Preston Road and Keller Springs Road. Sidewalks were improved recently with area roadway improvements. The Project would also provide enhanced pedestrian and bicycle access. The mode share also indicates a 27 percent bus mode of access given higher density residential north and south along Preston Road. Bus access would be from bus stops along Preston Road near Westgrove, requiring pedestrian access across Preston Road where there is currently no signal or stop sign. A key issue raised by the community is the potential for “hide-and-ride” parking in the neighborhood due lack of parking at the station. The community has also expressed concern for the potential traffic impacts to the complicated traffic circle adjacent to the station area.

Coit Road Station

This station would be accessible from one main station access driveway off Coit Road. Coit Road would be grade separated over the project corridor with the roadway back to grade near the driveway entrance. There may be a need for turn lanes and a traffic signal at the driveway entrance to ensure safe access for autos and buses from Coit Road given the potential for sight distance constraints from southbound Coit Road as it passes over the rail line. A detailed traffic impact analysis would be needed to determine appropriate improvements.

UT Dallas Station

This station would generate additional traffic along Waterview Parkway to access the park-and-ride via two new access roads. These roads would eventually be integrated into future development with the potential for shared structured or surface parking with DART. The potential need for access, signal or turn lanes improvements would need to be coordinated with the timing and final configuration of new development at this location. As part of the project, Rutford Drive would be extended across the rail corridor to link to the main campus to the south of the station. Future infrastructure improvements by UT Dallas and the City of Richardson would enhance both vehicular and pedestrian circulation. The Cotton Belt Regional Trail would also extend through the station area.

CityLine/Bush Station

No new parking would be provided at this location and it would primarily function as a destination station and location for LRT to Cotton Belt transfers. There would be additional drive attractions to the existing park-and-ride and there is excess capacity to absorb those vehicles. The City of Richardson continues to make trail and sidewalk investments in the area which will greatly enhance access to and from the platform. Bus and kiss-and-ride access would be modified as the new platform would be built between West Routh Drive and the existing LRT platform. DART would relocate West Routh Drive to continue to provide circulation for bus, paratransit and passenger drop-off.



12th Street Station

This station area would consist of both the at-grade Cotton Belt station and the infill 12th Street LRT station on the elevated Red Line. The park-and-ride will attract riders for both stations but primarily the LRT station. Based on model results, many of these are being redistributed from Parker Road Station. There would be a walk required for transfers between the two lines; thus, most rail-rail transfers would occur at CityLine/Bush due to the ease of the cross-platform transfer. New sidewalks and street markings would direct pedestrians to the LRT platform. This area continues to transition to mixed-use. The Plano Transit Village Veloweb would extend north to south through the station area. This multi-use trail would connect downtown Plano to the CityLine Development. Portions of the trail would use the Cotton Belt and the Red Line LRT rights-of-way.

Shiloh Road Station

This station would have the largest park-and-ride facility with 672 spaces as an end of line station. Based on ridership projections, parking demand may be lower than this but could grow over time. Two station entrances would be accessible from Shiloh Road for autos only. There may need to be improvements to the Shiloh median and turn lanes to accommodate traffic flow. Bus service would be limited here and is anticipated to stop at on-street bus stops. Since the parking lot is separated from the platform by an ONCOR facility, a new pedestrian connection would be provided to link to the platform.

There are no anticipated impacts to parking in terms of displacements along the corridor beyond those impacts associated with right-of-way acquisitions.

Mitigation Measures

During final design, DART will conduct a detailed traffic study based on final configuration of roadways and feeder bus plans for stations if required by the local jurisdiction. These studies may recommend turn lanes, traffic control, signal improvements, pedestrian markings/signals, bus stop relocations, or other improvements to ensure safe access for autos, buses and pedestrians. DART will coordinate with each city during final design to conduct these analyses and develop appropriate mitigation.

Table 5-8 presents a summary of additional potential impacts at stations and proposed mitigation measures.

5.5 Non-Motorized Transportation

Affected Environment

Dedicated non-motorized (bicycle and pedestrian) facilities exist at several locations along the Cotton Belt Corridor. Trails, paths, bikeways, and sidewalks are part of the local transportation system which function primarily for transportation along portions of the Cotton Belt Corridor.

Pedestrian circulation facilities in the Study Area are primarily provided as part of the roadway facility cross section via sidewalks, pedestrian crossings and pedestrian signals. High numbers of pedestrian crossings do not occur at many locations along the alignment, and are typically highest in areas of denser development. There are also areas where school children may cross the alignment to access schools. Pedestrian access is important at rail stations and is a priority of station design. This is especially important for the Project at stations where transfer activity occurs with bus and rail. **Section 5.4** Station Access and Parking focuses on station area access.

Bicycle routes and trails also exist throughout the corridor. **Section 3.4** documents off-street trail locations within the Study Area. Additional information can also be found in the *Parks and Trails*



Existing Conditions Technical Memorandum in **Appendix B** for the trails located within the proximity of the Cotton Belt Corridor.

A total of three existing trails cross the corridor. Spring Creek Trail, in Richardson, crosses the track alignment just east of Alma Road near PGBT, and Preston Ridge Trail crosses just north of McCallum Boulevard along the eastside of Meandering Way in Dallas. In Carrollton, Green Trail crosses the tracks on the western side of Denton Drive north of Belt Line Road.

Table 5-8. Summary of Potential Impacts and Proposed Mitigation Measures at Stations

Station	Potential impact	Mitigation
DFW North	Potential for additional parking demand long-term.	Monitor parking utilization and work with DFW Airport and FWTa to preserve right-of-way for parking expansion or shared parking. Coordinate new roadway development with airport.
Cypress Waters	Potential for increased parking demand.	Monitor parking utilization and preserve excess right-of-way for potential parking expansion.
Downtown Carrollton	Potential for pedestrian crossings of freight spur between new parking lots.	Provide fencing along the freight spur to control access between parking lots and direct pedestrians to Denton Drive. Provide signage, pedestrian crossings and markings to direct passengers to safe crossing locations.
Addison	Pedestrian access enhancements.	Coordinate with the Town of Addison to facilitate pedestrian connections to existing and new development.
Knoll Trail	Hide-and-ride parking in nearby commercial areas. Pedestrian access from bus stops across Knoll.	Monitor parking overflow with adjacent property owners and develop mitigation plan such as signage or increased enforcement if an issue is identified. Provide mid-block access across Knoll Trail to the station via the Cotton Belt Regional Trail crossing.
Preston Road	Hide-and-ride parking in nearby neighborhoods. Pedestrian access from bus stops on Preston and Westgrove.	Monitor parking overflow with adjacent property owners and develop mitigation plan such as signage or increased enforcement if an issue is identified. Coordinate with the City of Dallas on pedestrian access improvements across Preston Road to the station platform. One suggested mitigation is elimination of this low ridership station.
Coit Road	Potential sight distance issues with southbound traffic from Coit overpass.	Evaluate need for traffic signal and turn lanes at station driveway entrance.
UT Dallas	Combined traffic from proposed development and park-and-ride.	Coordinate future traffic study with UTD and City of Richardson to assess need for signal and roadway improvements, including potential shared parking garage.
CityLine/Bush	Access from modified bus and passenger drop-off locations.	Coordinate street improvements and pedestrian linkages with the City of Richardson.
12 th Street	Pedestrian access between platforms.	Provide pedestrian crossings and markings to direct passengers between stations.
Shiloh Road	Pedestrian crossing of Shiloh Road from northbound bus stop.	Coordinate northbound bus stop placement in conjunction with crosswalk or designated street intersections.

Source: DART Capital Planning

In addition to off-street trails, six cities have signed bike routes that share the roadway with vehicles and may or may not have a buffered or striped bicycle lane. For example, in north Dallas, route 350 McCallum and route 360 Davenport/Keller Springs cross the corridor as part



of the roadway right-of-way. Richardson has an extensive bicycle network with signed routes, bicycle lanes and “share the road” corridors. However, the Waterview Parkway bicycle route currently is disconnected at the Cotton Belt right-of-way. Several other possible connections have been identified throughout the corridor to accommodate the construction of a future Cotton Belt Trail. Once identified, the type and number of crossovers will vary pending the cities’ designs and construction.

The Cotton Belt Regional Trail currently exists within DART-owned right-of-way in several locations west of DFW Airport. Expansion of the Cotton Belt Regional Trail system within the DART Cotton Belt Project Corridor is part of the NCTCOG Regional Veloweb plan. According to NCTCOG, corridors identified on the Veloweb as “planned” may be prioritized for future funding.

DART Policy

The DART Hike and Bike Trail Policy III.09 states that DART-owned rights-of-way may be available to other governmental entities for hiking, bike transportation, or recreational use.

Two trails are currently programmed that would utilize portions of the Cotton Belt Corridor. Portions of the Cypress Waters Trail would use the new DART right-of-way through Cypress Waters. This trail would serve the rail station new development. The Plano Transit Village Veloweb which will connect downtown Plano to the CityLine area, would use a portion of the Cotton Belt and the Red Line LRT rights-of-way.

Impact Evaluation

No-Build Alternative

Under the No-Build Alternative, the existing trail system, including Spring Creek Trail, will remain unaffected. The Plano Transit Veloweb has an agreement to be in DART right-of-way but will not connect to the 12th Street Station. Portions of the programmed Cypress Waters Trail will need to be reconsidered as it is designed to use new DART right-of-way that would be acquired for the Project. This portion of the trail is also envisioned to facilitate connecting the station to an extensive regional trail network. The No-Build Alternative would only accommodate some sections of the Cotton Belt Regional Trail. Portions of this proposed trail would be eliminated or delayed.

Build Alternative

Pedestrian and on-street bicycle facilities that cross the corridor as part of the roadway cross-section may be temporarily affected by construction of the project as roadway crossings are rebuilt. Potential impacts associated with school zone crossings are addressed in **Section 4.3** Community Facilities as well as **Section 4.8** Safety and Security. The Project would directly impact approximately 150 linear feet of the Spring Creek Trail near Alma Road and approximately 100 linear feet of trail roughly 1,500 feet east of Alma Road. As a result, another 1,500 feet of the trail would be severed by the Project. A detailed discussion of this impact and proposed mitigation can be found in **Section 4.22** Draft Section 4(f)/6(f) Evaluation. Impacts to off-street trails are discussed in **Section 4.5** Parks and Recreational Facilities.

Several future facilities, as shown in **Figures 3-16 to 3-19**, are planned in the Study Area. While these would not be affected by the Project, coordination is necessary to ensure they are not precluded from future implementation by the local jurisdictions.

Mitigation Measures

DART will minimize closures of pedestrian and bicycle facilities as roadway crossings are rebuilt. Mitigation measures for temporary construction impacts would include installation of safety equipment. Necessary precautions to ensure a safe environment for operation of and



access to crosswalks and access to trails will be taken. Measures could include enhanced traffic signals, crosswalks, and striping, and signage and notifications of road and sidewalk closures and detours during construction. A portion of Spring Creek Trail will be reconstructed parallel to and south of the new tracks as part of the Project. Temporary closure of the trail may be necessary during construction; however, the trail will remain open to the greatest extent possible. Stations will be designed to accommodate clear and safe pedestrian linkages across the tracks and between station platforms where transfers occur. DART will coordinate with local jurisdictions and private developers to facilitate connections from DART facilities to nearby uses. A discussion of station specific access is provided in **Section 5.4**. Mitigation for school zone crossings and recreational trails is provided in **Chapter 4**.

Where future facilities are planned, DART will coordinate with cities to ensure that future non-motorized facilities are not precluded. DART also is working with the NCTCOG and communities along the corridor to preserve an envelope for the Cotton Belt trail within the DART right-of-way, where feasible. This trail concept is described in **Section 2.6** and the trail envelope is identified in the plan and profile drawings in **Appendix A**.



6. Airports and Aviation

6.1 FAA Policy and Guidance

This chapter analyzes potential impacts of the Build Alternative related to FAA environmental impact assessment guidance.

The Cotton Belt Project crosses northern portions of DFW Airport property traveling under IH 635 and International Parkway and would join with the TEXRail Project at a shared station. The existing Cotton Belt railroad right-of-way and Project traverses south of the southern property line of Addison Airport. Because portions of the Project are located on DFW Airport and near Addison Airport properties, the FAA has an interest in the Project (see **Figure 6-1**). Therefore, the FAA has been invited to participate in the EIS process as a Cooperating Agency. With joint approval authority, the FAA's signed approval of this DEIS is required.

As a Cooperating Agency with jurisdiction over a component of the proposed federal action as described below, the FAA assumes responsibility to independently review the environmental documents prepared for the FEIS/ROD and assess whether the documentation meets the standards of adequacy under NEPA, including consideration of all actions and direct, indirect, and cumulative impacts. FAA focuses its efforts on those issues and subject areas in the EIS pertaining to and related to airport planning and potential effects on the airport. This EIS will comply with FAA Order 1050.1F, *Environmental Impacts: Policy and Procedures* (Order 1050.1F) and FAA Order 5050.4B: *NEPA Implementing Instructions for Airport Actions* (Order 5050.4B).

Airport Layout Plans (ALP)

The proposed federal action includes as a connected action, FAA approval of a revision to the DFW Airport ALP (see **Appendix C**). Pursuant to 49 USC Section 47107(a)(16), the FAA Administrator, under authority delegated from the Secretary of Transportation, must review any revision or modification to an ALP and ensure that the alteration does not adversely affect the safety, utility, or efficiency of the airport. Any FAA determination to approve a revision of the ALP to accommodate the Project must take these factors into consideration. As the regional rail line would remain within the existing rail right-of-way south of Addison Airport, revisions to the Addison Airport ALP would not be required (see **Appendix D**).

Runway Protection Zones (RPZ)

The FAA Office of Airports (ARP) issued interim guidance dated September 7, 2012, on land uses within a RPZ with intent to clarify its policy on land uses within the RPZ. This interim guidance addresses what constitutes a compatible land use and how to evaluate proposed new or modified land uses that would exist in an RPZ. Coordination with the FAA Airport Planning and Environmental Division (APP) is required when transportation facilities such as rail are proposed within the RPZ. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects the airport sponsor to take all possible measures to protect against and remove or mitigate incompatible land uses. Under FAA's interim guidance, establishing DART rail service, even within existing right-of-way, may be considered a change of land use and require coordination.

DART provided FAA schematic drawings of the alignment south of Addison Airport. FAA made a final determination that an RPZ alternative analysis is not required since the majority of the alignment would remain the same and a land use change was not occurring. See **Appendix D** for FAA's RPZ determination for Addison Airport.



TxDOT Aviation

TxDOT Aviation is responsible for assisting with federal funding for reliever and general aviation airports included in the Texas Airport System Plan. TxDOT oversees the construction activities at these airports providing rules, standards and guidelines. TxDOT would be engaged to facilitate coordination with the FAA and to assist with the planning, development and construction activities near Addison Airport.

6.2 Introduction and Methodology

The DEIS for the Project has been prepared in accordance with Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508); DOT Order 5610.1C, *Procedures for Considering Environmental Impacts*; and FAA Orders 1050.1F and 5050.4B. FAA is a Cooperating Agency in the DEIS and will be a co-signatory agency for the NEPA documentation.

Purpose and Need

The Purpose and Need for the Cotton Belt Project is presented in **Chapter 1: Background, Purpose and Need**. The Project would improve mobility by providing another transportation option (passenger rail) to commute within the region, but would not alter the physical features of DFW's aviation infrastructure or trigger a change in aviation forecasts; therefore, no aviation forecasts are included. There are projected to be 12,000 daily riders on the Cotton Belt Project in 2040 from the Shiloh Station in Plano to the DFW Airport-Terminal B Station. Of the 12,000 daily riders, approximately 10 percent (or about 1,200) are expected to arrive at DFW (at either the DFW Airport-North or the DFW Airport-Terminal A/B Stations). Many riders are expected to be airport employees, or transit patrons traveling to destinations in the DART Service Area.

The implementation of the Project would provide alternative airport access for employees and airline passengers. However, rather than increasing the demand for commercial air travel, the Project has more potential to decrease the demand for other ground transportation modes and parking. The Project is less expensive, more direct or faster than other ground transportation options.

Proposed Action

As described in **Chapter 2: Alternatives Considered**, the Project would be a 26.2-mile commuter rail system with 12 stations planned to operate between Plano and DFW Airport. The existing east-west Cotton Belt Railroad Corridor traverses the north end of DFW Airport on existing right-of-way that predates the airport. The FTA is currently constructing the TEXRail Project, which extends from downtown Fort Worth to DFW Airport, on the western portion of the Cotton Belt right-of-way. At the north end of the airport, the TEXRail Project turns south from the railroad corridor to new right-of-way extending to Terminal B. On September 29, 2014, both FTA and FAA issued a ROD for the TEXRail Project. On April 16, 2015, FTA issued an amended ROD for project changes off airport property.

On DFW Airport property, new tracks would be constructed in the vicinity of the junction with TEXRail. Coming from the east in existing right-of-way, the line would veer north of the current alignment before turning south in new right-of-way before joining the TEXRail alignment at the DFW Airport-North Station. Within the existing TEXRail right-of-way, the alignment would cross over SH 121/SH 114 and parallel International Parkway, terminating at Terminal B of the DFW Airport-Terminal B Station. At DFW Airport Fire Station 6 (711 Regent Boulevard) on the existing railroad right-of-way, DART would construct a new at-grade crossing to allow fire access to the north side of the right-of-way. DFW Airport is also planning two additional aerial roadway crossings of the rail line. One would cross the existing railroad right-of-way east of the



DFW North Station to connect to future airport developments across the tracks. The second is Dallas Road which crosses the new right-way south of the DFW North Station. This would facilitate east-west circulation.

The portion of the Project on airport property would require FAA approval of DFW Airport's proposed changes to the ALP. This connected federal action is referred to as the DFW Airport Proposed Action. The DFW Airport Proposed Action would allow the proposed construction of the Cotton Belt Project on DFW Airport property as described in this paragraph. A station platform would be constructed directly adjacent to the TEXRail platform to accommodate transfers. A second platform would be constructed within existing right-of-way north of the junction to accommodate east-west movements. South of the station area, the rail line would be constructed along the TEXRail Project using a single-track alignment, with one passing siding south of North Airfield Drive. Also, south of the station area, the Project would utilize the bridges, culverts, underpasses and at-grade crossings being constructed for the TEXRail Project.

The details of the alignment, stations and service are described in **Chapter 2**. Overall Project impacts are described in **Chapters 4 and 5**. This chapter addresses potential environmental effects to airports and airport property. Therefore, this chapter primarily focuses on the portion of the Project located on DFW Airport property as illustrated in **Figure 6-1**. It is noteworthy that the majority of the Project through DFW Airport is located on existing railroad right-of-way or in new right-of-way that has previously received environmental clearance for the TEXRail Project. As such, there are few impacts to airport property associated with the proposed action. The Project is consistent with the TEXRail Project and complementary to airport development plans which include TEXRail and Cotton Belt service to Terminal B as well as Orange Line light rail service to Terminal A.

The Project includes identification of a 12-foot wide envelope for the proposed Cotton Belt Regional Trail, a multi-use trail identified in the NCTCOG Regional Veloweb Plan. This trail envelope is identified within the DART right-of-way along approximately 16 miles of the project corridor where it is feasible. This includes the railroad alignment extending from DFW North Station to the east through DFW Airport, but does not extend to the south to Terminal B. While the trail envelope is included in this DEIS, additional environmental clearance may be required depending on the project funding source and final trail design. This is especially true where the trail may impact water resources or riparian areas.

Shared Corridor

DART has coordinated the Project with the FUTA TEXRail Project and DFW Airport. As previously indicated, portions of the Project corridor will be co-located with the TEXRail track in a corridor that has previously been environmentally cleared. DFW Airport is currently constructing the DFW Terminal B Station, a dual-track station that will be shared by both transit agencies. North of the Terminal B Station, FUTA is constructing a single-track rail alignment extending 10,000 feet to the TEXRail DFW North Platform. DART will construct a second track and a 1900-foot siding in this corridor. Much of the infrastructure being constructed by TEXRail will accommodate the TEXRail and Cotton Belt tracks. This infrastructure includes: a culvert over Grapevine Creek, a bridge over Cottonwood Branch, two roadway bridges over the tracks (Southbound International Parkway frontage road and North Airfield Drive), and a railroad bridge over SH 121/SH 114. The two tracks will also share two at-grade roadway crossings (Crossunder # 2 and North Employee Road).

At the DFW North Station, the two projects diverge. DART would construct separate platforms and dual tracks in new right-of-way to spur to the existing Cotton Belt railroad right-of-way.

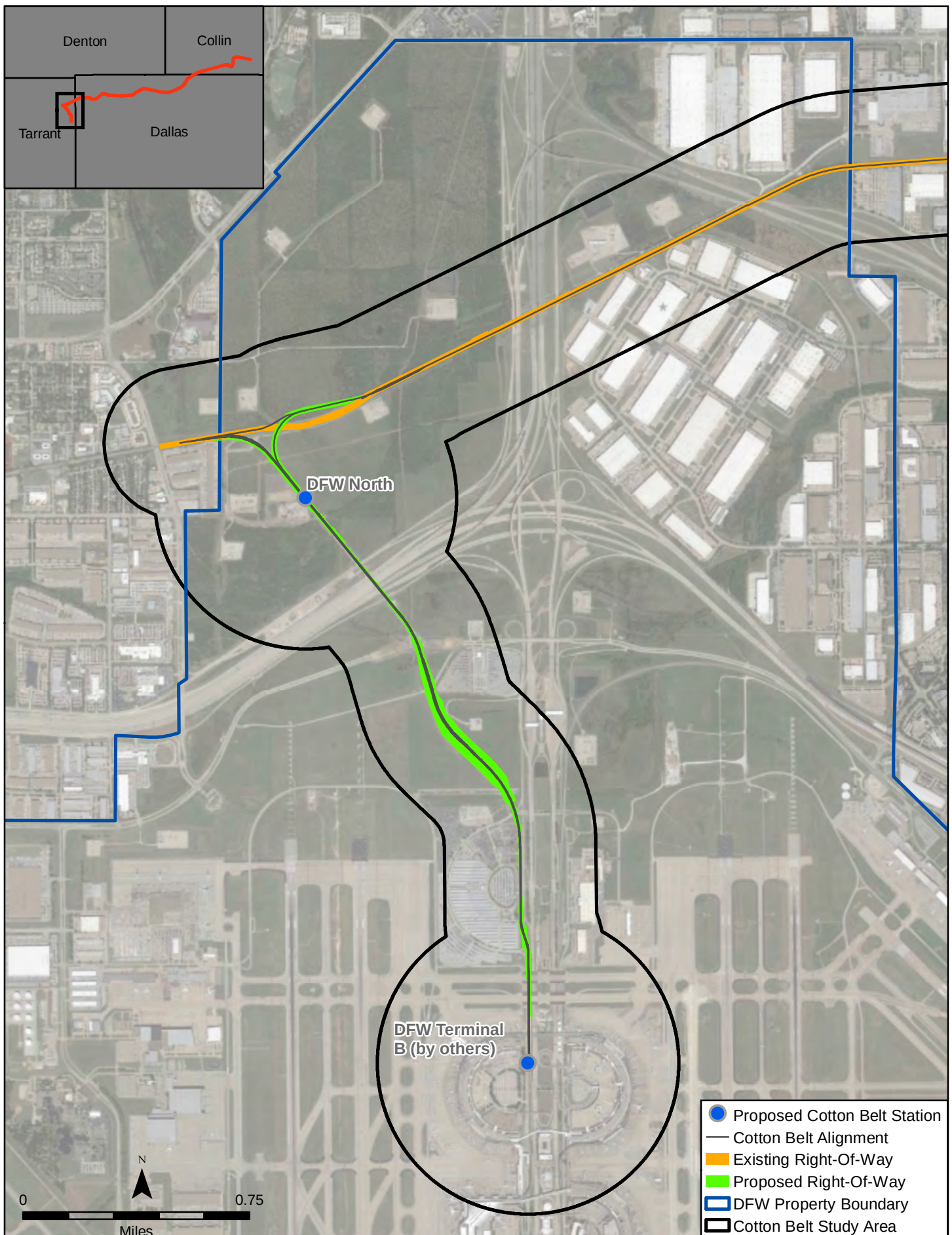


Figure 6-1
DFW Airport Study Area



The two projects would share the DFW Station parking, bus lanes and station access being constructed for the TEXRail project. DART would add additional pedestrian connections.

No-Build Alternative

No new construction would be included on DFW Airport property as part of the No-Build Alternative. The No-Build Alternative reflects the impacts and benefits associated with only the current provisions and programs in the NCTCOG Mobility 2040 MTP, as well as programmed projects in the Transportation Improvement Plan (TIP) (currently the 2017-2020 TIP). The No-Build Alternative includes existing and committed roadway and transit projects in the Study Area, as described in detail in **Chapter 2: Alternatives Considered**. In general, the capital improvement projects include additional roadway lanes as well as new roadways, bike/pedestrian trails, interchanges, intersection improvements, traffic signal improvements, and improvements to existing transit infrastructure.

6.3 Airport Environment

This section provides documentation of existing environmental conditions of the potentially affected geographic area or areas (i.e., the Study Area). The Study Area varies based on the impact category being analyzed; thus, this section describes how to define the existing or baseline environmental conditions in the Study Area for each impact category.

The following sections of the DEIS relate existing conditions (affected environment) and impacts (environment consequences) for the No-Build Alternative and DFW Airport Proposed Action as required by NEPA, FAA Orders 1050.1F and 5050.4B, and the CEQ Regulations.

As required under FAA Order 1050.1F, considerations of impacts to the following resource categories, and proposed mitigation measures where appropriate, were assessed:

- Air Quality
- Biological Resources
- Climate
- Coastal Resources
- Department of Transportation Act, Section 4(f)
- Farmlands
- Hazardous Materials, Solid Waste, and Pollution Prevention
- Historical and Archeological Resources
- Land Use
- Natural Resources and Energy Supply
- Noise and Noise-Compatible Land Use (including Vibration)
- Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks
- Visual Effects
- Water Resources
- Cumulative Impacts
- Irreversible and Irretrievable Commitment of Resources

Each resource section contains an introduction to the regulatory context and methodologies, and the affected environment. The impact evaluation and mitigation measures for the impacted resources are in **Section 6.4**. Significance thresholds are derived from FAA Order 1050.1F.

6.3.1 Addison Airport

No ALP changes are planned for Addison Airport. **Chapter 3** of the DEIS contains the resource discussion of the existing environment near Addison Airport. **Chapter 4** of the DEIS lists any



impacts of the Project within the Addison Airport Study Area. An Airspace Study (FAA Form 7460-1, Notice of Proposed Construction or Alteration) will be completed and provided for FAA approval during the design/build phase of the Project.

DART provided FAA schematic drawings of the alignment south of Addison Airport. FAA reviewed the alignment located within the Addison Airport RPZ and addressed FAA's Interim Guidance on Land Use (September 2012). FAA determined that since the majority of the alignment would remain the same, there appears to not be a land use change; therefore, an RPZ alternative analysis is not required. There is a slight realignment of the track on the east boundary of the RPZ, but the land use before and after the Project would remain the same (see **Appendix D** for FAA RPZ Coordination).

6.3.2 DFW International Airport

As noted above, the rail alignment on DFW Airport property south of the DFW North Station would be constructed adjacent to TEXRail track within the previously approved project corridor. DART would construct a second track within this corridor. The TEXRail Project is being constructed in advance of the Cotton Belt Project. The corridor is being disturbed by construction activity and all bridges, culverts, underpasses and at-grade crossings along this shared portion of the corridor will be constructed by the TEXRail Project. DFW Airport will be constructing the Terminal B Station. The Cotton Belt would share this infrastructure with TEXRail. Except as noted below, no new environmental impacts between the two stations are anticipated.

Note: An Airspace Study (FAA Form 7460-1, Notice of Proposed Construction or Alteration) will be completed and provided for FAA approval during final design.

6.3.2.1 Air Quality

Regulatory Context and Methodology

Air Quality Standards

Air quality is a term used to describe the amount of air pollution to which the public is exposed. Air quality is governed by the CAA and administered by the EPA. As required by the CAA, NAAQS have been established for certain transportation-related air pollutants: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), lead (Pb), and particulate matter (PM₁₀ and PM_{2.5}). The EPA also regulates MSAT. The CAA states that transportation projects are subject to transportation conformity analysis; that is, a proposed transportation project must conform to the state air quality implementation plan (SIP). Transportation conformity has two parts, regional (mesoscale) conformity and local (microscale or hotspot) conformity. Regional conformity is demonstrated by the project being included in the area's Regional Transportation Plan (RTP) and TIP. The Project is included in these plans which reflects conformity with the SIP.

Two types of national air quality standards have been established. Primary NAAQS set limits to protect public health, including the health of "sensitive" populations, such as asthmatics, children, and the elderly. Secondary NAAQS set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings. The CAA requires that all states attain compliance through adherence to the NAAQS, as demonstrated by the comparison of measured pollutant concentrations with the NAAQS.

The NAAQS represent the maximum levels of background pollution considered acceptable with an adequate margin of safety to protect public health and welfare. These pollutants are typically quantified in units of milligrams per cubic meter (mg/m³), parts per million (ppm), or micrograms per cubic meter (µg/m³). **Table 3-11** in **Chapter 3** lists the NAAQS for six criteria pollutants.



Regional Attainment and Conformity Attainment Status

The EPA tracks compliance with NAAQS by using categories to designate areas, including attainment, nonattainment, unclassifiable, and maintenance (40 CFR 81). Attainment refers to an area where the NAAQS for a pollutant is not exceeded or meets the national primary or secondary NAAQS. Nonattainment refers to any area where the concentration of a particular pollutant exceeds or does not meet the national primary or secondary NAAQS for that pollutant. Unclassifiable refers to areas that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant. Maintenance areas are those areas that were formerly nonattainment for a criteria air pollutant, but have since achieved attainment status.

Pursuant to the CAA, the EPA has established NAAQS for six criteria pollutants as discussed above. States are required to develop EPA-approved plans, or SIPs, to achieve or maintain the NAAQS within timeframes set under the CAA. In 2012, the EPA designated ten counties (Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, Tarrant and Wise counties) in North Central Texas as being in nonattainment for the pollutant ozone in accordance with the 2008 8-hour ozone NAAQS. The attainment deadline for the DFW Moderate Nonattainment Area is December 31, 2018.

Conformity

This section discusses applicable FAA conformity requirements (General Conformity Rule) for the DFW Airport Proposed Action (*Chapter 1, Desktop Reference*). Section 176 (1)(A) of the CAA provided a definition and expanded the scope and content of conformity as:

(A) conformity to an implementation plan's purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards and achieving expeditious attainment of such standards; and

(B) that such activities will not:

- (i) cause or contribute to any new violation of any standards in any area
- (ii) increase the frequency or severity of any existing violation of any standard in any area, or
- (iii) delay timely attainment of any standard or a required interim emission reduction or other milestones in any area.

The NCTCOG is responsible for determining that area transportation projects conform to the current TIP and the Metropolitan Transportation Plan.

The General Conformity Rule refers to the requirements under Section 176(c) of the CAA for federal agencies [other than the FHWA and FTA] to show that their actions conform to the purpose of the applicable SIP. General conformity is required for all non-exempt federal projects within nonattainment areas if the project emissions are not covered by transportation conformity. Although the Project is consistent with the area's financially constrained and conforming MTP under FTA transportation conformity regulations, the FAA has requested that a General Conformity review of the portion of the project traversing DFW Airport property be conducted.

As described in *40 CFR 51 Revisions to the General Conformity Regulations* issued by the EPA, general conformity analysis evaluates both direct emissions, which occur at the same time and place as the Project (e.g. emissions from construction equipment building new railroad tracks), and indirect emissions, which are reasonably foreseeable emissions that may occur later in time and/or are farther removed from the Project (e.g. emissions from trains utilizing newly constructed tracks), in order to ensure that the project emissions conform with the SIP.



Once it has been determined by the FAA that a non-exempt project in a nonattainment area is subject to the requirements of general conformity, an applicability analysis of the Project's direct and indirect emissions is conducted. These emissions are totaled and compared to the *de minimis* levels established by the EPA. If the expected emissions fall below the *de minimis* threshold, then no further air quality analysis is needed and the preparation of a full general conformity determination is not required. The DFW area is currently classified as a moderate nonattainment area under the 2008 ozone standard, and the resulting *de minimis* level is 100 tons per year for VOC or NO₂.

Affected Environment

Air Basin

The DFW MSA represents the air basin or air quality control region and the Air Quality DFW Airport Study Area. The DFW MSA 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 lie in the upper margins of the Coastal Plain. The rolling hills in the area range from 500 to 800 feet in elevation (NWS, 2007).

According to the 2010 US Census, approximately 6.4 million residents live within the DFW MSA. The area is home to numerous industries, commercial areas, aviation activity, and a robust transportation system, all of which contribute to local air quality degradation. Air quality pollutant concentrations on any given day represent a combination of emissions from all of these sources.

Existing Air Quality and Meteorological Conditions

Outdoor air quality in a given location is described by the concentration of various pollutants in the atmosphere. Air quality is a function of several factors, including the quantity and dispersion rates of pollutants in the region, temperature, the presence or absence of inversions, and topographic features of the region.

The DFW Airport Study Area can be classified by two seasons, summer (April through October) and winter (November through March). The climate in the region is humid subtropical, with hot summers and prevailing winds generally from the south. Summers are accompanied by fair skies, westerly winds, and low humidity and winters are generally mild. Average monthly maximum temperatures for summer are 87 degrees Fahrenheit (°F) with the highest temperature averaging 95°F usually in July and August. Minimum temperatures during these months average 65°F. Average monthly maximum temperatures for the winter months are 61°F and the minimum temperatures average 23°F. Average annual normal precipitation is 35 inches (National Weather Service, 2017).

The TCEQ operates air monitoring stations in the Study Area. The air monitoring station location is shown in **Figure 6-2**.

The nine-county DFW metropolitan area was originally designated a serious nonattainment area under the 1997 8-hour ozone NAAQS. A nonattainment designation means that an area is not achieving federal air quality standards established by the EPA. The ozone nonattainment area included Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties. On March 27, 2008, the EPA lowered the primary and secondary eight-hour ozone NAAQS to 75 parts per billion (ppb). Wise County was added to the ozone nonattainment area, and the new ten-county DFW area was designated nonattainment and classified moderate under the 2008 eight-hour ozone NAAQS, effective July 20, 2012. The attainment deadline for the DFW Moderate Nonattainment Area is December 31, 2018. A final determination of ozone attainment status for an area is made by the EPA after a review of complete, quality assured air quality monitoring data over a three-year period using the methods shown in **Table 3-11**.

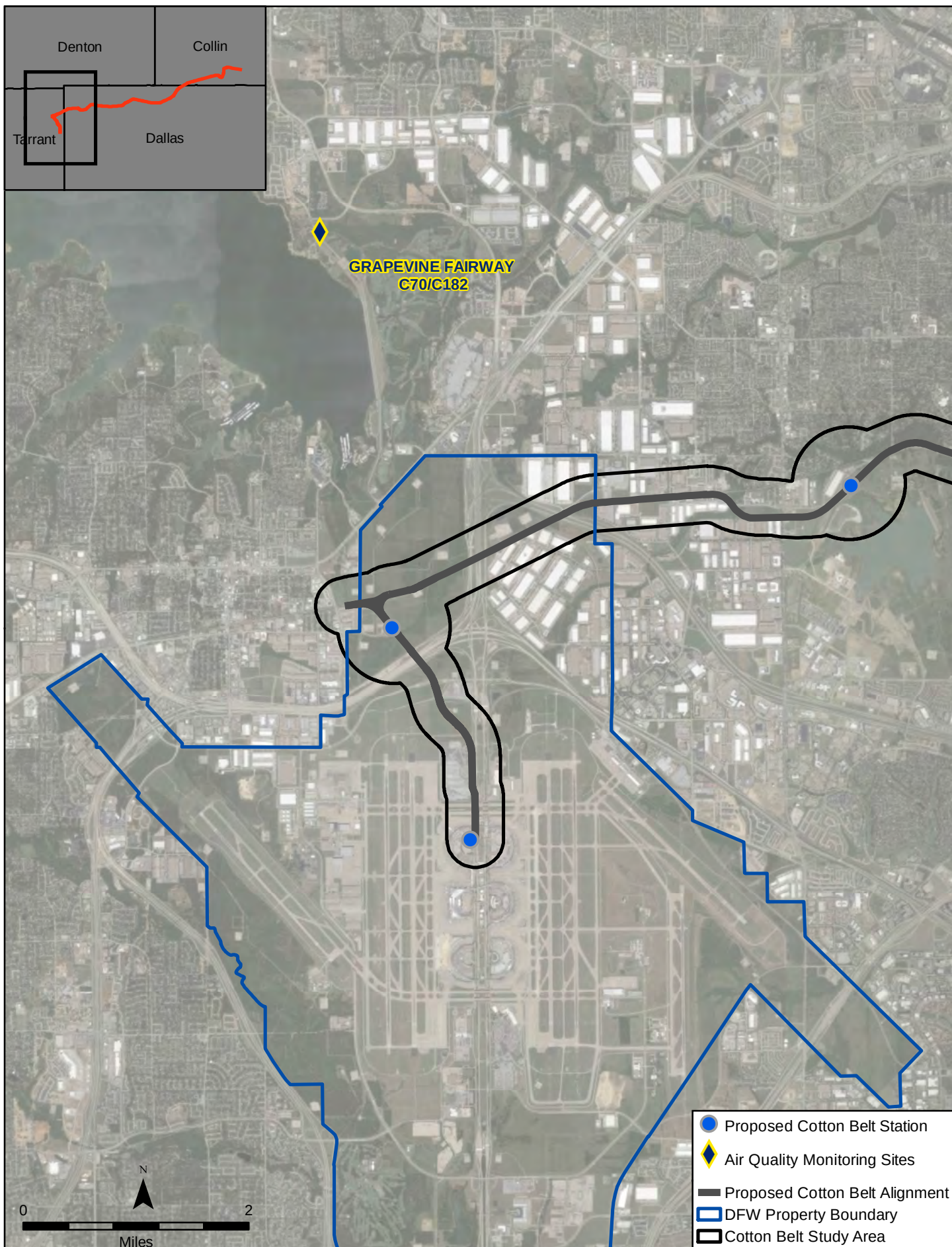


Figure 6-2
Air Monitoring Location Near DFW Airport
 Source: North Central Texas Council of Governments

Cotton Belt Corridor
Regional Rail Project
 Draft Environmental Impact Statement





Transportation currently contributes to only four of the criteria pollutants under the NAAQS including O₃, CO, NO_x, and PM₁₀. Other non-transportation related sources contribute to Pb and SO₂ pollution.

6.3.2.2 Biological Resources (Including fish, wildlife, and plants)

This section describes the existing natural vegetation types, ecoregion and biotic province areas found within the DFW Airport Study Area which is 0.25-mile from each side of the proposed right-of-way and 0.5-mile radius around the proposed station/platform footprints. The corridor-wide study area is discussed in **Section 3.15** and **Section 4.17**.

Regulatory Context and Methodology

Federal regulations and guidance require protection of species and minimization of adverse project effects. Certain biotic resources are protected under federal and state jurisdiction by the ESA and Texas statutes, respectively. The ESA not only prohibits the direct take of a protected species, but also includes a prohibition of indirect take such as destruction of designated critical habitat. Listed plant species are not protected from take, although it is illegal to collect or maliciously harm them on federal land.

In addition, FAA Advisory Circular 150/5200-33 Hazardous Wildlife Attractants on or near Public Use Airports, recommends that a wildlife management biologist review landscaping plans for airports to minimize attracting wildlife that could be hazardous to aircraft movement areas.

Affected Environment

Ecoregion and Biotic Province

The DFW Study Area contains two ecological subregions: The Northern Blackland Prairie and the Eastern Cross Timbers (LBJ et al, 1978).

Vegetation

A vegetation analysis was performed within the DFW Airport Study Area utilizing EMST GIS shapefiles to estimate vegetation areas and unique habitat types. The EMST data set provides an updated ecological system classification for Texas which includes more land cover classes than were previously identified for the State (TPWD, 2016). The spatial resolution of this data was developed by first classifying the existing vegetation, and then modeling the resulting ecological systems by overlaying data such as land position, slope, aspect, and soil type. The data was then clipped using the Study Area shapefile, and lists of specific area vegetation types were determined (**Table 6-1**). A calculation of the percent area and acres of each vegetation type was then developed to support the determination of possible significant vegetation area impacts within the Study Area.

The largest areas defined by the EMST criteria found within the DFW Airport Study Area include: Urban Low Intensity at 29.1 percent, Blackland Prairie: Disturbance or Tame Grassland at 21.9 percent, Urban High Intensity at 20.6 percent, and Native Invasive: Deciduous Woodland at 16.5 percent. These four vegetation types include approximately 88 percent of the Study Area and are described in detail below.

- The Urban Low Intensity vegetation type includes most of the area found within cities and towns. These areas are built-up but not entirely covered by impervious cover.



Table 6-1. EMST Vegetation Types Within the Study Area

Vegetation Type*	Acres	% of Study Area
Urban Low Intensity	576.07	29.09
Blackland Prairie: Disturbance or Tame Grassland	432.65	21.85
Urban High Intensity	406.99	20.55
Native Invasive: Deciduous Woodland	326.77	16.50
Central Texas: Floodplain Hardwood Forest	94.03	4.75
Crosstimbers: Post Oak Woodland	55.59	2.81
Crosstimbers: Savanna Grassland	25.76	1.30
Row Crops	22.47	1.13
Barren	16.37	0.83
Native Invasive: Mesquite Shrubland	13.99	0.71
Open Water*	6.38	0.32
Edwards Plateau: Live Oak Motte and Woodland	1.20	0.06
Central Texas: Riparian Hardwood Forest	1.17	0.06
Central Texas: Riparian Herbaceous Vegetation	0.78	0.04
Totals for Study Area	1,980.22	100.00

*Open water, which is not a vegetation type includes 6.4 acres or 10.32 % of the Study Area.

- Because little intact Blackland prairie remains, the existing grasslands are mapped as Blackland Prairie: Disturbance or Tame Grasslands. This vegetation type includes disturbance or tame grasslands that contain primarily non-native grasses such as *Cynodon Dactylon* (bermudagrass), and *Sorghum halepense* (Johnsongrass). In addition, weedy forbs such as *Ambrosia Psilostachya* (western ragweed), and trees including *Prosopis glandulosa* (honey mesquite) are often present and may occur in dense groupings. Native grasses important to this area include *Schizachyrium scoparium* (little bluestem), *Sorghastrum nutans* (Indiangrass), and *Aristida* spp. (threeawn species) among others.
- The Urban High Intensity areas are dominated by impervious cover and include built-up areas and wide transportation corridors.
- Native Invasive: Deciduous Woodland is a broadly defined vegetation type which may include *Celtis laevigata* (sugar hackberry), *Liquidambar styraciflua* (sweetgum) and *Prosopis glandulosa* (honey mesquite) among the dominant tree species. Other species which may be important in this area include *Quercus stellata* (post oak), and *Quercus fusiformis* (plateau live oak).

Four additional vegetation types each contain five percent or less of the Study Area, and the remaining five vegetation types each include less than one percent of the Study Area total. Open water was included in the above table to realize the listing of potential habitats within the Study Area, but it is not considered a vegetation type.

A review of current aerial photography of the DFW Airport Study Area revealed that although the majority of the area vegetation types as mapped by EMST have remained relatively stable, additional urban development has occurred northeast of the intersection of SH 114 and SH 121. Urban areas within the Study Area typically include a mix of landscaped species and introduced opportunistic species which are considered to be indicative of highly disturbed habitat. These areas are most prevalent within the southern and northeastern portions of the Study Area. The portions of the Study Area located immediately north of the DFW Airport operations area and



northeast of the intersection of SH 114 and SH 121 include the majority of the pasture and woodland areas. Pasture areas provide important cover and food sources for birds and small mammals, especially when located near highly urbanized areas. Woodland areas are primarily found near riparian or floodplain areas in the northwest and northeast portions of the Study Area. These are smaller areas which are generally vegetated with native species, which typically support a diverse community of faunas. **Figure 6-3** displays the EMST cover types found within the DFW Airport Study Area.

A review of TPWD and USFWS lists of threatened and endangered species for Tarrant County, Dallas County, and TPWD's Texas Natural Diversity Database (TXNDD) Element of Occurrence (EOC) records for rare resources identified within ten miles of the Study Area was conducted to determine the likelihood for threatened, endangered, candidate, and rare species, or their habitat to exist within or near the Study Area. None of the rare resources were identified within the DFW Airport Study Area.

Approximately 49 species of mammals, 57 species of reptiles, and 23 species of amphibians occur in the Texan Biotic Province (Blair, 1950). In addition, approximately 471 avian species, including both residents and migrants, have been reported in the Oaks and Prairies and Osage Plains of Texas (Freeman, 2003) which is roughly analogous to the Texan Biotic Province.

The DFW Airport Study Area is mostly urban and suburban in nature. The majority of wildlife species inhabiting the Study Area would be anticipated to be those which are generally associated with these types of vegetation. The *Cotton Belt Corridor Biological Resources Existing Conditions Technical Memorandum* is located in **Appendix B**.

Threatened and Endangered Species

The Endangered Species Act of 1972, as amended, provides protection for federally-listed species and their habitats. Texas state law includes provisions which prohibit direct harm to state-listed species. USFWS' endangered species list for Tarrant, Dallas, and Collin counties and TPWD's Annotated County List of Rare Species for Tarrant, Dallas, and Collin counties were examined along with Study Area information to determine whether the project is likely to have an effect on listed species or their habitats. In addition, TPWD's TXNDD was reviewed to determine previously recorded occurrences of any of the listed species within or near the Study Area.

Six federally-listed endangered species, two federally-listed threatened species, six state-listed endangered species, 14 state-listed threatened species, and 20 state species of concern (which are tracked by TPWD for monitoring purposes, but do not currently receive regulatory protection) are listed as having potential to occur in Tarrant, Dallas, or Collin counties (TPWD, 2017b; USFWS, 2017a). **Table 6-2** contains a listing of all of these species and a determination of whether habitat exists within the Study Area.

None of the species listed were observed during project field visits; however, potential habitat was identified for nine state-listed threatened or endangered species, and two state species of concern as included in **Table 6-2**. No designated critical habitat or preferred habitat for any federally-listed species was identified on DFW Airport property, or within or near the Study Area.

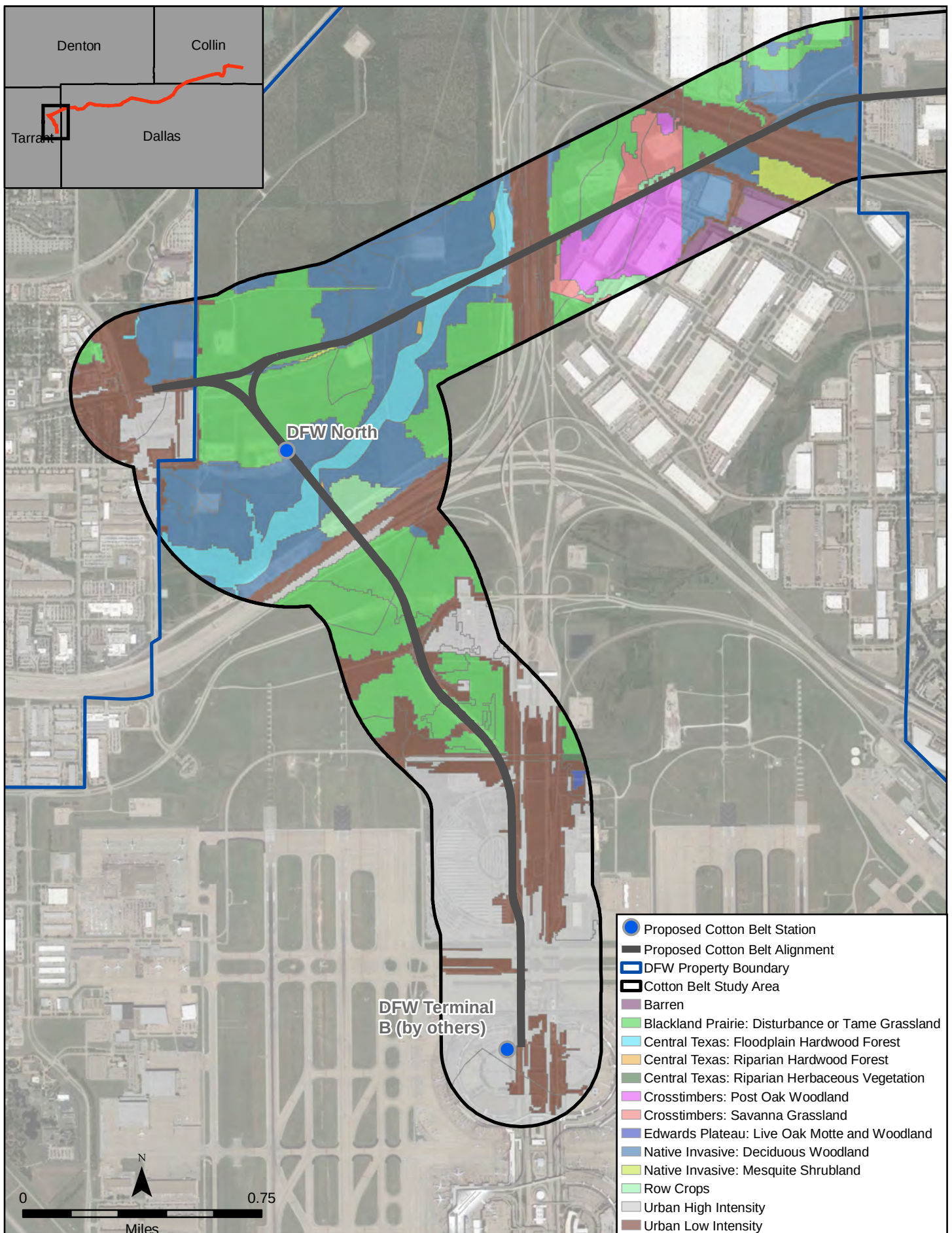


Figure 6-3

EMST Vegetation Types Found within the DFW Airport Study Area
Data Source: TPWD EMST 2016

**Cotton Belt Corridor
Regional Rail Project**

Draft Environmental Impact Statement





Table 6-2: Rare, Threatened, & Endangered Species of Potential Occurrence in Tarrant, Dallas, and Collin Counties, Texas

Common Name	Scientific Name	Federal Status	State Status	Potential Habitat Present
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	DL	T	No
Arctic Peregrine Falcon	<i>Falco peregrinus tundrius</i>	DL	SOC	No
Bald Eagle	<i>Haliaeetus leucocephalus</i>	DL	T	Yes
Black-capped Vireo	<i>Vireo atricapilla</i>	LE	E	No
Golden-cheeked Warbler	<i>Setophaga chrysoparia</i>	LE	E	Yes
Henslow's Sparrow	<i>Ammodramus henslowii</i>	NL	SOC	No
Interior Least Tern	<i>Sterna antillarum athalassos</i>	LE	E	No
Peregrine Falcon	<i>Falco peregrinus</i>	DL	T	No
Piping Plover	<i>Charadrius melodus</i>	LT	T	No
Red Knot	<i>Calidris canutus rufa</i>	LT	SOC	No
Sprague's Pipit	<i>Anthus spragueii</i>	NL	SOC	No
Western Burrowing Owl	<i>Athene cunicularia hypugaea</i>	NL	SOC	No
White-faced Ibis	<i>Plegadis chihi</i>	NL	T	Yes
Whooping Crane	<i>Grus americana</i>	LE	E	No
Wood Stork	<i>Mycteria americana</i>	NL	T	Yes
Shovelnose sturgeon	<i>Scaphirhynchus platyrhynchus</i>	NL	T	No
Black Lordithon rove beetle	<i>Lordithon niger</i>	NL	SOC	No
Cave myotis bat	<i>Myotis velifer</i>	NL	SOC	No
Gray wolf	<i>Canis lupus</i>	LE	E	No
Plains spotted skunk	<i>Spilogale putorius interrupta</i>	NL	SOC	Yes
Red wolf	<i>Canis rufus</i>	LE	E	No
Louisiana pigtoe	<i>Pleurobema riddellii</i>	NL	T	Yes
Sandbank pocketbook	<i>Lampsilis satura</i>	NL	T	Yes
Texas heelsplitter	<i>Potamilus amphichaenus</i>	NL	T	Yes
Texas pigtoe	<i>Fusconaia askewi</i>	NL	T	Yes
Auriculate false foxglove	<i>Agalinis auriculata</i>	NL	SOC	No
Glass Mountains coral-root	<i>Hexalectris nitida</i>	NL	SOC	No
Glen Rose yucca	<i>Yucca necopina</i>	NL	SOC	No
Hall's prairie clover	<i>Dalea hallii</i>	NL	SOC	No
Osage Plains false foxglove	<i>Agalinis densiflora</i>	NL	SOC	No
Plateau milkvine	<i>Matelea edwardsensis</i>	NL	SOC	No
Reverchon's curfpea	<i>Pedimelum reverchonii</i>	NL	SOC	No
Texas milk vetch	<i>Astragalus reflexus</i>	NL	SOC	No
Topeka purple-coneflower	<i>Echinacea atrorubens</i>	NL	SOC	No
Tree dodder	<i>Cuscuta exaltata</i>	NL	SOC	No
Warnock's coral-root	<i>Hexalectris warnockii</i>	NL	SOC	No
Alligator snapping turtle	<i>Macrochelys temminckii</i>	NL	T	Yes
Texas garter snake	<i>Thamnophis sirtalis annectens</i>	NL	SOC	Yes
Texas horned lizard	<i>Phrynosoma cornutum</i>	NL	T	No
Timber rattlesnake	<i>Crotalus horridus</i>	NL	T	Yes

Key: LE = Federally Endangered; DL = Delisted; LT = Federally Threatened; SOC = Species of concern; NL = Not Federally Listed; E = State Endangered, T = State Threatened; SOC = State Species of concern

Source: TPWD, 2017b; USFWS, 2017a

6.3.2.3 Climate

Energy from the sun drives the Earth's weather and climate by heating the Earth's surface; in turn, the Earth radiates energy back into space. Atmospheric greenhouse gases (GHGs),



including water vapor, CO₂, and other gases, trap some of the outgoing energy by retaining heat somewhat like the glass panels of a greenhouse. This warming of the Earth is called the “greenhouse gas effect” (USDOT, 2016). Without this natural greenhouse effect, temperatures would be much lower than they are now, and life as it is known today would not be possible.

Many GHGs occur naturally and remain in the atmosphere for periods ranging from decades to centuries. Water vapor is the most abundant GHG and makes up approximately two thirds of the natural greenhouse effect. CO₂ occurs naturally, as well as through human activities such as fossil fuel combustion.

In its history, the Earth has gone through many natural changes in climate. Because the atmospheric concentration of GHGs continues to climb in recent history, our planet may experience global climate change-related phenomena. For example, warmer global temperatures may cause changes in precipitation, sea levels, storm frequency and intensity, and could contribute to increased drought and forest fires.

To date, no national standards have been established regarding GHGs, nor has the EPA established criteria or thresholds for ambient GHG emissions pursuant to its authority to establish motor vehicle emission standards for CO₂ under the CAA. However, there is a considerable body of scientific literature addressing the sources of GHG emissions and their impacts on climate, including reports from the Intergovernmental Panel on Climate Change (IPCC), the National Academy of Sciences, EPA, and other federal agencies.

Given their characteristic rapid dispersion into the global atmosphere, GHGs are different from other air pollutants evaluated in federal environmental reviews, because the impacts are not localized or regional. The Resource Study Area for CO₂ and other GHG emissions is the entire planet. In addition, from a quantitative perspective, and in terms of both absolute numbers and types, global climate change is the cumulative result of numerous and varied natural and anthropogenic emissions sources. Each source makes a relatively small addition to global atmospheric GHG concentrations. In contrast to broad-scale actions such as those involving an entire industry sector or very large geographic areas, it is difficult to isolate and understand the GHG emissions impacts for a particular transportation project. Presently, there is no scientific methodology for attributing specific climatological changes to a particular transportation project’s emissions.

The transportation sector is the second-largest source of total GHG emissions in the US behind electricity generation. The transportation sector was responsible for approximately 27 percent of all anthropogenic GHG emissions in the US in 2009 (EPA, 2016b). The majority of transportation sector GHG emissions result from fossil fuel combustion. CO₂ is the largest component of these GHG emissions. CO₂ emissions from the U.S.’ consumption of energy accounted for about 18 percent of the worldwide energy consumption-related CO₂ emissions in 2009 (EIA, 2016). CO₂ emissions from the U.S.’ transportation sector accounted for about 6 percent of worldwide CO₂ emissions in 2009 (EIA, 2011).

While the contribution of GHGs from transportation in the U.S., as a whole, is a large component of US GHG emissions, the GHG contributions become quite small as the scale of analysis is reduced down to an individual transportation project.

6.3.2.4 Coastal Resources

No coastal barriers are located within the Study Area which is located inland and over 250 miles from the coast (Texas General Land Office, 2012).



6.3.2.5 Section 4(f) and 6(f)

No publicly owned parks or recreational areas, National Wildlife Refuges (NWRs), wildlife refuges, and waterfowl refuge lands exist in the DFW Airport Study Area. FTA, in coordination with the SHPO, determined that no historic sites of national, state, or local significance are located in the DFW Airport Study Area. Refer to **Appendix B** for the Section 4(f) Evaluation.

6.3.2.6 Farmlands

No farmlands are located within the DFW Airport Study Area, which is located within the DFW Metroplex, a dense urban development. There are six prime farmland soil types located within the DFW Airport Study Area; however, there are no active farms on DFW Airport property.

6.3.2.7 Hazardous Materials, Solid Waste, and Pollution Prevention

This section analyzes potential contaminant sources that may be present within the Study Area. It assesses the potential of encountering hazardous waste and impacted soil and/or groundwater during project construction activities, as well as the project's potential use of hazardous materials and its potential impact to the environment.

Regulatory Context

The primary federal laws regulating hazardous waste and materials are RCRA and CERCLA. The NPL is a listing of the most polluted sites in the nation that are eligible for cleanup funding (Superfund) under CERCLA. The EPA is the primary agency responsible for administering RCRA and CERCLA.

Affected Environment

A screening of hazardous materials issues associated with the DFW Airport Study Area was conducted by reviewing available regulatory agency databases and topographic maps (see **Figure 6-4**). One site that was determined to be a high-risk site is the former location of Budget Rent-A-Car. According to the EDR database report (EDR, 2017b), the address of the site was 5305 DFW Airport North, DFW Airport, and is listed in the Leaking Petroleum Storage Tanks (LPST) and Underground Storage Tanks (UST) database. According to the database report, the LPST resulted in soil contamination and did not require a remedial action plan. Final concurrence has been issued and the case is closed. This facility is also listed as inactive in the UST database.

DFW Terminal B Station: This proposed station would be located on the north side of Terminal B at DFW Airport. This area was not visited during site reconnaissance. Based on the EDR regulatory database search, one hazardous material site of indeterminate risks was located within 0.25 mile of the DFW Terminal B Station site. DFW Airport has initiated construction activities at this station as part of the TEXRail Project.

DFW North Station: This proposed station would be located north of SH 114, west of SH 121, and east of Texan Trail Road. At the time of the site reconnaissance, the station location was not accessible due to construction; however, the site was viewed from nearby roadways. Based on the EDR regulatory database search, no hazardous material sites with potential risk was found within 0.25 mile of this site. Additionally, the TEXRail Project did not identify any hazardous materials issues in the DFW North Station area.

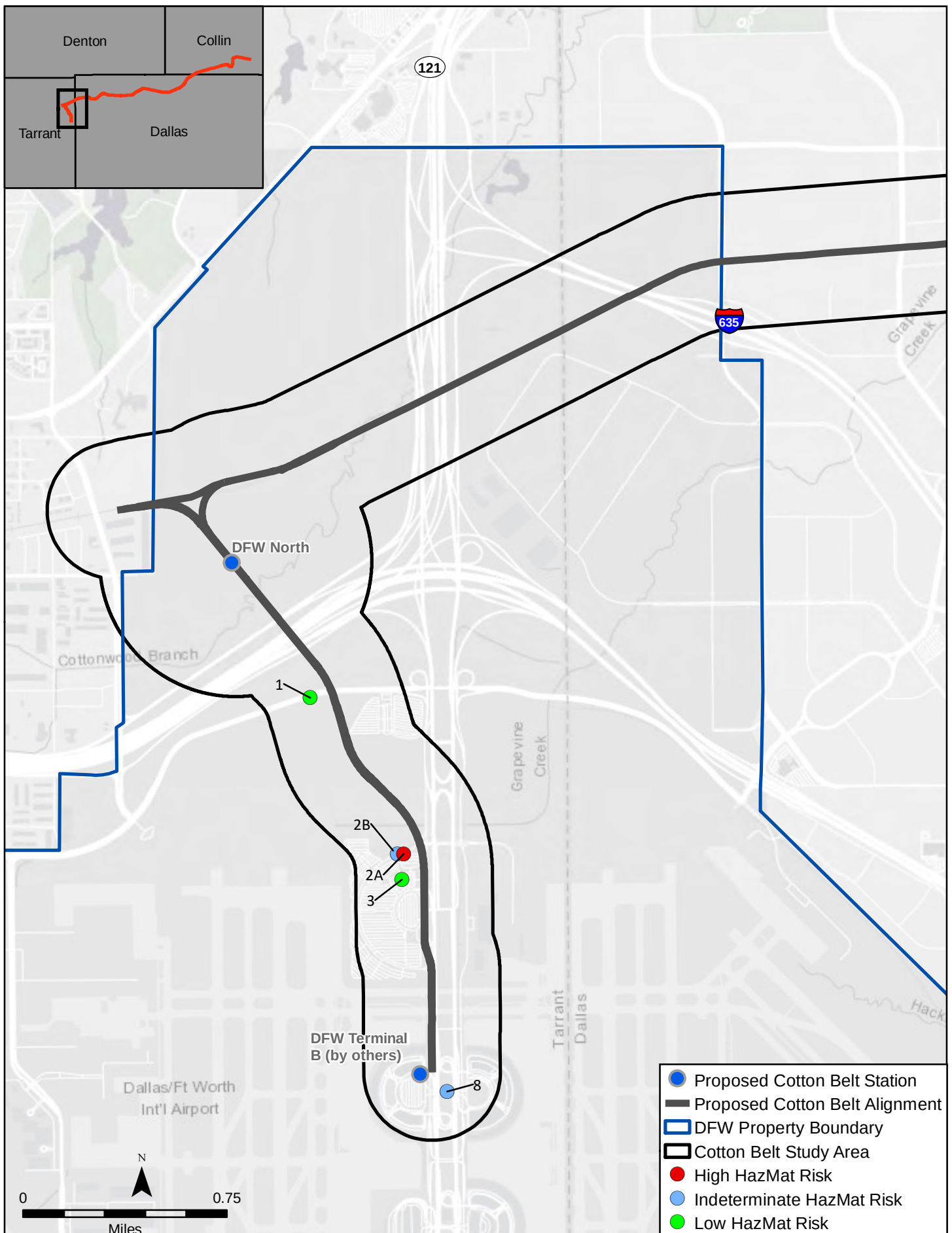


Figure 6-4
Hazardous Material Database Inventory
on DFW Airport
 Data Source: EDR, 2017



The remaining sites with locations that could be determined were all considered low risk sites.

As previously stated, the rail alignment on DFW Airport property, south of the DFW North Station would be constructed adjacent to TEXRail track within the previously approved project corridor. DART would construct a second track within this corridor. The TEXRail Project is being constructed in advance of the Cotton Belt Project. The corridor is being disturbed by construction activity at the location of the high-risk site and at bridges, culverts, underpasses and at-grade crossings along this shared portion of the corridor. DFW Airport will be constructing the Terminal B Station. The Cotton Belt Project would share this infrastructure with TEXRail.

The *Cotton Belt Corridor Hazardous Materials Existing Conditions Technical Memorandum* is located in **Appendix B**.

6.3.2.8 Historic and Archeological Resources

The Project is subject to compliance with the NHPA of 1966, as amended (16 USC 470 et seq.) and its implementing regulations (36 CFR 800). Specifically, Section 106 of the NHPA requires that the responsible federal agency consider the effects of its actions on historic properties, which are properties listed in or determined eligible for listing in the NRHP, and provide the ACHP an opportunity to comment on the undertaking.

Methodology

Per Section 106 requirements, the lead federal agency, in consultation with the SHPO, develops the APE, identifies historic properties (i.e., NRHP-listed and NRHP-eligible properties) in the APE, and makes determinations of the Project's effects on historic properties in the APE. Section 106 regulations require that the lead Federal agency consult with the SHPO and identified parties with an interest in historic resources during planning and development of the Project. The ACHP may participate in the consultation or may leave such involvement to the SHPO and other consulting parties. ACHP, if participating, and SHPO are provided an opportunity to comment on the Project and its effects on historic properties. They participate in development of a MOA or Programmatic Agreement (PA) to avoid, minimize, or mitigate adverse effects, as applicable.

Stipulations in a MOA or PA must be implemented. If a National Historic Landmark (NHL) is located within the APE and would be adversely affected by the project, the federal agency must also comply with Section 110(f) of the NHPA. Section 110(f) requires that the agency undertake, to the maximum extent possible, planning and actions to minimize harm to any adversely affected NHL and afford the ACHP an opportunity to comment. The ACHP regulations require that the NPS, an agency of the DOI, be notified and invited to participate in the consultation involving NHLs.

Area of Potential Effects

FTA, in consultation with the SHPO, determined the APE for identification of built resources. The SHPO concurred with the APE in February 2017. The APE is 175 feet from the centerline of the existing or new alignment.

Historic Resources

A review of the Texas Historical Sites Atlas (Atlas) shows no previously-recorded resources of historic-age, no NRHP-eligible or listed properties, no Recorded Texas Historic Landmarks (RTHL), or any historic markers within the DFW Airport Proposed Action's APE.

A reconnaissance survey for the Study Area was conducted to record all historic-age resources within the project APE. The surveys were completed during two field sessions – July 2010 and



May 2017. No historic-age resources were identified on DFW Airport property within the DFW Airport Proposed Action's APE. The *Cotton Belt Historic-Age Resource Reconnaissance Survey* is located in **Appendix B**.

Archeological Resources

The GPC6 archeologists consulted the Atlas to identify previous surveys and previously-recorded cultural resources. According to the Atlas, 45 previous surveys have been conducted within one kilometer (0.62 mile) of the Study Area. None of the surveys were located within the APE and none documented any sites within the survey areas.

The proposed corridor from Terminal B to the junction within the existing Cotton Belt Corridor north of SH 114 was previously surveyed (Hartsfield et al, 2013). The DFW North Terminal, which will be shared with TEXRail, is included in the previously surveyed section and was therefore not surveyed as part of this Project. However, a small amount of proposed new right-of-way was located north and south of the existing railway north of the station, in which 17 shovel tests were excavated. None of these tests were positive, encountering only compact black clays. No archeological resources were identified within the APE. The *Cotton Belt Archeological Survey* is located in **Appendix B**.

6.3.2.9 Land Use

In the DFW Airport Study Area, the majority of the Project is located on existing railroad right-of-way with freight activity or new regional rail right-of-way that will be occupied by the TEXRail Project that has previously received environmental clearance. Most of the land surrounding the Project is currently undeveloped or vacant. Within the DFW Airport Study Area, land uses were identified by NCTCOG in 2015 as approximately 54 percent vacant, 20 percent runways, 14 percent industrial, and 11 percent airport. The remaining approximately one percent of the DFW Study Area is composed of commercial, railroad, hotel/motel, ranchland, utilities, and small water bodies, as illustrated in **Figure 6-5**.

There are also existing natural gas gathering systems on DFW Airport. There are no plans to expand these based on current lease agreements, as shown in **Figure 6-6**. According to the 2014 *DFW Airport Land Use Plan*, the Project corridor is committed for use as a transportation corridor, as presented in **Appendix C**. Commercial office/corporate spaces would be located south, adjacent to the Project corridor. East and southeast of the Project corridor's east-central zone, surrounding land use is designated for airport support facilities. The remaining area is designated as open space or is undevelopable.

6.3.2.10 Natural Resources and Energy Supply

Regulatory Context and Methodology

EO 13123, "Greening the Government through Efficient Energy Management" (64 Federal Register 30851, June 8, 1999), encourages each federal agency to expand the use of renewable energy within its facilities and in its activities. EO 13123 also requires each federal agency to reduce petroleum use, total energy use and associated air emissions, and water consumption in its facilities. EO 13514 "Federal Leadership in Environmental, Energy, and Economic Performance" (74 Federal Register 52117, October 8, 2009) requires agencies to coordinate with regional ecosystem, watershed, and environmental management programs.

The FAA has not established a significance threshold for Natural Resources and Energy Supply.

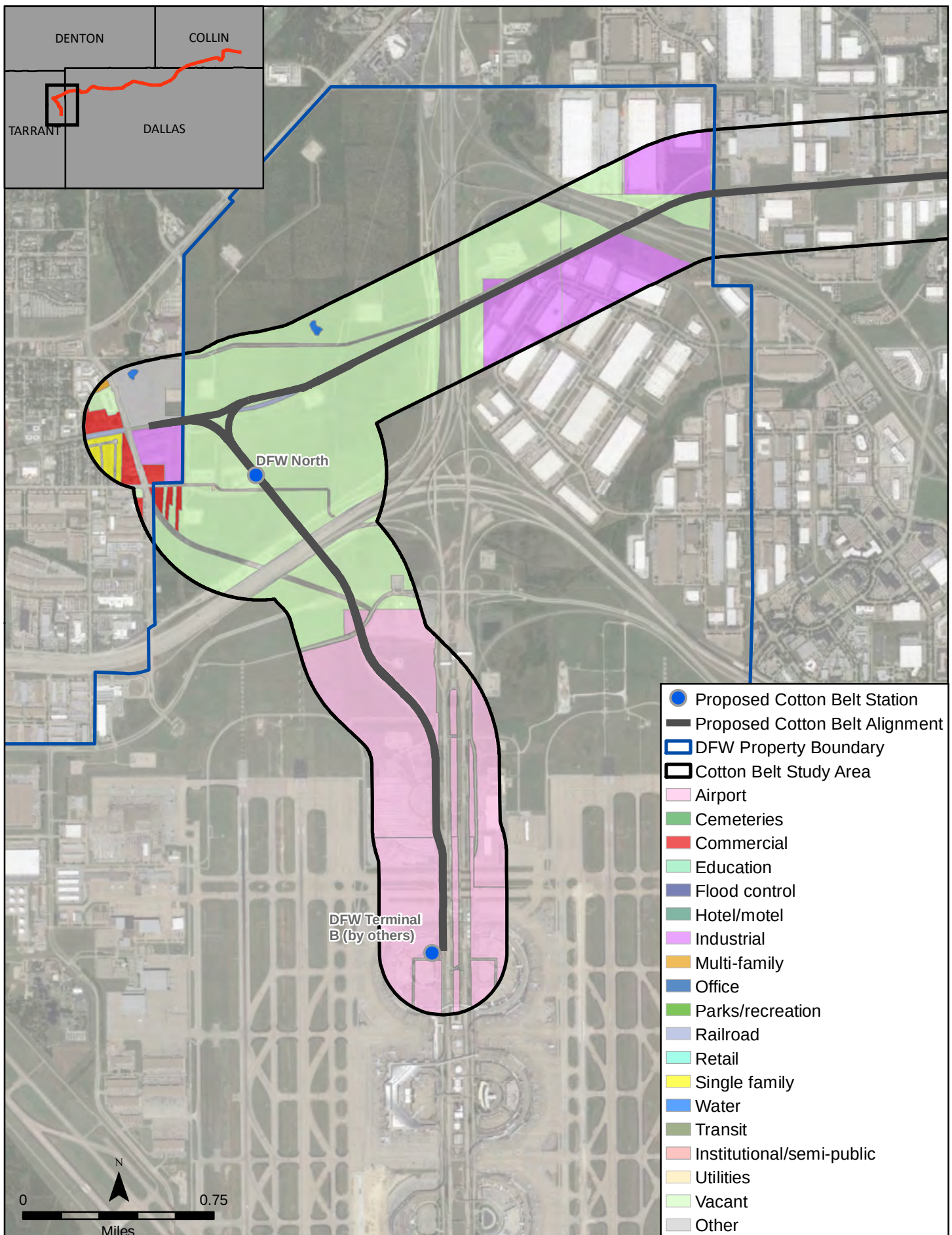


Figure 6-5
Land Use Within DFW Airport Study Area
 Data Source: North Central Texas Council of Governments, 2015 Draft Environmental Impact Statement

Cotton Belt Corridor
Regional Rail Project

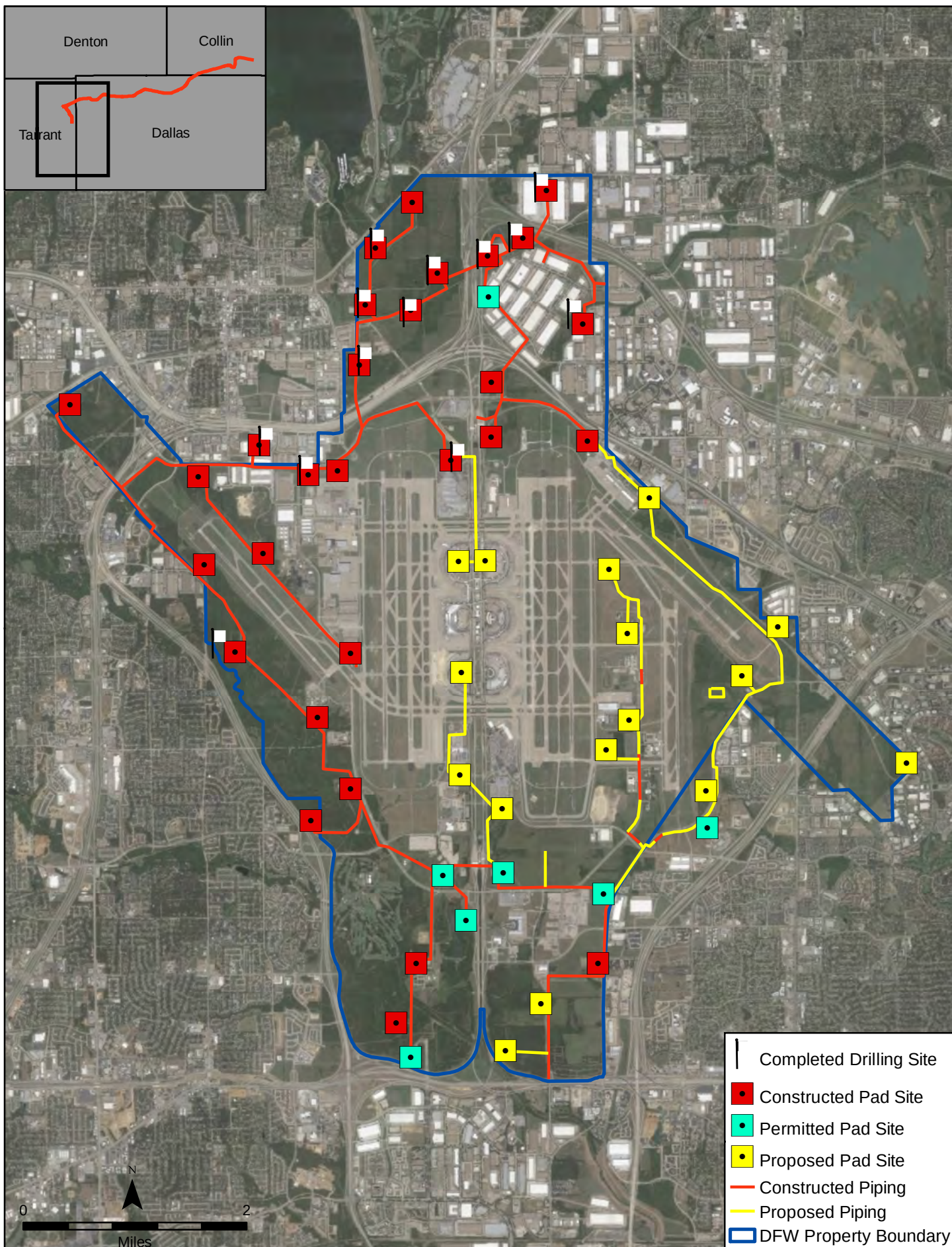


Figure 6-6
Natural Gas System at DFW Airport



Affected Environment

The suppliers of energy resources found in the DFW Airport Study Area include local utility service providers and DFW Airport water utilities, sewage disposal utilities, and suppliers of natural gas and petroleum.

6.3.2.11 Noise and Vibration-Compatible Land Use

Regulatory Context and Methodology

Noise Methodology

The objective is to assess the potential noise impacts of commuter rail operations with trains consisting of diesel motorized unit (DMU) vehicles at community locations along the Cotton Belt Study Area. Potential noise impacts for the proposed action are discussed in the following sections. The methodology used to assess the potential for noise or vibration impacts within the Study Area on DFW Airport property is in accordance with the provisions set forth in **Appendix B** of FAA Order 1050.1F.

Vibration Methodology

The FTA has developed ground-borne vibration impact criteria based on land use and train frequency data that was used to determine potential vibration impacts along the DFW Airport Proposed Action alignment.

The potential effects of ground-borne vibration on navigation aids and other airport structures at DFW Airport are discussed in the following sections.

Affected Environment

Noise

The existing noise levels within DFW Airport property are dominated by aircraft operations and airport roadway traffic. There are no noise-sensitive receptors along this section of the Cotton Belt Corridor. Since there are no noise sensitive uses on DFW property and no change in aviation forecasts associated with the DFW Airport Proposed Action, no noise measurements were conducted in this area.

Vibration

The existing vibration levels within DFW Airport property are dominated by aircraft operations and other airport-related ground activities. FAA has identified the existing Area Surveillance Radar (ASR)-9 facility located approximately 400 feet from the TEXRail and DFW Airport Proposed Action alignment as a potential vibration impact site. Due to the sensitivity of equipment located at the ASR site, the ASR installation has been added as a vibration-sensitive receptor. No other vibration sensitive sites were identified adjacent to the Proposed Action.

During the TEXRail assessment, potential vibration impacts at the ASR-9 radar facility were analyzed based on vehicle technology, number of train cars, and projected train speeds in the vicinity of the ASR facility.

6.3.2.12 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Regulatory Context and Methodology

Section 1508.27(b) of the CEQ Regulations Implementing NEPA requires federal agencies to consider a proposed action's impact significance by considering the impact's intensity and context. Section 1508.8 addresses indirect impacts (effects) which are caused by the action and



are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induce changes in the pattern of land use, population density or growth rate, and related effects on air and water.

The FAA Desk Reference requires an evaluation of how a proposed action would affect communities by the following factors:

- Shifts in patterns of population movement and growth;
- Public service demands;
- Changes in business and economic activities; or
- Other factors identified by the public.

Affected Environment

No residences or businesses are located on DFW Airport property other than businesses associated with DFW Airport that are located within the terminal areas and outside of the Study Area.

6.3.2.13 Visual Effects

Regulatory Context and Methodology

NEPA states the need to “assure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings. The FAA Desk Reference states that visual effects deal broadly with the extent to which the proposed action or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment.

The FAA has not established a significance threshold for visual effects in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for visual effects. These factors include:

- The potential to create annoyance or interfere with normal activities
- The potential to affect the visual character of the area
- The potential to contrast with the visual resources in the Study Area
- The potential to block or obstruct the views of visual resources

Affected Environment

In the DFW Airport Study Area, the majority of the Project is located on existing railroad right-of-way with freight activity or new regional rail right-of-way that will be occupied by the TEXRail Project that has previously received environmental clearance. The DFW North station platforms would be located adjacent to the TEXRail Station. Outside the rail alignment physical characteristics of the area include open space, trees, transportation facilities, vacant land, and structures and development associated with DFW Airport. Highway transportation infrastructure at the SH 114/121 interchange is immediately north of DFW Airport. The interchange includes elevated ramps and lanes. Primary viewers in this inventory unit would be motorists along SH 114 and SH 121 and employees and patrons of DFW Airport.

6.3.2.14 Water Resources

Regulatory Context and Methodology

The USACE, under Section 404 of the CWA (33 USC 1344), regulates the discharge of dredged and fill material into waters of the U.S., including wetlands, defined under 33 CFR Section 328.3. The USACE authorizes general activities with minimal impacts by issuing Nationwide



Permits (NWP). Under the Fish and Wildlife Coordination Act, federal actions require consultation with the USFWS.

In accordance with Section 404 of the CWA, existing waters of the U.S., including wetlands, along the DFW Airport Study Area were evaluated. The field reconnaissance first occurred during the growing season when plants were easily identifiable, in March and August 2012, and then again in May 2017, and included wetland delineations (using the *USACE 1987 Wetlands Delineation Manual* in addition to the *USACE Regional Supplement 2010 Great Plains Region Version 2.0*). These USACE guidance manuals utilize a set of primary metrics for preliminary determinations of jurisdictional water bodies including wetlands.

Jurisdictional water bodies are determined by the presence of an OHWM and connectivity to another jurisdictional water body. USACE defines waters of the US as displaying an OHWM and defined bed and bank. Wetlands are also regulated by the USACE under Section 404 as defined by waters of the U.S., but must meet different criteria than having an OHWM and defined bed and bank. To be classified as a jurisdictional wetland, a site must be delineated using the USACE methodology, which typically requires that each of three parameters be present at a site (hydrophilic vegetation, wetland hydrology, and hydric soils) and must show connectivity to other jurisdictional waters (e.g., a perennial stream).

Wetlands are highly productive, biologically diverse systems, which provide floodwater attenuation, groundwater recharge, nutrient cycling, filtering of sediments and toxins from surface water, and maintenance of plant and animal communities. From a regulatory standpoint, wetlands are those areas inundated or saturated by surface water 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.

Non-jurisdictional wetlands are not regulated by the USACE and can include isolated wetlands or areas that may briefly retain water only during stormwater runoff events and not long enough to support wetland plant species or hydric soils. Non-jurisdictional wetlands reviews were included during the field reconnaissance. This methodology is in accordance FAA Order 1050.1F, Executive Order 11990, US DOT Order 5660.1A, and Section 404 of the CWA.

Affected Environment

The Study Area is located within the Trinity River Basin, in a part of the state that receives an average of 30 to 35 inches of rainfall a year (TPWD, 2006). Surface water flow across the Study Area is generally to the southeast.

The DFW Airport Study Area lies within the Cottonwood Branch and Grapevine Creek watersheds, situated within the Trinity River Basin (USGS, 2012). According to TCEQ, the DFW Airport Proposed Action would cross Cottonwood Branch (Segment 0822A), which flows into Denton Creek (Segment 0825). Grapevine Creek (Segment 0822B) also crosses the alignment and flows into Elm Fork of the Trinity River (Segment 0822).

Neither Cottonwood Branch nor Grapevine Creek are included in the 2014 Texas Integrated Report

(https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_303d.pdf), which contains the Texas 303(d) List of Category 5 water bodies. However, the *Texas Integrated Report Index of Water Quality Impairments*, identifies both Category 4 and Category 5 water bodies with one or more impairments.

(https://www.tceq.texas.gov/assets/public/waterquality/swqm/assess/14txir/2014_303d.pdf).

These segments are classified as Category 4a which means that all TMDLs have been completed and approved by EPA. Bacteria TMDLs for Cottonwood Branch and Grapevine Creek were approved by the EPA on May 30, 2012. Completion of an approved implementation



plan for these segments occurred on December 11, 2013. In addition, a TMDL project for PCBs in fish tissue for four segments of the Trinity River including Cottonwood Branch was completed in 2008. The most recent consumption advisory for the area, ADV-43 released in 2010, added the pollutant dioxin and extended the area of the consumption advisory to areas of Clear Fork Trinity River and West Fork Trinity River (https://www.tceq.texas.gov/waterquality/tmdl/77-trinity_pcb.html).

The May and June 2017 field surveys and delineations within DFW Airport property resulted in the identification of three crossings at two streams and no non-jurisdictional or jurisdictional wetlands as outlined in **Table 6-3** and depicted on **Figure 6-7**. The two streams were delineated as waters of the US for having a defined bed and bank, an OHWM, and having a significant nexus to the Elm Fork of the Trinity River.

Table 6-3. Streams/Drainages in the DFW Airport Study Area

Crossing ID	Name	Type	Description
S-1a	Grapevine Creek	Perennial	The headwaters of Grapevine Creek; the stream has been channelized and concreted.
S-2a and S-2b	Cottonwood Branch	Perennial	A small stream draining bottomland within abandoned farm/ranch land. A riparian corridor along stream banks with low sloped floodplains.
S-3	Unnamed tributary to Cottonwood	Ephemeral Stream	An ephemeral stream draining bottomland adjacent to highway.

Source: FEMA, 2012; GPC6, 2017

FEMA has regulations governing alterations or development within floodplains shown on Flood Insurance Rate Maps (FIRM). Under FEMA regulations, no alterations of flood zones can result in an increase in the 100-year base flood elevation or cause an increase in the velocity of floodwaters. In addition, DFW Airport is responsible for issuance of construction permits on airport property.

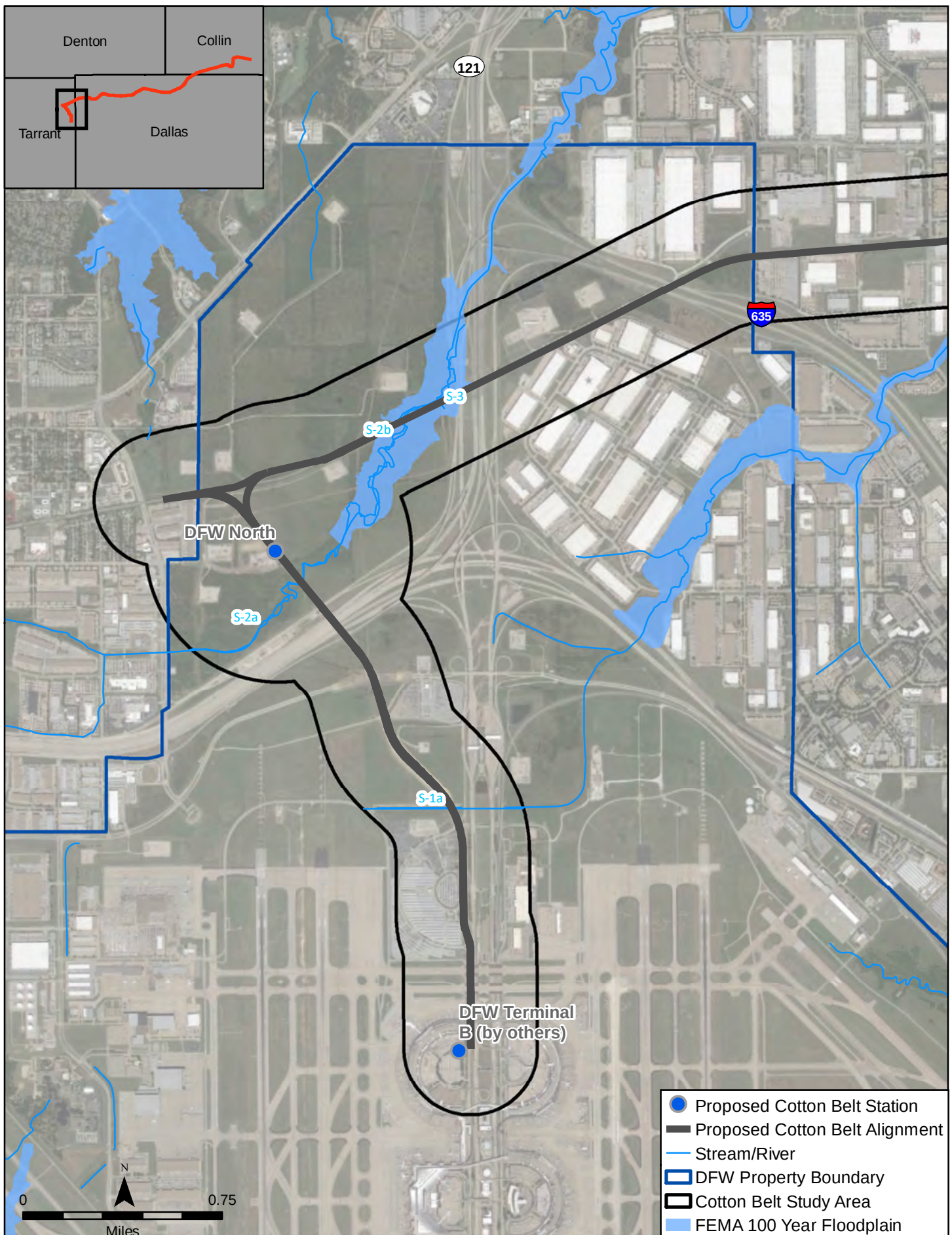
In compliance with FAA Order 1050.1F and DOT Order 5650.2, all FAA actions must avoid floodplains if a practicable alternative exists. If no practicable alternative exists, actions in a floodplain must be designed to minimize adverse impacts to the floodplain's natural and beneficial values. If the proposed action or alternative(s) involves a *significant encroachment* in a floodplain, the FAA should issue a written *finding* that the proposed significant encroachment is the only practicable alternative. As defined in DOT Order 5650.2, significant encroachment is an encroachment in a floodplain that results in one or more of the following construction or flood-related impacts: 1) considerable probability of loss of human life, 2) likely future damage associated with the encroachment that could be substantial in cost or extent, including interruption of service on or loss of a vital transportation facility, and 3) a notable adverse impact on "natural and beneficial floodplain values."

Wetlands

No wetlands are located within the area affected by the proposed action.

Floodplains

According to the floodplain maps, the DFW Airport Study Area includes approximately 1,300 linear feet of the Cottonwood Branch floodplain (see **Figure 6-7**).



- Proposed Cotton Belt Station
- Proposed Cotton Belt Alignment
- Stream/River
- DFW Property Boundary
- Cotton Belt Study Area
- FEMA 100 Year Floodplain



Figure 6-7
Waters of the US within DFW Airport Study Area
 Data Source: FEMA, 2012



Surface Waters

The DFW Airport Study Area lies within the Cottonwood Branch and Grapevine Creek watersheds that are within the Trinity River Basin (USGS, 2012). According to TCEQ, the DFW Airport Proposed Action would cross Cottonwood Branch (0822A), which flows into Denton Creek (Segment 0825). Grapevine Creek (Segment 0822B) also crosses the alignment and flows into Elm Fork of the Trinity River (Segment 0822).

Bacteria total maximum daily loads (TMDLs) for Cottonwood Branch (0822A) and Grapevine Creek (0822B) were approved by the EPA on May 30, 2012. Completion of an implementation plan is anticipated in 2013. A TMDL project for PCBs in fish tissue for four segments of the Trinity River including Cottonwood Branch was completed in 2008. The most recent consumption advisory for the area, ADV-43 released in 2010, added the pollutant dioxin and extended the area of the consumption advisory to areas of Clear Fork Trinity River and West Fork Trinity River (https://www.tceq.texas.gov/waterquality/tmdl/77-trinity_pcb.html).

Groundwater

The region centering on the Dallas-Fort Worth Metroplex is served by the Trinity and Woodbine aquifers. The Trinity Aquifer is a major aquifer extending across much of the central and northeastern part of the state. The Woodbine Aquifer is a minor aquifer overlying the Trinity Aquifer.

Due to intense groundwater extraction, 18 counties in this region have been included in the list of Priority Groundwater Management Areas of the state by the TCEQ. These management areas are designated as currently experiencing or are expected to experience critical water issues within the next 25 years. In the Trinity Aquifer, water quality impacts have resulted from progressive groundwater quality decline. While in the Woodbine Aquifer, impacts are associated with higher salinity and chemical contamination that exceed safe drinking water quality standards (Ledbetter and Srinivasulu, 2013).

Based on information provided by the DFW Airport Board, Water Systems, drinking water at the airport is purchased from the cities of Dallas and Fort Worth. Dallas currently obtains water from area reservoirs: Lake Ray Hubbard, Lake Lewisville, Lake Grapevine, Lake Ray Roberts and Lake Tawakoni with plans to use Lake Fork and Lake Palestine in the future. All of Dallas' water supply comes from surface water (http://dallascityhall.com/dwu/water_quality_information.html). Fort Worth currently obtains water from Lake Bridgeport, Eagle Mountain Lake, Lake Worth Cedar Creek, Richland-Chambers, and Benbrook Lake (http://fortworthtexas.gov/water/info/default.aspx?id=6056&ekmense=c1987b5b_1306_2296_6056_3).

Wild and Scenic Rivers

There are no wild and scenic rivers within or adjacent to the Project corridor. The Wild and Scenic Rivers Act would not be applicable.

6.4 Environmental Impact Evaluation

The Environmental Impact Evaluation section provides guidance on the analysis and documentation of any impacts. No ALP changes are planned for Addison Airport and potential project impacts in the vicinity of Addison Airport are addressed elsewhere in the document. This section focuses on DFW Airport and summarizes the impact thresholds identified in FAA Order 1050.1F that are used by the FAA to determine the significance of the impacts of the proposed action and alternative(s) where such thresholds have been established. This section also summarizes the factors to consider when evaluating the significance of potential impacts. If



necessary, types of mitigation that may be used to reduce the potential impact of the proposed action are described.

The No-Build Alternative would reflect impacts and benefits associated with only the current provisions and programs in the NCTCOG Mobility 2040 Plan, as well as programmed projects in the Transportation Improvement Plan (TIP) (currently the 2017-2020 TIP). The No-Build Alternative includes existing and committed roadway and transit projects in the Study Area, as described in detail in **Chapter 2: Alternatives Considered**. In general, the capital improvement projects include additional roadway lanes as well as new roadways, bike/pedestrian trails, interchanges, intersection improvements, traffic signal improvements, and improvements to existing transit infrastructure.; therefore, the No-Build Alternative would have no effect on any of the resource categories identified in FAA Order 1050.1F.

As stated in paragraph of 4-2.c of FAA Order 1050.1F, “if an environmental impact category is not relevant to the proposed action or any of the reasonable alternatives identified (i.e., the resources included in the category are not present or the category is not otherwise applicable to the proposed action and alternative(s)), this should be briefly noted and no further analysis is required.”

As discussed in **Section 6.3.1**, the geographic location and site-specific characteristics of DFW Airport render several resource categories as not relevant to the proposed action. These categories are: coastal barriers; coastal management zones; Section 4(f) and 6(f) properties; farmlands; historic and archeological resources; environmental justice populations; children’s health and safety populations; and wild and scenic rivers. These resources are not discussed further.

Those impact categories that are minimally affected by a project are not described in detail, but are briefly discussed as to why they are being dismissed.

6.4.1 DFW International Airport

6.4.1.1 Air Quality

Potential air quality impacts associated with the DFW Airport Proposed Action would occur if the project exceeded one or more of the NAAQS for any time periods analyzed, or increased the frequency or severity of existing air violations. Compliance with local transportation and air quality management plans and the General Conformity Rule is also required.

As identified in the NCTCOG Mobility 2040 Metropolitan Transportation Plan for North Central Texas, estimates of air emissions associated with diesel and locomotive traffic under 2040 conditions indicates that the DFW Airport Proposed Action would provide reduced emissions of all NAAQS criteria pollutants relative to the No-Build Alternative. The No-Build Alternative, which does not involve new rail construction, would not exceed established significance thresholds.

The DFW Airport Proposed Action has been included in the previous TIP and the current TIP conformity analyses. Therefore, it complies with the Transportation Conformity Rule. The analysis results indicate the DFW Airport Proposed Action would not cause or contribute to any new NAAQS air quality violations or increase the frequency or severity of existing violations in the ten-county DFW Ozone (O₃) Nonattainment Area (which is also the DFW MSA). Therefore, the DFW Airport Proposed Action conforms to the goals set forth in the CAA Amendments of 1990 and is in conformity with the SIP.

Furthermore, the DFW Airport Proposed Action direct and indirect air emissions would not exceed *de minimis* levels for VOCs and NO_x individually. This meets the requirements of the General Conformity Rule, and a full General Conformity Determination is not required. The DFW Airport Proposed Action is a commuter rail project operating on airport property and not an



aviation source of emissions, DFW Airport emissions were evaluated with the same regional travel demand model maintained by NCTCOG as the remainder of the DFW Airport Study Area.

In consideration of potential emissions and FAA significance thresholds, the DFW Airport Proposed Action would not exceed the significance threshold.

Construction Air Quality

Air quality impacts during construction will be limited to short term, increased fugitive dust and mobile source emissions. These impacts would be short-term and cease once construction is complete.

As discussed in **Section 3.11**, the proposed alignment is located within the ten-county ozone nonattainment area for North Central Texas and has been included in current Transportation Improvement Plan (TIP) conformity analysis. Air quality impacts from transportation projects generally focus on changes in motor vehicle-related pollution caused by on road vehicles; however, during construction non-road equipment would be expected to generate exhaust emissions which could contribute to a localized area of poor air quality. Non-road equipment typically used for construction of transit projects and the types of tasks they perform is listed in **Table 4-23**.

Prior to Cotton Belt Project construction, DART or its designated Design-Build contractor will prepare an estimate of the construction emissions for the DFW Airport Proposed Action using emission factors for the construction-related direct emissions analysis obtained from the EPA Clean Air Nonroad Diesel – Tier 4 Final Rule (*40 CFR Part 89* et al).

It is assumed that the direct emissions will be below the de minimis level based on the measurements calculated for the TEXRail Project at DFW Airport. The direct emissions fell well below the de minimis level of 100 tons per year established for VOC and NOx when estimating the construction emissions. The Cotton Belt Project construction activities will be less extensive than the TEXRail Project, which included approximately 2.5 miles of track construction on new right-of-way on DFW Airport property, the DFW North parking lot, a 1,600-foot bridge over SH 121/SH 114, and several other roadway, culvert and bridge infrastructure. The construction in new right-of-way includes grading and track bed preparation. The conservative estimate assumed that construction would occur over approximately 12 months and would fall within one calendar year.

By contrast, only 3,700 feet of the Cotton Belt Project will be constructed in new right-of-way. Two miles of the Cotton Belt will be placed on right-of-way that has been cleared and graded by the TEXRail Project. DART will share two miles of corridor that will have been cleared, graded and prepared by TEXRail. Additionally, DART will use the parking, SH 121/SH 114 bridge, and other roadway, culvert and bridge infrastructure being constructed by TEXRail. Extending to the east, the remainder of the Cotton Belt will be located within DART owned right-way. Construction of the Cotton Belt on DFW Airport property is anticipated to be less than one year.

Other impacts to air quality due to construction activities include dust generated from construction activities associated with concrete demolition, delivery trucks, and earth-moving operations throughout the project corridor.

Mitigation Measures

For the proposed alignment, compliance with Clean Air Act legislation would require that DART or its designated Design-Build contractor submit FAA Form 7460-1, Notice of Proposed Construction or Alteration. For airports within ozone non-attainment areas, an Airport Construction Emissions Inventory must accompany the FAA Form 7460-1. This inventory would



be completed by the Design-Build contractor once construction material quantity estimates are completed and construction staging planned.

The control of exhaust emissions emanating from non-road equipment and other construction related vehicles would be in accordance with EPA guidelines. To minimize exhaust emissions, contractors would be required to use emission control devices and limit the unnecessary idling of construction vehicles. Other measures to mitigate air quality include minimizing emissions through the use of clean fuels in construction equipment, deployment of clean diesel construction equipment (new, retrofit, rebuilt or repowered), and the implementation of anti-idling practices at construction sites.

6.4.1.2 Biological Resources (Including fish, wildlife, and plants)

Biotic Resources

Areas designated for new tracks and fill embankments would be cleared and graded, and therefore impacted more than areas within existing right-of-way. Trees close to the right-of-way and large trees with branches overhanging the right-of-way would be removed or trimmed. Areas designated for new tracks and fill embankment would be impacted to a greater extent as these areas would be cleared and graded. The extent of these impacts cannot be determined until design of the alignment is finalized. During final design, a tree survey will be conducted to quantify the number, size, and species of any trees to be removed. As the current project design is not sufficiently advanced to accurately assess areas of impact, the impact analysis for the Project utilizes a conservative approach, assuming that all vegetation within the right-of-way and current station footprints would be impacted by clearing and grading.

Based on the EMST shapefiles and current aerial photography, the riparian and floodplain densely wooded area impacted by the new alignment along Cottonwood Branch is approximately one acre. Additional wooded areas that are impacted is approximately 1.3 acres. The remaining portion of the new alignment occurs within disturbed or non-disturbed grassland, and shrubland.

It is estimated that the proposed trail would impact approximately 0.5 acres of additional wooded riparian area. Additional design would be required to determine the actual impact.

Fish

Project activities involving work within streams, temporary or permanent haul roads or crossings within streams, the construction of bridges or culverts, and dewatering activities may impact aquatic resources, if occurring within the Project area. Dewatering activities can impact aquatic resources by stranding fish and mussels. Trampling, dredging or filling riparian areas can impact stationary aquatic resources such as plants and mussels.

Fish species may be impacted at the crossings of Cottonwood Branch during construction activities, both perennial and intermittent waters crossed by the DFW Airport Proposed Action. Neither of these streams is considered an Ecologically Significant Stream Segment (ESSS) (TPWD, 2013). Essential fish habitats are not located in the Biotic DFW Airport Study Area as this status applies only to coastal fisheries; therefore, the Proposed Action would not result in impacts.

Wildlife

The portions of the Study Area located immediately above the DFW Airport and northwest of the intersection of SH 114 and SH 121 include the majority of the pasture and woodland areas within the Study Area. Pasture areas provide important cover and food sources for birds and small mammals, especially when located near highly urbanized areas. Woodland areas are



primarily found near riparian or floodplain areas and are generally vegetated with native species, which typically support a diverse community of faunas.

Minor impacts to common wildlife species and their associated habitats would be anticipated within the Biotic DFW Airport Study Area. Implementation of the Build Alternative would result in trees being removed or trimmed within the proposed right-of-way and station footprint.

Post-construction, the operation of the DFW Airport Proposed Action would be anticipated to have minor impacts on wildlife in the immediate vicinity of the right-of-way. Common wildlife species within the Biotic DFW Airport Study Area are currently exposed to the existing freight service within the corridor of the DFW Airport Proposed Action; therefore, impacts as a result of the Build Alternative to these wildlife species would be considered negligible. Impacts may include minimal adverse effects from the increased use of the tracks (i.e., more frequent disruption due to noise and presence of the trains) and thus a greater likelihood for wildlife to be struck by the trains. Fencing will not be located on DFW Airport property. It is anticipated that the wildlife species currently nesting or foraging within these areas have acclimated and conditioned themselves to the presence of trains. Additionally, the developed nature of the corridor and surrounding area has already resulted in the displacement of less adaptable, more sensitive species from the Project. In areas where habitat would be affected along the proposed right-of-way, similar habitats are available in adjacent areas.

As described in **Section 6.3.2.2**, eight federally-listed threatened or endangered species, 20 state-listed threatened or endangered species, and 20 state species of concern (which are monitored by TPWD but do not currently receive regulatory protection) are listed as having potential to occur in Tarrant, Dallas, or Collin counties (TPWD, 2017b; USFWS, 2017a). A listing of all of these species, information about recorded occurrences of the species, and habitat descriptions is located in the *Cotton Belt Corridor Biological Resources Existing Conditions Technical Memorandum (Appendix B)*.

Federally-listed species and their habitats are protected under the Endangered Species Act of 1973 (16 USC § 1531 et seq.) No designated critical habitat or preferred habitat for any federally-listed species was identified on DFW Airport property, or within or near the Study Area, therefore the Project would have **no effect** on federally-listed species for Tarrant, Dallas or Collin counties.

No species listed by TPWD were observed during field surveys of the Study Area. Species having potential habitat in the study area on DFW Airport property include peregrine falcon, western burrowing owl, plains spotted skunk, Texas garter snake, timber rattlesnake, Louisiana pigtoe, sandbank pocketbook, Texas pigtoe and Texas heelsplitter. The Louisiana pigtoe, sandbank pocketbook, and Texas heelsplitter, all have recorded TXNDD element of occurrences within 0.7 – 7 miles from the Study Area. The Project may impact these state-listed species if they are present within the Study Area.

Migratory Bird Treaty Act

Construction activities have the potential to impact migratory bird species primarily through the destruction of and disturbance of vegetation and bare ground that may harbor active nests, including nests that may occur in grass, shrubs and trees, potentially resulting in the loss of eggs and young birds. Mitigation measures for avoiding impacts to MBTA-protected species are discussed below.

Summary

Implementation of the DFW Airport Proposed Action would have impact biotic resources; however, by integrating the proposed mitigation measures (described below); the DFW Airport Proposed Action will not exceed the established thresholds of significance.



Mitigation Measures

Biotic Resources

The Presidential Memorandum on Economically and Environmentally Beneficial Landscaping encourages the use of native plants at federal facilities and federally funded landscaping projects. Landscaping and re-vegetation plans would be developed during final design and take into consideration the guidance provided in the Presidential Memorandum listed above. Disturbed vegetated areas would be replanted with replacement vegetation that would utilize native species yet not create an unacceptable wildlife attractant for aeronautical operations. Site planning and construction techniques will be designed to avoid and preserve existing mature native trees and shrubs to the greatest extent possible.

DART will coordinate with DFW Airport to identify appropriate plant species to ensure they minimize attracting potentially hazardous wildlife.

Wildlife

All wildlife species present within the Biotic DFW Airport Study Area are subject to an existing urban environment that is regularly disturbed. Temporary and long-term impacts would be mitigated through re-vegetation. Existing vegetation or habitat would be replanted along the disturbed areas.

Additionally, TPWD provided several recommendations for mitigating impacts to wildlife resources which DART will implement. These recommendations include:

- Utilizing existing rail, transportation and utility corridors to minimize the impact to undeveloped areas,
- Minimizing the amount of riparian vegetation that is to be disturbed,
- Designing all stream crossings to be perpendicular to the stream course,
- Designing the bridge spans across the streams to allow usable vertical and horizontal space beneath the structures for wildlife to cross under,
- Avoidance and preservation of existing mature native trees and shrubs (native replacement trees will be planted as mitigation for trees removed), and
- The use of native vegetation beneficial to fish and wildlife will be used for all landscaping areas (with DFW Airport coordination).

State law prohibits direct harm for state-listed species, but does not currently provide for habitat protection. If any individuals of state-listed species are encountered within the Study Area during construction, care will be taken to avoid harming them.

Potential construction-related erosion and sedimentation would be minimized by implementation of standard engineering BMPs (i.e., silt fences around the construction limits). These construction and mitigation measures would minimize and/or alleviate any potential negative effects to the aquatic habitat resulting from erosion and subsequent sedimentation. Other construction BMPs would be implemented to prevent invasive species and prevent impacts to migratory bird species through wildlife awareness programs.

In compliance with the MBTA, trees with active nests would be avoided.

The following guidelines will be adhered to:

- During the nesting season, active nests will not be disturbed, destroyed, or removed.
- The removal of unoccupied, inactive nests, as practicable will be avoided.
- The establishment of active nests during the nesting season proposed for replacement or repair will be prevented.



- Birds, eggs, young, or active nests will not be collected, captured, relocated, or transported without a permit.
- If clearing vegetation during the March 15th through September 15th nesting season is unavoidable, DART will survey the construction area to ensure that no nests with eggs or young will be disturbed by construction. Any vegetation or bare ground areas where occupied nests are located will not be disturbed until the eggs have hatched and the young have fledged. Removal of trees which contain colonial waterbird rookeries will be avoided through route adjustments to the extent reasonable and feasible.

6.4.1.3 Climate

This document does not incorporate a quantitative analysis of the GHG emissions or climate change impacts of the Build Alternative because the potential change in GHG emissions would be minimal in the context of the affected global environment. As documented in **Section 4.13**, the Project is estimated to reduce VMT by nearly 80,000 per day, and save nearly 3,800 hours of congestion delay. Since automobile transportation is a source of GHG emissions, the Project will have a net positive effect at a regional level. Because of the insignificance of the project-level GHG emission impacts, those impacts would not be meaningful toward identification of the Project.

6.4.1.4 Hazardous Materials, Solid Waste, and Pollution Prevention

FAA Order 1050.1F Desk Reference establishes significance thresholds for hazardous material concerns for projects that:

- Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management;
- Involve a contaminated site (including, but not limited to, a site listed on the NPL);
- Produce an appreciably different quantity or type of hazardous waste;
- Generate an appreciably different quantity or type of solid waste, or use a different method of collection or disposal, and/or would exceed local capacity; or
- Adversely affect human health and the environment.

The Project does not fall within any of the above categories and therefore is not expected to meet or exceed any of these thresholds. FAA Order 1050.19B was developed to provide the FAA a means to comply with applicable federal environmental regulations and best practices associated with environmental due diligence during property acquisitions and disposals. The Project requires no property acquisition or disposal.

Mitigation Measures

If contaminated soil is suspected due to visual and/or olfactory evidence of contamination during subsurface construction activities, and needs to be removed from the premises, the soil will be tested to evaluate whether it is contaminated and requires proper disposal. If it is found to be contaminated, that soil would be properly classified and disposed of as non-hazardous or hazardous waste (i.e., Type II landfill or hazardous waste treatment/landfill).

Environmental due diligence activities would be performed prior to use agreements. According to ASTM 1527-05, "Due diligence is the process of inquiring into the environmental characteristics of a parcel of commercial real estate or other conditions, usually in connection with a commercial real estate transaction. The degree and kind of due diligence vary for different properties and differing purposes." A compliant Phase I ESA would be conducted. If the Phase I ESA concludes that one or more recognized environmental concern (RECs) exist,



Phase II testing would be performed to help establish whether contamination is present and, if present, its nature and extent.

With respect to anticipated materials to be brought onto the project site and waste materials to be generated, all will be managed in accordance with good industry practices and federal, state and local regulations.

6.4.1.5 Land Use

FAA Order 5050.4B requires consideration of several factors when analyzing effects on land uses in the airport area, including: community disruption, business relocations, induced socioeconomic impacts, wetland and floodplain impacts, and critical habitat alteration. Each of these factors can have potential land use ramifications. The Project's impacts associated with these factors do not meet the significance threshold established by FAA Order 5050.4B.

As illustrated in the 2014 *DFW Airport Land Use Plan* map (**Appendix C**), DFW Airport has long planned to develop the vacant developable areas in the general Study Area. The Project corridor is set aside in the plan as a transportation corridor, and the project would be consistent with the airport's development plans.

There would be no acquisitions, community disruption, business relocations or any displacements associated with the Project. There would be no induced socioeconomic impacts, wetland and floodplain impacts, or critical habitat alteration.

In consideration of the factors with potential to have land use ramifications and FAA significance thresholds, the Project would not constitute a significant land use impact.

The Project conforms with DFW Airport's 2009 Airport Development Plan Update, Executive Summary: VFR 2030, Vision of the Future, Realized and with the DFW Airport 2012 and 2014 Commercial Development Land Use Plans. Although the project corridor is currently undeveloped and vacant land, the Commercial Development Land Use Plan commits this land for development as a transportation corridor. The remaining undeveloped or vacant land surrounding the project corridor is designated for future Mixed-Use commercial, commercial – office corporate development, or is undevelopable. The Project has been designed to not encroach upon the existing nearby utility land lease boundary, or onto property otherwise designated for future development as described above. No adverse impacts affecting planned land uses are anticipated as a result of the Build Alternative.

Mitigation Measures

The use of DFW Airport land needed to build and operate the Proposed Action would be gained through a Public Mass Transit Easement agreement between DART and DFW Airport. DFW Airport will be compensated fair market value for the use. A release from federal obligations and land use requirements would not be anticipated.

6.4.1.6 Natural Resources and Energy Supply

The primary impact on energy supplies, air emissions, and water consumption would result from the construction of the DFW Airport Proposed Action. This includes fuel usage during construction of the proposed improvements, construction-related air emissions, and water consumption during construction.

Indirect impacts attributed to construction activities would temporarily increase use of some or all of the following: electricity, fuel, oil, chemicals, water, and other forms of energy and resources needed to construct the proposed improvements. The demand for these resources would not exceed supply or substantially increase demand.



6.4.1.7 Noise and Vibration-Compatible Land Use

FAA Order 5050.4B requires consideration of several factors when analyzing effects on compatible land uses in the airport area, including change in airport noise. As illustrated in the 2014 *DFW Airport Land Use Plan* map (**Appendix C**), DFW Airport has long planned to develop the vacant developable areas in the general Study Area. The Project corridor is set aside in the plan as a transportation corridor, and the project would be consistent with the Airport's development plans.

Noise

There are no noise-sensitive land uses within DFW Airport property, and the Cotton Belt project is compatible with existing land uses.

The DFW Airport Proposed Action would be constructed partially within DFW Airport property; however, it would not be constructed or operated by DFW Airport and would not directly affect any aviation operations or activities. Based on the ridership model that shows the DFW Airport stations are used predominantly for transfers to the TEXRail system and for employees of the companies located at the airport, there is no increase in air passenger activity expected as a result of the DFW Airport Proposed Action.

No aviation-related noise changes are anticipated as a result of the Project. The project would not directly or indirectly increase aviation operations at the airport, including the number of aircraft takeoffs/landings, flight patterns, or ground taxiing operations; therefore, the project would not increase the airport's day-night noise level (DNL) contours. The resulting noise levels would also have no impact on the airport DNL contours.

There would be no resulting increase in airplane activity and associated noise. Therefore, no increase in aviation operations would occur as a result of implementation of the DFW Airport Proposed Action and the threshold of significance is not exceeded.

Vibration

Due to the sensitivity of equipment located at the ASR site, the ASR has been added as a vibration-sensitive receptor for the Cotton Belt Project.

The TEXRail Project team completed a vibration study of the ASR-9 facility at DFW Airport in July 2010. The objective of the study was to assess the potential effects of ground-borne vibration on the ASR-9 facility due to the planned construction and operation of the DFW Airport Proposed Action. Potential vibration impacts at the ASR-9 radar facility were analyzed based on updated locomotive hauled coach vehicle technology, number of train cars, and projected train speeds in the vicinity of the facility. The study concluded that no vibration impact is anticipated at the DFW Airport ASR-9 radar facility from TEXRail Project construction or operation. The FAA reviewed the study and determined that additional analysis was not required at this time; however, this will be monitored during TEXRail operation start-up, and testing and mitigation would be implemented if impacts are identified.

During final TEXRail Project design, several infrastructure modifications have occurred. One included realignment of the track to the west side of the ASR-9. The realignment also minimized the below-grade trench near the ASR-9. The realignment increased the distance of the tracks to the ASR-9 and decreased the trench depth. Both of these modifications minimize possible vibration effects to the ASR-9.

Due to FAA concerns, DART will participate in vibration testing when TEXRail begins testing in October 2018.



As part of its study and evaluation, the FAA will utilize the Radar Analysis Support System tool to measure the vibration or “jitter” in the antenna pedestal group. The FAA will also study and evaluate the operational system software and perform data recordings to ensure the radar is performing within its operational tolerance and at an operational capability equal to or better than before the installation of TEXRail and the operations thereon. DART will coordinate with FAA to conduct similar analysis on the Cotton Belt operations. DART will also coordinate with FAA to study, evaluate, and as necessary, conduct further vibration testing once test rail operations have commenced on the Cotton Belt Project.

Coordination with the FAA will continue for the ASR-9 tower and a determination of potential mitigation measures that may be required will be made during the regional rail testing period (as requested by the FAA). DART will participate with the testing to determine if an additional track and increased frequency would result in impacts.

- a) In the event that trains operating on the DFW Airport Proposed Action cause or produce any interference or false targets for the ASR-9, the FAA will perform radar data recordings to determine if the radar reflector tables can eliminate the interference and false targets caused by the operating train.
- b) In the event that vibration or “jitter” is an issue with regard to the operational capability of the ASR-9, the offending frequencies would have to be mitigated. DART and the Airport Sponsor would be required to mitigate all of these issues and will work with the FAA to remedy the situation prior to operation of the Cotton Belt Rail line.
- c) In the event that interference or false targets are an issue with regard to the operational capability of the ASR-9, the FAA would attempt to optimize the radar so as to eliminate or “mask out” the interference or false targets created by the trains so that the ASR-9 does not misinterpret or “confuse” the trains as or with airborne targets.
- d) The foregoing additional testing, and mitigation, if necessary, will take approximately three to six months. It is anticipated that this testing will be conducted concurrently with the Cotton Belt Rail line testing period.
- e) The FAA construction representative or Responsible Engineer (RE) must be present for any work associated with this facility.

Mitigation Measures

Vibration

Coordination with the FAA will continue for the ASR-9 tower and a determination of potential mitigation measures that may be required will be made during the regional rail testing period (as requested by the FAA). DART will participate with the testing to determine if an additional track and increased frequency would result in any impacts.

6.4.1.8 Visual Effects

As the DFW Airport Study Area lacks coastal areas, wild and scenic rivers, sensitive wildlife species, Section 4(f) and 6(f) properties, and historic properties; the Proposed Action will not have a visual impact on these visually protected resources.

The DFW Airport Proposed Action would minimally add to the number of aboveground structures in the DFW Airport Study Area. DFW Airport is planning two new aerial roadway crossings of the rail line, east and south of the DFW North Station area. Within the existing railroad corridor, DART would reconstruct two bridges over creeks. Extending south, most of the project would be constructed adjacent to the TEXRail Project and utilize TEXRail infrastructure including bridges and overpasses. The DFW Proposed Action would modify the DFW North Station by adding tracks and platforms. The DFW Terminal B Station would not be



altered. The general visual identity of the area is characterized by transportation infrastructure and structures emphasizing horizontal planes, such as bridge overpasses.

Because the Project is consistent with the current and historical use of the Cotton Belt right-of-way and the emerging TEXRail Project as transportation corridors, and because visual elements associated with the existing railroad contribute to the overall visual quality and affect the visual sensitivity of the corridor, minimal visual impacts would occur from the proposed alignment.

Likewise, the proposed DFW North Station platform development is consistent with the TEXRail Project. Elevated highways are visible in the distance. The area is primarily industrial and visual impacts at this area would be viewed primarily by travelers. Visual impacts would be expected to be minimal.

Limited new light emissions would result from the DFW Airport Proposed Action. The origin of the light emissions from the DFW Airport Proposed Action would be a result of platform lighting at the DFW North Station. Adjacent land uses include the TEXRail platform and parking. The DFW Airport Proposed Action would not create an annoyance to people in the vicinity or interfere with normal airport activities.

Mitigation Measures

Coordination to ensure compliance with DFW Airport development guidelines is ongoing and DFW Airport Staff will review the design of the proposed action. Any project lighting would be designed to ensure compliance with DFW Airport development guidelines and would be compatible with that approved and installed developments of similar elevation and distance from the airfield.

6.4.1.9 Water Resources

Wetlands

Since there are no wetland resources; none would be impacted as a result of the DFW Airport Proposed Action, and no mitigation would be required.

Floodplains

As shown in **Figure 6-7**, the Project crosses approximately 1,313 linear feet in the Cottonwood Branch floodplain. The Project would be located within the existing Cotton Belt railroad corridor which operates at grade across the northern end of DFW Airport. Major highways (IH-635 and SH 121) are grade separated over the railroad corridor. Infrastructure associated with SH 121, its frontage roads and ramps represents a barrier to east-west movements in this area. The existing 100-foot wide railroad corridor provides the only opportunity to pass under the freeway. Moving from east to west the railroad corridor emerges from the SH 121 underpass directly into the Cottonwood Branch floodplain. In this location, the floodplain cannot be avoided because of geometrical requirements for the track. Specifically, the need for the Cotton Belt Project alignment to meet and provide service at the DFW North Station, as well as to fit under the SH 121 underpass, prevents an opportunity for an alternative route to avoid the floodplain. The existing right-of-way provides a direct route between the existing DART-owned underpass and the shared DFW North Station currently under construction. Railroad track design requires a minimum degree (maximum radius) of curves. This track geometry precludes diverting the alignment to minimize encroachment into the floodplain. Additionally, the existing corridor contains active freight service. The freight provider has operating rights to maintain this service in the existing corridor.

While attempts have been made in the design of the Build Alternative to avoid the Cottonwood Branch floodplain, the challenges of the passenger rail geometric design criteria and its



horizontal curvature constraints, physical location of the SH 121 freeway grade separation, and need to serve the DFW Airport North Station do not allow the avoidance of the floodplain. Although the existing Cotton Belt rail represents a current encroachment upon the 100-year floodplain of Cottonwood Branch, the Build Alternative would avoid significant floodplain encroachments and actions that adversely affect the base floodplains by constructing sufficient Cottonwood Branch bridge crossing openings and sizeable culverts allowing for needed floodwater passage. These designs would be compatible with the NFIP and FEMA programs; therefore, the Build Alternative would meet the requirements of a practicable alternative under Executive Order 11988.

No relocation or alteration of any natural channel is proposed. Direct impacts to the floodplain include minor amounts of fill associated with retaining walls and structures for the bridges of the two crossings of the channels in the Cottonwood Branch floodplain. The DFW Airport Proposed Action is not anticipated to exceed the significance threshold stated in Order 1050.1F. During final design, a detailed hydrologic/hydraulic analysis will be conducted to ensure that the floodplain encroachment will not modify the floodplain in a manner that it would adversely affect any existing infrastructure or development.

Impacts on Human Life and Transportation Facilities

The Cottonwood Branch floodplain is located in a largely undeveloped section DFW Airport property which is isolated from airport infrastructure and airport commercial development by SH 121 and SH 121/SH 114. Outside the floodplain, several unmanned gas well sites are scattered across the otherwise expansive vacant property. Because of this isolated location, there is a low probability that the Cotton Belt floodplain encroachment will result in loss of human life or property.

Similarly, it is unlikely that there are any damages associated with this encroachment and no interruption of service on or loss of a vital transportation facility is anticipated. No airport or FAA infrastructure is located in this vacant and isolated portion of the airport. All major infrastructure and facilities and access roads are segregated from the floodplain as they are located south of SH 121/SH 114 and would not be affected by the floodplain encroachment. Access to the airport and its facilities will not be altered by the floodplain encroachment. To the east, SH 121 and its frontage roads are elevated over the floodplain and creek. To the south, SH 121/SH 114 is on higher ground than the floodplain.

The future hydrologic/hydraulic analysis will ensure that modification of the floodplain will not cause flood-induced spills of hazardous materials at the natural gas facilities which are located outside the existing floodplain. The owner or operator of the natural gas facilities are also responsible for having a Spill Prevention, Control, and Countermeasure (SPCC) Plan which documents measures to prevent accidental release to the environment, and should they occur, the response procedures and corrective actions in place to minimize environmental impact. In addition, the SPCC Plan would be required to comply with federal, state, and local hazardous materials/waste management regulations to assure proper management of hazardous and other special waste streams.

Impacts to the Floodplain's Natural and Beneficial Values

The DFW Airport Proposed Action would not have a notable and adverse effect on the floodplain's natural and beneficial values. No agricultural or aquacultural activities currently take place in the Cottonwood Branch floodplain. As discussed in **Section 6.4.2.1**, Cottonwood Branch is not considered an ESSS. Only minor impacts to fish, wildlife and their associated habitats are anticipated. No relocation or alteration of any natural channel is proposed and all modifications to the floodplain will be directly adjacent to the active freight railroad line. The



impacts do not exceed the established thresholds of significance. Mitigation to wildlife impacts are discussed in **Section 6.4.2.1**.

The proposed hydrologic/hydraulic analysis will ensure that modification of the floodplain will not cause unacceptable flow alterations or aquifer recharge capabilities, nor would it disrupt the floodplain's capacity to maintain desired water qualities. Modifications to the floodplain will occur adjacent to the existing railroad alignment and the existing stream channel will not be altered. The proposed rail and track bed will be permeable surfaces although they may have a lower infiltration rate than existing surfaces. The DFW Airport Proposed Action is expected to have a less than significance impact on floodplains with the proposed mitigation described below.

Surface Waters

As depicted on **Figure 6-7**, the DFW Proposed Action would cross Grapevine Creek at Crossing S-1a, Cottonwood Branch at Crossings S-2-a and S-2b, plus a tributary to Cottonwood Branch at Crossing S-3. Crossings S-1a and S-2a would have no impact as they would occur on existing infrastructure being constructed for the TEXRail Project. Crossings S-2b and S-3 would be placed on new aerial structure. Total impacts to these water bodies would be dependent upon the size and number of support columns placed within the OHWM for each individual water body. Despite placing support columns into these water bodies, significant impacts are not expected. Given the current design of the Project, the permanent impacts appear to be limited to the stream crossings where bridge columns would be placed in the water areas. These bridge column impacts would total 0.017 acres (refer to **Figure 6-8**).

Groundwater

The Project has the potential to contribute to the current trend of declining water levels within the Trinity Aquifer.

Project construction activities during which proper spill response and BMP implementation are practiced are not expected to impact groundwater quality. Increased impervious areas post-construction may decrease the amount and quality of stormwater available for aquifer recharge. However, this potential impact may be mitigated by appropriate BMP implementation. There would be no impact on groundwater quality.

Mitigation Measures

With regard to all water resources, DART will continue to coordinate with the USACE, DFW Airport, and the cities of Dallas, Fort Worth, and Grapevine during final design. The project design will require review and approval. Preliminary coordination with the USACE has been initiated in order to document the expected permits and mitigation needs for any Section 404 impacts. DART, through an MOA with NCTCOG and USACE, participates in Section 214 of the Water Resources Development Act (WRDA) and was issued Permit No. SWF-2011-00508 in 2011. Section 214 of the WRDA, as amended, allows the USACE to accept funds from non-federal public entities to provide priority review of their permit applications. Participation in this program is anticipated to expedite the permitting process. The Project is currently at a 10 percent design level. The USACE requires a higher level of design to fully assess impacts and prescribe mitigation. As design progresses, coordination efforts will continue until a permit has been authorized. Permit authorization may occur after the FEIS/ROD, but will be available for public review.

Although the entire Cotton Belt Project has the potential to impact to 1.32 acres of Waters of the US, the impact to waters at DFW Airport is anticipated to be 0.017 acres. During final design, DART will continue to investigate reducing both the impacts to the stream crossings. DART and its contractors would comply with all federal, state, and local regulations regarding construction and operation within floodplains.

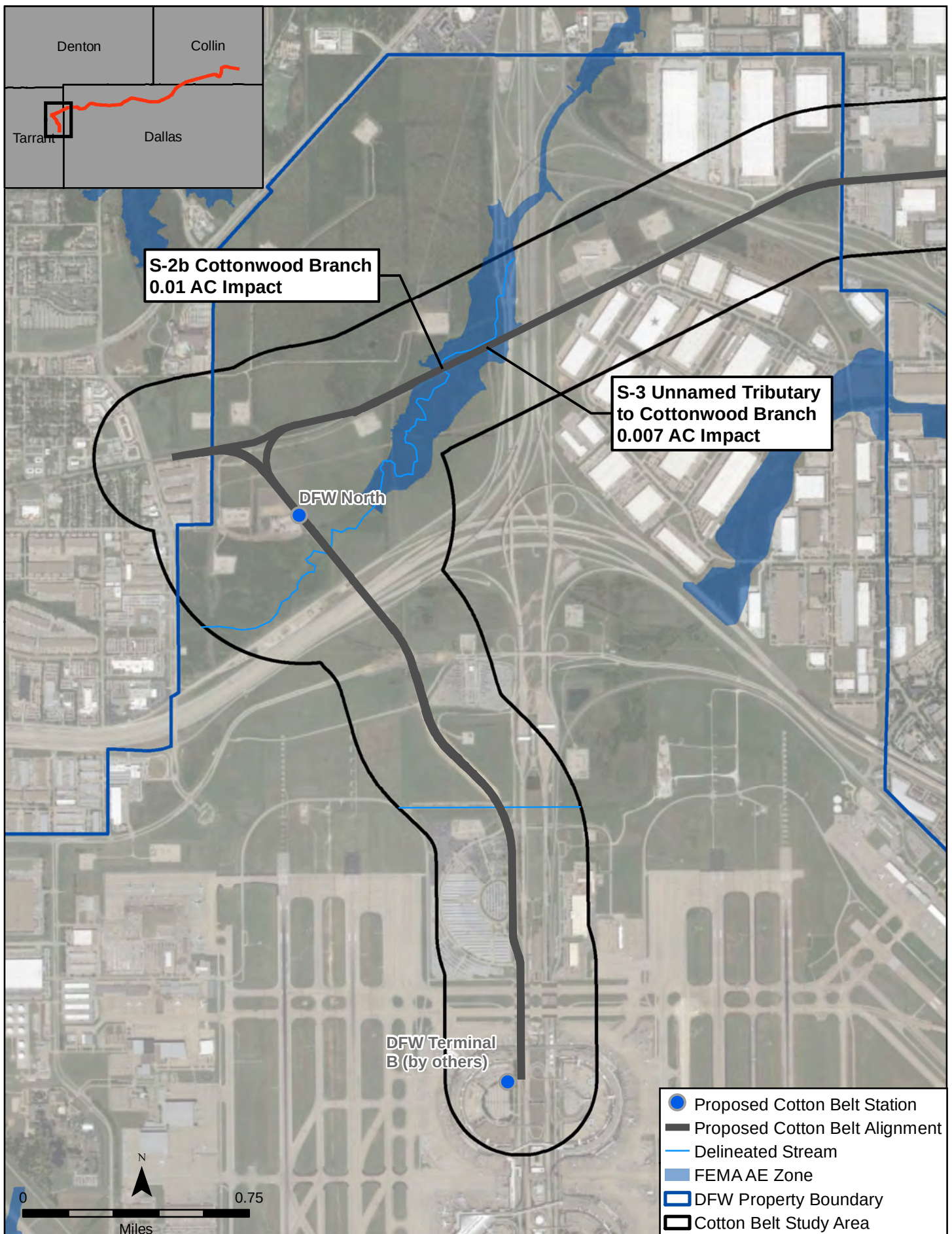


Figure 6-8

Surface Water Impacts of DFW Airport Proposed Action

Source: FEMA and GPC6

**Cotton Belt Corridor
Regional Rail Project**

Draft Environmental Impact Statement





During final design, efforts will be made to elevate the alignment above any 100-year floodplain that would be crossed. Impacts to floodplains would be minimized, when practical, to replacing existing piers located in the flood zone or minor amounts of fill associated with retaining walls, culverts, and other improvements to existing bridges. Future design phases will include a detailed hydrologic/hydraulic analysis to determine if any existing infrastructure or development would be adversely impacted. Final design will also include erosion and runoff controls and include measures to restore beneficial natural functions of the floodplain including water circulation. If an unavoidable floodplain encroachment would occur as a result of the DFW Airport Proposed Action, DART will follow the public involvement process as outlined in Section 2(d) of E.O. 11988 *Floodplain Management*. Public notice will also be provided during the FEIS/ROD process.

Additional design of the proposed Cotton Belt Trail is required to determine if there are additional water resource impacts associated with this separate project. Additional environmental clearances may be required.

More than five acres of earth disturbance would occur as a result of the project; therefore, a SWPPP, construction site notice, and NOI would be required.

Construction activities, such as grading, removal or addition of fill materials, paving, and material storage and use (i.e., concrete, petroleum products) can be potential pollutant sources which are controllable with the proper implementation of BMPs identified in the DFW Airport Proposed Action's construction SWPPP. Potential post-construction pollutant sources include stormwater discharges from train tracks, station platforms and parking lots associated with the station areas which may carry trash, anti-freeze, lubricating fluids, gasoline and other petroleum hydrocarbons associated with trains and automobiles. In addition, stormwater runoff from platforms could contribute to erosion and sedimentation issues adjacent to station sites.

With appropriate project design and BMP implementation, such as minimizing impervious cover, implementing low impact development design, regular station and parking lot sweeping/cleaning, it is assumed that there would be minor impacts to surface water which would be below the significance threshold.

6.4.1.10 Cumulative Impacts

Cumulative impacts refer to those impacts that result from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable future actions.

As shown in the 2014 *DFW Airport Land Use Plan* map (**Appendix C**), the TEXRail and Cotton Belt Projects have been incorporated into the development plans for DFW Airport. South of the DFW North Station the two projects share a corridor. This alignment has been coordinated with DFW Airport to avoid conflicts with major airport infrastructure projects including the Northeast Perimeter Taxiway Extension and the Terminal Renewal and Improvement Program (TRIP). Several roadway modifications minimize or avoid traffic impacts of the rail corridor. The North Airfield Drive realignment will be grade separated over the rail corridor. The service road for the ASR-9 Radar facility has been relocated to avoid crossing the tracks. Access to DFW North Employee Parking and the DFW North Express Parking has also been modified. DFW Airport has long planned to develop the vacant developable land areas surrounding the Project corridor. The Project is consistent with these plans. It is understood that the DFW Airport's property development would proceed with or without the Project, and such development is thus not a secondary or induced impact of the Project.

At DFW Airport Fire Station 6 (711 Regent Boulevard) on the existing railroad right-of-way, DART would construct a new at-grade crossing to allow fire access to the north side of the right-of-way. DFW Airport is also planning two additional aerial roadway crossings of the Project. One



would cross the existing railroad right-of-way east of the DFW North Station to connect to future airport developments across the tracks. The second is Dallas Road which crosses the new right-way south of the DFW North Station. This would facilitate east-west circulation.

Although the DFW Airport Proposed Action is mostly undeveloped and vacant land, the DFW Airport *Commercial Development Land Use Plan* commits this land for development as a Transportation Corridor. No adverse impacts affecting planned land uses are anticipated as a result of the Build Alternative.

The cumulative effects relating to DFW Airport Study Area considered actions planned by the City of Grapevine, DART, DFW Airport, NCTCOG, FWTa, and TxDOT. Transportation plans near the Study Area include the TEXRail Project, the addition of lanes to the DFW Connector on SH 121 to the north of the airport and construction of a new four-lane arterial identified as the East-West Connector, connecting SH 360 at East Harwood Road and the Spur 97 at Rental Car Drive on the south end of the airport. Land use developments included in the DFW Airport *Commercial Development Land Use Plan* provide a general pattern for location, distribution, and character of future commercial land uses, while the City of Grapevine does not currently have a comprehensive plan, nor an adopted plan, for the area.

6.4.1.11 Irreversible and Irretrievable Commitment of Resources

The construction of the DFW Airport Proposed Action would impact energy supplies, air emissions, and water consumption. This includes fuel usage during construction of the proposed improvements, construction-related air emissions, and water consumption during construction.

Construction activities would temporarily increase use of some or all of the following: electricity, fuel, oil, chemicals, water, and other forms of energy and resources needed to construct the proposed improvements. The demand for these resources would not exceed supply or substantially increase demand.

The DFW Airport Proposed Action would not result in substantial impacts to natural resources and energy supply above the threshold of significance; therefore, further analysis is not required.

To ensure the construction and operations of the Cotton Belt Project meets the principles of EO 13123 by reducing petroleum use, total energy use and associated air emissions, and water consumption, DART will include language within its contracts requiring contractors and operators to follow these guidelines. Within the Design/Build contract, the General and Special Provisions will include the following references:

- Energy Policy and Conservation Act – the Contractor shall comply with mandatory standards and policies relating to energy efficiency contained in the State Energy Conservation Plan issued in compliance with the Energy Policy and Conservation Act (42 USC Section 6321, et seq. and 49 CFR Part 18)
- Buy America Certificate – the Contractor certifies that it will comply with the requirements of Section 165(a) of the Surface Transportation Assistance Act of 1982, as amended, and the applicable regulations of 49 CFR Part 661 Buy America Requirements for mass transit procurements.



7. Cost and Financial Analysis

7.1 Introduction

This chapter presents the capital and operating and maintenance (O&M) cost estimates and the financial analysis for the Build Alternative. Capital cost estimates reflect a 10 percent level of preliminary engineering and understanding of the principal structural and systems elements. The DART 20-Year Financial Plan includes a range of funding sources for the project, which are also discussed in this chapter.

7.2 Cost Estimate Methodology

This section summarizes the cost estimating methodology for both the capital cost estimate and ongoing O&M costs.

7.2.1 Capital Cost Methodology

The methodology for estimating the capital construction costs for the Cotton Belt Project is in accordance with Federal Transit Administration (FTA) guidance as outlined in the Capital Investment Grant program and is further defined in the *DART Cotton Belt Corridor Capital Cost Estimating Methodology Technical Memorandum, January 2018 (Appendix B)*. The cost estimates use parametric unit prices (unit cost per route foot) and special condition costs for the majority of the cost effort. The parametric unit costs are based on a level of detail appropriate for conceptual engineering and project development phases. The parametric unit costs are an estimate developed for all elements included in a typical cross section for a unit of measurement (route feet, each, etc.). The parametric cost is then multiplied by the total length of the project for the total cost of that element.

This estimate includes expenses for the development of civil/structural elements, cost to develop transit passenger stations, accommodation of known site conditions, purchase and installation of system control components, and acquisition of vehicles. The conceptual composite unit prices were developed by using unit prices recently experienced by DART from the Green and Orange Lines Corridor construction and the South Oak Cliff Corridor Blue Line Extension project. Various major elements of the estimates include: utilities, special construction, grade preparations, trackwork, structures, street grade crossings, stations, ticket vending machines, park and ride lots, communications, train signals, a maintenance facility, and vehicles. Cost estimates were developed based on the current 10 percent level of design.

The *DART Cotton Belt Corridor Capital Cost Estimating Methodology Technical Memorandum, January 2018* also identifies estimated direct costs, non-construction related costs, and corresponding allocated and unallocated contingencies associated with the current status of design. Once the typical “unit cost per route foot” and/or “cost per mile” estimates were determined at a basic civil cost level, several allowances and add-on factors are applied. These factors are added to account for uncertainty of the estimates at this level given that only 10 percent design has been completed, and also account for the costs of non-construction items such as engineering design, construction management, and insurance. The capital cost estimate utilizes FTA Standard Cost Categories (SCC) for Capital Projects encompassing the anticipated project components and corresponding estimated unit prices into a comprehensive conceptual estimate.

7.2.2 O&M Cost Methodology

The methodology for estimating operating and maintenance (O&M) costs was designed to satisfy FTA guidance on cost modeling. Additional information about the methodology used to forecast O&M costs is provided in **Appendix B** in the *DART Cotton Belt Operations and*



Maintenance Plan, January 2018. Key assumptions to support the O&M plan and O&M cost estimate include:

- The system would require a fleet of seven DMUs (five required for peak revenue service).
- During initial operations, weekday span of service would generally be from 6:00 am to 9:00 pm. The service hours for some stations could be as early as 5:15 am or as late as 10:15 pm as trains come in and out of revenue service from the EMF.
- Trains would operate in both directions every 30 minutes during the peak travel periods of 6:00 am - 9:00 am and 3:00 pm - 7:00 pm.
- Trains would operate in both directions every 60 minutes during the non-peak travel periods of 9:00 am - 3:00 pm and after 7:00 pm.
- Service on Saturday, Sunday, and major holidays would be from 8:00 am to 8:00 pm operating in both directions every 60 minutes throughout the day.
- In the future (date to be determined) trains would operate during the peak periods at an increased service level of every 20 minutes in both directions, and service hours may be extended to 12:15 am.
- A phased approach to implementation with an initial operating schedule of 30-minute peak headways and 60-minute off-peak headways. The ultimate phase would operate with an operating schedule of 20-minute headways. O&M costs were only estimated for the initial schedule as the schedule for reducing headways is not yet known.
- Under normal operations, it is assumed that every scheduled train will stop at every passenger station along the line on every revenue trip. DART may run a "Special Event" train with limited station stops for key special events along the corridor such as Addison Kaboom Town, Richardson Wildflower Festival, and Carrollton Festival at the Switchyard.
- Each train will be staffed by two people, an Engineer and a Conductor. To allow for flexibility of assignments with a small overall staff, Engineers and Conductors will be cross-trained, certified, and qualified in both crafts.

7.3 Capital Plan

The following sections discuss the status of the capital cost estimate of the Project, as well as proposed funding sources. The DART 2030 Transit System Plan (TSP), approved in October 2006, identified the Cotton Belt Corridor as a priority project. In 2016, DART advanced implementation of the Cotton Belt Corridor to the year 2022 and reflected this new revenue service date in its FY17 Twenty-Year Financial Plan. The DART 2040 Transit System Plan, which is under development, will reflect this change to the project schedule.

7.3.1 Capital Cost Estimate

The preliminary cost estimate is based on 10 percent design and is subject to change. It is in line with the current FY18 Financial Plan budget of \$1,135 million (year-of-expenditure or YOY). **Table 7-1** documents the current draft cost estimate using FTA Standard Cost Categories (SCC). The design contingency at this stage of design is typically up to 30 percent. Thus, categories 10.0 through 70.0 will include some level of contingency.

A brief description of each of the capital cost categories, and key items of note are as follows:

Guideway and Track Elements – This capital cost category includes the costs of track guideway including the ties, rail, ballast, the aerial grade separation bridge structures, and the retaining walls to support the retained fill and retained cut areas.



Table 7-1. Capital Cost Estimate for Cotton Belt

FTA Standard Cost Category	Categories	Base Cost Estimate (YOE - \$M)
10.0	Guideway and track elements	\$247.0
20.0	Stations	\$127.0
30.0	Support facilities (EMF, Mercer Yard, Mockingbird Yard improvements)	\$45.0
40.0	Sitework and special conditions	\$82.0
50.0	Systems	\$98.0
60.0	Right-of-way, land, existing improvements	\$93.0
70.0	Vehicles	\$93.0
80.0	Professional services	\$197.0
	Allocated and Unallocated Contingency and Betterments	\$153.0
Total		\$1,135.0

Source: DART

Stations – There are 11 new regional rail stations included in the cost estimate with varying costs depending on if it is platform only or if a new park-and-ride, bus circulation area, vertical circulation, etc. is provided. The largest cost component of this category will be the infill 12th Street LRT Station.

Support Facilities (Maintenance Facility) – For the Project, it was determined that a new maintenance facility was required. Information from the recently completed TEXRail Maintenance Facility and DCTA A-Train Maintenance Facility will inform estimates for site development, track, and building facilities. This category also includes relocation of Mercer Yard in Carrollton and improvements to Mockingbird Yard in Dallas.

Sitework and Special Conditions – This capital cost category includes the costs of any necessary demolition, clearing, earthwork, site utilities, environmental mitigation, sound walls, pedestrian trail relocation, and automobile and bus access roads to the rail stations.

Systems – This includes the costs of passenger vehicle positive train control and signals, the addition of any street crossing traffic signals and crossing protection, communications systems, fare collection systems, and additions needed to the DART Control Center.

Right-of-Way, Land Improvements – As outlined in **Section 4.4**, there will be acquisitions and displacements, as well as other right-of-way easements (permanent or temporary) for the project. The project will assume a percentage of the total construction costs until full details related to right-of-way are determined.

Vehicles – This cost estimate will reflect purchase of seven regional rail vehicles; five for service and two spares. For the Project, it is assumed that a modern diesel multiple unit (DMU) commuter rail technology vehicle will be selected for operations similar to the selected TEXRail vehicle.

Professional services (Add-On Allowances) - An additional allowance is included in the construction costs. This covers the administrative cost of planning, support services, insurance, preliminary and final design, project management and construction management, which are consistent with the items identified in the FTA Standard Cost Category (SCC) worksheets.

Unallocated contingency - A contingency is added to the construction cost estimate to cover the expense of unforeseen costs incurred by contractors during construction. This is also referred to as an unallocated contingency. This is included above.



7.3.2 Proposed Capital Funding Sources

The Project is proposed to be financed through a federal loan program called Railroad Rehabilitation and Improvement Financing (RRIF), along with a combination of other federal, regional and local sources. **Table 7-2** summarizes the proposed funding sources, which total \$1,135.0 million (YOE). This amount is currently contained in the FY18 20-Year Financial Plan. A description and status of each of the funding sources is provided below.

Table 7-2. Project Funding Sources

Sources	Amount (millions\$ YOE)
Railroad Rehabilitation and Improvement Financing (RRIF) Loan	\$908.0
FTA Congestion Mitigation and Air Quality (CMAQ)	\$100.0
FTA (Section 5307 Formula)	\$3.3
FTA (CMAQ)	\$36.0
Local*	\$87.7
TOTAL	\$1,135.0
*Anticipated local sources may include a combination of the following: - DART sales tax - City of Plano (tax increment financing) - City of Richardson (tax increment financing) - City of Addison (cash contributions) - City of Coppell (equivalent of 3/8 cent sales tax) - Fare revenue - Naming rights, advertising - Other value capture sources	

Source: DART Finance Department; FY18 20-Year Financial Plan

7.3.2.1 RRIF Loan

The RRIF program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe Accountable, Flexible and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Under this program, the FRA Administrator is authorized to provide direct loans and loan guarantees to finance development of railroad infrastructure. The funding may be used to acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops. Direct loans can fund up to 100 percent of a railroad project with repayment periods of up to 35 years and interest rates equal to the cost of borrowing to the government.

DART submitted a pre-application to the FRA with project information and the anticipated loan request amount of \$908 million. A complete application will be submitted concurrent with the completion of the NEPA process and issuance of a Final EIS.

7.3.2.2 FTA

On July 13, 2017, the Regional Transportation Council (RTC) approved allocation of \$100 million from the CMAQ and Surface Transportation Block Grant (STBG) funding program to the Cotton Belt Project over years 2018-2022. During each of the years when funding is approved, DART will file a grant application with FTA for the funding.

- FTA (Section 5307 Formula) - In FY18, DART will file a grant application with FTA for the funding.
- FTA (CMAQ) - In FY18, DART will file a grant application with FTA for the funding.



7.3.2.3 Local

Local sources are anticipated to fund approximately \$87.7 million of the project. It is anticipated that appropriate interlocal agreements (ILA) will be developed with public and private entities to document these local contributions and finalize amounts and funding schedules. Local sources may include:

- DART sales tax
- City of Plano (tax increment financing)
- City of Richardson (tax increment financing)
- City of Addison (cash contributions)
- City of Coppell (equivalent of 3/8 cent sales tax)
- Fare revenue
- Naming rights, advertising
- Other value capture sources

7.4 Operating and Maintenance Costs

Based on the above methodology and assumptions, an O&M Cost Build-up for Cotton Belt initial operations was developed. Labor costs account for nearly half (46 percent) of annual costs. In total, Cotton Belt operations are estimated to cost about \$17.8 million dollars per year.

Table 7-3 summarizes the anticipated O&M costs by National Transit Database (NTD) category. These annual costs reflect the initial operating plan of 30-minute peak and 60-minute off-peak headways. Costs are divided into five categories: Transportation, Propulsion Fuel & Utilities, Maintenance of Way, Vehicle Maintenance, and General Administration.

Table 7-3. Annual Operating and Maintenance Cost Estimate

NTD Cost Category	2022 Opening Year Annual O&M Cost Estimate (\$1,000s 2017 dollars)	Cost Driver
Transportation	\$3,619	Revenue train hours
Fuel & Utilities	\$2,497	Revenue train hours
Vehicle Maintenance	\$2,219	Vehicles
Maintenance of Way	\$3,440	Directional route miles
General Administration	\$3,084	26% of other O&M costs
TOTAL	\$17,832	

Source: LTK; Cotton Belt Operations and Maintenance Plan (Draft; December 2017)

Vehicle maintenance capabilities will encompass the activities of inspection, servicing, and component repair and replacement. Specialized infrequently performed maintenance work may be performed off-site through subcontracts (i.e., diesel engine rebuild). Systems and facilities maintenance work requiring infrequently used specialty skills, such as roof repair, landscape maintenance, or upholstery may also be handled by contractors.

In addition, the DART FY 2018 Financial Plan includes an estimate of \$35 million for Cotton Belt Preventive Maintenance for a 20-year period on the Capital/Non-Operating Project Budget List.

7.5 Cash Flow Analysis

As previously stated, DART is currently pursuing a loan from the FRA's RRIF program to finance the project. If such a loan can be obtained, it would come at a substantially lower interest rate than conventional tax-exempt debt. As the project progresses and expenses are incurred, draws will be made against the loan. It is anticipated that the debt will be structured with level repayments over approximately thirty years.



Beyond already existing discretionary grants, DART assumed the following federal participation in future programs in the FY2018 Financial Plan: \$103.3 million for Cotton Belt Rail scheduled to be received between 2018 and 2022.

When service begins on the Cotton Belt in December 2022, it will generate additional formula funds beginning in 2024. An estimate of \$2.3 million has been made for these additional funds based on current federal apportionment values.

Cash flow for local sources will be developed as interlocal agreements are developed. An additional \$33.1 million is expected from several sources between 2022 and 2035 to support operations, maintenance, and debt service for the Cotton Belt.

7.6 Risks and Uncertainties

As with any project in the planning stage, there is a degree of cost risk associated with the build alternative. This cost risk is primarily associated with the definition of the project scope, project schedule, and project funding.

In DART's FY2017 Financial Plan, total sources of funds for the period FY 2017 through FY 2021 were projected to increase \$969 million (20.8 percent) from the FY 2016 Plan. \$860 million of this increase was associated with debt issuances and capital contributions for advancing the Cotton Belt by 13 years.

Cost estimates are under review and are based on an approximate 10 percent level of engineering. The cost estimate will become more precise as the project is refined. Cost increases could occur as a result of unexpected soil conditions and geotechnical issues, or the need for unexpected utility relocations. The current cost estimate includes contingencies to cover much of these and other potential changes.

DART has also identified several scope elements that will be studied further during the next engineering phase including any additional betterment costs above mitigation identified in this DEIS for areas along the corridor, specifically residential areas. These costs are not yet included in the project capital cost pending board discussion and approval of a betterments program during early final design efforts.

Schedule delays could be related to unforeseen construction challenges, local decision-making process, equipment malfunctions, or general construction delays. Uncertainty still exists in the precise timing of construction phases, which may be affected by the availability of local funding, and the timing of Federal funding approvals.

7.6.1 Local Funding Risks

The primary source of non-Federal funding is local cities' sales tax. Sales tax collections are sensitive to economic conditions and overall rates of consumption. Any reduction in funding could impact DART's ability to complete the Cotton Belt Project. Conversely, positive economic conditions could improve DART's financial position and increase funding availability.



8. Public and Agency Consultation and Coordination

8.1 Public Involvement Plan

This chapter summarizes public participation and agency consultation and coordination during development of the environmental studies and documentation of this DEIS. A DART Cotton Belt Public Involvement Plan (PIP) was developed to proactively and effectively communicate the project scope, issues, and potential impacts and benefits while collecting valuable public, agency and stakeholder input for the project. Refer to **Appendix H** for the Cotton Belt Public Involvement Plan (PIP).

Goals of the PIP are as follows:

- Develop and maintain relationships with community leaders, stakeholders and technical group members to provide an environmentally aware and multi-modal approach to transportation needs.
- Inform, educate and actively involve the public throughout the planning process by providing timely and easily understood information to members of the affected community and any other interested party.
- Integrate citizens' needs and concerns into the project development process.
- Work with traditionally underserved populations to understand and consider their needs by implementing processes recommended for environmental justice by the US Department of Transportation (USDOT).
- Providing for periodic review of the effectiveness of the public involvement process to ensure full and open access to all and revision of the process, if necessary.

Public and Agency Scoping

Public and agency involvement activities officially started with the publication of the Notice of Intent (NOI) to prepare an environmental impact statement for the proposed Cotton Belt Regional Corridor Project. The NOI was issued in the Federal Register by the FTA on July 8, 2010. It provided information on the scoping process purpose and meeting logistics, the project's proposed purpose and need, location and environmental setting, possible alternatives, possible effects, FTA procedures, and other pertinent project information.

The public scoping meeting was held on Thursday, July 29, 2010, at 6:30 p.m. at the Addison Conference Center. DART held an Interagency Scoping Meeting on July 28, 2010. Numerous federal, state, tribal, regional and local agencies were invited to provide input during the scoping process. Comments received during this initial scoping process are documented in the Scoping Summary Report, available on DART.org/Cottonbelt as part of the AECR documentation (**Appendix F**). In August 2016, DART relaunched the project and EIS documentation efforts. This chapter focuses on the additional outreach done since August 2016. Both the initial scoping effort and more recent activities provided the basis for identification of issues important to project definition and EIS development.

8.2 Methods and Tools

Implementation of the PIP involves a variety of methods and tools, ranging from regular DART Board of Directors meetings, federal agency meetings, city and stakeholder coordination meetings, and formation of specific Area Focus Groups (AFGs) along the corridor. AFGs were established after project scoping and reconvened in early 2017 to provide input and assist with resolving issues and developing support for the project. These AFGs, which consist of residents, property owners, schools, and other community leaders representing a variety of interests, reviewed the recommendations relative to the environmental analysis and preliminary



design of the project. The role of the AFG is to provide input, exchange ideas, identify and assist with resolving issues and concerns and disseminate information to their respective neighborhoods or organizations. Four AFGs were established: DFW Airport/Coppell, Cypress Waters, Carrollton/Addison, North Dallas, and Richardson/Plano.

A web page was also established for the Project at DART.org/Cottonbelt. Persons visiting the website can obtain information on the status of the project, reference material, prior studies, meeting presentations and materials, and meeting summaries and comments. The website is a comprehensive source of project information. The website also provides a means for the public to provide comments. Since July 2010, the site has registered over 109,000 page hits.

In August 2016, DART relaunched the public process for the Project with a series of public meetings held along the Cotton Belt Corridor. Since the relaunch of the Project, DART has hosted four sets of public meetings (May 2017, August 2017, November/December 2017, and March 2018 in North Dallas only) to present information to the public, as well as receive input from the affected community. A Facebook Live public meeting was held on March 15, 2018, which had nearly 14,000 views. Public meetings were tailored to meet community needs and have occurred in accordance with project milestones. Meeting presentation materials, technical information, and documentation of the meeting summaries were posted to the project website for each meeting.

For public meetings, a variety of outreach methods were used. As DART sought meaningful public input specific to the EJ communities, a special effort was made to involve these communities. EJ inclusion efforts included bilingual advertisements and publications, outreach to minority organizations, and material distribution within EJ communities. **Section 4.9** identified the key issues and concerns raised by the EJ community. The following specific notification efforts were used for Cotton Belt public meetings:

- 20,000 brochures printed in both English and Spanish for each community meeting. A postage paid comment card was attached to the brochure;
- Bilingual meeting brochures were placed on all DART vehicles: bus routes, LRT, TRE;
- Windshield distribution was done at six DART facilities located near the corridor: Downtown Carrollton, Addison Transit Center, CityLine/Bush Station, Arapaho Center Station, Jack Hatchell Transit Center and Parker Road Station;
- Door hangings were placed along the corridor at residential and business locations within 500 feet from center of tracks on both sides of alignment;
- Newspaper ads were in the following publications: Dallas Morning News, Al Dia (Hispanic), Dallas Weekly (African American), Dallas Chinese News (Asian);
- Email/texts for DART meetings to Cotton Belt subscribers (5,290);
- Posted on DART.org, Twitter and Facebook page;
- Posted to 38 Nextdoor neighborhoods along the corridor (12,384);
- Email to the following: DART AFG members, all previous meeting attendees and any other appropriate contact;
- Email to Chambers of Commerce including the Hispanic, African American and Asian Chambers;
- Email to the DART congressional delegation, councilmembers, mayors, city managers, and appropriate city staff; and
- Email to all media outlets.

8.3 Summary of Public and Agency Participation

Public participation strategies and activities have been used to disseminate project information and solicit and receive public input and comment on project-related issues, concerns and



potential environmental impacts of the project. A summary of public and agency coordination meetings since the August 2016 project re-initiation is provided in **Table 8-1**.

Table 8-1. Public and Agency Coordination Meetings

Meeting	Date	Location
Public Meetings/Hearings		
Project Re-Initiation Meetings	August 24, 2016 August 25, 2016 August 29, 2016 August 30, 2016 August 31, 2016 August 31, 2016	Richardson Civic Center Addison Conference Center Parkhill Junior High School, Dallas Event 1013, Plano Plaza Arts Center, Carrollton DFW Airport Marriott
May 2017 Project Update Meetings	May 15, 2017 May 17, 2017 May 22, 2017	Parkhill Junior High School, Dallas Richardson Civic Center DeWitt Perry Middle School, Carrollton
September 2017 Project Update Meetings	September 18, 2017 September 20, 2017 September 25, 2017	DeWitt Perry Middle School, Carrollton Richardson Civic Center Parkhill Junior High School, Dallas
November/December 2017 Project Update Meetings	November 28, 2017 November 30, 2017 December 7, 2017	Parkhill Junior High School, Dallas Richardson Civic Center Addison Conference Center
March 2018 Project Update Meeting	March 8, 2018	Parkhill Junior High School, Dallas
Project Update	March 8, 2018	Parkhill Junior High School, Dallas
Facebook Live	March 15, 2018	DART HQ/Facebook
DART Service Plan Amendment Public Hearing	March 27, 2018	DART HQ
Draft EIS Public Hearing	May 14, 2018	Renaissance Dallas Addison – Lalique Ballroom
Draft EIS Public Hearing	May 15, 2018	Richardson Civic Center – Grand Ball Room
Draft EIS Public Hearing	May 16, 2018	DFW Airport Marriott
Area Focus Group (AFG) Meetings		
Richardson/Plano AFG	April 27, 2017	Richardson City Hall
DFW Airport/Coppell/Cypress Waters AFG	May 4, 2017	Cypress Waters Office Conference Room
North Dallas AFG	May 9, 2017	North Central Police Service Center
Addison/Carrollton AFG	May 10, 2017	Addison Conference Center
Richardson/Plano AFG	August 24, 2017	Plano Municipal Center
Addison/Carrollton AFG	August 29, 2017	Addison Conference Center
DFW Airport/Coppell/Cypress Waters AFG	August 31, 2017	Cypress Waters Office Conference Room
North Dallas AFG	September 11, 2017	Campbell Green Recreation Center
North Dallas AFG	March 1, 2018	UT Dallas, Richardson
DART Board/Committee Meetings		
DART Board Workshop	February 3, 2017	Renaissance Richardson
DART Planning Committee	February 28, 2017	DART
DART Planning Committee	March 28, 2017	DART
DART Planning Committee	April 25, 2017	DART
DART Planning Committee	May 23, 2017	DART
DART Planning Committee	July 11, 2017	DART
DART Planning Committee	August 22, 2017	DART
DART Planning Committee	September 26, 2017	DART
DART Planning Committee	September 26, 2017	DART
DART Planning Committee	October 3, 2017	DART
DART Committee-of-the-Whole	November 1, 2017	DART – Special Meeting



Table 8-1. Public and Agency Coordination Meetings (continued)

Meeting	Date	Location
DART Planning Committee	November 14, 2017	DART
DART Committee-of-the-Whole	November 28, 2017	DART – Special Meeting
DART Committee-of-the-Whole	December 12, 2017	DART
DART Planning Committee	January 23, 2018	DART
DART Planning Committee	February 27, 2018	DART
DART Planning Committee	March 28, 2018	DART
DART Committee-of-the Whole	April 10, 2018	DART
One DOT Meetings (FTA, FAA, FRA)		
Project Initiation Meeting	December 8, 2016	FTA Region VI Headquarters
Project Update Meeting	January 4, 2017	Conference Call
Project Update Meeting	January 29, 2017	Conference Call
Project Update Meeting	February 1, 2017	Conference Call
Project Update Meeting	March 2, 2017	Conference Call
Project Update Meeting	March 26, 2017	Conference Call
Project Update Meeting	April 13, 2017	Conference Call
Project Update Meeting	April 27, 2017	Conference Call
Project Update Meeting	May 18, 2017	Conference Call
Project Update Meeting	June 29, 2017	Conference Call
Project Update Meeting	September 14, 2017	Conference Call
Project Update Meeting	September 28, 2017	Conference Call
Project Update Meeting	November 2, 2017	Conference Call
Project Update Meeting	December 7, 2017	Conference Call
Project Update Meeting	January 25, 2018	Conference Call
Project Update Meeting	February 22, 2018	Conference Call
Project Update Meeting	March 15, 2018	Conference Call
Project Update Meeting	April 5, 2018	Conference Call
FTA Coordination Meetings		
Coordination/Project Update	August 8, 2016	Conference Call
Coordination/Project Update	August 25, 2016	Conference Call
Coordination/Project Update	September 22, 2016	Conference Call
Coordination/Project Update	October 4, 2016	Conference Call
DART/FTA Quarterly Meeting	October 17, 2016	DART Headquarters
Coordination/Project Update	November 3, 2016	Conference Call
Coordination/Project Update	November 17, 2016	Conference Call
Coordination/Project Update	December 15, 2016	Conference Call
Coordination/Project Update	January 13, 2017	Conference Call
DART/FTA Quarterly Meeting	January 26, 2017	FTA Region VI Headquarters
Coordination/Project Update	March 9, 2017	Conference Call
Coordination/Project Update	March 23, 2017	Conference Call
Coordination/Project Update	April 4, 2017	Conference Call
Coordination/Project Update	April 12, 2017	Conference Call
Coordination/Project Update	May 3, 2017	Conference Call
Coordination/Project Update	April 4, 2017	Conference Call
DART/FTA Quarterly Meeting	April 20, 2017	DART Headquarters
Coordination/Project Update	April 24, 2017	Conference Call
Coordination/Project Update	May 3, 2017	Conference Call
Coordination/Project Update	May 31, 2017	Conference Call
Coordination/Project Update	June 15, 2017	Conference Call
Coordination/Project Update	June 27, 2017	Conference Call
Coordination/Project Update	July 12, 2017	Conference Call
DART/FTA Quarterly Meeting	July 20, 2017	FTA Region VI Headquarters



Table 8-1. Public and Agency Coordination Meetings (continued)

Meeting	Date	Location
Coordination/Project Update	August 22, 2017	Conference Call
Coordination/Project Update	September 7, 2017	Conference Call
Coordination/Project Update	September 21, 2017	Conference Call
DART/FTA Quarterly Meeting	October 19, 2017	DART Headquarters
Coordination/Project Update	November 1, 2017	Conference Call
Coordination/Project Update	November 30, 2017	Conference Call
4f Coordination Meeting	December 14, 2017	Conference Call
Coordination/Project Update	January 11, 2018	Conference Call
DART/FTA Quarterly Meeting	January 18, 2018	FTA Region VI Headquarters
Coordination/Project Update	February 8, 2018	Conference Call
Coordination/Project Update	February 22, 2018	Conference Call
Coordination/Project Update	March 8, 2018	Conference Call
Coordination/Project Update	April 5, 2018	Conference Call
FAA/Airport Coordination Meetings		
DFW Airport Station Design	January 19, 2017	DART
DFW Airport Coordination Meeting (DFW, FWTa, NCTCOG)	February 7, 2017	DART
DFW CEO Briefing	April 20, 2017	DART
Addison Airport	November 2, 2017	Addison Service Center
DFW Airport Project Coordination	November 13, 2017	DFW Airport
DFW Airport Project Coordination	January 9, 2018	DFW Airport
FRA/Freight Railroad Coordination Meetings		
FRA Passenger Division Coordination	October 7, 2016	Conference Call
FWRW Coordination	May 2017	Multiple telephone and email exchanges
DGNO Coordination	May 2017	Multiple telephone and email exchanges
FWRW Coordination	July 2017	Multiple telephone and email exchanges
DGNO Coordination	July 2017	Multiple telephone and email exchanges
DGNO Coordination Meeting	July 12, 2017	DGNO Carrollton
BNSF Coordination	September 22, 2017	BNSF HQ Fort Worth, TX
FWRW Coordination	October 2017	Multiple telephone and email exchanges
FWRW Coordination	November 30, 2017	Corridor Hi Rail Tour
DGNO Coordination	November 30, 2017	Corridor Hi Rail Tour
KCS Coordination	December 1, 2017	Corridor Hi Rail/Walking Tour
DGNO Plan Review	January 25, 2018	DGNO Garland, Tx
FWRW Plan Review	January 30, 2018	FWRW Hodge Yard
BNSF Coordination	March 2, 2018	TRE Irving Yard
BNSF Coordination	March 9, 2018	TRE Irving Yard
Agency/City Coordination Meetings		
Richardson City Council Briefing	August 22, 2016	Richardson City Hall
FWTA Coordination Meeting	February 3, 2017	DART
Corridor City Managers Meeting	February 7, 2017	DART
Coppell Parks Department	February 14, 2017	Coppell City Hall
City of Coppell	March 6, 2017	Conference Call
City of Dallas	March 7, 2017	Dallas City Hall
City of Carrollton	March 8, 2017	Carrollton City Hall
City of Plano	March 9, 2017	Plano City Hall
City of Richardson	March 16, 2017	Richardson City Hall
Town of Addison	March 29, 2017	Addison Service Center
City of Richardson/UT Dallas	April 4, 2017	Richardson City Hall
NCTCOG, Regional Trails	April 13, 2017	DART
Corridor City Managers Meeting	April 27, 2017	DART



Table 8-1. Public and Agency Coordination Meetings (continued)

Meeting	Date	Location
Dallas Councilmember Alonzo	May 4, 2017	Dallas City Hall
City of Coppell	May 5, 2017	Coppell Service Center
Dallas City Council Transportation and Trinity River Project Committee Meeting	May 8, 2017	Dallas City Hall / Joint DART Board of Directors meeting
City of Plano, Douglass Community/Davis Cemetery	August 7, 2017	Plano City Hall
Texas Historical Commission	August 21, 2017	Conference Call
NCTCOG, Regional Trails	August 23, 2017	NCTCOG
Dallas County/NCTCOG, Trails	August 29, 2017	Dallas County Administration Building
City of Coppell, Parks	August 29, 2017	Dallas County Administration Building
NCTCOG	September 18, 2017	Conference Call
City of Richardson	October 6, 2017	Richardson City Hall
City of Coppell, Parks	October 18, 2017	Coppell Service Center
City of Coppell	October 18, 2017	Coppell City Hall
City of Carrollton	October 23, 2017	Carrollton City Hall
Town of Addison	November 2, 2017	Addison Service Center
NCTCOG	November 7, 2017	Conference Call
City of Dallas, Traffic Analysis	November 7, 2017	Dallas City Hall
NCTCOG, Cotton Belt Trail	November 7, 2017	Conference Call
NCTCOG/Corridor Cities, Trails	November 13, 2017	Carrollton City Hall
NCTCOG, Regional Trails	November 16, 2017	NCTCOG
City of Plano	November 21, 2017	Plano City Hall
City of Carrollton	December 1, 2017	Carrollton City Hall
NCTCOG/DCTA	December 4, 2017	NCTCOG
Dallas City Managers Meeting	December 15, 2017	DART
Corridor City Managers Meeting	December 19, 2017	DART
City of Dallas	January 31, 2017	Dallas City Hall
NCTCOG, Regional Trails	February 14, 2017	DART
City Manager/Richardson	March 2, 2018	DART
Corridor City Managers Meeting	March 8, 2018	DART
City of Dallas Mobility Committee	March 26, 2018	Dallas City Hall
NCTCOG, Regional Trails	March 28, 2018	NCTCOG
Stakeholder Meetings/Briefings		
Stadler – Vehicle Discussion	January 31, 2017	DART
Cotton Belt Concerned Citizens Coalition (CBCCC)	March 13, 2017	DART
Craig Janssen, North Dallas Noise Analysis review	March 30, 2017	Idibri Offices
Cypress Waters/Lucy Billingsley	April 18, 2017	Arts District
Operations Modeling Workshop	May 24, 2017	DART
Douglass Community/Davis Cemetery	June 30, 2017	Plano City Hall
Stadler Vehicle Workshop	July 13, 2017	DART
Douglass Community/Davis Cemetery	July 31, 2017	Plano City Hall
ONCOR	August 29, 2017	Dallas County Administration Building
Cotton Belt Design Workshop	September 15, 2017	DART
Addison Business Association	October 18, 2017	Crown Plaza Addison
Craig Janssen, North Dallas Noise Analysis review	October 31, 2017	Idibri Offices
ONCOR	December 4, 2017	Conference Call
Minority Business Outreach Partners Roundtable	December 5, 2017	DART
Cypress Waters/Lucy Billingsley	January 30, 2018	Arts District
Trafalgar Square HOA	March 23, 2018	DART

Source: DART



8.4 Agency Coordination

In addition to meetings listed above, DART has coordinated with agencies to ensure review of potential environmental impacts and obtain comments or concurrence on proposed approach to mitigate impacts. **Appendix G** includes agency coordination documentation since re-initiation of the project in August 2016. Original consultation letters were provided at the time of the NOI to prepare an EIS. Project and issue specific coordination has continued since that time.

8.5 Public and Agency Involvement and the Draft EIS

The DEIS acts as a public decision-making document, in accordance with applicable state and federal regulations, by presenting the anticipated environmental consequences of the Build and No-Build Alternatives with appropriate mitigation measures. This DEIS has been approved for public circulation by the FTA, and the cooperating agency, FAA. FRA as a participating agency has coordinated with DART on the Project and is continuing to provide input. The DEIS has been made available to the public, stakeholder organizations, and local, regional, state and federal agencies for their review and comment. Its availability for review and comment has been officially advertised in the Federal Register, as well as through the local media and press.

Formal public hearings will be held to give affected and interested parties the opportunity to formally submit comments on the DEIS. The hearings may include a technical presentation to be followed by time for testimony during the public comment period. Additional or subsequent written comments may be received at DART headquarters via written or email form.

Public hearing transcripts and all correspondence will be reviewed at the close of the DEIS public and agency review period. Substantive comments will be classified and recorded into appropriate subject areas. All comments will be reviewed and documented. However, only substantive comments will receive responses and will be documented in the FEIS/ROD.



9. List of Preparers

9.1 Introduction

This chapter lists the individuals who have provided key input, technical expertise and/or guidance for preparation of the Cotton Belt Project DEIS.

9.2 Public Agency Staff

Table 9-1 lists public agency individuals that provided oversight, guidance and/or technical review for the DEIS.

Table 9-1. Public Agency Staff

Name	Title
Federal Transit Administration (Lead Federal Agency)	
Robert Patrick	Region VI Administrator
Sharyn LaCombe	Office of Planning and Environment (Headquarters), Federal Preservation Officer
Don Koski	Region VI Director of Planning and Program Development
Ronisha Hodge	Region VI Community Planner
Brian Hooker	Region VI General Engineer
Melissa Foreman	Region VI Community Planner
Leslie Roche	Region VI Environmental Contractor
Federal Aviation Administration (Cooperating Agency)	
Dean McMath	Southwest Region Environmental Team Leader
John MacFarlane	Texas Airports Development Office
Federal Railroad Administration (Participating Agency)	
Kevin Wright	Environmental Protection Specialist
Dallas Area Rapid Transit	
Tim McKay	Executive Vice President, Growth and Regional Development
Steve Salin	Vice President, Capital Planning
Bonnie Murphy	Vice President of Commuter Rail/Railroad Management
Michael Miles	Vice President, Government Relations
Chad Edwards	Assistant Vice President, Capital Planning
John Hoppie	Cotton Belt Project Manager
Kay Shelton	Project Manager, Capital Planning
J. Lawrence Meshack, III	Senior Manager, Community Engagement
Rosa Rosteet	Community Engagement Representative
John Rhone	Vice President, Capital Design & Construction
David Ehrlicher	Assistant Vice President, Capital Design & Construction
Reza Shirmanesh	Project Manager, Design & Construction
Nathaniel Morgan	Assistant Vice President, Commuter Rail/Railroad Management
Annka Robinson	Project Manager, Commuter Rail/Railroad Management*
Phil Johnson	Capital Planning, Travel Demand Modeling
Connie Xu	Capital Planning, Travel Demand Modeling
Victor Ibewuiké	Capital Planning, Environmental Coordination
Cleo Grounds	Assistant Vice President, Real Estate
Greg Althoff	Acquisition and Relocations Manager
Rob Smith	Assistant Vice President, Bus Service Planning
Hans Michael Ruthe	Project Manager, Bus Service Planning
Dallas/Fort Worth International Airport – DFW Airport	
Greg Royster	Senior Airport Planner
Sandy Lancaster	Environmental Affairs

*No longer with DART



9.3 Consultant Team Members

Table 9-2 lists consultant team staff that provided technical input and oversight for preparation of the DEIS document and associated preliminary engineering documents.

Table 9-2. Consultant Team Members (GPC 6 Consultant Team)

Name and Title	Years of Experience	Role
HDR Engineering, Inc.		
Tom Shelton, P.E., Vice President Regional Transit Market Leader	37	Project Manager
Amanda Stahlnecker, P.E., Senior Rail Engineer	14	Engineering Lead
Israel Crowe, P.E., Senior Transportation Engineer	20	Rail Engineering
Mark Martin, P.E., Senior Rail Engineer	32	Rail Engineering
Chris Phonpituck, P.E., Rail Engineer	13	Rail Engineering
Lucas Gublo, EIT, Rail	7	Rail Engineering
Lindsey Boitsov, P.E., Rail Engineer	10	Rail Engineering
Cassandra Wallof, P.E., Bridge Engineer	7	Bridge Structural Engineering
Reddy Edulakanti, P.E., Senior Traffic Engineer	14	Traffic Engineering
Kristine Lloyd, NEPA Project Manager	25	Document Preparation, Public Involvement
Maggie Cowling, GIS Manager	8	GIS Mapping
Terri Asendorf Hyde, Environmental Project Manager	11	Land Use Research, Document Preparation
Jory Dille, Transportation Planner	10	Acquisitions and Displacements, GIS, QA/QC
Peggy Jones, Environmental Scientist	32	Habitat Assessment, Document Preparation
Christine Magers, CWB, Environmental Scientist II	11	Water Resource Section Author, Lead Wetland Delineator
Sara Moren, Environmental Scientist	13	Air Quality, Hazardous Materials, Document Preparation
Adam Roberts, Environmental Scientist	10	Geology and Water Quality, Land Use, Visual and Aesthetic Resources
Sherry Sultenfuss, Environmental Scientist	30	Parks, Safety and Security
Shane Valentine, P.G., Senior Project Manager	20	Geology, Land Use, QA/QC Technical Reviewer
KAI Texas		
Darren James, AIA	24	Station Design Lead
Veronica Castro de Berrera, RA, AIA, LEED AP	20	Station Architecture
Derwin Broughton, AIA	18	Station Architecture
K Strategies		
Dianne Tordillo, Public Engagement Specialist	7	Public Involvement
Stephanie Tapke, Public Engagement Specialist	2	Public Involvement
Emily Riggs, Public Engagement Specialist	6	Public Involvement
Cross Spectrum Acoustics		
Dave Towers, Principal Associate	43	Noise and Vibration Specialist
Scott Edwards, Senior Associate	7	Noise and Vibration Analyst
Joelle Suits, Associate	5	Noise and Vibration Analyst
AmaTerra Environmental		
Deborah Dobson-Brown, PhD, RPA, Cultural Resources Program Manager	31	Cultural Resources, Historic Resources Survey
Joel Butler, Principal Investigator/GIS Analyst	15	Archeological Survey, Document Preparation, GIS analysis, Figure Preparation
Amy Goldstein, Project Archeologist	7	Archeological Survey, Document Preparation
Joshua Hamilton, Archeologist, GIS Technician	10	Archeology Field work & Research
Noel Steinle, Archeology Technician	10	Archeology Field work & Research
Katherine Seikel, Archeology Curation/Lab Manager	10	Archeology Curation
Erica Howard, M.A., Staff Architectural Historian	10	Historic Resources Survey, Document preparation



Table 9-2. Consultant Team Members (GPC 6 Consultant Team) (continued)

Name and Title	Years of Experience	Role
Civil Associates, Inc.		
Jenn-Hwan Ma, P.E.	27	Civil Engineering and Station Civil Design
Iconic Consulting Group, Inc.		
Jeffrey Briscoe, P.E.	18	Street Modifications and Drainage Design
HNTB		
Selena Solis Asire, P.E.	21	Passenger Rail Systems Design
Julie Morse, Environmental Task Lead	21	Socioeconomics, Indirect and Cumulative Impacts
Michele Lopez, Environmental Planner	12	Socioeconomics, Indirect and Cumulative Impacts
Nathan D. Maier Consulting Engineers, Inc.		
Gary Matthews, RPLS	39	Field Surveying & R.O.W. Confirmation
William Wallace, RPLS	40	Field Surveying & R.O.W. Confirmation
Rudy Santini	14	Field Surveying & R.O.W. Confirmation
Urban Engineers Group		
Faisal Syed, P.E., PTOE, LEED AP	21	Project Engineer, Utility Research
Hasan Raza	5	Project Designer, Utility Research
Urban Opportunity		
Frank Turner, Principal	40	Stakeholder Coordinator

Source: GPC6, 2017



10. Distribution List

Chapter 10 contains the distribution list for the notice of availability for this DEIS.

FEDERAL AGENCIES

Mr. Reid Nelson, Director - Advisory Council on Historic Preservation
Mr. Vishal Joshipura, Financial Policy Advisor - Build America Bureau; U.S. Department of Transportation
Mr. Leo Wetula, Program Manager - Build America Bureau; U.S. Department of Transportation
Mr. John Tahsuda, Acting Assistant Secretary - Bureau of Indian Affairs
Mr. Terry McClung, NEPA Coordinator - Bureau of Indian Affairs
Ms. Carol Braegemann, Director, Office of Environmental Policy and Compliance - Department of the Interior
Mr. Ryan Zinke, Secretary of Interior - Department of the Interior
Mr. John MacFarlane, Environmental Protection Specialist - Federal Aviation Administration - Southwest Region
Mr. Tony Robinson, Regional Director - Federal Emergency Management Agency, Region VI
Mr. Al Alonzi, Division Administrator - Federal Highway Administration-Texas Division
Mr. Kevin Wright, Environmental Protection Specialist - Federal Railroad Administration
Mr. Vence Haggard, Regional Administrator - Federal Railroad Administration - Region 5
Mr. Nathan Wallace, HQ Passenger Rail Safety Specialist - Federal Railroad Administration, Passenger Division
Mr. Robert Babcock, Regional Administrator - General Services Administration
Ms. Sue Masica, Regional Director - National Park Service Intermountain Region
Mr. Stephen Brooks, Chief, Regulatory Branch - U.S. Army Corps of Engineers
Colonel Calvin C. Hudson II, Ft. Worth District Commander - U.S. Army Corps of Engineers
Rear Admiral David Callahan, District Commander - U.S. Coast Guard, 8th District
Mr. Bob Cook, Field Office Director - U.S. Department of Housing and Urban Development, Dallas Office
Mr. Arturo Blanco, Deputy Director, Region 6 Tribal Program - U.S. Environmental Protection Agency, Region 6
Ms. Anne Idsal, Administrator - U.S. Environmental Protection Agency, Region 6
Ms. Kimeka Price, EIS Reviewer, Transportation Projects - U.S. Environmental Protection Agency, Region 6
Ms. Debra Bills, Field Supervisor - U.S. Fish and Wildlife Service, Ecological Services
Ms. Amy Lueders, Southwest Regional Director - U.S. Fish and Wildlife Service, Region 2

STATE AGENCIES

Ms. Christi Craddick, Chairman - Railroad Commission of Texas
Mr. Tony Walker, Regional Director - Texas Commission on Environmental Quality, Dallas/Fort Worth Region
Mr. Peter Espy, Rail Division Director - Texas Department of Transportation
Mr. William Hale, PE, Chief Engineer - Texas Department of Transportation
Mr. Dan Perge, Environmental Affairs - Dallas Division - Texas Department of Transportation
Mr. Kelly Selman, PE, District Engineer - Texas Department of Transportation
Mr. Carlos Swonke, Director, Environmental Affairs Division - Texas Department of Transportation
Mr. Marc Williams, Deputy Executive Director, Transportation - Texas Department of Transportation
Mr. George P. Bush, Commissioner - Texas General Land Office, Asset Management
Mr. Justin Kockritz, Lead Architectural Historian - Texas Historical Commission
Ms. Becky Shelton, Regional Archeologist - Texas Historical Commission
Mr. Mark Wolfe, Executive Director - Texas Historical Commission
Mr. Bob Gottfried, Program Supervisor, Texas Natural Diversity Database - Texas Parks and Wildlife Department
Ms. Karen Hardin, Habitat Assessment Biologist, WHAP - Texas Parks and Wildlife Department
Mr. Carter Smith, Executive Director - Texas Parks and Wildlife Department
Ms. Laura Zebehazy, Program Leader, WHAP - Texas Parks and Wildlife Department



REGIONAL AGENCIES

Mr. Joel Jenkinson, PhD, AAE, Airport Director - Addison Airport
Mr. Drew Campbell, Executive Director - Dallas Regional Mobility Coalition
Mr. Jim Cline, President - Denton County Transportation Authority
Mr. John Brookby, Commercial Development - DFW International Airport
Ms. Karen Kavanagh, Vice President Planning - DFW International Airport
Ms. Lisa Hughes, Assistant Vice President Planning - DFW International Airport
Mr. Jason Williams, Planning Manager - DFW International Airport
Mr. Robert Horton, Vice President Environmental Affairs - DFW International Airport
Mr. Rusty Hodapp, Vice President Design, Code, and Construction - DFW International Airport
Mr. Ramiro Garcia, DCC Program Manager - DFW International Airport
Ms. Tammy Huddleston, AVP Infrastructure Planning and Engineering - DFW International Airport
Ms. Smitha Radhakrishnan, Sr. Land and Facilities Manager - DFW International Airport
Mr. John Terrell, Vice President Commercial Development - DFW International Airport
Mr. Charles Cinquemani, DPS Police Chief - DFW International Airport
Mr. Stephen Knox, Project Manager - DFW International Airport
Ms. Sandy Lancaster, Environmental Program Manager - DFW International Airport
Mr. Greg Royster, Senior Airport Planner - DFW International Airport
Mr. Eddie Tovar, Systems Performance Manager - DFW International Airport
Mr. Paul Ballard, President/Executive Director - Fort Worth Transportation Authority
Mr. Richey Thompson, Chief Engineer, TEXRail - Fort Worth Transportation Authority
Mr. Michael Eastland, Executive Director - NCTCOG
Mr. Dan Lamers, Senior Program Manager - NCTCOG
Ms. Edith Marvin, Director of Environment & Development - NCTCOG
Mr. Michael Morris, Director of Transportation - NCTCOG
Mr. Gerry Carrington, Executive Director - North Texas Tollway Authority

LOCAL AGENCIES

Mr. John Crawford, Public Works Director - City of Carrollton
Mr. Marcos Fernandez, Senior Engineer - City of Carrollton
Mr. Tom Hammons, Transportation Engineering Manager - City of Carrollton
Mr. Scott Hudson, Director of Environmental Services - City of Carrollton
Ms. Kelli Lewis, Marketing Director - City of Carrollton
Mr. Mike McKay, Civil Engineering Manager - City of Carrollton
Mr. Cesar Molina, Director of Engineering - City of Carrollton
Ms. Erin Rinehart, City Manager - City of Carrollton
Mr. Ravi Shaw, Urban Development Director - City of Carrollton
Mr. Scott Whitaker, Parks & Recreation Director - City of Carrollton

Mr. Brett Haney, City Manager - City of Cockrell Hill

Mr. Kent Collins, Assistant Director of Engineering & Public Works - City of Coppell
Mr. John Elias, Parks & Recreation Department - City of Coppell
Mr. Mike Land, City Manager - City of Coppell
Ms. Traci Leach, Deputy City Manager - City of Coppell
Mr. Matt Steer, City Planner - City of Coppell

Mr. Majed Al-Ghafry, Assistant City Manager - City of Dallas
Mr. T.C. Broadnax, City Manager - City of Dallas
Ms. Tanya Brooks, Assistant Director, Transportation Operations - City of Dallas
Mr. Larry Casto, City Attorney - City of Dallas
Ms. Jeanne Chipperfield, Chief Ethics and Compliance Officer - City of Dallas
Mr. David Coatney, Chief, Fire Department - City of Dallas
Mr. David Cossum, Department Director, Sustainable Development and Construction - City of Dallas
Ms. Beverly Davis, Fair Housing - City of Dallas
Mr. Mark Doty, Historic Planner - City of Dallas



Mr. William Finch, Chief Information Officer - City of Dallas
Ms. Erica Flores, Department Director, Economic Development - City of Dallas
Mr. Jon Fortune, Assistant City Manager - City of Dallas
Mr. Mike Frosch, Department Director, Business Development and Procurement - City of Dallas
Mr. Ricardo Galceran, Department Director, Public Works and Transportation - City of Dallas
Ms. Renee Hall, Chief of Police, Police Department - City of Dallas
Mr. Raymond Lee, III, Streets Service Manager - City of Dallas
Ms. Terry Lowery, Department Director, Water Utilities - City of Dallas
Mr. James McGuire, Department Director, Office of Environmental Quality - City of Dallas
Ms. Theresa O'Donnell, Chief Resiliency Officer - City of Dallas
Ms. Jody Puckett, Assistant City Manager - City of Dallas
Ms. Elizabeth Reich, Chief Financial Officer - City of Dallas
Ms. Jacqueline Rodarte-Valle, Assistant Director, Housing/Community Services - City of Dallas
Mr. Michael Rogers, Director, Transportation Department - City of Dallas
Ms. Kris Sweckard, Department Director, Code Compliance - City of Dallas
Ms. Kimberly Tolbert, Chief of Staff to the City Manager - City of Dallas
Mr. Jared White, Bicycle Transportation Manager - City of Dallas
Mr. Willis Winters, Department Director, Parks and Recreation - City of Dallas
Mr. Joey Zapata, Assistant City Manager - City of Dallas

Mr. Charles Cox, City Manager - City of Farmers Branch

Mr. David Cooke, City Manager - City of Fort Worth

Mr. Bryan Bradford, City Manager - City of Garland

Ms. Aretha Ferrell-Benavides, City Manager - City of Glenn Heights

Mr. Bryan Beck, Director of Public Works - City of Grapevine
Mr. Bruno Rumbelow, City Manager - City of Grapevine

Mr. Chris Hillman, City Manager - City of Irving
Mr. Dan Vedral, Traffic and Transportation Director - City of Irving

Mr. Peter Braster, Director of Special Projects - City of Plano
Mr. Jack Carr, Deputy City Manager - City of Plano
Ms. Christina Dorrance Day, Director of Planning - City of Plano
Mr. Bruce Glasscock, City Manager - City of Plano

Mr. Dave Carter, Asst. Director of Development Services: Traffic & Transportation - City of Richardson
Mr. Dan Johnson, City Manager - City of Richardson
Mr. Cliff Miller, Assistant City Manager - City of Richardson
Mr. Michael Spicer, Director of Development Services - City of Richardson
Mr. Mark Titus, Transportation Engineering Manager - City of Richardson

Mr. Brian Funderbunk, City Manager - City of Rowlett

Ms. Robbie Corder, City Manager - City of University Park

Ms. Laura Bell, City Secretary - Town of Addison
Mr. Orlando Campos, Director of Economic Development & Tourism - Town of Addison
Ms. Ashley Mitchell, Deputy City Manager - Town of Addison
Mr. Wes Pierson, City Manager - Town of Addison
Ms. Lisa Pyles, Director of Infrastructure and Development Services - Town of Addison
Ms. Caitlan Smelley, Assistant City Manager - Town of Addison



Mr. Bill Lindley, Town Administrator - Town of Highland Park

Mr. Clarence Daugherty, Collin County Engineering Department - Collin County
Mr. Bill Bilyeu, Collin County Administrator - Collin County Administration Building

Ms. Alberta Blair, Director of Public Works - Dallas County
Ms. Antoinette Bacchus, Assistant Director Transportation Planning - Dallas County

Mr. G.K. Maenius, Tarrant County Administrator

FEDERAL ELECTED OFFICIALS

The Honorable Joe Barton, Congressman - U.S. House of Representatives
The Honorable Michael Burgess, Congressman - U.S. House of Representatives
The Honorable Jeb Hensarling, Congressman - U.S. House of Representatives
The Honorable Sam Johnson, Congressman - U.S. House of Representatives
The Honorable Eddie Bernice Johnson, Congresswoman - U.S. House of Representatives
The Honorable Kenny Marchant, Congressman - U.S. House of Representatives
The Honorable Pete Sessions, Congressman - U.S. House of Representatives
The Honorable John Cornyn, Senator - U.S. Senate
The Honorable Ted Cruz, Senator - U.S. Senate

STATE ELECTED OFFICIALS

The Honorable Greg Abbott, Governor, State of Texas - Office of the Governor
The Honorable Roberto Alonzo, State Representative, District 104 - Texas House of Representatives
The Honorable Rafael Anchia, State Representative, District 103 - Texas House of Representatives
The Honorable Rodney Anderson, State Representative, District 105 - Texas House of Representatives
The Honorable Cindy Burkett, State Representative, District 113 - Texas House of Representatives
The Honorable Angie Chen Button, State Representative, District 112 - Texas House of Representatives
The Honorable Yvonne Davis, State Representative, District 111 - Texas House of Representatives
The Honorable Pat Fallon, State Representative, District 106 - Texas House of Representatives
The Honorable Helen Giddings, State Representative, District 109 - Texas House of Representatives
The Honorable Justin Holland, State Representative, District 33 - Texas House of Representatives
The Honorable Eric Johnson, State Representative, District 100 - Texas House of Representatives
The Honorable Linda Koop, State Representative, District 102 - Texas House of Representatives
The Honorable Jodie Laubenberg, State Representative, District 89 - Texas House of Representatives
The Honorable Jeff Leach, State Representative, District 67 - Texas House of Representatives
The Honorable Morgan Meyer, State Representative, District 108 - Texas House of Representatives
The Honorable Victoria Neave, State Representative, District 107 - Texas House of Representatives
The Honorable Tan Parker, State Representative, District 63 - Texas House of Representatives
The Honorable Matt Rinaldi, State Representative, District 115 - Texas House of Representatives
The Honorable Toni Rose, State Representative, District 110 - Texas House of Representatives
The Honorable Scott Sanford, State Representative, District 70 - Texas House of Representatives
The Honorable Matt Shaheen, State Representative, District 66 - Texas House of Representatives
The Honorable Ron Simmons, State Representative, District 65 - Texas House of Representatives
The Honorable Joe Straus, Speaker of the House - Texas House of Representatives
The Honorable Lynn Stucky, State Representative, District 64 - Texas House of Representatives
The Honorable Jason Villalba, State Representative, District 114 - Texas House of Representatives
The Honorable John Wray, State Representative, District 10 - Texas House of Representatives
The Honorable Brian Birdwell, Texas Senator, District 22 - Texas Senate
The Honorable Craig Estes, Texas Senator, District 30 - Texas Senate
The Honorable Bob Hall, Texas Senator, District 2 - Texas Senate
The Honorable Kelly Hancock, Texas Senator, District 9 - Texas Senate
The Honorable Don Huffines, Texas Senator, District 16 - Texas Senate
The Honorable Jane Nelson, Texas Senator, District 12 - Texas Senate



The Honorable Dan Patrick, Lt. Governor, State of Texas - Texas Senate
The Honorable Van Taylor, Texas Senator, District 8 - Texas Senate
The Honorable Royce West, Texas Senator, District 23 - Texas Senate

LOCAL ELECTED OFFICIALS

The Honorable Kevin Falconer, Mayor - City of Carrollton
Mayor Pro Tem Glen Blanscet - City of Carrollton
Deputy Mayor Pro Tem John Sutter - City of Carrollton
Councilmember Frances Cruz - City of Carrollton
Councilmember Mike Hennefer - City of Carrollton
Councilmember Doug Hrbacek - City of Carrollton
Councilmember James Lawrence - City of Carrollton
Councilmember Young Sung - City of Carrollton

The Honorable Karen Hunt, Mayor - City of Coppel

The Honorable Mike Rawlings, Mayor - City of Dallas
Mayor Pro Tem Dwaine Caraway, District 4 - City of Dallas
Deputy Mayor Pro Tem Adam Medrano, District 2 - City of Dallas
Councilmember Tennell Atkins, District 8 - City of Dallas
Councilmember Rickey Callahan, District 5 - City of Dallas
Councilmember Mark Clayton, District 9 - City of Dallas
Councilmember Kevin Felder, District 7 - City of Dallas
Councilmember Sandy Greyson, District 12 - City of Dallas
Councilmember Scott Griggs, District 1 - City of Dallas
Councilmember Philip Kingston, District 14 - City of Dallas
Councilmember Lee Kleinman, District 11 - City of Dallas
Councilmember Adam McGough, District 10 - City of Dallas
Councilmember Omar Narvaez, District 6 - City of Dallas
Councilmember Jennifer Staubach Gates, District 13 - City of Dallas
Councilmember Casey Thomas, II, District 3 - City of Dallas

The Honorable William Tate, Mayor - City of Grapevine

The Honorable Rick Stopfer, Mayor - City of Irving

The Honorable Harry LaRosiliere, Mayor - City of Plano
Mayor Pro Tem Rick Grady - City of Plano
Deputy Mayor Pro Tem Ron Kelley - City of Plano
Councilmember Tom Harrison - City of Plano
Councilmember Angela Miner - City of Plano
Councilmember Kayci Prince - City of Plano
Councilmember Anthony Ricciardelli - City of Plano
Councilmember Rick Smith - City of Plano

The Honorable Paul Voelker, Mayor - City of Richardson
Mayor Pro Tem Mark Solomon, Place 2 - City of Richardson
Councilmember Bob Dubey, Place 1 - City of Richardson
Councilmember Scott Dunn, Place 3 - City of Richardson
Councilmember Marta Gomez Frey, Place 5 - City of Richardson
Councilmember Steve Mitchell, Place 6 - City of Richardson
Councilmember Mabel Simpson, Place 4 - City of Richardson

The Honorable Joe Chow, Mayor - Town of Addison
Mayor Pro Tem Ivan Hughes - Town of Addison
Deputy Mayor Pro Tem Jim Duffy - Town of Addison



Councilmember Al Angell - Town of Addison
Councilmember Tom Braun - Town of Addison
Councilmember Paul Walden - Town of Addison
Councilmember Lori Ward - Town of Addison

The Honorable Susan Fletcher, Collin County Commissioner
The Honorable Keith Self, Collin County Judge
The Honorable John Thomas, Collin County Commissioner
The Honorable Duncan Webb, Collin County Commissioner
The Honorable Cheryl Williams, Collin County Commissioner

The Honorable Mike Cantrell, Dallas County Commissioner, District 2
The Honorable Theresa Daniel, Dallas County Commissioner, District 1
The Honorable Dr. Elba Garcia, Dallas County Commissioner, District 4
The Honorable Clay Jenkins, Dallas County Judge
The Honorable John Wiley Price, Dallas County Commissioner, District 3

The Honorable Hugh Coleman, Denton County Commissioner
The Honorable Andy Eads, Denton County Commissioner
The Honorable Mary Horn, Denton County Judge
The Honorable Ron Marchant, Denton County Commissioner
The Honorable Bobbi Mitchell, Denton County Commissioner

The Honorable Roy Charles Brooks, Tarrant County Commissioner
The Honorable Gary Fickes, Tarrant County Commissioner
The Honorable J.D. Johnson, Tarrant County Commissioner
The Honorable Andy Nguyen, Tarrant County Commissioner
The Honorable B. Glen Whitley, Tarrant County Judge

INTERESTED ORGANIZATIONS/PROPERTY OWNERS/AREA FOCUS GROUP MEMBERS

Jim Abadie, Resident - City of Carrollton
Joe Altemore, Manager - Bush/75 Partners
Carol Armstrong, President - Haggard Park HOA
Matt Bach, President/Holiday Park HOA - North Dallas Neighborhood Alliance/Holiday Park HOA
Linda Baity - Cotton Belt Concerned Citizens Coalition (CBCCC)/Willow Green Condominiums
Jim Baker, Membership Chair - Bel Air of Josey Ranch Homeowners Association
Judi Bargmann, President - Preston Green Homeowners Association
Blake Barnard, Representative - Town of Addison
Richard Barnor, Pastor - Fountain of Life International Church
Gail Barth, Representative - Town of Addison
Mr. John Hollingsworth, Manager, Utility Coordination North Texas - AT&T
Mr. David Coker - Atmos
Ms. Sue Inurrigarro, Project Manager - Atmos
Vijay Bilamuri - Coppell Greens
Lindsay Billingsley - Alliance Residential Company
Ms. Lucy Billingsley, Partner - Billingsley Company
Brian Binggelli, School Superintendent - Plano ISD
Ryan Binkley, Lead Pastor - Create Church
Sandy Blue, Customer Relations - TreeHouse Foods
Vijay Borra, Property Owner - Coppell
Taylor Bowen - AMLI Residential
Juli Branson, Representative - Town of Addison
Allen Brier, Senior Manager - Facilities - Halliburton
Gia Brodt - AMLI Residential
Adam Brown - Trinsic Residential
Bob Bruce, Director - Fifteenth Street Village Homeowners Association



Joe Bruce, Managing Director - Transwest
Mr. Paul Cristina, Director - Public Private Partnerships - Burlington Northern Santa Fe
Ms. Olivia Templeton, Director - Contracts and Joint Facilities - Burlington Northern Santa Fe
Vance Bryson - The Vance Bryson Company, PC
Bobby Burns, School Superintendent - Carrollton-Farmers Branch ISD
Allison Burrow, Membership Director - The Clubs of Prestonwood
Michael Byington, Representative - Chalfont Place Homeowners Association
Warren Caldwell, President Elect - Canyon Creek Homeowners Association
Ms. Martina Callahan, THPO - Comanche Nation of Oklahoma
Bill Calvalle - Creekview Homeowners Association
Jeffery Canose - Texas Health Resources Plano
Erin Carney, President - Metrocrest Chamber of Commerce
Wilbert Carter, Plant Manager - Gerdau-Carrollton Wire Products
Mary Jo Cater, Representative - Town of Addison
Josh and Adrienne Causey - Creekview Homeowners Association
Alex Chako, Pastor - Sehion Mar Thoma Church
Jun Choi, Pastor - Semihan Church (Korean)
Dane Cofer, Resident - North Dallas
Josh Cohen, Resident
Elizabeth Corbell, Senior Property Manager - CYPR Office - Billingsley
Nancy Craig, Representative - Town of Addison
Mona Crider, President - La Foofaraw
Mr. Phil Cross, THPO - Caddo Nation
Charles Dale - Creekview Homeowners Association
Jack Daniels - Highland Springs
Richard Dempsey, AVP of Facilities Management - The University of Texas at Dallas
Herman Denzer - Creekview Homeowners Association
Dennis Dshazer, Homeowner - CBCCC/Prestonwood
David Dick, President - Prestonwood Trails
Jeff Diora, Owner - Precision Technology, Inc.
Christine Douglass, President/CEO - Coppell Chamber of Commerce
Raymond Egana, Facility Manager - United Health Group
Ms. Marnese Elder, President - Dallas Black Chamber of Commerce
Danelle Ericson, Resident
Rick Fambro, President - Fairway Groups, Real Estate
Lisa Faulkner-Dunne, Representative - CBCCC/Preston Creek Homeowners Association
Joe Ferrier, Facility Superintendent - Blue Cross and Blue Shield of Texas
Logan Finkelstein, President - Bel Air of Josey Ranch Homeowners Association
Bobby Finken - Lakes of Coppell
Clarence Ford, Pastor - Hill's Chapel CME Church
Ms. Tamara Francis, Chairman - Caddo Nation
Tim Freeney, President - Trafalgar Square
Karen & Bill French
Camille Garcia, Public Affairs Manager - State Farm
Randy Garrison, General Manager - Riverchase Golf Course
Tonya Gilbert, Administrative Assistant - Abeo Practice Management
Charles Gillet, Member - The Historic Downtown Plano Association
Gayle Glosser, Co-Owner - Tenth Street Industries
Katherine Gorenc, Resident
Scott Gorenc, Resident
Lydia Goulas, Board Member - Northlake Woodlands HOA
Danny Goulas, - Northlake Woodlands HOA
Rick Gover, Representative - Chalfont Place Homeowners Association
Sid Grant, Assistant Superintendent for Business Support Services - Coppell ISD
Lesli Gray, Representative - Town of Addison
Guy Gregg, Director of Landscape Management - Billingsley



Margie Gunther, Representative - Town of Addison
Mr. Kenny Day, General Manager - Dallas Garland and Northeastern Railroad
Andy Harmon - Highlands of McKamy HOA
Maya Hayes, Property Manager - Madison Estates HOA
Whitney Heiman, Member - Summit at the Springs
Julie Higginbotham, Partner - La Foofaraw
Mark Hill, LEED AP BD+C
Mr. Michael Hinojosa, Superintendent - Dallas Independent School District
Mr. Terry Leppla, Right-of-Way Specialist - ExxonMobil Pipeline Company
Tom Holland, Vice President Development - Billingsley
Gage Hunt - Mary Kay, Inc.
Lola Hurt, Representative - Town of Addison
E. Kenneth Hutchenrider, Jr., President - Richardson Regional Medical Center
Kathy Ingle - Ingle Rentals
Mr. Kevin Erasmus, President/CEO - Fort Worth and Western Railroad
Mr. Bill Parker, Director of Planning and Special Projects - Fort Worth and Western Railroad
Carol Jablonski, President - Preston Creek Homeowners Association
Matt Jackson, President - Copynet
Martin Jackson, Vice President - Copynet
John Jacobs, Senior Vice President - Richardson Chamber of Commerce
Calvin Jamison, Senior Vice President - The University of Texas at Dallas
Craig Janssen, Representative Acoustic Engineer - Court Estates
Sherry Jenkins, Secretary - River of Glory
Hildegard Jessup, Headmistress - Oak Crest Private School
Steve Johnson, President - Creekview Homeowners Association
Jamee Jolly, President - Plano Chamber of Commerce
Steve Jones, Project Manager - Billingsley
Mr. Phillip Jones, President/CEO - Dallas Convention and Visitors Bureau
Anil Joshua, Secretary - Sehion Mar Thoma Church
Dr. Judy Kelly, President - Carrollton Heights HOA
Marty Kennard, Owner - Sports Garden DFW
Heidi Kessel, Assistant to Senior Vice President - The University of Texas at Dallas
Sang Tae Kim, Pastor - Korean Church of Dallas
Russ Kissick, Co-Director - The Plano Conservancy
Cathy Kuebler, VP Property Management - Billingsley
Phillip LaBerge, President - Coppell Greens
Sandra LaClave, General Manager - Collin Creek Mall
Marijke Lantz, Senior Vice President Investments - Billingsley
Dr. Wright Lassiter, Jr., Chancellor - Dallas County Community College District
Mr. Joe Turner, Roadmaster Dist.7 - Kansas City Southern Railway Company
Paul Lauriat - The Bonaventure
Lead Pastor - Fountain of Life International Church
Yohan Lee, Korean Church of Dallas - Associate Pastor
Barrett Leshner - Hallett & Perrin
Tom Lewis, Sales Manager - Plano Marine
Daniel K. Long, Sr., President - Plano Homeowners Council
Lot Manager - Park 'n Fly
Bill Lovell, Vice President - Old Downtown Carrollton Neighborhood Association
Chris Luna, Staff Vice President & Assistant General Counsel - MetroPCS Communications
Sheila Lustfield, Director - The Country Place, Inc. Homeowners Association
Mirna Lynch, Chairman of the Board - The Historic Downtown Plano Association
Mr. John Bachelder, OSP National Support/Investigations - MCI/Verizon
Paula MacDonald, President - Old Downtown Carrollton Neighborhood Association
Donna Magro, President - Highland Square Homeowners Association
April Maldonado, HR Director - Reliant Rehabilitation Hospital-North Texas
Property Manager, Principal Management Group - The Woodlands of Plano



Walt Marston, President - Hillcrest Manor Homeowners Association
Tony Martellott, President - Dallascape, Inc.
Mr. Russell Martin, President - Tonkawa Tribe of Oklahoma
Liesl Mayerson, Representative - Town of Addison
Gray Mayes, Public Affairs Manager - Texas Instruments
David McCall, Partner - Gay, McCall, Isaacks, Gordon, May & Roberts, P.C.
Laura McCorkle, Principal - All Saints Catholic School
Paula McDonald, Treasurer - Carrollton Heights HOA
Mr. Jon Bowers, Sr. Right of Way Agent - ONCOR
Mr. Matt Kinsey, Transmission Engineering - ONCOR
Mr. Keith Williams, Project Manager, Network Design - ONCOR
Robert McGraw, OEM and National Account Contact - AER Manufacturing Corporation Headquarters
Rockie McMillan-Allen, Operations Manager - Cypress Waters
Mansi Mhashelkar, President - Chateaus of Coppell
Robert Miller, President - Dallas North Estates HOA
Mohammed Amer Mohiuddin, President - Medina Villas
Walt Monford, Executive Vice President - KDC
David Montoya, President - Fairfield of Plano Homeowners Association
Bob Moore, Representative - Preston Green Homeowners Association
Shahzad Nathani, Director - Ivy Montessori School
Mr. William Nelson, Chairman - Comanche Nation of Oklahoma
Matt Neville, Executive Director - Highland Springs Retirement Community
Bernard O'Brian, Facilities Manager - Qorvo
Mr. Ricardo Ortiz, President & CEO - Greater Dallas Hispanic Chamber of Commerce
Robert Pannell, Plano Masonic Lodge Member - Plano Masonic Lodge
Ms. Terri Parton, President - Wichita and Affiliated Tribes
Cookie Peadon, Representative - CBCCC/Highlands of McKamy IV-V
Roy Pendergrass, Chairman of the Board - Fairhill School
Rusty Pendleton, Board of Directors - The Country Place, Inc. Homeowners Association
Mr. Dale Petroskey, President - Dallas Regional Chamber
Peggy Ploss, Representative - Town of Addison
Frank Polma, Homeowner
Robert Pope, President - Robert W. Pope & Associates
Chip Pratt, Community Relations Director - Canyon Creek Homeowners Association
Mr. David Preziosi, Executive Director - Preservation Dallas
Stacia Price, CBCCC Steering - Highlands of McKamy
Carmen Prince - Coppell Greens
Jim Prince - Coppell Greens
Mike Reeves, Asst. Director - The Country Place, Inc. Homeowners Association
A Reynolds - Century Golf
John Richardson - Court Estates
Ellen Richardson, Representative - Highlands of McKamy 1-3 Homeowners Association
Melissa Robinson, Director - Small Miracles Daycare
Aryeh Rodin, Rabbi - Congregation Ohev Shalom
Barry Rosen, Homeowner - CBCCC
Jan Rugg, Board President - Addison Business Association
Dori Ruiz, Office Administrator - Grapevine Mills Mall
Chris Ryan, VP of Sales and Marketing - Air Liquid America
Amit Sangani - Chateaus of Coppell
Luis Santeliz, Representative - Town of Addison
Bob Sappington, President - Jackson Highlands Homeowners Association
Jean Schobert, Transportation Chair - North Dallas Neighborhood Alliance
Bill Schultz, Social Chairman - Bel Air of Josey Ranch Homeowners Association
Ken Schwantner - Creekview Homeowners Association
Chris Seaman, Owner - Seamans Lawn and Landscape, Inc.
Shannon Sear, Resident - Post Addison Circle



Angela Sham, Owner - Royale Ballet
Bonnie Shea, President - The Historic Downtown Plano Association
Russ Sikes, President - Tenth Street Industries
Larry Slawter, Horticulture Manager - Gaylord Texan Hotel & Convention Center
Tony Soto, Owner - Soto's Auto
Bill Sproull, President - Richardson Chamber of Commerce
Michelle St. Claire, Office Staff - Bush/75 Partners
Carla Stanford, Executive Director - Fairhill School
Jonathan Stites - Argent Property Company
Ms. Dottie Kelly - Time Warner Cable
Jeannie Stone, School Superintendent - Richardson ISD
Sam Swanson - Bush/75 Partners
Deb Tarantino, Representative - Highlands of McKamy 1-3 Homeowners Association
Neil Teitelman, President - CBCCC/Willow Green Condominiums
Sean Terry, Vice President - Centurion American
Barbara Thomas - Hudson Heights
Jeremy Thomason, President - Canyon Creek Homeowners Association
Susan Thompson, President - Campbell Green Neighborhood Association
Scott Vann - Southwood Estates
Gracie Vela, Manager - The Woodlands of Plano
Kisha Voss, President - Douglas Community Neighborhood Association
Bill Walker, Senior Vice President Development - Billingsley
Robert Weatherford, President - Carter Estates
Kevin Whitfield, Sr. V.P. Design/Development - Drury Hotel
Jim Wills, Partner - BC Station Pinsland
Roy Wilshire - Kimley-Horn
Richard Wiltshire - Carrollton Heights HOA
Mr. James Stuart, National Field Ops - Field Engineer - US Sprint
Mr. Buddy Smith - Verizon
David Wiseman - Congregation Ohev Shalom
Sally Wolfish, Representative - Prestonwood Homeowners Association
Tom Wood, Representative - Preston Green Homeowners Association
Hank Woodburn, Owner - Adventure Landing
Ulyssess Wright, President HOA - Oak Creek Estates Homeowners Association

A hard copy of the Draft EIS will be available for viewing at the following libraries:

Carrollton Public Library at Josey Ranch Lake – 1700 Keller Springs Rd., Carrollton, TX 75006
Cozby Library and Community Commons – 177 N. Hartz Rd., Coppell, TX 75019
Fretz Park Branch Library – 6990 Belt Line Rd., Dallas, TX 75254
Grapevine Public Library – 1201 Municipal Way, Grapevine, TX 76051
Harrington Library – 1501 18th St., Plano, TX 75074
Park Forest Branch Library – 3421 Forest Ln., Dallas, TX 75234
Richardson Public Library – 900 Civic Center Dr., Richardson, TX 75080



Acronyms

Acronym	Description
ARRP	Aquatic Resource Relocation Plan
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Materials
ACS	American Community Survey
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AFG	Area Focus Group
ALP	Airport Layout Plan
APAR	Affected Property Assessment Report
APE	Area of Potential Effect
APP	Airport Planning and Environmental Division
ASCE	American Society of Civil Engineers
ASR-9	DFW Airfield Surveillance Radar
AST	Above Ground Storage Tank
ASTM	American Society for Testing and Materials
AUL	Activity and Use Limitation
BEA	Bureau of Economic Analysis
BLS	Bureau of Labor Statistics
BMP	Best Management Practices
BNSF	BNSF Railway Co. (formerly known as the Burlington Northern Santa Fe Railroad)
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDC	Corridor Development Certificate
CEQ	Council on Environmental Quality
CESQG	Conditionally Exempt Small Quantity Generator
CERCLIS	Comprehensive Environmental Response Compensation & Liability Information System
CFR	Code of Federal Regulations
CGP	Construction General Permit
CLI	Closed and Abandoned Landfills
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CO	Carbon Monoxide
COA	Comprehensive Operations Analysis
CORRACTS	RCRA Corrective Action
CPS	Comprehensive Payment System
CT	Census Tract
CTA	Central Terminal Area
CTC	Centralized Traffic Control
CWA	Clean Water Act
DART	Dallas Area Rapid Transit
dBA	Decibel
dbh	Diameter At Breast height
DCAD	Dallas Central Appraisal District
DCTA	Denton County Transportation Authority
DEIS	Draft Environmental Impact Statement
DFW	Dallas-Fort Worth
DFW Airport	Dallas-Fort Worth International Airport
DGNO	Dallas Garland Northeastern Railroad
DMU	Diesel Multiple Unit
DNT	Dallas North Tollway



Acronym	Description
DOCKETS	EPA Docket Data
DOD	Department of Defense
DOT	Department of Transportation
DOI	Department of the Interior
EAD	DFW Airport Environmental Affairs Department
ECHO	EPA Enforcement and Compliance History Online
EDMS	Emissions and Dispersion Modeling System
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMF	Equipment Maintenance Facility
EMST	Ecological Systems Classification and Mapping Project
ENF	Enforcement Report
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Sites Assessment
EO	Executive Order
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Protection Policy Act of 1981
FR	Federal Register
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
FTTS	FIFRA/TSCA Tracking System
FWTA	Fort Worth Transportation Authority (also known as Trinity Metro)
FWWR	Fort Worth & Western Railroad
GC	General Condition
GCOR	General Code of Operating Rules
GCP	General Construction Permit
GCC	Groundwater Contamination Cases
GHG	Greenhouse Gas
HC	Hydrocarbons
HMIRS	Hazardous Material Information Resource System
Hz	Hertz
I-3	Orange Line DFW Airport Extension (IRVING-3)
I-35E	Eastern Split of Interstate Highway 35 (also commonly referred to as IH-35E)
IH	Interstate Highway
IHW	Industrial Hazardous Waste
IOP	Innocent Owner/Operator Program
I-ETMS	Interoperable Electronic Train Management System
ISD	Independent School District
ITS	Intelligent Transportation System
KAST	Kills and Spills Team
KCS	Kansas City Southern
LBJ	Lyndon B. Johnson Freeway
Ldn	Day-Night Sound Level
LEED	Leadership in Energy and Environmental Design
LEP	Limited English Proficiency
Leq	Equivalent Sound Level



Acronym	Description
LNAPL	Light Non-Aqueous Phase Liquid
LOS	Level of Service
LQG	large quantity generator
LRT	Light Rail Transit
LRV	Light Rail Vehicle
LPST	Leaking Petroleum Storage Tank
LWCF	Land and Water Conservation Fund Act
MAP-21	Moving Ahead for Progress in the 21st Century
MBTA	Migratory Bird Treaty Act
MMP	Mitigation Monitoring Program
µg/m ³	micrograms per cubic meter
mg/m ³	milligrams per cubic meter
MKT	Missouri, Kansas and Texas Railroad
MOA	Memorandum of Agreement
Mobility 2035	NCTCOG Mobility 2035: The Metropolitan Transportation Plan for North Central Texas
Mobility 2040	NCTCOG Mobility 2040: The Metropolitan Transportation Plan for North Central Texas
MOS	Minimum Operable Segment
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MPH	Miles per hour
MSA	Metropolitan Statistical Area
MS4	Municipal Separate Storm Sewer System
MSAT	Mobile Source Air Toxics
MTP	Metropolitan Transportation Plan
MVEB	Motor Vehicle Emissions Budget
NAAQS	National Ambient Air Quality Standards
NCTCOG	North Central Texas Council of Governments
NDNA	North Dallas Neighborhood Alliance
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NIST	National Institute of Standards and Technology
NLEV	National low emission vehicle
NLR	No Longer Regulated
NMHC	non-methane hydrocarbon
NOA	Notice of Availability
NOI	Notice of Intent
NOV	Notice of Violation
NO _x	Nitrous Oxides
NO ₂	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
NTD	National Transit Database
NTTA	North Texas Tollway Authority
NWI	National Wetlands Institute
NWP	Nation Wide Permit
O ₃	Ozone
O&M	Operations and Maintenance



Acronym	Description
OHWM	Ordinary High Water Mark
Pb	Lead
PCB	polychlorinated biphenyl
PCN	Pre-Construction Notification
PE	Preliminary Engineering
PGBT	President George Bush Turnpike
PIP	Public Involvement Plan
PM ₁₀	Particulate matter equal to or less than ten micrometers in diameter
PM _{2.5}	Particulate matter equal to or less than 2.5 micrometers in diameter
ppb	parts per billion
PTC	Positive Train Control
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
ROD	Record of Decision
ROE	Right-of-Entry
ROW	Right-of-Way
RPZ	Runway Protection Zone
RRIF	Railroad Rehabilitation and Improvement Financing
RRCS	Regional Rail Corridor Study (by NCTCOG)
RTC	Regional Transportation Council
RTHL	Recorded Texas Historic Landmark
SAL	State Antiquities Landmark
SCC	Standard Cost Categories
SEL	Sound exposure level
SEMS	Superfund Enterprise Management System
SH	State Highway
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
STB	Surface Transportation Board
STBG	Surface Transportation Block Grant
SUE	Subsurface Utility Engineering
SWPPP	Storm Water Pollution Prevention Plan
TAC	Texas Administrative Code
TAD	Tarrant Appraisal District
TARL	Texas Archeological Research Laboratory
TASA	Texas Archeological Sites Atlas
TCEQ	Texas Commission on Environmental Quality
TDA	Tire Derived Aggregate
THC	Texas Historical Commission
THSA	Texas Historic Sites Atlas
TIP	Transportation Improvement Program
TMDL	total maximum daily loads
TMP	Traffic Management Plan
TOD	Transit-Oriented Development
TPDES	Texas Pollutant Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TRB	Transportation Research Board
TRE	Trinity Railway Express
TRIS	Toxic Release Inventory System
TSA	Transportation Security Administration
TSP	Transit System Plan
TSS	Total Suspended Solids



Acronym	Description
TSCA	Toxic Substances Control Act
TWDB	Texas Water Development Board
TxDOT	Texas Department of Transportation
TxDPS	Texas Department of Public Safety
TXNDD	Texas Natural Diversity Database
UP	Union Pacific
URA	Uniform Relocation Assistance and Real Property Acquisition Policies Act
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UTD	University of Texas - Dallas
VCP	Voluntary Cleanup Program
VdB	Vibration velocity (in decibels)
VOC	Volatile Organic Compounds
VHT	Vehicle Hours Traveled
VMT	Vehicle Miles of Travel
YOE	Year-of-Expenditure

References

All About Birds (AAB)

- 2017a Red Knot. Accessed online https://www.allaboutbirds.org/guide/Red_Knot/lifehistory June 23, 2017.
- 2017b Sprague's Pipit. Accessed online https://www.allaboutbirds.org/guide/Spragues_Pipit/id, June 23, 2017.
- 2017c. Burrowing Owl. Accessed online https://www.allaboutbirds.org/guide/Burrowing_Owl/id, June 23, 2017.

American Society of Testing Materials (ASTM)

- 2013 E 1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

AIRNow

- 2017 Ozone. Accessed April 19, 2017.
<http://www.airnow.gov/index.cfm?action=aqibasics.ozone>

American Association of State Highway and Transportation Officials

- 2016 Practitioner's Handbook Number 12. Assessing Indirect Effects and Cumulative Impacts Under NEPA.

American Public Transit Administration (APTA)

- 2007 Standard for Rail Transit Grade Crossing Warning System Design Criteria, Installation and Operation (APTA RT-S-RGC-004-03).

American Railway Engineering and Maintenance of Way Association (AREMA)

- 2017 Communications and Signals Manual

Anderson, Jacob E.

- 1957 80 Years of Transportation Progress: A History of the St. Louis Southwestern Railway. Story-Wright

Audubon

- 2017 Guide to North American Birds. Accessed online at <http://www.audubon.org/field-guide/bird/henslows-sparrow>, June 30, 2017.

Black, Stephen L.

- 1989 Central Texas Plateau Prairie. In *From the Gulf to the Rio Grande: Human Adaptation in Central, South, and Lower Pecos Texas*, by T. R. Hester, S. L. Black, D. G. Steele, B. W. Olive, A. A. Fox, K. J. Reinhard, and L. C. Bement, pp. 17–36. Research Series No. 33. Arkansas Archeological Survey, Fayetteville.

Blair, W. F.

- 1950 The Biotic Provinces of Texas. *The Texas Journal of Science* 2: 93-117.

Bousman, C. B.

- 1998 Paleoenvironmental Change in Central Texas: The Palynological Evidence. *Plains Anthropologist* 43(164):201–219.



Brownlow, R. K., D. J. Prikryl, T. Gustavson, J. Garner, and M. B. Collins

- 1999 An Intensive Cultural Resources Survey of the Texas Army National Guard's Fort Wolters Facility, Parker and Palo Pinto Counties, Texas. Studies in Archeology 32, Texas Archeological Research Laboratory, The University of Texas at Austin. Environmental Report 1, Texas Army National Guard, Austin.

Bruseth, J. E., and W. A. Martin (editors)

- 1987 The Bird Point Island and Adams Ranch Sites: Methodological and Theoretical Contributions to North Central Texas Archaeology. Richland Creek Technical Series, Vol II. Archaeology Research Program, Southern Methodist University, Dallas, Texas.

Campbell, Jeff

- 2017 Davis Cemetery. *Plano Magazine*. 7 February. Electronic Document, <http://planomagazine.com/davis-cemetery/>, accessed July 3, 2017.

Campbell, L.

- 1995 Endangered and Threatened Animals of Texas, Their Life History and Management. Texas Parks and Wildlife Department PWD BK W7000-013.

City of Carrollton

- 2006 Downtown Carrollton Transit-Oriented Development, *Carrollton Trails Master Plan*. Available online <https://www.cityofcarrollton.com/home/showdocument?id=1970>.

City of Coppell

- 2015 History of Coppell. Electronic Document, <http://www.coppelltx.gov/about-coppell/history-of-coppell>, accessed July 5, 2017.
- 2016 Coppell 2030 – A Comprehensive Plan. Available online <http://en.calameo.com/books/003114634e97aaebed956>

City of Dallas

- 2006 ForwardDallas! Available online <http://dallascityhall.com/departments/pnv/strategic-planning/Pages/comprehensive-plan.aspx>
- 2010 Cypress Waters TIF District. Available online <https://www.dallasecodel.org/420/Cypress-Waters-TIF-District>

City of Plano

- N.d. City of Plano History. Electronic Document, <https://www.plano.gov/1797/City-of-Plano-History>, accessed June 30, 2017.
- 2015 Plano Tomorrow Comprehensive Plan <http://www.planotomorrow.org/>
- 2017 Downtown Plano Vision and Strategy Update

City of Richardson

- 2009 2009 Comprehensive Plan. Available online <https://www.cor.net/modules/showdocument.aspx?documentid=899>
- 2011 Caruth Properties Transit Oriented Planned Development Code
- 2017 Historical Setting of Richardson. Electronic Document, <https://www.cor.net/index.aspx?page=799>, accessed July 10, 2017.



Collins, M. B.

- 1995 Forty Years of Archeology in Central Texas. *Bulletin of the Texas Archeological Society* 66:361–400.

Coppell Historical Society

- N.d. A Brief History of Coppell. Electronic Document, <http://www.coppellhistoricalsociety.org/history.html>, accessed July 5, 2017.
- 2015 Coppell Map 1. Electronic Document, <http://www.coppellhistoricalsociety.org/coppellmap1915-1930.html>, accessed July 10, 2017.

Council on Environmental Quality

- 1997 Considering Cumulative Effects Under the National Environmental Policy Act.

Dallas Area Rapid Transit (DART)

- 1997 Betterments Policy for Residential Areas. Resolution No. 970217.
- 2001 Light Rail Transit System Development Procedures Policy. Resolution No. 010117.
- 2011 DART LRT Project Design Criteria Manual, Volume Number 1. Infrastructure Design Criteria. <https://www.dart.org/ShareRoot/about/expansion/cottonbelt/aecr/AppendixD/5%20-%20Design-Criteria-Manual-V1.pdf> Date Accessed: May 1, 2017.
- 2014 Dallas-Fort Worth Airport Land Use Plan. Available online <https://dfwairport.com/landhere/useplan/index.php>
- 2016 Environmental Impact Assessment and Mitigation Guidelines for Transit Projects.
- 2017 DART Police Department History. <http://www.dart.org/about/dartpolice/dartpolicehistory.asp> Date Accessed: April 26, 2017.

Dallas Geological Society

- 1965 The Geology of Dallas County: Symposium on Surface and Subsurface Geology, Gravity, Physiography, Underground Water Supply, Economic Geology and Engineering Geology of Dallas County. Dallas, Texas.

Diamond, D. D. and F. E. Smeins

- 1993 The Native Plant Communities of the Blackland Prairie. In: M. R. Sharpless and J. C. Yelderian [eds.]. *The Texas Blackland Prairie: Land, history, and culture*. Waco, TX: Baylor University Press. pp. 66–81.

DFW International Airport Land Use Plan, 2014

Environmental Data Resources, Inc. (EDR)

- 2017a Cotton Belt Corridor Project - EDR Data Map TM Environmental Atlas (4928025.5s). Dated May 18, 2017.
- 2017b EDR DataMap TM Corridor Study (4999692.5s). Dated July 24, 2017.

Environmental Protection Agency (EPA)

- 2013 Descriptions of the Level IV Ecoregions of Texas. Electronic document, ftp://newftp.epa.gov/EPADDataCommons/ORD/Ecoregions/tx/tx_back.pdf, accessed June 30, 2017.



- 2017 Particulate Matter (PM) Pollution. Accessed April 19, 2017. <https://www.epa.gov/pm-pollution/particulate-matter-pm-basics#effects>
- 2017 NAAQS Table. Accessed April 7, 2017. <https://www.epa.gov/criteria-air-pollutants/naaqs-table>
- 2017a Accessed April 19, 2017. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>
- 2017b Mobile Source Pollution and Related Health Effects. Accessed April 19, 2017. <https://www.epa.gov/mobile-source-pollution>
- 2017 *Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks*. <https://www.epa.gov/children/executive-order-13045-protection-children-environmental-health-risks-and-safety-risks> Date Accessed: May 1, 2017.

Federal Aviation Administration (FAA)

- 2015 1050.1F Desk Reference, Washington, DC, 2015a, 0-1
https://www.faa.gov/about/office_org/headquarters_offices/apl/enviro_policy_guidance/policy/faq_nepa_order/desk_ref/media/desk-ref.pdf
- 2015a Order 1050.1F - Environmental Impacts: Policies and Procedures, U.S. Department of Transportation, Washington, D.C., July 16, 2015.
https://www.faa.gov/documentLibrary/media/Order/FAA_Order_1050_1F.pdf
- 2006a FAA Order 5050.4b - National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, U.S. Department of Transportation, Washington, D.C., April 28, 2006a.
https://www.faa.gov/airports/resources/publications/orders/environmental_5050_4/

Federal Transit Administration (FTA)

- 2006 Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06)
- 2016 Environmental Resources Information. Indirect and Cumulative Impacts.
www.transit.dot.gov/regulations-and-guidance/environmental-programs/environmental-resources-information-0.
- 2016 Social Resources and Economic Impacts. www.transit.dot.gov/regulations-and-guidance/environmental-programs/social-resources-and-economic-impacts.

Federal Highway Administration (FHWA)

- 1996 *Community Impact Assessment: A Quick Reference for Transportation*.
https://www.fhwa.dot.gov/livability/cia/quick_reference/chapter00.cfm.
- 2006 Construction Noise Handbook.
- 2016 Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents. Accessed April 19, 2017.
https://www.fhwa.dot.gov/ENVIRONMENT/air_quality/air_toxics/policy_and_guidance/msat/

Ferring, C. R.

- 2001 *The Archeology and Paleoecology of the Aubrey Clovis Site (41DN479), Denton County, Texas*. Center for Environmental Archeology, Department of Geography, University of North Texas, Denton.

Ferring, C. R., and B. C. Yates

- 1997 Holocene Geoarcheology and Prehistory of the Ray Roberts Lake Area, North Central Texas. Institute of Applied Sciences, University of North Texas, Denton.



Fort Worth Transportation Authority

- 2008 Draft Environmental Impact Statement. Online. Available at <http://www.texrail.com/draft-environmental-impact-statement/>. Accessed July 20, 2017.
- 2015 Final Environmental Impact Statement. Online. Available at <http://www.texrail.com/final-environmental-impact-statement/>. Accessed July 20, 2017.

Freeman, B.

- 2003 Birds of the Oaks and Prairies and Osage Plains of Texas: A Field Checklist. Texas Parks and Wildlife Department PWD BK W7000-869.

George, P., Mace R., and Petrossian, R.

- 2011 "Aquifers of Texas". Report 380. July 2011. Available online: http://www.twdb.texas.gov/publications/reports/numbered_reports/doc/R380_AquifersofTexas.pdf.

Gilbert, M.T.P., D.L. Jenkins, A. Gotherstrom, N. Naveran, J.J. Sanchez, M. Hofreiter, P.F. Thomsen, J. Binladen, T.F.G. Higham, R.M. Yohe II, R. Parr, L.S. Cummings and E. Willerslev

- 2008 DNA from Pre-Clovis Human Coprolites in Oregon, North America. *Science* 320: 786-789.

Grapevine Convention and Visitors Bureau

- 2017 Grapevine History. Electronic Document, <https://www.grapevinetexasusa.com/plan/history/>, accessed July 7, 2017.

Greaves, R. D.

- 2003 *Camp Maxey 5: Archaeological Testing of Seven Sites on the Camp Maxey Training Facility, Lamar County, Texas*. Archaeological Survey Report No. 330. Center for Archaeological Research, The University of Texas at San Antonio.

Griffith, Glen, Sandy Bryce, James Omernik, and Anne Rogers

- 2007 Ecoregions of Texas. Texas Commission on Environmental Quality.

Hartsfield, Shelley, Christopher R. von Wedell, Michelle Davenport, and Michael M. Margolis

- 2013 Archaeological Resources Intensive Survey of the Fort Worth Transportation Authority TEX Rail Corridor, Tarrant County, Texas. URS, Dallas.

HMMH

- 2013 Cotton Belt Corridor Regional Rail Noise and Vibration Existing Conditions Technical Memorandum.
- 2014 Noise and Vibration Test Program for the DCTA Stadler DMU.

Howard, Erica and Deborah Dobson-Brown

- 2017 Historic-Age Resource Reconnaissance Survey of Station Locations, Cotton Belt Corridor. AmaTerra Environmental, Inc., Austin, Texas.

International Crane Foundation (ICF)

- 2017 Wintering Whooping Crane Update. Accessed online at https://www.fws.gov/refuge/Quivira/wildlife_and_habitat/whooping_crane.html June 23, 2017.



Kenmotsu, N., and T. Perttula

- 1993 *Archeology in the Eastern Planning Region, Texas: A Planning Document*. Cultural Resource Management Report 3. Department of Antiquities Protection, Texas Historical Commission, Austin.

King, Jim G.

- 2014 Tower 49 and Tower 166 - Plano. Electronic Document, <http://txrrhistory.com/towers/049/049.htm>, accessed July 17, 2017.

Klym, M., and G.P. Garrett

- 2002 Texas Non-game Freshwater Fishes. Texas Parks and Wildlife Department PWD BK W7000-798 (1/02).

Lady Bird Johnson Wildflower Center

- 2017 Native Plants Database. Accessed online at <https://www.wildflower.org/plants/> June 23, 2017.

Mauldin, R. P., and D. L. Nickels

- 2001 *An Archeological Survey of Twin Buttes Reservoir, Tom Green County, Texas*. Archeological Survey Report, No. 300. Center for Archeological Research, The University of Texas at San Antonio.

Maxwell, Lisa C.

- 2010 a Addison, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hfa01>, accessed July 5, 2017.
2010 b Richardson, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hdr01>, accessed July 10, 2017.

McElhaney, Jackie and Michael V. Hazel

- 2015 Dallas, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hdd01>, accessed July 1, 2017.

McKay, D., K. Kahl, and R. Proctor

- 2003 Cultural Resources Inventory of 3,942 Acres at Five Lakes in Eastern Oklahoma and Northeastern Texas: Tenkiller, Eufaula, Fort Gibson, Pat Mayse, and Texoma. Report of Investigations Number 3. Lopez Garcia Group, Dallas.

McMahan, Craig A., Roy g. Frye and Kirby L. Brown

- 1984 The Vegetation Types of Texas Including Cropland. Wildlife Division Texas Parks and Wildlife Department, Austin, Texas.

Murph, Jean and Lou Duggan

- 2016 *Coppell, Texas: A History*. The History Press, Charleston, SC.

Museum of the American Railroad

- 2016 A History of Railroads in Dallas. Electronic document, <http://www.museumoftheamericanrailroad.org/learn/ahistoryofrailroadsinnorthtexas.aspx>, accessed June 28, 2017.



Nall, Matthew Hayes

- 2010 Coppel, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hgc15>, accessed July 5, 2017.

National Aeronautical and Space Administration (NASA)

- 2017 Global Climate Change. Accessed April 19, 2017. <https://climate.nasa.gov/>

National Weather Service (NWS)

- 2017 DFW Climate Narrative. Electronic Document, <http://www.weather.gov/fwd/>, accessed June 30, 2017.

National Wildlife Federation (NWF)

- 2017 Alligator Snapping Turtle. Accessed online at <https://www.nwf.org/Wildlife/Wildlife-Library/Amphibians-Reptiles-and-Fish/Alligator-Snapping-Turtle.aspx>, on June 30, 2017.

NatureServe

- 2017a *Lampsilis satura*. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchSpeciesUid=ELEMENT_GLOBAL.2.11_7064 June 23, 2017.
- 2017b *Agalinis densiflora*. Accessed online at <http://explorer.natureserve.org/servlet/NatureServe?searchName=Agalinis+densiflora>, June 30, 2017.
- 2017c *Matelea edwardsensis*. Accessed online at <http://explorer.natureserve.org/servlet/NatureServe?searchName=Pediomelum+reverchonii>, June 30, 2017.
- 2017d *Pediomelum reverchonii*. Accessed online at <http://explorer.natureserve.org/servlet/NatureServe?searchName=Matelea+edwardsensis>, June 30, 2017.
- 2017e *Astragalus reflexus*. Accessed online at http://explorer.natureserve.org/servlet/NatureServe?searchSpeciesUid=ELEMENT_GLOBAL.2.13, June 30, 2017.
- 2017f *Cuscuta exaltata*. Accessed online at <http://explorer.natureserve.org/servlet/NatureServe?searchName=Cuscuta+exaltata>, June 30, 2017.
- 2017g *Lordithon niger*. Accessed online at <http://explorer.natureserve.org/servlet/NatureServe?searchName=Lordithon+niger>, June 30, 2017.

North American Orchid Conservation Center (NAOCC)

- 2017 *Hexalectris nitida* – Glass Mountain Coral Root, Shining Cock's Comb. Accessed online at <http://goorchids.northamericanorchidcenter.org/species/hexalectris/nitida/?pile=orchid-monocots> May 8, 2017.

North Central Texas Council of Governments (NCTCOG)

- 2015 Land Use Data. Accessed online <http://rdc.nctcog.org/>
- 2016a 2016 Transportation Conformity. Accessed April 19, 2017. <http://www.nctcog.org/trans/air/conformity/2016TransportationConformity.asp>
- 2016b Mobility 2040. Accessed April 19, 2017. <http://www.nctcog.org/trans/mtp/2040/>
- 2017 Air Quality Program. Accessed April 7, 2017. <http://www.nctcog.org/trans/air/>



National Cooperative Highway Research Program

- 2002 Report 466: Desk Reference for Estimating the Indirect Effects of Proposed Transportation Projects.

National Park Service (NPS)

- 1997 *How to Apply the National Register Criteria for Evaluation*. U.S. Department of the Interior, Washington, D.C.

Poole, J.M., W.R. Carr, D.M. Price, and J.R. Singhurst

- 2007 Rare Plants of Texas. Texas A&M University Press, College Station, Texas.

Natural Resources Conservation Service (NRCS)

- 1969 Soil Survey of Collin County, Texas. United States Department of Agriculture.
1980 Soil Survey of Dallas County, Texas. United States Department of Agriculture.
1981 Soil Survey of Tarrant County, Texas. United States Department of Agriculture.
2017 Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.sc.egov.usda.gov/>. Accessed (03/29/2017).

Perez, Joan Jenkins

- 2010 Carrollton, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hdc01>, accessed July 5, 2017.

Peter, D. E., and D. E. McGregor (editors)

- 1988 *Late Holocene Prehistoric of the Mountain Creek Drainage*. Joe Pool Lake Archaeological Project Vol.1. Archaeology Research Program of North Texas, Denton.

Perttula, Timothy K.

- 1995 The Archeology of the Pineywoods and Post Oak Savanna of Northeast Texas. *Bulletin of the Texas Archeological Society* 66:331–359.
2004 An Introduction to Texas Prehistoric Archaeology. In *The Prehistory of Texas*, edited by Timothy K. Perttula, pp. 5–13. Texas A&M Press, College Station.

Prikryl, D. J.

- 1990 Lower Elm Fork Prehistory: A Redefinition of Cultural Concepts and Chronologies along the Trinity, North Central Texas. Report No. 37. Office of the State Archeologist, Texas Historical Commission, Austin.

Prikryl, D. J., and B. C. Yates (editors)

- 1987 *Test Excavations at 41CO141, Ray Roberts Reservoir, Cooke County, Texas*. Institute of Applied Sciences, North Texas State University, Denton.

Pitblado, B.L.

- 2011 A Tale of Two Migrations: Reconciling Recent Biological and Archaeological Evidence for the Pleistocene Peopling of the Americas. *Journal of Archaeological Research* 19(4): 327-375.

Railroad Commission of Texas

- 2015 Early Texas Railroads. Electronic document, <http://www.rrc.state.tx.us/about-us/history/informal-history-toc/early-texas-railroads/>, accessed June 28, 2017.



Ricklis, R. A.

- 1992 The Spread of the Late Prehistoric Bison Hunting Complex: Evidence from the South-Central Coastal Prairie of Texas. *Plains Anthropologist* 37(140):261–273.

RRCT

- 2016 Public GIS Viewer. Last updated December 6, 2016. <http://www.rrc.state.tx.us/about-us/resource-center/research/gis-viewers/>

Sabo, G., III, and A. M. Early

- 1990 Prehistoric Culture History. In *Human Adaptation in the Ozark and Ouachita Mountains*, by G. Sabo, III, A. M. Early, J. C. Rose, B. A. Burnett, L. Vogelee, Jr., and J. P. Harcourt, pp. 34–120. Arkansas Archeological Survey Research Series Number 31. Arkansas Archeological Survey, Fayetteville.

Schell, Shirley and Francis B. Wells

- 2010 Plano, TX. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/hdp04>, accessed June 30, 2017.

Schmidly, D.J.

- 2004 *The Mammals of Texas*, revised edition. University of Texas Press, Austin, Texas.

Shuler, E.W.

- 1918 The Geology of Dallas County. University of Texas Bulletin No. 1818: March 25, 1918. Bureau of Economic Geology and Technology, Division of Economic Geology.

Singhurst, Jason.

- 2015 Flora Fact: Over and Over Prairie Clovers come in all Shapes and Sizes. Accessed online https://www.tpwmagazine.com/archive/2015/jul/scout3_florafact_clover/ May 8, 2017.

Singleton, Kate, Nicky DeFreece Emery, Deborah Dobson-Brown, Tanya McDougall, and Kasey Fox

- 2013 Historic Resources Reconnaissance Survey Report for the Proposed Cotton Belt Corridor Regional Rail Project, Tarrant, Dallas, and Collin Counties, Texas. URS Corporation, Dallas.

Solamillo, Stan

- 1997 Cotton Belt Railroad Industrial Historic District NRHP Registration Form. Electronic Document, <https://atlas.thc.state.tx.us/NR/pdfs/97001109/97001109.pdf>, accessed July 7, 2017.

Story, D. A.

- 1990 Culture History of the Native Americans. In *Archeology and Bioarcheology of the Gulf Coastal Plain*. Volume I, by D. A. Story, J. A. Guy, B. A. Burnett, M. D. Freeman, J. C. Rose, D. G. Steele, B. W. Olive, and K. J. Reinhard, pp. 163–366. Arkansas Archeological Survey Research Series Number 38. Arkansas Archeological Survey, Fayetteville.

Swaminathan, N.

- 2014 Debra L. Friedkin Site. American Archaeology Magazine Online. <http://www.archaeology.org/issues/145-1409/features/2371-peopling-the-americas-friedkin-site>, accessed July 1, 2017.



Tennant, Alan.

- 1985 A Field Guide to Texas Snakes. Texas Monthly Press. Austin, Texas.

Texas Commission on Environmental Quality (TCEQ)

- 2004 Atlas of Texas Surface Waters: Maps of the Classified Segments of Texas River and Coastal Basins. TCEQ Publication GI-316, August 2004.
- 2013 Priority Groundwater Management Areas (PGMAs). December 2013.
https://www.tceq.texas.gov/assets/public/permitting/watersupply/groundwater/maps/pgma_areas.pdf.
- 2015 Texas Integrated Report of Surface Water Quality. Approved by the EPA on November 19, 2015.
- 2017 Continuous Air Monitoring Station (CAMS) webpage. Accessed April 9, 2017.
http://www17.tceq.texas.gov/tamis/index.cfm?fuseaction=report.site_list

Texas Department of Transportation

- 2015 Environmental Handbook: Community Impacts, Environmental Justice, Limited English Proficiency and Title VI Compliance.
- 2016 Indirect Impacts Analysis Guidance.
- 2016 Cumulative Impacts Analysis Guidelines.

Texas Historical Commission (THC)

- 2009 “THC Letter Dated 21 December 2009: Project review under Section 106 of the National Historic Preservation Act of 1966 Proposed Abandonments/Discontinuances in Collin and Dallas counties, Texas (STB).” Letter on File at THC, Austin, Texas, and URS, Dallas, Texas.

Texas Parks and Wildlife Department (TPWD)

- 2009 TPWD News Release November 5, 2009: 15 Texas Freshwater Mussels Placed on State Threatened List. Accessed online at
<http://www.tpwd.state.tx.us/newsmedia/releases/?req=20091105c>, December 3, 2009.
- 2016 Ecological Systems Classification and Mapping Project. Accessed online at
http://tpwd.texas.gov/arcgis/rest/services/Vegetation_Mapping/Texas_Ecological_Mapping_Systems_Data/MapServe, April 27, 2017.
- 2017a Texas Natural Diversity Database. Element of Occurrence and shapefile data for the *Addison, Carrollton, Garland, Grapevine, Hebron, Lewisville East, Lewisville West, Plano, Rowlett, and Wylie, Texas* USGS topographic quadrangles, received June 20, 2017.
- 2017b Annotated County Lists of Rare Species: Collin County (last revision 12/30/2016), Dallas County (last revision 12/30/2016), and Tarrant County (last revision 12/30/2016).
<http://gis.tpwd.state.tx.us/TpwEndangeredSpecies/DesktopDefault.aspx>, accessed June 11, 2017.
- 2017c Whooping Crane. Accessed online at
<http://tpwd.texas.gov/huntwild/wild/species/whooper/>, on July 3, 2017.
- 2017d White-faced Ibis (*Plegadis chihi*). <http://www.tpwd.state.tx.us/huntwild/wild/species/ibis/>, accessed June 27, 2017.
- 2017e Louisiana Pigtoe (*Pleurobema riddellii*). Accessed online at
<https://www.fws.gov/southwest/es/ArlingtonTexas/pdf/Louisiana%20pigtoe%20fact%20sheet%2020170301.pdf> June 23, 2017.



- 2017f Texas horned Lizard (*Phrynosoma cornutum*). Accessed online at <http://tpwd.texas.gov/huntwild/wild/species/thlizard/>, on June 30, 2017.
- 2017g Timber rattlesnake (*Crotalus horridus*). Accessed online at <http://www.tpwd.state.tx.us/huntwild/wild/species/timberrattlesnake/>, accessed July 3, 2017.
- 2017h Cave Myotis (*Myotis velifer*). Accessed online at <http://www.tpwd.state.tx.us/huntwild/wild/species/cavemyotis/>, accessed June 27, 2017.

Texas Water Development Board (TWDB)

- 2007 "Northern Trinity/Woodbine GAM Assessment of Groundwater Use in the Northern Trinity Aquifer Due To Urban Growth and Barnett Shale Development". January 2007. https://www.twdb.texas.gov/groundwater/models/gam/trnt_n/TRNT_N_Barnett_Shale_Report.pdf
- 2013 Texas Water Development Board Groundwater Database. 2013. Available for download online: <http://www.twdb.texas.gov/groundwater/data/gwdbbrpt.asp>.
- 2014 Major Aquifers of Texas. http://www.twdb.texas.gov/mapping/doc/maps/Major_Aquifers_36x36.pdf Last updated January 2014.
- 2017 Population Projections in Texas. <http://www.twdb.texas.gov/waterplanning/data/projections/2017/popproj.asp>.
- 2017 Trinity Aquifer. Summary. <http://www.twdb.texas.gov/groundwater/aquifer/majors/trinity.asp>. Accessed June 29, 2017.

Toomey, R. S., M. D. Blum, and S. Valastro, Jr.

- 1993 Late Quaternary Climates and Environments of the Edwards Plateau, Texas. *Global and Planetary Change* 7:299–320.

Town of Addison

- 2006 The Blueprint
- 2013 Comprehensive Plan
- 2016 Master Transportation Plan

U.S. Army Corps of Engineers (USACE)

- 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0), ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- USACE, 1987 Corps of Engineers Wetlands Delineation Manual, Wetlands Research Program Technical Report Y-87-1, Vicksburg, MS, January 1987.
- Available at: <http://www.cpe.rutgers.edu/Wetlands/1987-Army-Corps-Wetlands-Delineation-Manual.pdf>

U.S. Bureau of Economic Analysis

- 2016 https://bea.gov/iTable/index_regional.cfm.



U.S. Bureau of Labor Statistics

- 2017 Labor Force Data and Unemployment Statistics.
https://www.bls.gov/regions/southwest/news-release/areaemployment_dallasfortworth.htm.

U.S. Census Bureau (USCB)

- 2010 *2010 Census*, American Fact Finder.
<https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>.
- 2016 *2011-2015 American Community Survey 5-Year Estimates*, American Fact Finder.
<https://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t>.
- 2017 American Community Survey 2011-2015. Accessed online
<https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml> March 29, 2017.

U.S. Department of Agriculture - Natural Resources Conservation Service (USDA-NRCS)

- 2017 Web Soil Survey. Electronic document,
<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, accessed June 30, 2017.

U.S. Department of Health and Human Services

- 2017 *Poverty Guidelines*. <https://aspe.hhs.gov/poverty-guidelines>.

United States Federal Bureau of Investigation (FBI)

- 2015 Uniform Crime Reporting Program. <https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s.-2015/offenses-known-to-law-enforcement/offenses-known-to-law-enforcement> Date Accessed: April 26, 2017.

U.S. Fish and Wildlife Service (USFWS)

- 1994 Endangered and Threatened Wildlife and Plants; Removal of Arctic Peregrine Falcon from the List of Endangered and Threatened Wildlife. Federal Register, Vol. 59 No. 192, p. 50796-50805, October 5, 1994.
- 1999 Endangered and Threatened Wildlife and Plants; Final Rule To Remove the American Peregrine Falcon From the Federal List of Endangered and Threatened Wildlife, and To Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Conterminous United States; Final Rule. Federal Register, Vol. 64 No. 164, p. 46543-46558, August 25, 1999.
- 2009 Endangered and Threatened Wildlife and Plants; 90-Day Finding on Petitions to List Nine Species of Mussels from Texas as Threatened or Endangered with Critical Habitat. Federal Register, Vol. 74 No. 239, p. 66260-66271, December 15, 2009.
- 2013 Federal Geographic Data Committee, 2013, Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013, Second Edition, Wetlands Subcommittee. Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.
- 2017a Endangered Species List by County for Texas: Collin, Dallas, and Tarrant Counties. <http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm>, accessed June 20, 2017.
- 2017b Whooping Crane, *Grus Americana*. Accessed online at https://www.fws.gov/refuge/Quivira/wildlife_and_habitat/whooping_crane.html, June 23, 2017.
- 2017c U.S. Fish and Wildlife Service, Midwest Region: Bald Eagle. <http://www.fws.gov/midwest/eagle/>, accessed June 27, 2017.



- 2017d U.S. Fish and Wildlife Service Species Profile: Peregrine Falcon (*Falco peregrinus*). Accessed online at http://tpwd.texas.gov/publications/pwdpubs/media/pwd_bk_w7000_0013_peregrine_falcon.pdf, June 29, 2017.
- 2017e U.S. Fish and Wildlife Service Species Profile: Wood stork (*Mycteria americana*). Accessed online at <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=B06Q>, June 29, 2017.
- 2017f U.S. Fish and Wildlife Service Species Profile: Shovelnose Sturgeon (*Scaphirhynchus platorhynchus*). Accessed online at <https://www.fws.gov/midwest/fisheries/library/broch-shovelnose.pdf>, June 29, 2017.
- 2017g Environmental Conservation Online System. Plains Spotted skunk. Accessed online at <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0GI#lifeHistory>, July 3, 2017.
- 2017 National Wetlands Inventory Wetlands Mapper. <https://www.fws.gov/wetlands/data/mapper.html>. Accessed June 21, 2017.
- U.S. Geological Survey (USGS)
- 1973 24k topographic map for the *Garland, Texas* quadrangle.
- 1981 24k topographic map for the *Grapevine, Carrollton, Plano, and Addison, Texas* quadrangles.
- 2007 Geological Database of Texas. Vector digital GIS data. Austin.
- 2017 USGSTopo (MapServer) https://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer. Last updated June 2017. Accessed June 21, 2017.
- University of Texas – Bureau of Economic Geology (UT-BEG)
- 1987 Geologic Atlas of Texas: Dallas Sheet. University of Texas – Dallas, 2013. Campus Master Plan Update 2013
- University of Texas, Dallas (UTD)
- 2009 North Campus TOD Plan
- 2013 Master Plan
- Wade, Harry E.
- 2010 Peters Colony. *Handbook of Texas Online*. Electronic Document, <https://tshaonline.org/handbook/online/articles/uep02>, accessed July 1, 2017.
- Webb, W. P. (editor)
- 1952 *The Handbook of Texas*. 2 Vols. Texas State Historical Association, Austin, Texas.
- Weniger, Del
- 1997 The Explorers' Texas Volume 2: The Animals They Found. Eakin Press, Austin.
- Werler, John E. and James R. Dixon
- 2000 Texas Snakes; Identification, Distribution, and Natural History. University of Texas Press.
- Werner, George C.
- 2010 Railroads. *Handbook of Texas Online*. Electronic document, <https://tshaonline.org/handbook/online/articles/eqr01>, accessed June 28, 2017.



Young, Charles H.

- 2010 Grapevine, TX. *Handbook of Texas Online*. Electronic document, <https://tshaonline.org/handbook/online/articles/heg02>, accessed July 5, 2017.